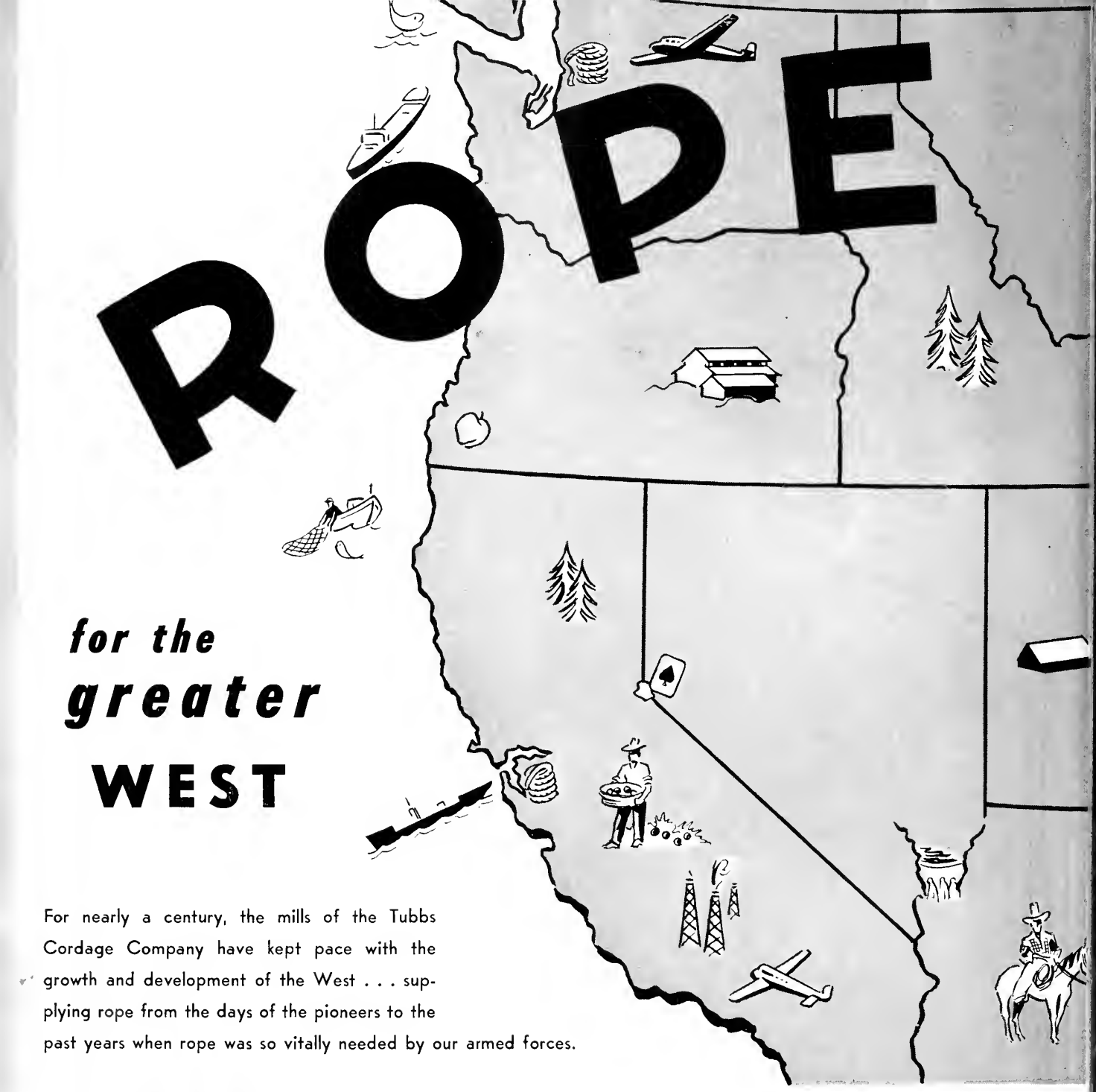
Pacific MARINE REVIEW

JANUARY 1946



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Pacific Marine Review

OFFICIAL ORGAN
Pacific American
Steamship Association

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Shipowners Association
of the Pacific Coast

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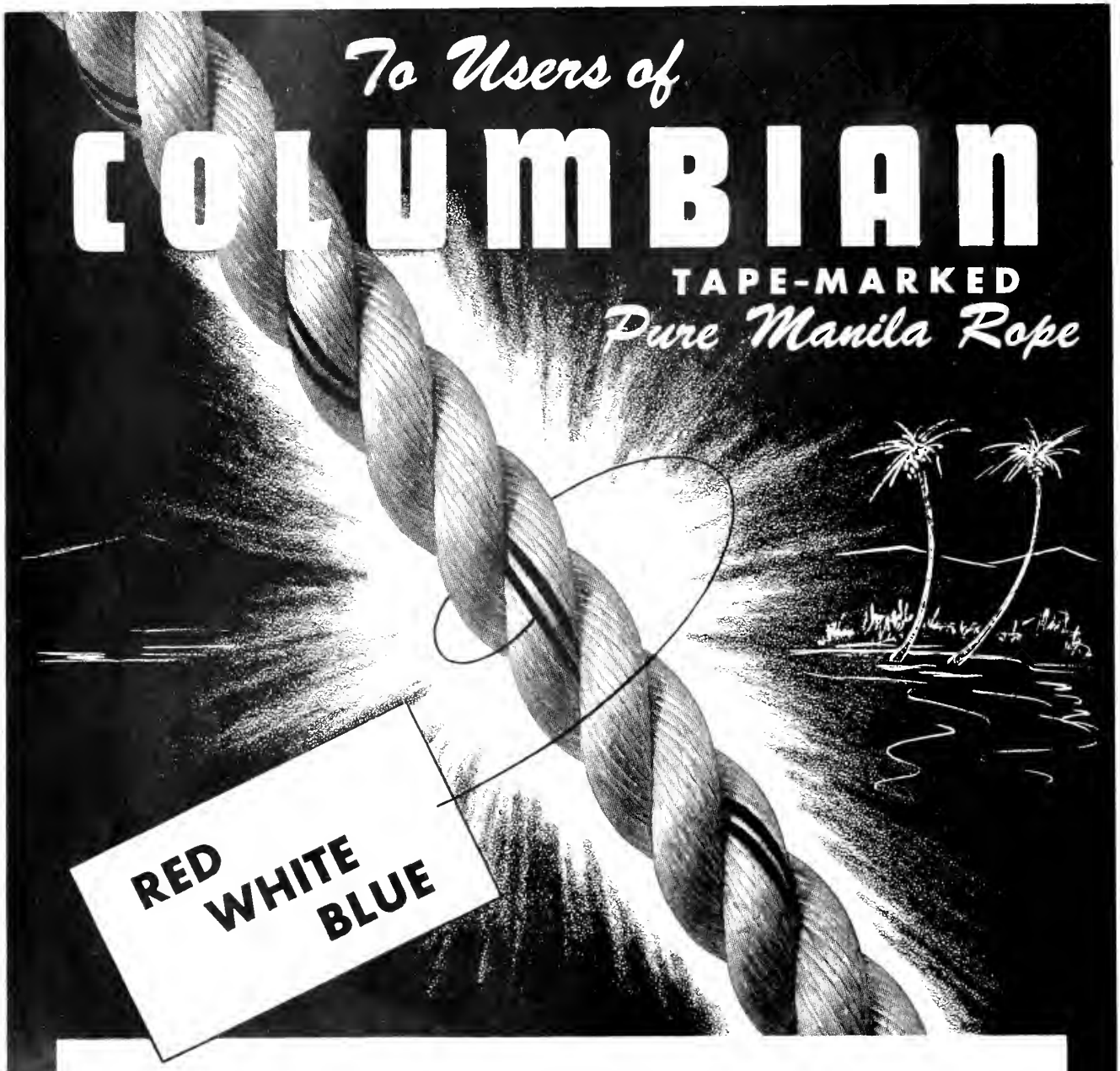


BEFORE the War, our own organization in the Philippines selected the pick of the crop of manila fibre. They bought, graded, and packed the fibre which was made into the famous COLUMBIAN TAPE-MARKED PURE MANILA ROPE. Naturally, the war destroyed that organization and its facilities as a working unit.

Today, we are busily rebuilding that organization and its facilities under the most extreme difficulties and Pure Manila fibre under the Columbian label will be among the early ship cargos of fibre from the Islands. We cannot now tell you just when this will occur nor how soon Columbian Tape-Marked Pure Manila Rope will again be available. We do want to assure our customers that we are bending every effort to hasten the day when it will be plentiful enough to supply the great need for a high-quality, completely dependable rope. We believe that that day is not far off!

COLUMBIAN ROPE COMPANY

400-90 Genesee St., Auburn, "The Cordage City," New York

The Shipping Outlook

Pacific MARINE REVIEW

At the beginning of our 42nd year of continuous publication on the Pacific Coast, with grateful feelings we thank all the many friends for their seasonal greetings and wish for all readers and for the Pacific American Merchant Marine a very happy and prosperous year in 1946.

Much water has run under the American Merchant Marine bridge since Pacific Marine Review first made its public appearance at Seattle in April, 1904. Depressions, inflations, booms, wars, strikes, and controversies have continually rocked the boat; but the hull, well designed for stability, has weathered all conditions of sea voyaging and is still carrying good cargoes.

As we come into 1946, with another world war happily behind us and considerable uncertainties ahead, we have the largest fleet of seagoing merchant vessels ever assembled under one flag.

From the cold logical viewpoint only a portion of this tremendous fleet can be profitably used in commercial peacetime normal trade. However, trade does not always follow cold logical reasoning, and it is often possible to create and to divert trade into channels that on first blush appear to be very illogical.

Our sea-borne trade naturally divides itself into three classifications—Coastwise—Intercoastal—and Overseas or Foreign.

Coastwise seagoing trade includes Hawaii and Alaska on the Pacific, and Puerto Rico on the Atlantic, and so becomes geographically overseas. It is strictly confined to American Flag vessels and so is competing only with truck, airplane, and rail for passengers and cargo. Intercoastal trade also is confined to American Flag ships. Yet so great is the cost of American Flag operation that the operating companies do not wish to take back from the War Shipping Administration the vessels chartered for the war effort unless they can secure better freight rates. In some cases, notably Alaska, the present rates are claimed by the businessmen to be ruinously high. In all cases of ship operators the present demands of the seafaring unions are claimed to be ruinously high.

Overseas shipping is the point at which we may be able, with wise planning, to create a great increase in business. This is true in the Atlantic Coast-European, the Atlantic Coast-Central American, the Atlantic Coast-South American, the Atlantic Coast-African, the Pacific Coast-Asia, the Pacific Coast-South American, the Pacific Coast-Central American, and the Pacific Coast-Oceania ranges. Everywhere on the earth the war has created a large pent-up demand for the things of modern civilization. America is in a better position to supply that demand than is any other nation.

The loans we are making to many countries will produce a large volume of manufactured products for transport overseas, and most assuredly the overseas vessels of the banker should carry a very considerable portion of the product of these loans. This business if conducted properly should result in a large volume of permanent foreign trade that would keep many ships busy.

There are some obstacles—the demands of labor—the increasing costs of cargo handling—the increasing pressure of air competition. Fundamentally, however, surface water transport is still the most economical method of carrying goods over long distances and will probably be so always.

What is needed to maintain a large merchant marine is large volume of cargo and passenger traffic. This is possible in coastwise and intercoastal traffic only when American merchants realize again the fundamental economics of water transport; and possible in overseas traffic when the American manufacturer recognizes the great value of foreign trade and the fundamental economics of carrying that trade in his own flag vessels.

Both these possibilities are to a large extent dependent on common sense, good judgment and constructive cooperation controlling the councils of American Business, American Industry, American Ship Operation, and American Union Labor. The common denominator of these four factors in the word "American." Let's get together for an American Merchant Marine as a permanent business-getting, foreign trade building, American institution.

Let's keep our merchant marine LOADED. *The future of the shipyards, the manufacturers of equipment, shipyard and seagoing labor, and the cities that serve the ships,* ARE DEPENDENT ON LOADED SHIPS.

Analysis of Ship Repairs and Conversions

ON THE PACIFIC COAST

CONFERENCES during the past month with important shipbuilders, steamship officials, and officers of the War Shipping Administration, Army and Navy, indicate a volume of ship repair and ship conversion business beyond the ability of Pacific Coast shipyards to handle for several years.

Troop movements from the Pacific theater of operations reached their peak in December and will be well on toward completion during the spring. On March 2 the United Nations Shipping Pool will terminate, and on that date, or earlier, most of the commercial ships will be returned to private owners.

Every ship must, as provided by law, be restored to the condition in which it was received from private owners by the Maritime Commission. An alternative to this is for the owners to accept a lump sum cash settlement and restore the ships themselves. Thus if the conversion and repair jobs are to be handled by the Commission, it is likely that all shipyards capable of handling the work will be flooded with business, because all of the owners are clamoring for ships. Some of these conversion jobs will extend over a long period. For instance, the big Matson ships will require almost complete reconstruction at a cost that is estimated by Matson at $3,500,000 each, and will require from 6 to 15 months.

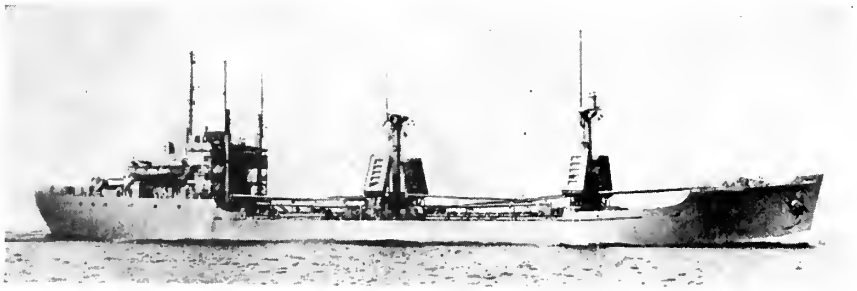
In the event that certain owners accept the cash settlement, a thorough inspection and in most cases drydocking will be necessary, with the probable changing of the arrangement plans on many vessels.

It is pointed out that in addition to the ships that are controlled by Pacific operators, such as American Mail, American President, American Hawaiian, Matson, McCormick and Alaska Steamship, there are as many as 25 sailings per month with United Nations Relief supplies for the Philippines, China, Russia, Korea and probably Japan and others, and these ships will be serviced on the Pacific. The relief program will extend through the year, under present appropriations, and may run into many years.

Further, there are many lines whose Pacific Coast general agents say their servicing will be done wherever yards are available.

On March 2 there will also be restored the rule requiring annual drydocking, and it is obvious that with the enormously increased trade to Pacific areas with a consequent increase of the number of ships operating on the Pacific, there will be the passing of German and Japanese prewar operations to American lines which will be controlled by American law.

It is understood that one important line with Eastern headquarters is transferring its entire engineering organization to the West Coast and will handle its repairs and service work in the West. And another line with head office in New York is transferring its operational management to San Francisco.



The C type and Victory type ships will nearly all require elaborate conversion. Above is a C-1-M-AVI. France is taking 5 C-1s. Below is a C-2. The C-2 type is now being converted at Consolidated for the International Freighting Corp. The U. S. Lines, Lykes Bros., Luckenbach and others are working on this model.

Ship Replacement

Every ship operator on the Pacific lost many of its ships. For instance,

Luckenbach lost 9 ships by enemy action, had 1 beached at Normandy, converted the 2 largest ships to hospital ships and another one to an animal carrier. These must be replaced, and the company will make selections from among the various C and Victory types which they are now operating as agents. It is expected that all will require important conversion and repair.

The American President Lines lost all but 3 of its pre-war ships and in addition to heavy replacements will probably be assigned a round-the-world route with several large vessels.

Matson will be taking 16 C-3's and may be making major design changes in their Big 4. The Alaska Steamship Company is planning a large new fleet. This service normally carries more passengers than all other Pacific operations combined. And so it goes with all of them. Of course, with the Intercoastal and Alaskan services, the freight rate and the cost of operations problems must be solved.

The Transport Service

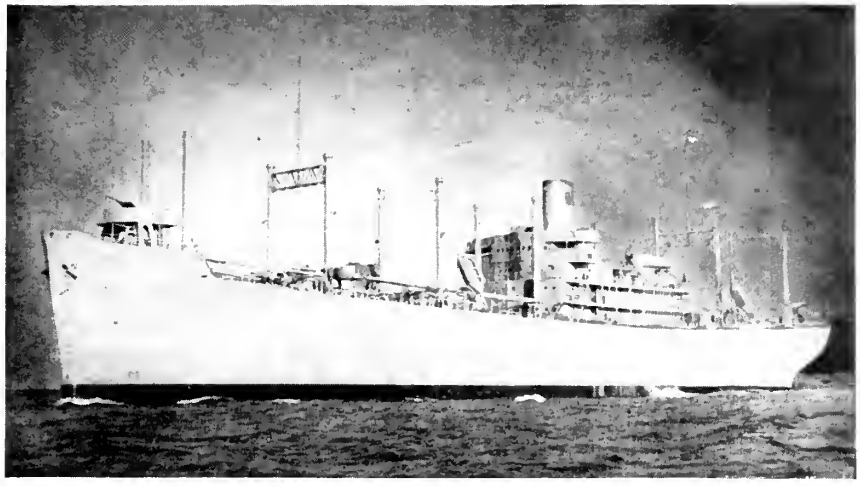
Before the war commercial lines handled the transport services for the Army and Navy. An officer of the Maritime Commission recently predicted that the Army and Navy will operate a considerable part of these services to the greatly increased number of remote bases which in the past have been either in the hands of other nations or been too unprofitable for American lines. The fact remains, however, that there will be more ships on the Pacific, with consequent voyage repairs and drydocking.

General

Few realize that during the war most ships received only emergency repairs. Nearly every ship that served the combat areas, as well as most others, received important structural damage. For instance, the dropping of a depth bomb usually caused the ship to heave violently with terrific strain on its structural parts. Ships under attack from either gunfire or bomb often received damage which can only be repaired after complete inspection, and this must be done in a shipyard. And all ships must be painted and their machinery overhauled or replaced.

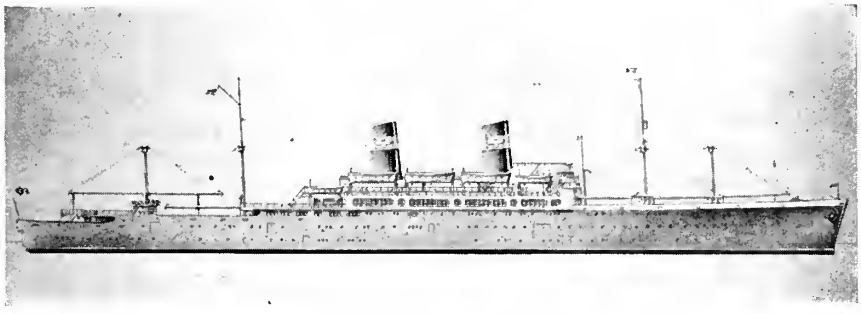
Ship Construction

Many important people in the in-



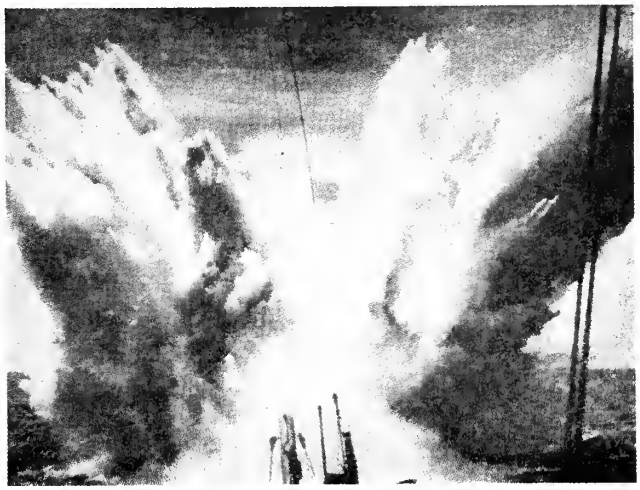
C-3, most popular of the C types. Will be converted by Matson, Grace, Lykes and many others.

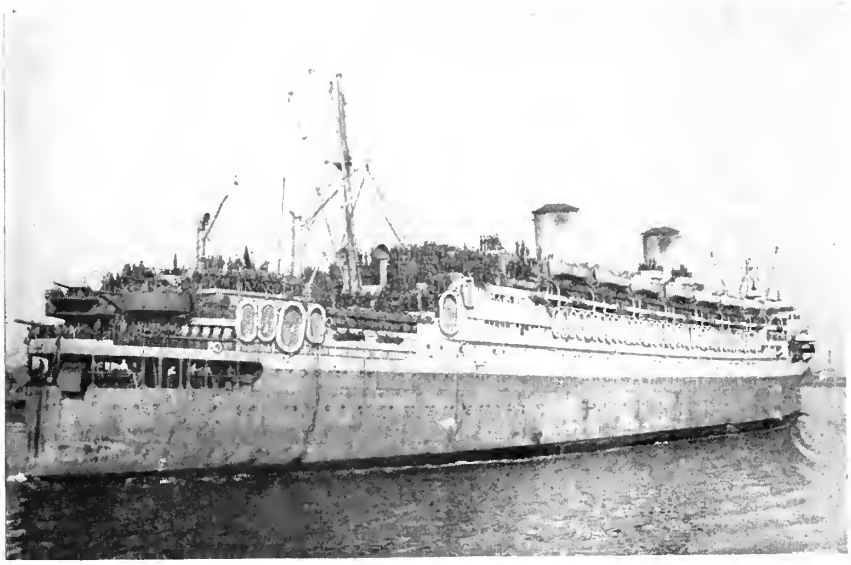
Artist's conception of what can be done with a C-4 for passenger service. Already in use or planned for American President Lines, American-Hawaiian and Luckenbach. Originally designed by American-Hawaiian for the intercoastal run. The Army may adopt the C-4 type.



Converted P-2 for American President Lines. **See feature story on page 16.**

This is what happened alongside a vessel whenever a depth bomb was dropped. The shock and strain ran through the entire ship.





Matson's Mariposo arriving from Europe with members of the 95th Division. A several-million-dollar conversion job will be required to restore her to the pre-war Mariposa in the lower picture on this page.

dustry confidently expect that either the Ship Sales Bill or an extension of the Merchant Marine Act will provide for a continuance of the program calling for the construction of 50 ships a year in order that the industry may be kept abreast of the art. In this event, certainly many of these ships will be built in Pacific Coast yards.

Small Boats and Commercial Craft

A revival of yachting in a big way is expected, and the smaller yards are busy with plans and work. Most of the yachts require complete overhaul and machinery replacement upon being restored to former owners. Commercial tugs, tankers, fishing boats and barges are being planned or built in many yards.

Foreign Vessels

With the elimination of innumerable shipyards in Europe and Japan, much of the work of European operators will be done in United States yards, and with many countries becoming merchant marine minded there will be many orders for American-built ships.

The Navy

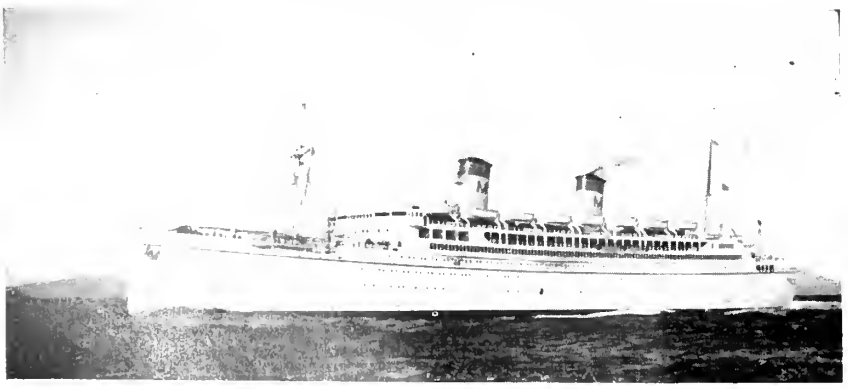
The so-called "Pre-Inactivation Overhaul" (the Navy will call the Reserve Fleet the Inactive Fleet) of most of the 1000 and more ships of the Navy will tax all of the Navy Yards on the Pacific Coast as well as the off-shore bases for upwards of two years, and there will be an overwhelming overflow to private yards in spite of the new and enlarged facilities at Hunters Point, Terminal Island and Pearl Harbor. Another article in this issue deals with overhaul program.

Radar

Sooner or later radar will no doubt be installed on all off-shore vessels. The Coast Guard has been holding hearings on the problem, and while the cost of the job worries some operators, the influence for safety will doubtless prevail. It will not be possible to complete all installations at once, but in any discussion of shipyard activity the radar installation program has an important place. On this subject also there is another article in this issue.

West Coast shipyards will not lack work for a long time to come.

The Mariposa, pre-war and post-war.



WSA Tanker Policy

Ocean tanker operations will be stabilized under a new War Shipping Administration policy of supplying tonnage to private owners and charterers whose fleets are unable to meet all demands.

As the result of the United Maritime Executive Board's decision to return to American owners 300 tankers of more than 3000 gross tons that were under requisition by the WSA, more than 200 tankers already have been restored to private operation. To insure orderly operation in the reconversion period and to avert discrimination and protect the industry against competition by the WSA tanker fleet, prospective voyage charterers of WSA-owned or controlled tanker tonnage must furnish the WSA Tanker Division by the fifteenth of each month with detailed statements or requirements for the following month's operation which cannot be supplied in the open market.

This will include certification that the open market has been thoroughly canvassed and found unable to supply suitable U. S. flag tonnage. Provision is made for submission of supplementary requests for tonnage made necessary by developments after the fifteenth of each month.

The WSA states that allocations will be for single voyages only, every effort being made to prevent employment of WSA tankers in commercial trades to the detriment of private tanker owners. Principal oil companies, brokers and other interests have been notified of the program, but services of brokers or agents employed by charterers will be at their own expense.

Reemployment Problems In Shipyards

By Joseph A. Moore, Jr.

THIS SUBJECT INVOLVES so many imponderables and uncertainties that it will be difficult indeed to give categorical answers to any of the pressing problems which are encompassed in the future employment and reemployment fields. I feel very much in the position of a department store manager who might be asked on December 26 to comment on immediate sales prospects! The shipbuilding and ship repair industries have just completed a period of growth and accomplishment unparalleled in the history of this nation or of any other nation. We entered World War II at a time when our naval and merchant fleets were far below the strength needed for ordinary peacetime operations. We did the job, and at this time it appears that generally speaking the shipbuilding industry will be turned loose to fend for itself, just as was done after World War I. We all sincerely hope and pray that never again may our nation need the industry as desperately in time of emergency as it did in 1941.

In considering prospects for utilization of man power in the industry we are immediately struck by the tremendous deflation that has already occurred. All statistics connected with World War II are startling and need not be stressed here. I would like to point out, however, that during the past five years naval and merchant ships were produced to a value of over 40 billion dollars, which represents about ten times our entire national budget as recently as 15 years ago. At the peak period of employment in 1943 over 4 million men, women and children were employed in our shipyards and in factories supplying goods and equipment for the shipyards. This represented approximately one out of 14 gainfully employed persons in the nation. It is obvious that at no time in the foreseeable future will any such production of ships and consequent tremendous employment of labor be possible, or even desirable, in the industry. Nevertheless, it is my belief that operations, hence employment, should, must and will be maintained at greater levels than prevailed during the decades of the twenties and the thirties. None of us should forget the days of only a few years ago when our industry did not rank among the first 50 in volume of products nor among the first 75 in number of employees.

Jobs in our industry will be furnished principally by conversion of wartime types of vessels to peacetime pursuits, by ordinary continuing voyage repairs, by adaptation of existing types to new uses and by construction of a certain number of vessels for our own and foreign governments and domestic and foreign private operators. The exact amount of such work will depend on whether sufficient activity can be maintained in U. S. shipyards during the peacetime years ahead to enable our country to keep adequately prepared for any emergency, to enable us to maintain our naval and merchant establishments on a par with those of other countries and to insure that this country will continue to carry a substantial percentage of our imports and exports in our own bottoms.

The question may be asked: "Why should shipyard activity and employment be maintained for the next ten years or so?" There are several reasons, but chief among them must be listed:

(1) The need for a constructive building program to maintain a minimum force of skilled mechanics for use in time of emergency.

(2) Need for maintenance of a modern and up-to-date merchant fleet which will be capable of competing in world markets and keep abreast of new developments in the shipbuilders' field.

(3) Maintenance of our position in the post-war world. Experience of other countries has proved that only through continual modernization and improvement of shipbuilding methods can the position of a maritime nation be sustained.

Several personnel problems peculiar to the present reconversion program are worthy of note at this point. First I should like to mention the problem of continued employment of female labor in the shipyards. Frankly, I believe that very few women will be employed in our post-war shipbuilding and ship repair programs. This detracts nothing from the magnificent performance that has been achieved by the women of America in our shipyards during the past few years. At one time upwards of 150,000 women, as well as many thousands employed in ancillary operations, were actively working in craft positions in our shipyards. With the lessening of activity and the return of veterans, this number is already very small and I believe that the end is in sight. To the women who came to our aid I say, "A job well done." It is my firm belief that but for the women of America the shipbuilding job could not have been accomplished.

Reemployment of veterans is a problem to which we will all be forced to devote an increasing amount of consideration in the months to come. In most cases the number of former employees in the Armed Forces has greatly exceeded the prospective total work forces for peacetime operation. I know that in the case of the company with which I am associated we have had some 24,000 of our employees leave us to go into the Armed Forces. Inasmuch as our peacetime employment will probably be somewhat under 1000, we feel that there is a very real problem here to be worked out. Furthermore, most of these men and women were unskilled at the time of their employment with us and it is very difficult to fit them into present activities. In many cases it will mean the release of old-time employees—men of high skill—in order to place returning veterans. This procedure will necessarily cause considerable readjustment within the crafts and in union-employer relationships. It is

(Continued on page 19)

(The author is president of Moore Dry Dock Co. He addressed the Merchant Marine Conference Panel on this subject at the recent Propeller Club Convention, and has herein amplified his remarks for Pacific Marine Review.)

THE ISLE OF THE MARE

A Modern Completely Equipped Navy Yard

(All photos Official U. S. Navy Photographs)

Rear Admiral Mahlon S. Tisdale, U.S.N.

FORMING A DELTA of the Napa River where that stream empties into San Pablo Bay (northerly arm of San Francisco Bay), there is an island of some 2247 acres. One of the legends of the Mexican days in California is concerned with the naming of this piece of land. General Mariano Guadalupe Vallejo, a Spaniard, had large grants of land in this vicinity and had large herds of horses and cattle. His favorite saddle animal was a white mare, and on a day when this mare was being transported across the bay with other animals the flat boat was wrecked and the white mare took a swim and scrambled ashore on this then desolate island. When she was found her Spanish owner immediately dubbed the spot as "Isla de Yuega," or the island of the mare, later contracted to Mare Island. This old story is the basis for the white horse on the emblem and the pennant of Mare Island Navy Yard.

In 1850, shortly after California was admitted as a state, Commodore John D. Sloat recommended the purchase of Mare Island as a site for a naval establishment, and it was acquired for $83,410. It was declared a Navy Yard in 1854 and Commander (later Admiral) David G. (Damn the Torpedoes) Farragut became the first commandant of the new yard. He brought out a corps of ship carpenters, most of them from around Boston and New York, and started to build wooden ships. At that time there were 12 vessels in the U. S. Pacific Naval Squadron, and Mare Island became their home port.

In 1849 prospectors traveling to the gold fields saw the advantages of the site on the mainland opposite Mare Island and founded a settlement known as Eden. A year later the name was changed to Eureka. In 1851 General Vallejo offered the State Legislature a considerable acreage and $370,000 in gold if the State capital was located on this site. The legislature accepted, changed the town name to Vallejo, and built a wooden "State House" of hewn planks from Hawaii, with a bowling alley and saloon in its basement. By 1852 Sacramento was luring the legislature, but they were prevented from moving there by the great spring floods of that year. Benicia in 1853 offered its new brick City Hall as a State Capitol and the government moved over there for a year or two until they were able to erect suitable quarters at Sacramento. Vallejo, however, became the home town for Mare Island workers, and has grown steadily with the growth of the Navy Yard.

First ship built at the yard was the wooden frigate Saginaw. Third and fourth generation descendants of the men who worked on this vessel are working in the yard today. After the Civil War practically all of the activity at Mare Island was repair and maintenance work on the Pacific Squadron. Practically the only steel work done from 1865 to 1898 was continuous repairs and rebuilding of the Civil War Monitor Monadnock, which was practically a new ship and ready for sea when the Spanish war started.

Rear Admiral Grover C. Klein, U.S.N.

When the first of the then "Modern Navy," the U. S. Cruiser Charleston, was built at the Union Iron Works, San Francisco, and delivered at Mare Island in 1889, conditions were so primitive that she was warped into the dock by a yoke of oxen. Today practically the whole of Mare Island is covered by a huge naval establishment that during the peak of the war effort employed 42,000 civilians and thousands of Navy personnel in a tremendous program of ship construction, ship repair, and ship equipment designed to keep the Pacific battle fleets in order.

As of December 1 Mare Island Navy Yard becomes a part of the newly established U. S. Naval Base, San Francisco, and will hereafter be designated U. S. Navy Shipyard Mare Island. Rear Admiral Mahlon S. Tisdale, Commandant at Mare Island, will assume command of the Naval Base San Francisco, and Rear Admiral Grover C. Klein is expected to be Commandant at U. S. Shipyard Mare Island. Admiral Klein has been

This recent aerial view of the gigantic Naval Shipyard, Mare Island, shows about three-fourths of the more than 2200 acres covered by the naval building and repair activities just across the straits from Vallejo, California. Of special interest is the cruiser in the drydock (in center part of the picture). It is ill-fated cruiser Indianapolis, sunk just prior to end of the war, and which was at Mare Island for repairs before leaving on her final trip.

On the right-hand side of the picture can be seen several of the 735 units of housing provided by the Navy for officers and enlisted personnel (and their families) at Mare Island while their ships are being repaired.

U. S. NAVY
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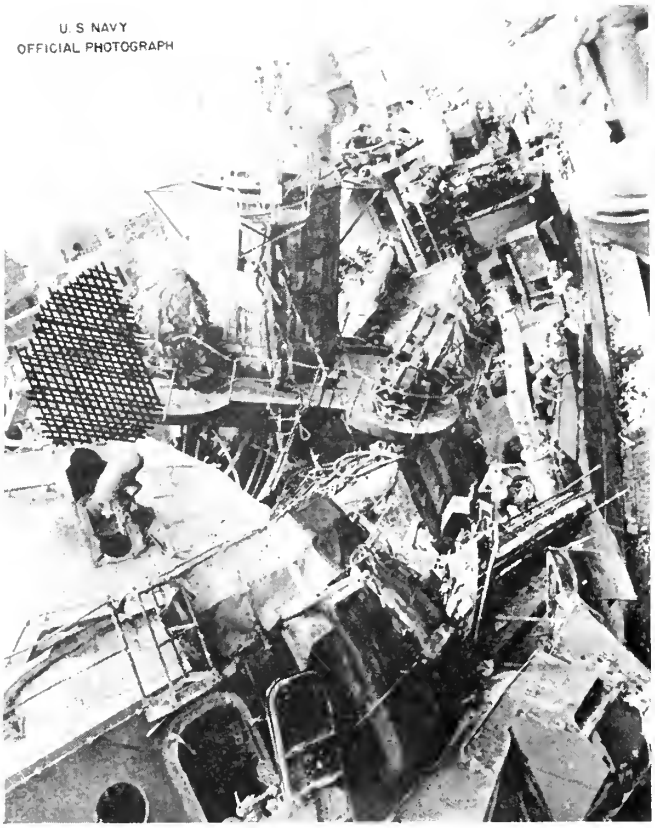

U. S. NAVY
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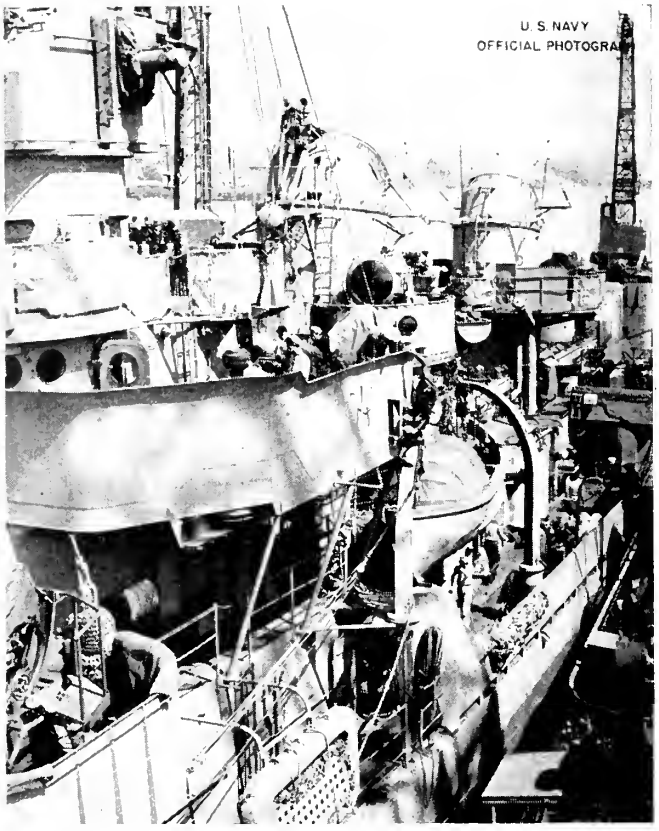
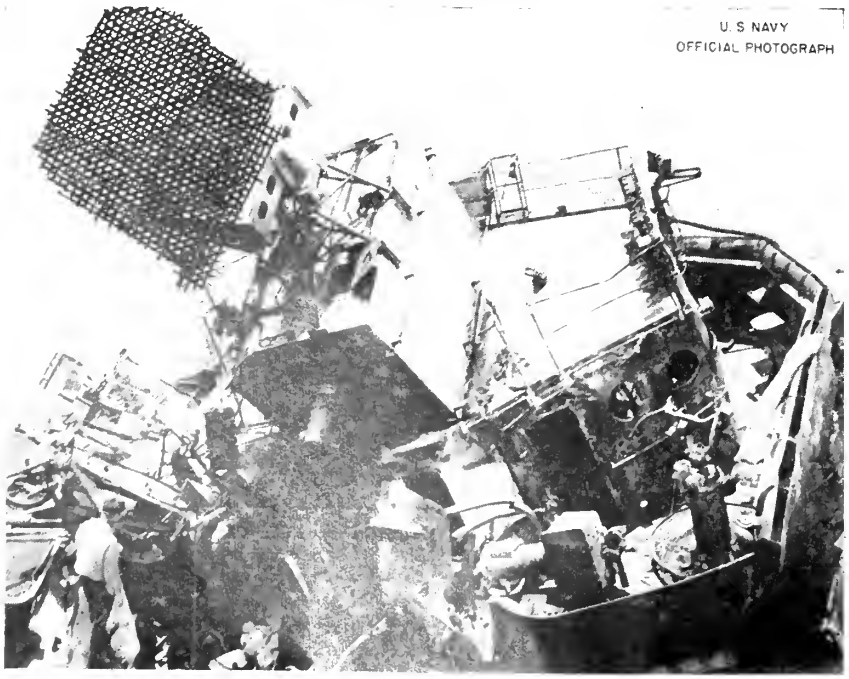


Left: The desperation of the Japanese, expressed through suicide attacks on American warships, is seen in this picture of the USS Hazelwood (DD531) shortly after a Japanese kamikaze pilot dived out of a low-hanging cloud to smash into the superstructure of the destroyer off Okinawa. About 22 per cent of the officers and men of the ship died or are missing from the explosion and fires started by this suicide plane. Over 96,000 man-hours, 60 per cent of it skilled labor, were required to put the area pictured here back in the fighting shape shown in the right-hand picture, only part of the 400,000 man-hours needed to repair the entire damage.

Right: This is how the Hazelwood looked before she was struck. The damage caused by this fanatical pilot is shown in the left-hand picture.

Here is an example of repair jobs that faced skilled Mare Island workmen during the hectic days when naval yards were trying to keep ahead of the deadly Jap kamikaze suicide pilots. Within a short time after the destroyer Hazelwood, shown here, arrived at Mare Island, she was again beginning to take shape as an efficient and deadly fighting craft.

U. S NAVY
OFFICIAL PHOTOGRAPH



industrial manager of the yard since February, 1944.

There are three principal branches of the Navy Yard, Industrial, Supply and Military. Captain Carleton R. Eagle is the Supply Officer and Captain A. G. Cook is Captain of the Yard with full control of military features.

Since December 7, 1941, four hundred vessels have been built at this yard, including destroyers, submarine landing craft, submarine tenders, destroyer escorts, and many types of smaller craft.

In addition to this huge new construction program and during the same period 713 vessels were repaired with a total man-day expenditure of 14,749,268. One hundred and fifty of these ships with a total man-day cost of 4,354,106, were completed during 1944. These repair jobs are mostly of the major type since minor repairs due to battle damage are usually effected at the fleet bases close to the combat zones.

Typical repair jobs were the U.

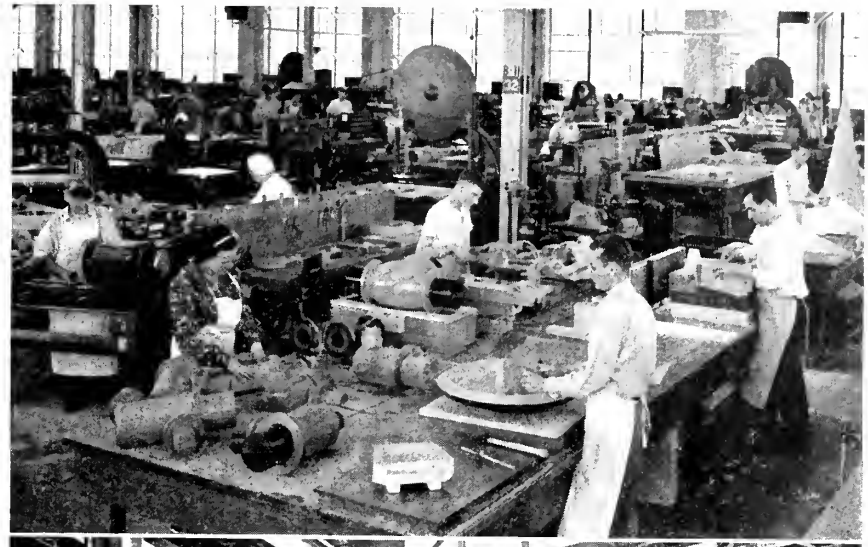
S. S. Denver, requiring 173,781 man-days, and the U. S. S. Alchiba (hit by three torepdoes and damaged by a big fire), requiring 81,399 man-days.

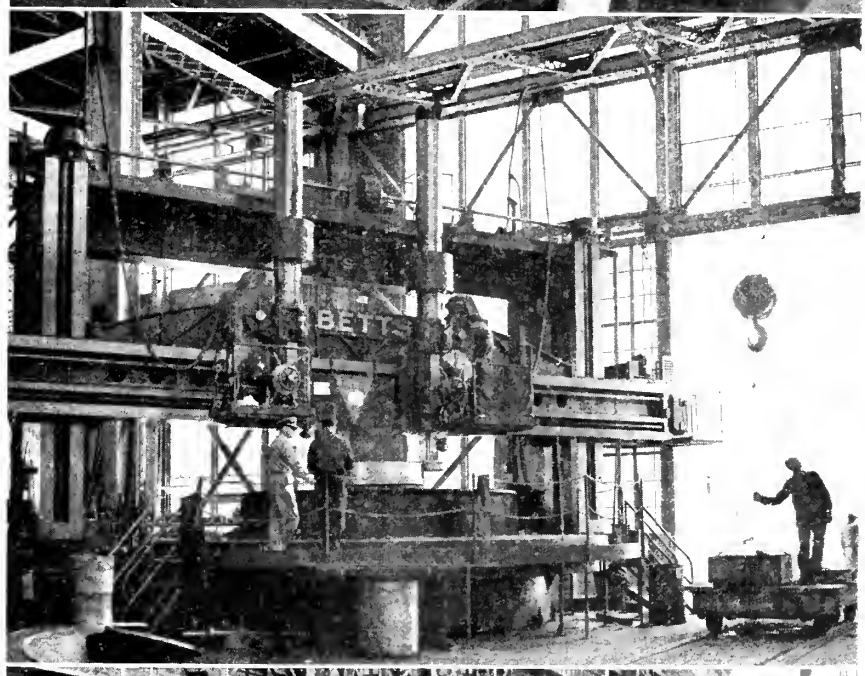
The southerly portion of Mare Island is hilly. Part of the south end is used as an ammunition depot with magazines honeycombing the hills and with facilities for loading ships' magazines and for unloading or loading ammunition ships. A little north of this is a section used for barracks and for 718 Homoja Huts. Here the men from ships undergoing repairs live with their families. There is also a Marine barracks area which is headquarters for the Marines who guard the island and run the Naval Disciplinary Barracks, which is a complete entity with Post Exchange, recreation center, ball field and other facilities.

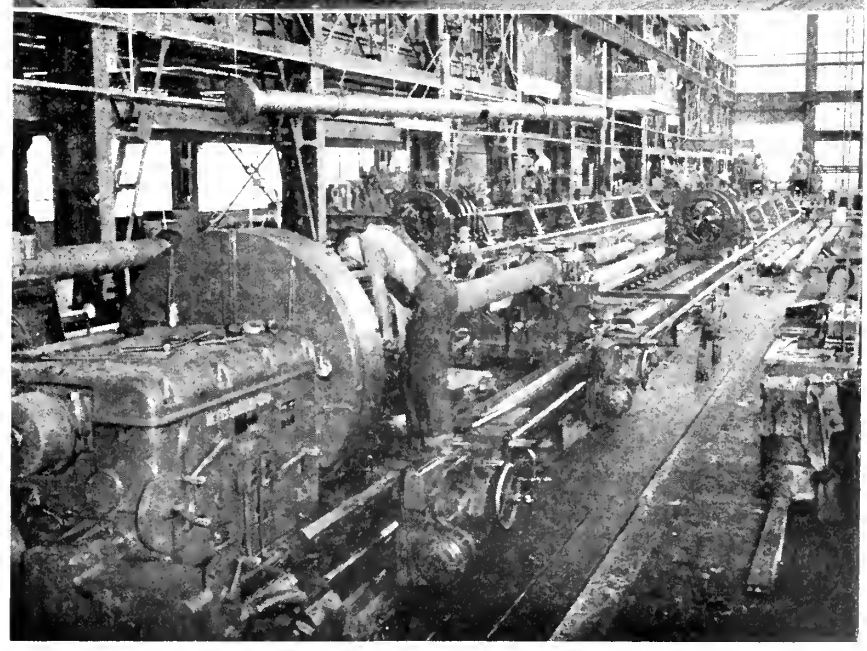
A Naval Hospital with a compound of 47 acres, rooms for 2000 bed patients, surgeries, laboratories, and facilities for production of individually fitted artificial limbs is part of this Navy Yard's equipment.

One of the most interesting shops on the island is the flag loft where at one time practically all the flags for the U. S. Navy were made. Here skilled women embroider emblems, cut out and fabricate pennants and flags, and listen to radio music broadcasts. At the peak there were 500 women employed in this shop, with a capacity for producing 80,000 flags a month. More than 3,500,000 pennants were produced by this shop during the war.

In the main industrial area of this yard are several of the largest shops of their type on the Pacific Coast. Most imposing of these is the machine shop, claimed to be the largest of its kind west of the Mississippi River. This huge structure is 904 feet long and 250 feet wide and therefore has a floor area of 226,000 sq. ft., or approximately 5 acres. At the peak 5000 machinists worked in this building. Of massive steel construction, it is served by numerous electric bridge cranes capable of handling the largest unit weights in naval machinery or ordnance. The floor is



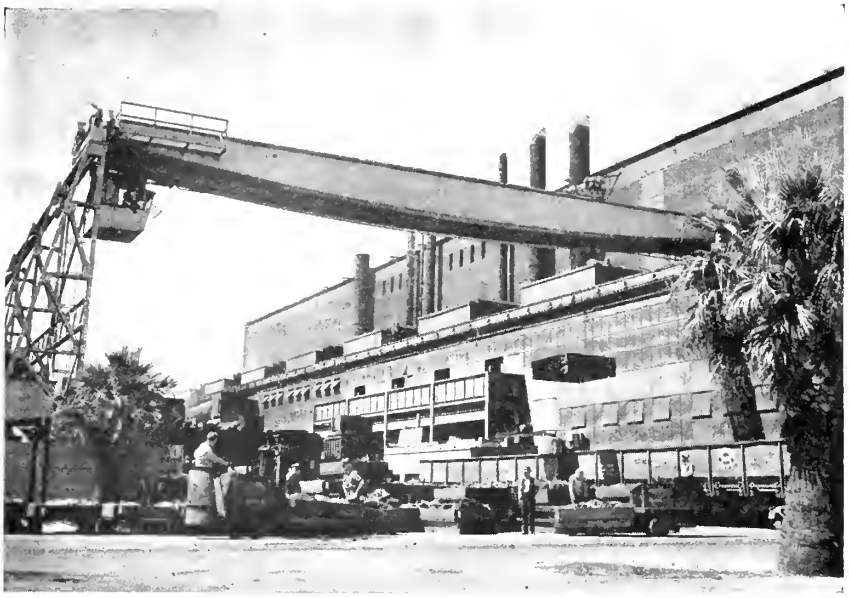




Top: A point of considerable interest at U. S. Naval Shipyard, Mare Island, is the mold loft, where wooden molds are prepared for later use in casting processes. This work requires highly skilled help.

Center: Nowhere in the West could you find a larger vertical boring mill than this huge machine that performs one of the major operations of making ship propellers in the Machine Shop.

Bottom: It requires highly skilled help to machine tool giant shafts at the yard. Many men and women make a lifetime career of this work at Mare Island.



An outside view of the foundry.

traversed by industrial trackage and by numerous covered trenches in which compressed air, steam, and waterpiping, and electric cables are carried to every part of the building. All large tools are driven by independently controlled individual electric motors. Many small tools are driven in groups from shafting actuated by an electric motor.

The equipment of this shop includes some of the largest engine lathes, open side planers, and vertical boring mills in the country. Large groups of turret lathes, milling machines and drill presses are arranged for multiple production of standard pieces of naval equipment or are ready for the special jobs that come in connection with replacing damaged hull and engine room machinery. Many of the machinists are second or third generation Mare Island employees.

This 2000-ton drop forge in the Shipfitters' Shop is the largest of its kind in the western part of the United States.

As in all the modern shop structures on the island, the machine shop fenestration is more than adequate. As will be noted in the pictures illustrating this article there is plenty of natural illumination and a minimum of shadow. The relatively large proportion of glass in the siding of these buildings is shown in the picture of the foundry.

In the pattern shop there are installed all the modern mechanisms for woodworking, and this establishment, together with its pattern storage warehouse, has been able to produce, when needed, all the patterns for iron, brass, or steel castings required by the tremendous building and repair program of the last four years. This shop is equipped with a special system that automatically disposes of all sawdust. Its intricate filing arrangements make old patterns available for use on demand, and the range available covers a very large proportion of the possible needs of standard naval vessels.

Modern in design and equipment, the foundry is another huge structural steel building. Its electric furnaces and cupolas have a capacity for large tonnages, and items are cast here daily ranging from a few pounds to many tons in weight. The molders in this plant include many highly skilled mechanics who have been trained in this yard as apprentices.

The largest single building in the yard is the structural shop. This building would cover four complete football fields. It is used by the welders and shipfitters. In the peak of employment 7000 employees worked in this shop. The equipment includes: multiple punches served by roller tables; huge rolls for shaping curves in ship plate; machine torches for trimming; automatic pantograph torches for multiple cutting; drill and reaming presses for plate work; huge shears for plate trimming; many jigs for welding; many welding machines and welding current outlets; and many flanging, pressing and forming machines.

Much prefabricating of large sections of ship hulls is carried on in this shop, which is adequately equipped with cranes and other facilities for moving these heavy assemblies.

Another important part of the plant is the shipsmith or blacksmith shop, where the forging of steel parts is done by large batteries of steam hammers and hydraulic presses, chief among which is the 2000-ton forging press. This is the heaviest press on the Pacific Coast.

Other shop units include: a boiler shop with complete equipment for overhaul, repair, or manufacture of any steam generator used in the Navy; an electric shop which repairs and installs complete electric systems on board ship, specializing on radar and fire control systems; a sheet metal shop which fabricates and installs lockers, metal furniture, ventilating ducts, and nonstructural metal hull work; a joiners' and boatbuilders' shop that manufactures and installs wooden items such as furniture, boats and cabinet work, and that handles all blocking, shoring, launching and drydocking; a paint shop that mixes and manufactures Navy standard paints; a paint department that does all the painting aboard ship and ashore; an outside machine shop that installs, removes, overhauls and repairs machinery aboard ship; and a pipe shop that shapes and installs all piping systems on shipboard, manufactures special tubular items from sheet copper, molds special rubber items, and maintains a rubber laboratory.

An industrial laboratory for testing materials and assemblies is maintained to insure maximum effectiveness and efficiency and to develop new processes and mechanisms.

A very interesting feature of this great naval shipyard is the apprentice system and school. Here ambitious

The last of many submarines to be launched at the yard prior to the end of the war was the USS Stickleback. On her bow is plaque stating: "This submarine sponsored and made possible by war bond purchases of the citizens of Yakima County, Wash."

young men are offered the highest grade of training in the various trades and at the same time can take accredited high school courses. This is arranged so that the young man can finish his high school course at the same time that this apprenticeship is over and in not much more elapsed time than he would take in the normal period devoted to the high school course alone.

In short, U. S. Navy Shipyard Mare Island is a very complete shipbuilding and ship repair yard wherein, if necessary, every item that goes into the completely equipped naval vessel can be manufactured. It is one of the oldest industrial establishments on the Pacific Coast and for many years has maintained a very high standard of craftsmanship and quality of output. It is one of the two U. S. Navy yards in the United States chosen for building, equipping, overhauling, and repairing submarines, and it will continue to be a busy shipyard for many years to come.

Sanitary Precautions On Vessel Reconversion

Leading American vessel operating companies are being offered United States Public Health Service facilities for the planning and effecting of ship sanitation in their reconversion of war-service vessels to peacetime commercial use.

Notification of the available services for ships of U. S. Registry has been sent to the larger operating companies by the Sanitary Engineering Division of the Public Health Service, Federal Security Agency. Upon request, Public Health Service personnel will guide the planning of the sanitary aspects of reconversion and furnish inspectional service during construction, alteration or extensive repair of vessels.

The Public Health Service is seriously concerned with adequate sanitation and ratproofing of vessels being converted or reconverted for commercial trade. The conversion of vessels for war use resulted in changes and additions which may have introduced potential hazards in the drinking and culinary water supply system, and in the facilities for food storage and handling. Harborage for rats may also have resulted.

In addition to its provision of healthful sanitary safeguards aboard ships, Public Health Service guidance in vessel reconversion would facilitate clearance of vessels in foreign trade through quarantine and would also aid in control of interstate spread of communicable diseases by coastwise vessels.

In its offer to the companies, Public Health Service points out that an adequately ratproofed vessel, with a good record as to absence of rat infestation and generally favorable sanitary conditions aboard, may clear quarantine without fumigation and thus effect a considerable saving in time and money.

Vessels which were ratproofed when built or prior to the war should be returned to a completely ratproof condition when reconverted, according to the Public Health Service. On other vessels, all rat harborages created by the conversion or reconversion should be ratproofed and ratproofing should be extended to other parts of the ship insofar as practicable.

Vessels on which the potable or drinking-culinary water system was constructed and certified as meeting the requirements of the Service should be brought into conformity with those requirements on reconversion. On other vessels all cross-connections between the potable or drinking-culinary system and any other system should be completely removed and any other major defect should be corrected.

Shipboard Corrosion Problems

By Kenneth Tator

SHIPBOARD CORROSION PROBLEMS fall into two categories: those which painting will prevent; and those for which paints offer no appreciable relief. For example, it would be a waste of money to use any protection other than a well-designed and properly applied paint system on hall or house plates to protect these from rusting caused by salt spray or sea water. Painting, however, has been not too successful in preventing corrosion of steel propeller shafts driving bronze wheels. For their protection a heavy, resilient synthetic rubber has given the best protection. It is of this latter class of corrosion protection that this article deals, that of linings or coverings.

Linings and coverings with but few exceptions are characterized by their thickness, normally from 3½ to ¼ of an inch. They are usually resilient, rubber-like materials, selected for corrosion and abrasion resistance. No one lining material will be a universal panacea for all corrosion problems, but among the lining materials commercially available there is generally at least one which will solve any specific problem. Among those materials available, and in common use for lining or covering, are rubber and the many types of synthetic rubbers, and plastics such as the Bakelites, vinyls, polyethlene, polystrene, vinylidene, chlorides and others. Unfortunately for many purposes these lining materials are seldom known by their true names, and their identity is obscured by non-informative trade-names. The writer recently visited the engineering division of a well-known organization which was then attempting the solution of a serious corrosion problem. Those men had invested a considerable amount of time and money in exhaustively testing eight lining samples, known only to them by trade-name, which had been recommended to them for the purpose. Of these eight test pieces, six were of identical material, differing only in trade-name, minor composition, and integrity of the manufacturer—an unnecessary duplication of investment, especially in view of the fact that this material proved inferior to other materials available. Such a situation can be avoided by asking the supplier the true nature of this material, or by enlisting the advice of men able to distinguish between the available trade-names.

Linings and coverings cannot economically and should not replace painting. Paint systems are adequate for the more common corrosion problems encountered on board ship. Furthermore they can be effectively applied by relatively unskilled workmen, with a minimum of specialized equipment. Their applied cost is low, rarely attaining 25c per square foot of surface painted. It must be borne in mind, however, that a paint film seldom exceeds twenty thousandths of an inch in thickness; that it is applied as a liquid and often remains a liquid for some time after it is applied, thus allowing it to flow back from and leave insufficient protection over sharp projections and edges. First signs of paint failure usually occur at sharp edges. In most instances failure from these causes is of little consequence as it is usually a simple matter to get the paint can and brush out and touch up these spots as failure is detected.

Linings and coverings are a different matter. Their application requires skilled workmen and specialized equipment. They are seldom applied in their entirety by brush or spray gun. They are never air-drying, but require some form of treatment to develop in them their maximum corrosion resistance and physical strength. For these reasons they are comparatively expensive. Linings, depending upon their nature and protection desired, will cost applied from 50c to $3.00 per square foot of surface lined or covered. For this reason if for no other, their consideration should be reserved for those uses where painting is inadequate and where the value of the parts which require protection is sufficient to justify these costs.

The virtues of linings lie in several properties, one of which is their thickness. This is especially important in abrasive exposure as, all other things being equal, the length of time they will afford protection will be in direct proportion to thickness. This greater thickness also presents a more substantial barrier against highly corrosive environment than a thin film. Furthermore, any defect in a thin film will almost certainly penetrate the film, but in a lining or covering this defect would be entirely surrounded by sound, resistant material.

View showing various stages in the lining of a hold.

(The author is president, Industrial Lining Engineers of Edgeworth, Pa.)

Sharp projections and edges are fully protected by sheer bulk of lining material.

Lining materials are usually resilient and rubber-like. This property gives still further protection against abrasion, as such abrasives will "bounce" off the lined surface instead of digging in and tearing up the surface. The success of the rubber-lined shaft bearings is evidence of this, to say nothing of the wearing qualities of automobile tires. Resilience is also of advantage in maintaining a protective barrier over "working" rivet heads on lap seams. The material at these points will stretch and "work" with the steel instead of cracking under the shearing action.

Linings and coverings are usually treated after application to impart to them their maximum resistance and strength. This "set," "cure" or vulcanization is variously accomplished by heat, pressure vapor or gas reaction. Special portable equipment is required. This operation after application insures maximum adhesion to the steel and a stress-free lining.

Lining and covering is in general accomplished by four different methods, depending upon the material employed or the result desired. They may be applied to specially prepared surfaces by pressure guns, by trowel, and by molding, and those so applied are characterized by being continuous and seamless. Sheet linings necessarily have seams but are usually smoother, of more uniform appearance and of uniform thickness.

Repairability of a lining is of paramount importance to shipowners. For protection as costly as lining or covering it is not economically desirable to replace a lining which has sustained damage to a small part of its total area. All linings cannot be repaired, but those which are classed as "thermoplastic" can be repaired with a minimum of time and expense, whereas with the "thermosetting" materials a repair is a major undertaking yielding a resulting lining which is often a compromise in quality. Hence in the summary at the end of this article the various lining materials will be classified according to their type.

Linings serve three types of function: they protect marine equipment from severe corrosion action of sea water, salt spray, or the cargo; they protect equipment from the abrasive action of silt, hard fuels, or solid bulk shipments; and they protect cargoes from undesirable contamination by iron or rust from contact with the bulkheads in the holds.

In the following the qualifications and uses of some of the principal lining and covering materials will be summarized:

Natural Rubber

Thermosetting. Best abrasion resistance. Excellent resistance to acid and alkaline conditions. Should not be used where lubrication oil or fuel oil will come in contact with it. Not suitable for oily shipments. Used to line battery compartments.

Synthetic Rubber—GR-S Type

Same general characteristics as natural rubber, but harder, hence with somewhat lessened abrasion resistance.

Synthetic Rubber—Buna N Type

Thermosetting. Good abrasion resistance. Excellent resistance to lubricating and fuel oils and to petroleum products. Excellent for vegetable oils and oily loadings.

Neoprene

Thermosetting. Excellent abrasion resistance. Excellent resistance to lubrication and fuel oils and to petroleum products except aviation gasoline, due to aromatics. Excellent for vegetable oils and oily ladings.

Thiokol

Thermosetting, although latex types readily repaired. Poor abrasion resistance. Has tendency to flow under pressure. Best resistance to petroleum products, including aviation gasoline, and used to line steel and concrete tankers and tank barges. Used to cover propeller shafts and streets. Not recommended for temperatures above 120 ° F.

Vinyls

Thermoplastic. Good abrasion resistance. Excellent resistance to alkaline and acid conditions, petroleum products, fats and oils.

Polyethylene

Thermoplastic. Fair abrasion resistance. One of best for acid and alkali resistance. Softened by contact with petroleum oils.

Bakelites

Thermosetting. Poor abrasion resistance. Excellent acid resistance. Poor alkali resistance. A glass-smooth thin lining with relatively good heat transfer properties, used to cover and line pumps, steel condenser tubes, pipes and fittings. Will withstand temperatures in excess of 350° F.

Polystyrene

Thermoplastic. Excellent acid and alkali resistance. Poor resistance to petroleum products.

Vinylidene Chloride (Saron)

Thermoplastic. Good abrasion resisitant to salt water and spray. Are not recommended for temperatures continuously above 200° F.

A lining installation.

Bethlehem's Repair Facilities At San Francisco

Said to Be Largest Private Plant of Kind in U. S.

MORE SHIPS can now be berthed for repairs or conversion at Bethlehem's San Francisco Yard than in any other privately operated repair yard in the country. "The recent addition of a 14,000-ton floating drydock and a 1300-foot-long pier puts the San Francisco Yard in first place in terms of capacity for reconditioning ships," W. M. Laughton, general manager of Bethlehem's West Coast Yards, stated. The two new facilities are Navy-owned.

In addition to the new 14,000-ton floating drydock, the yard operates a 22,000-ton, an 11,000-ton and a 6500-ton floating dock. Ships ranging in size from a tug to a luxury liner can be drydocked for repairs. The yard's eight piers with a total tie-up space of 14,000 feet will accommodate a fleet of twenty-five 2200-ton destroyers or Liberty ships at one time.

The San Francisco Yard's record during the emergency period in repairing or converting over 2500 vessels is outstanding. These ships ranged from the smallest minesweeper and fleet tug to the 36,287-ton ship S. S. Nieu Amsterdam, and 32,000-ton battleships were not an uncommon sight at the Bethlehem yard during war years. In 1942, the USS Pennsylvania, commissioned in 1916, underwent a complete modernization, and this was followed by the 25,000-ton aircraft carrier Essex, which was given a 30-day overhaul. This included new radar equipment, secondary batteries, revamped flag quarters, a changed island structure and stowages for droppable fuel tanks. Largest battlewagon in the yard was the California. Others included the Mississippi, Nevada and Maryland.

The yard also holds the distinction of having been the only submarine repair base in the country operated by a private company. Thirty-one of the undersea craft were completely overhauled here. The complete removal of all quipment and working parts was required on each job, leaving only the shell. The main engines were removed and brought into the machine shop on individual cradles and rolled from one end of the shop to another, during which time they were completely disassembled, cleaned and then reassembled with the addition of necessary new parts. Parts not immediately available on the Coast were made right at the base. All batteries and electrical equipment were removed and repaired in shops at the base or at the main yard.

Many foreign ships also put into Bethlehem's San Francisco Yard for repairs—Russian, Javanese, French—but the largest of them all was the Nieu Amsterdam, biggest Dutch vessel afloat, then a troop carrier. Bethlehem workmen gave her a major overhaul, made changes in her armament, in troop arrangements and troop carrying facilities. The Navy troop transport Montecello, once the Italian luxury liner Conte De Savoia, also was a visitor. These, however, were the torpedo, bomb and shell days of the early war years. The Kamikazes came later, and with them came more ships to Bethlehem. The yard's repair facilities were jammed in the spring of 1945, when 80 per cent of its 10,500 employees were engaged in repair work—10 hours a day, 7 days a week.

Typical of the ships that limped in for mending and sometimes virtual rebuilding were the USS Caldwell, a Bethlehem-built destroyer, struck from the starboard aft quarter in the radio room by a suicide plane carrying two bombs. One exploded in the No. 2 handling room and the other struck the superstructure. Only the 5/8" STS steel on the pilot house saved the personnel inside. The first shell, after exploding in the handling room, went on down through the crew's scullery and 18 inches of metal mess trays, which probably prevented it from going all the way through the bottom of the ship.

Ship repairs take equipment and machinery, and Bethlehem's two machine shops are the most complete and modern on the West Coast. The Navy owns some of the machine shop equipment, but all is operated by Bethlehem personnel. The two shops are equipped with overhead cranes with lifting capacity up to 60 tons, lathes up to 125-inch swing and 39 feet long, and others with a 48-inch swing and 64 feet long; vertical boring mills up to 22 feet in diameter; a 72-inch horizontal mill which is a combination draw cut shaper and milling machine; hydraulic presses which exert pressures up to 500 tons; assorted portable boring bars for boring large or small cylinders and shaft taper couplings and taper coupling bolt holes; and portable machines for turning crank pins in place.

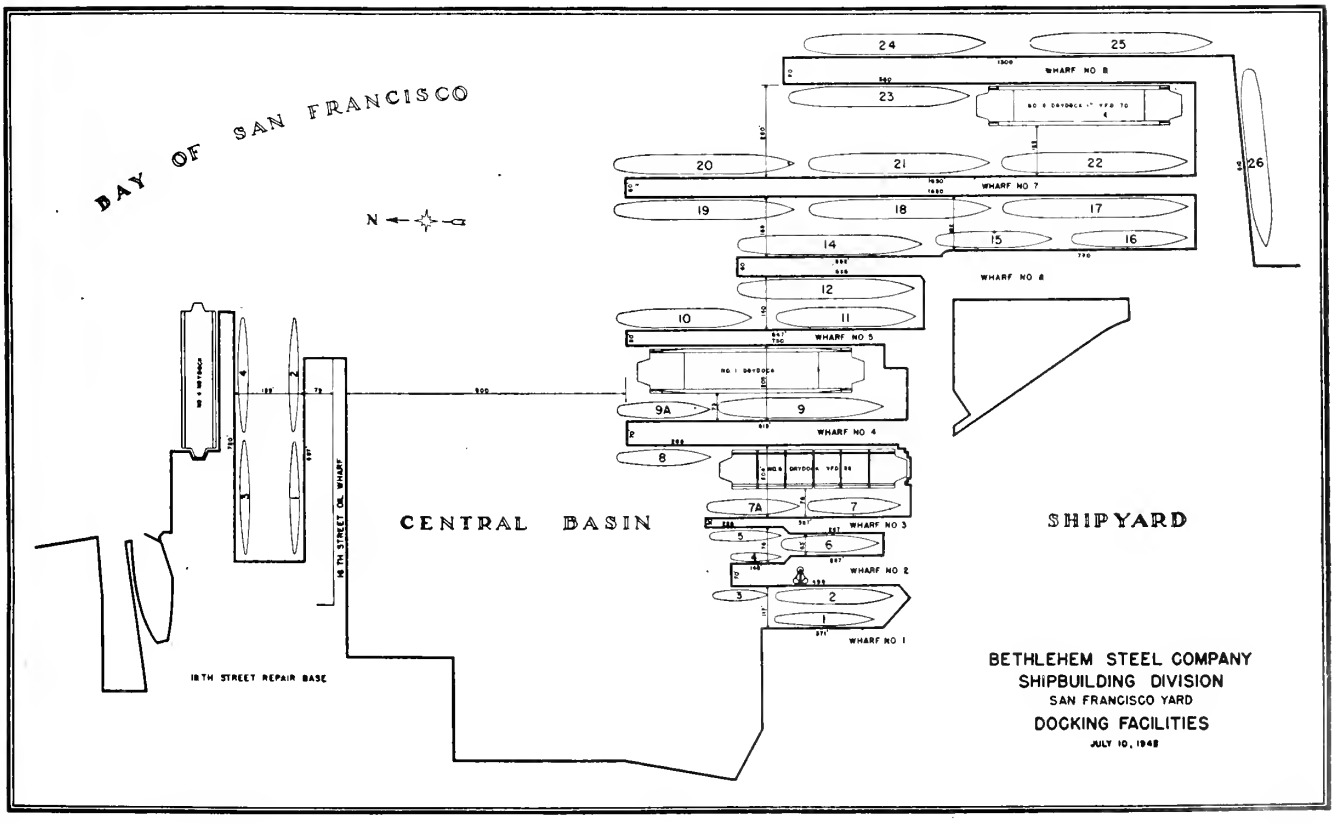
It was these machines and others—some developed by War Production Board Citation Winner Victor Lepkey, a San Francisco Yard machinist supervisor—that helped get ships off drydock, and others speeding back to the war zone in record time.

All repair work was not done in the machine shop, however; other departments drew an equally heavy load—the electrical department, the welding department, the copper shop, and the pipe shops. The blacksmith shop is equipped with a 1000-ton hydraulic press; two 30-ton cranes and steam hammers which exert pressures of from 800 to 7000 pounds. This shop can handle jobs from a 30-ton shaft down to the smallest door hook.

An indication of the magnitude of the yard's wartime repair and new construction program is found in the following monthly requirements: 56 million gallons of fresh water, enough to supply a city of 15,000 population; 860,000 kilowatt hours of electricity, which is comparable to an amount consumed by a city the size of Redding, California, with 10,300 population; 37 million cubic feet of natural gas, sufficient to supply the city of Eureka, California, with an estimated population of 20,000.

Wartime activities of Bethlehem Steel Company's San Francisco Yard were by no means confined to repairs. Fifty-one combatant ships were completed, and these included four high-speed anti-aircraft cruisers.

Bird's-eye view of Bethlehem Steel Company's San Francisco yard, the Risdon plant, naval yard, and the submarine base, all operated by Bethlehem. Upper right shows San Francisco Bay Bridge. The Bethlehem yard includes four flooting drydocks—22,000, 14,000, 11,000 and 6500-ton; tie-up space on piers, 14,000 feet; capacity for Libertys or destroyers, 29 at a time; number of vessels repaired or converted during war, over 2500.



Converted P-2 Passenger Liners

IN THE NOVEMBER, 1945, issue of Pacific Marine Review we published the general arrangement and profile drawings of the P-2 Army transports built by Bethlehem Steel Company Shipbuilding Division at its Alameda, California, shipyard. Herewith we are presenting the general arrangement, profile and midship section drawings of the same type of ship, two of which are now being built at the Bethlehem Alameda Yard as transpacific passenger liners for the Maritime Commission.

Propulsion is by the turbo-electric system with two separate turbine rooms and two separate motor rooms. Each turbine room contains two Combustion Engineering steam generators designed to operate at working pressure of 600 psi, and a temperature of 825° F. at the superheater outlet. This steam from each pair of boilers goes directly into a main propulsion General Electric turbine generating set that normally operates at 590 psi 815° F. throttle and exhausts to the condenser at a vacuum of 28¾" Hg with injection temperature for the cooling sea water at 70° F. Each main propulsion turbo generator set is designed and nozzled for continuous operation at 7650 K.W. running 3715 rpm with steam at 585 psi and 840° F. Each of these main generators is directly connected through suitable control and switchboard arrangements to one or both of the main propulsion motors. The current is three phase 60 cycle A.C. at 3500 volts. Each motor is rated 10,500 shp for maximum continuous duty and is directly connected to a propeller shaft. At the normal rating of 9000 shp the propeller turns 124 rpm. A complete description of this power plant and the auxiliary machinery of this type of vessel was published in Pacific Marine Review, October, 1944.

The hulls are largely welded but there are 350,000 rivets used in the hull joints. A curved stem, a modified cruiser stern and graceful sheer give the ship a fine profile appearance. Good propulsive efficiency is guaranteed by the finely molded underwater body and the long easy run aft. All scantlings, plating, subdivision of hull are designed to the highest class of the American Bureau of Shipping, and equipment is installed to conform to all the regulations of the various Federal agencies, bureaus, and regulations governing American shipping, such as:

Division of Marine Inspection, U. S. Coast Guard
International Load Line Convention
U. S. Public Health Service
International Convention for Safety of Life at Sea
Senate Report 184
U. S. Customs Admeasurement
Panama Canal Regulations
U. S. Maritime Commission

General characteristics are shown in the table herewith.

Promenade Deck

The promenade deck extends from the stern to frame 165. The after part of this deck from frame 75 to frame 165 is devoted to an enclosed promenade and the public rooms for cabin class passengers. A built-in swimming pool occupies the after portion of this enclosed deck area, and moving forward from the pool the plans show: a marine veranda; a cocktail lounge; the main stair hall with shops and service rooms; the smoking room; a library port and a writing room starboard; the forward stair hall with service rooms; and at the forward end of the house a main lounge or social hall.

Upper Deck

From frame 48 to frame 145 the upper deck port and starboard is occupied by 49 cabin class staterooms and two cabin class suites. Forward of frame 48 this deck is arranged for quarters for seamen, bo'suns, quartermasters, storekeepers, and carpenter. Each cabin class room is arranged with its own bathroom equipped with either bath or shower and toilet. All of these rooms are outside rooms and each of the two suites has a veranda, a sitting room, a bedroom, and a bathroom. All the staterooms are outside rooms. Between frames 145 and 166 are located a gymnasium, a massage room, and a children's playroom, and the tourist class lounge and smoking room, each of which has an enclosed promenade. In hatch No. 7 on this deck there is arranged a tourist class swimming pool.

"A" Deck

From the stern to frame 115 on "A" deck the entire space is devoted to engineers, petty officers, and steward's department. In this space at frame 87 is the hatch for refrigerated cargo spaces. This hatch will be served by a special crane that hoists the cargo out and runs it to and through the side port on either end of athwartship passage.

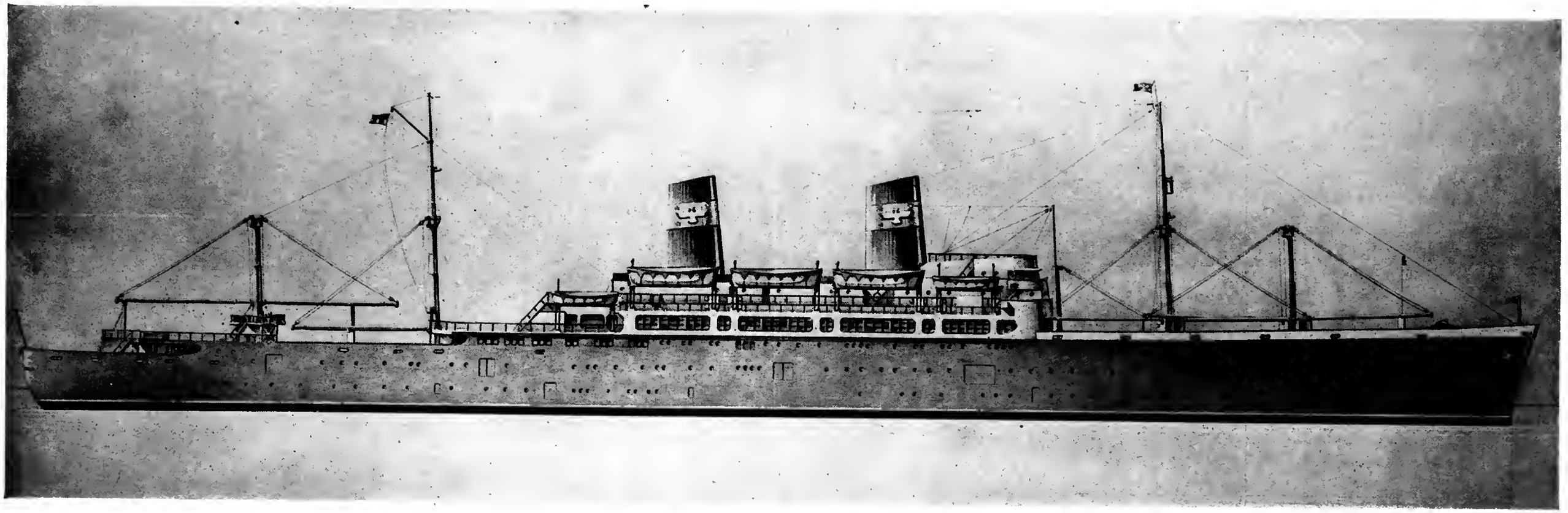
Just aft of this crew accommodation on "A" deck is the purser's office and the main cabin class entrance hall. Aft of this entrance are cabin and tourist class staterooms and at frame 160 is the tourist class entrance and purser's office. The third class passengers' entrance and purser's office is at frame 190 and aft of this a third class smoking room and lounge.

"B" Deck

From stern to frame 36 this deck is occupied by bo'suns stores, chain locker, and dry cargo hold No. 1. From 36 to 106 there are crew's accommodations, including galley and mess rooms. From frame 106 to frame 128 the cabin class dining room occupies the full beam of the hull. The galley runs from frame 128 to frame 152. A tourist class dining room takes 10 frames aft of the galley. Thence to frame 195 there are a group of tourist class staterooms on the starboard side and a complete hospital on the port side. Aft of this group of rooms is the third class dining room and the third class galley.

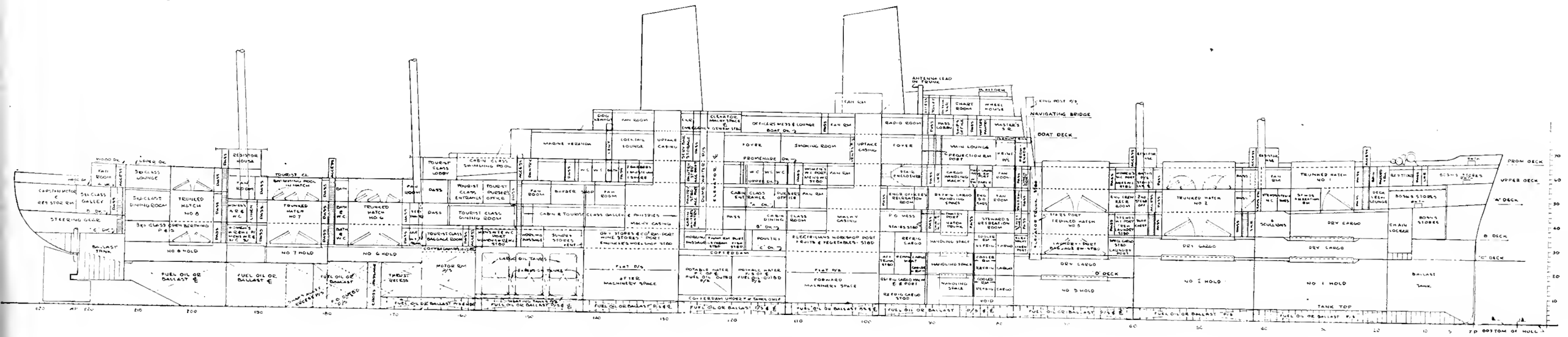
"C" Deck

On "C" deck from the stern aft are located: chain locker; dry cargo hold No. 1; dry cargo hold No. 2; ship's laundry port and strongroom and baggage room starboard; refrigerated cargo chambers and refrigeration machinery; ship's refrigerated stores and miscellaneous ship's stores;

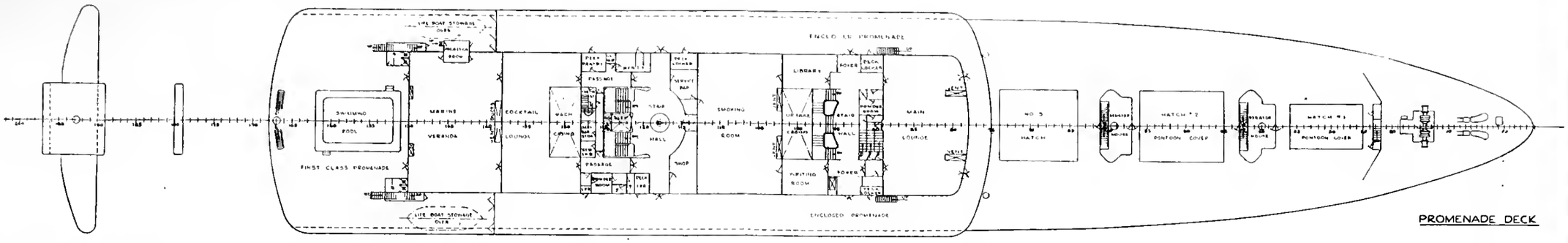


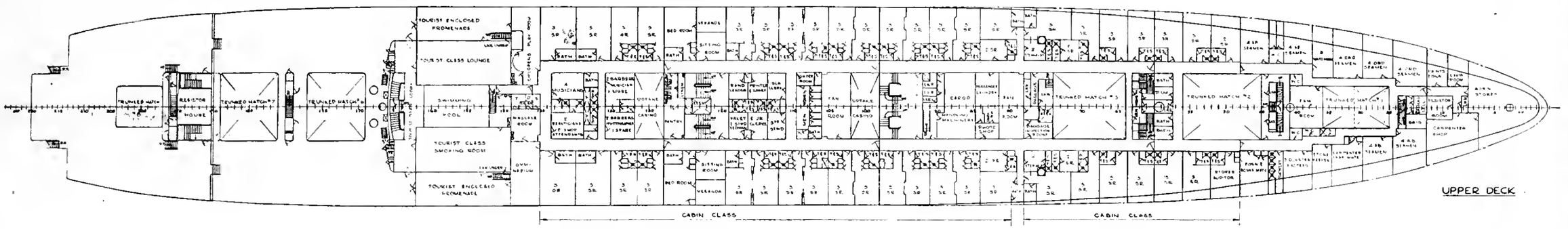
P-2 PASSENGER LINERS

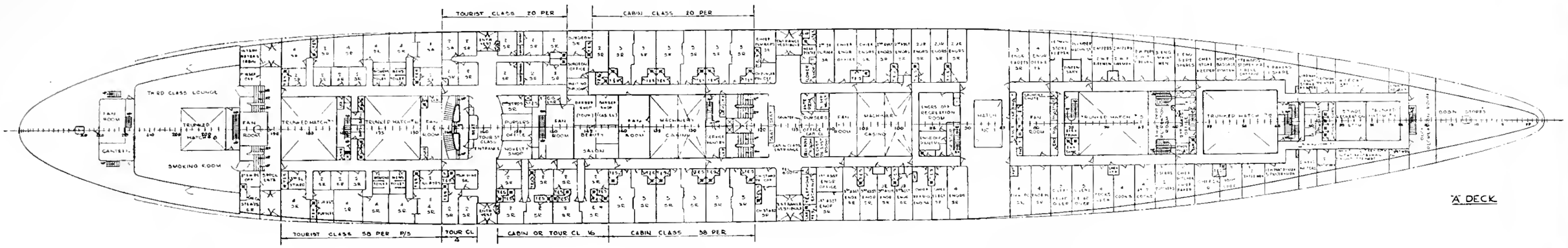
Artist's conception of the converted P-2 liners being completed at Bethlehem Alameda Yard for the American President Lines. Each of these two passenger liners will cost seven and a half millions for the conversion items, in addition to the seven and a half millions already expended on the vessel as a Navy transport, so that the total cost will be approximately $15,000,000 for each ship. On launching they will be christened PRESIDENT CLEVELAND and PRESIDENT WILSON. The present expectation is that the two ships will be ready for delivery in July and September, 1946.

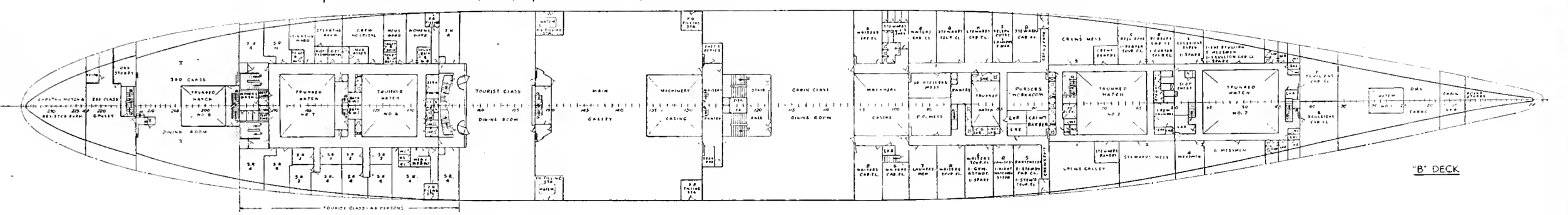


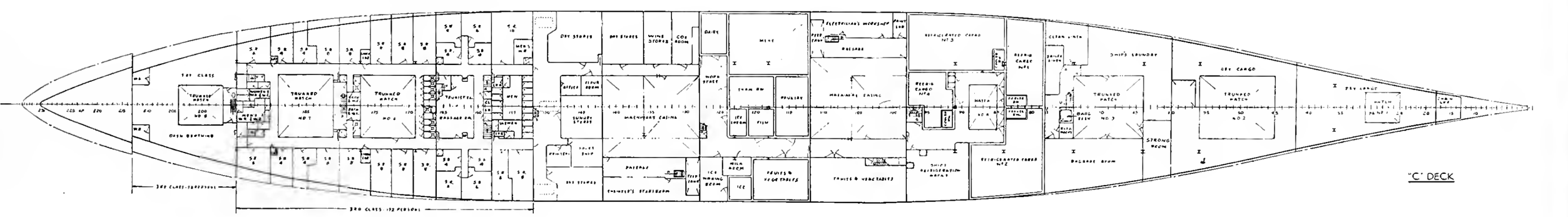
INBOARD PROFILE

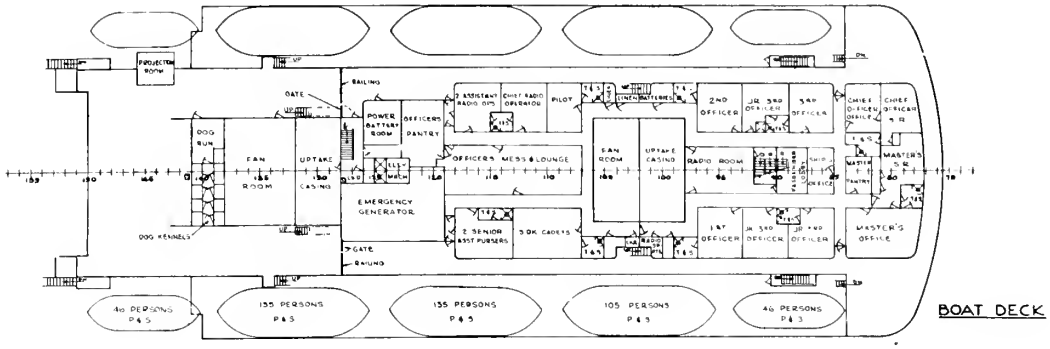

PROMENADE DECK
FIRST CLASS PROMENADE
ENCLOSED PROMENADE
SWIMMING POOL
VERANDA
COCKTAIL LOUNGE
SMOKING ROOM
MAIN LOUNGE
LIBRARY
HATCH No 2
HATCH No 1


UPPER DECK
TOURIST ENCLOSED PROMENADE
TOURIST CLASS LOUNGE
SWIMMING POOL
TOURIST CLASS SMOKING ROOM
CABIN CLASS
CABIN CLASS
CARPENTER SHOP

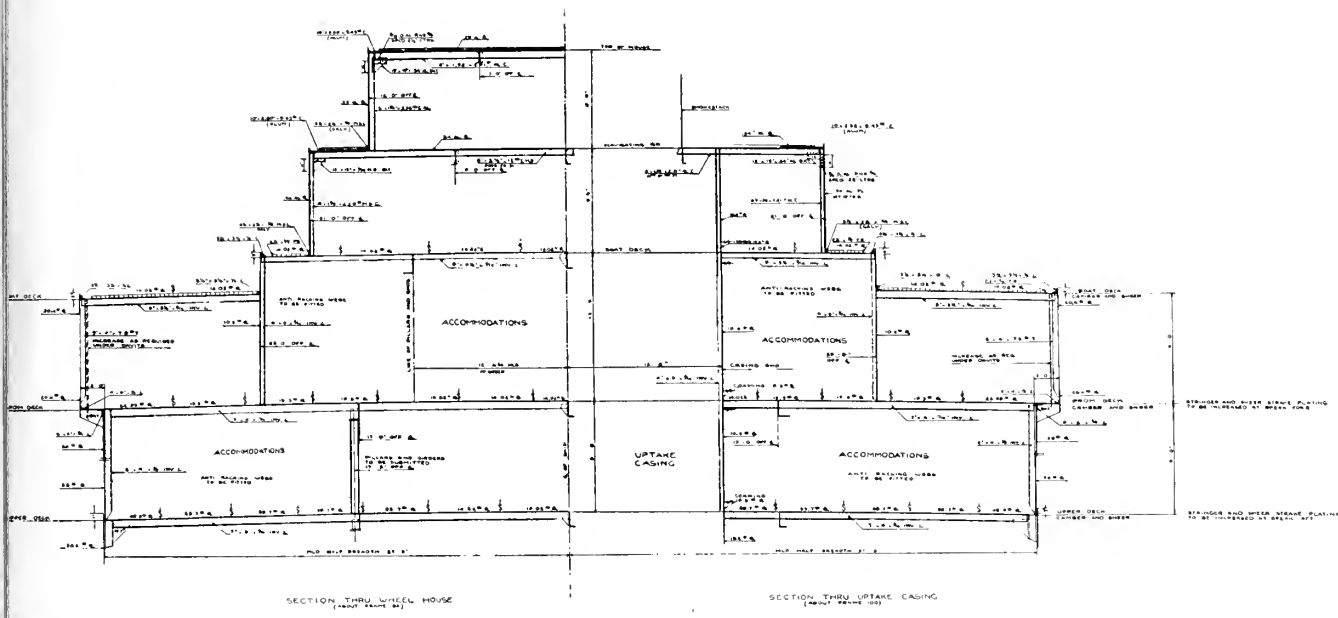

TOURIST CLASS 20 PER
CABIN CLASS 20 PER
A DECK
THIRD CLASS LOUNGE
SMOKING ROOM
TOURIST CLASS 58 PER P/S
TOUR CL
CABIN OR TOUR CL 16
CABIN CLASS 58 PER

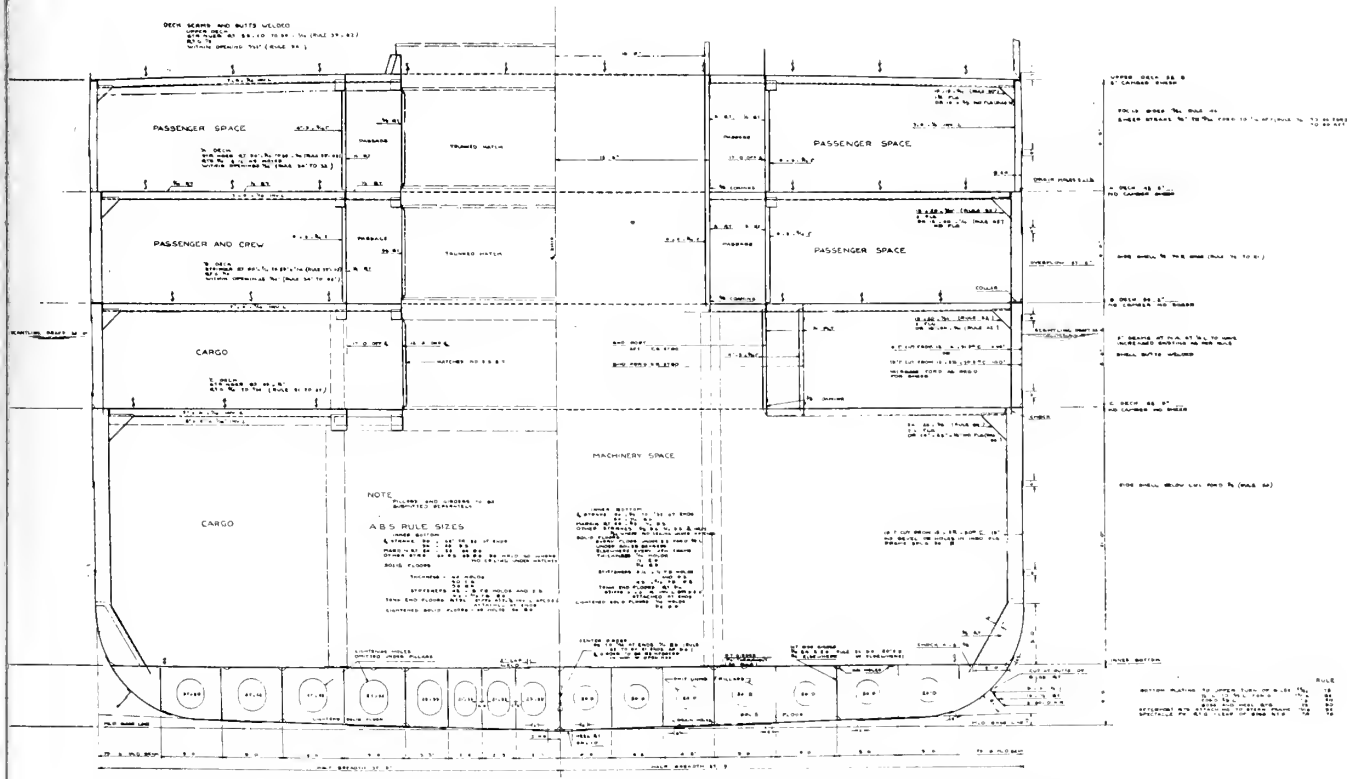

B DECK
3RD CLASS
TOURIST CLASS
DINING ROOM
MAIN
GALLEY
MACHINERY CASING
CABIN CLASS
DINING ROOM
TOURIST CLASS - AB PERSONS


C DECK
3RD CLASS
DRY STORES
WINE STORES
MESS
MACHINERY CASING
REFRIGERATED CARGO
SHIP'S LAUNDRY
DRY CARGO
STRONG ROOM
320 CLASS - 172 PERSONS



BOAT DECK





Top diagram shows arrangement of Boat Deck. Middle diagram shows section through wheel house (left), and section through uptake casing (right). Lower diagram shows midship section.

General Characteristics of P-2 Hull

Length O. A.	608′ 11″
" W. L.	590′ 0″
" B. P.	593′ 2″
Beam Molded	75′ 6″
Depth Prom. Deck at Side	61′ 6″
" Upper Deck at Side	52′ 4″
" "A" Deck at Side	43′ 6″
Draft Scantling	26′ 0″
" Subdivision	30′ 0″
Displacement Loaded	22,380 Tons
Cargo Deadweight	10,550 Tons
Refrigerated Cargo	621 Tons
Normal Speed	19 Knots
" Power	18,000 shp
Max. Continuous Power	20,500 shp
Cabin Class Passengers	182
Tourist Class Passengers	144
Third Class Passengers	224
Total Passenger Capacity	550
Total Crew	338

and third class passenger accommodations.

"D" Deck

This is a partial deck starting at the after bulkhead of hold No. 2 and running through hold No. 3 and the refrigerated cargo spaces to the forward bulkhead of the forward machinery space. At the after bulkhead of the propulsion motor rooms this deck forms a platform in the after holds aft to the after peak bulkhead.

Boat Deck

The first deck in the midship erection above the promenade deck will carry five boats port and starboard on Welin McLaughlin davits, fitted with Welin electric boat hoists. These 10 boats are approved to carry a total of 934 persons. One boat on each side will be fitted with a gasoline motor and will be able to tow the others. Quarters on this deck provide accommodation for: the principal deck officers; the officers' pantry and mess; the radio room and radio operator's room; and the emergency generator room.

Public Room Design

There will be ample need for a very intelligent use of the interior decoration art in the public rooms of this vessel. In the tourist and the cabin class dining rooms, for instance, where the width of the room is the beam of the ship, or approximately 70 feet clear, and the ceiling height is less than 8 feet, there is quite a problem to make the rooms seem to be airy and spacious. The same is true also of the lounge, smoking rooms, and marine veranda on the promenade deck, where the ceiling will be not much higher. The stair halls will give opportunity for some beautiful effects and no doubt will be used to great advantage for first impressions on passengers at the entrance lobbies.

An extension of the promenade deck aft would have given opportunity for more deck promenade space and more spacious public rooms for the cabin class passengers. However, as in all cargo passenger liners, the design problem becomes a compromise between passenger accommodations and cargo handling, and in this instance the arrangements for cargo seem to have been worked out very thoroughly.

When delivered, these vessels will be the largest commercial ships ever built on the Pacific Coast, and all of these experts will be watching with keen interest the finish and the neatness of Pacific Coast craftsmanship in the passenger accommodations for ships of this class. The machinery installation is the same as that used in several identical hull Navy transports already delivered by the same shipyard and tested satisfactorily in many transpacific voyages.

Of interest to the entire industry is the promise for the future of the merchant marine contained in the third and fourth paragraphs of President Truman's Christmas Message to Admiral Land.

THE WHITE HOUSE
WASHINGTON

December 10, 1945

Dear Admiral Land:

During the past five years Christmas has come to men of the Merchant Marine as they huddled behind blackout screens, riding loads of ammunition, oil and supplies for War.

Now, with the aid of Divine Providence, our Merchant Marine can sail the seas with lights on. When the job of bringing the troops back home is finished, the Merchant Marine will move the goods of Peace.

During the black years of War, the men of the Merchant Marine did their job with boldness and daring. Six thousand were killed or missing in carrying out their duties.

In memory of those men, and in the interest of our Nation, the United States must carry out the bold and daring plan of Franklin D. Roosevelt for a Merchant Marine of the best designed and equipped passenger and cargo ships, manned by the best trained men in the world.

In view of the magnificent job the Merchant Marine has done, the re-affirmation of that pledge is the best Christmas message we can give.

Very sincerely yours,

Harry Truman

Vice Admiral Emory S. Land
Administrator
War Shipping Administration
Washington 25, D. C.

Reemployment Problems In Shipyards

(Continued from page 5)

noteworthy, however, that a surprisingly large number of veterans have apparently decided not to attempt to return to the shipyards. They seem to be going back to the work they followed before coming to the shipyards or to be turning to new fields that will utilize new skills learned while in the Armed Forces.

The spasmodic nature of ship repair operations has always presented a challenge to employers and employees alike. More than almost any other industry, daily employment fluctuations have been extreme, due to the very nature of the business. During periods of ship construction considerable alleviation of this condition has been possible in so-called "combination yards"; however, it has been my belief that the possibilities of continued transfer of numbers of employees back and forth from ship repair to new construction have been exaggerated. Experience in many such operations has convinced most observers that both types of work suffer in the long run from such tactics and that the two activities should be carried on using separate labor resources to the greatest extent possible. With respect to ship repair operations, present discussions of guaranteed annual wage plans and permanence of employment pose special difficulties for this industry. It appears that increasing problems along these lines will have to be faced in the coming years. I believe that real progress in the solution of this problem can be made provided realistic, cooperative and practical thinking is brought to bear by both sides in any argument that may arise. If, on the other hand, prejudice, emotion and false economics prevail, we may see this problem develop into the most serious threat to substantial and continued employment in the ship repair industry.

Shipbuilding and ship repair will always be dependent—for a major portion of their markets—upon foreign customers. Employment in the industry will therefore suffer in the event that costs are allowed to rise beyond levels that can be justified. Repair work on foreign ships can only be secured for this country's shipyards if costs are competitive with foreign billings. This fact must ever be kept in mind by those responsible for continued increases in the cost of labor, which is by far the largest element in the cost of ship repairs. Employment in shipbuilding and ship repairing will vary almost inversely as costs are continually pushed upwards. It should never be forgotten that foreign business depends upon our ability to compete in the world markets.

It is obvious that the size of shipyard pay-rolls is directly related to the size of the merchant marine and the Navy. Shipyards were built and are maintained to build and repair ships and of necessity they must maintain their present activity if they are to continue to operate as shipyards. That, however, does not prevent the use of their facilities in the development of other types of work within the capacity and availability of their equipment. To some extent, at least, the development of other products and services will be carried on, but it is my belief that the number of jobs created in shipyards through such extracurricular activities will not be of major importance. Presently there are too many yards and too many ships for full continual utilization of all; the number of active ships and shipyards must necessarily be reduced. The shipyard reduction will certainly depend to some extent, at least, upon the number of ships in service.

We finished the war with approximately 60 million deadweight tons in the merchant marine and a stupendous investment in our mighty Navy. National policy, economy and security, as well as the acumen, courage and disposition of our shipping industry, all are involved in the picture. Until all these factors are resolved, the extent of shipyard employment is difficult to forecast. We are on the shores of what may be a tempestuous ocean of reconversion. In the difficult days ahead we should all remember that the fundamental basis of our national, business and personal prosperity is our individual disposition to work and to produce efficiently. Efficiency, purchasing power and job security—including shipyard security—are all tied together, and right there lies the key to reemployment possibilities in shipbuilding and in our entire national economy. We have all the resources, including the man-power and the know-how, which brought this country to its dominant position of industrial world leadership and we still are capable of showing that spirit of adventure and courage by which this position was attained under our democratic system of free enterprise, the system which provided the only great reservoir of experience, intelligent management and trained personnel upon which government could draw, in the hour of emergency, for the enormous expansion necessitated by its wartime effort.

Through the last four strenuous years we added greatly to our experience, and if all of us, individually and collectively, determine to apply that experience and our basic knowledge of industry with the utmost efficiency, the possible extent of shipyard employment, of all employment, will be increased. Neither labor nor management alone can create that condition; neither can profit without the enthusiastic cooperation of the other, but both can and will profit together.

Adjustment of the size of naval and merchant fleets is necessary, but in the process of accommodating those fleets to our necessities a considerable amount of shipyard work will be required. Conversions and long-deferred repairs will present the first opportunities, involving overhaul of machinery, removal of ballast and defense features, including armament, berthing, messing facilities and passenger quarters; the opening of bulkheads and provision of tonnage openings; removal of special deck houses; installation of rigging, cargo gear and awnings; adjustment of deep tanks and piping for special purposes and various modifications required by different operators, as well as drydocking, cleaning and painting and underwater repairs.

The restoration of coastwise and intercoastal operations should provide a continuing source of employment, and increased Pacific trade, requiring additional shipping facilities and resultant shipyard service, is a possibility. The outlook on new construction is less definite but plans are contemplated for a number of new vessels for special services and passenger transportation. Obviously the maintenance of shipbuilding operations is essential to the preservation of the skills necessary both in time of national emergency and to maintain a modern fleet of vessels capable of meeting competition.

Low Pressure Evaporators

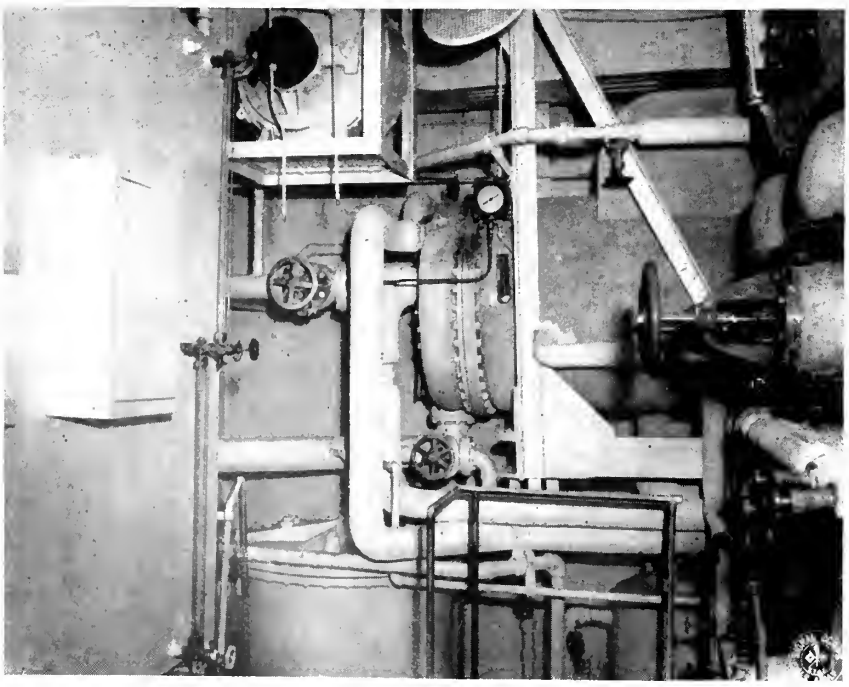
They Helped Make Freighters Into Troopships

By George H. Harlan

The problem of hauling American troops to our far-flung fighting fronts in ships which were never originally built to carry passengers was directly connected with the problem of fresh water supply. The solution hinged upon the ability of the ship either to carry sufficient supplies of water to support the additional passengers or to produce an adequate supply in an economical distilling plant which could be continuously operated while troops were aboard.

The answer lay in low pressure evaporators, the cost of installation of which compared favorably with the cost of installing adequate tanks to supply the passengers' requirements for the long voyages undertaken while occupying but a small fraction of the space required for such tanks. The water producing and purifying plant under discussion occupies a total of 3000 cu. ft. of space aboard ship, which is the equivalent of a tank holding a little more than 83 tons of water. This plant alone is sufficient to supply 1200 troops with water for an indefinite length of time on a basis of the minimum requirement of five gallons per man per day. This figure includes the water that the man would require for drinking, for culinary purposes, and for his share of hospitalization during his voyage across the ocean. His washing water would be salt unless the ship had surplus fresh water aboard. To carry the required amount of water for 1200 men in tanks for a 30-day trip would require 21,500 cu. ft. of tankage which would have to be subtracted from valuable store and cargo spaces. However, on ships where the steam supply is taken from the boiler directly, anywhere from 5 to 10 per cent of the volume of water produced would be required for additional fuel oil for evaporator operation. On ships with an auxiliary exhaust line carrying a back pressure, heat is used which would normally be wasted in the overboard discharge of the condenser, hence additional fuel space requirements are none. The space savings feature speaks so favorably for the evaporator plant that it was adopted on all ships where additional water supplies were required in any quantity whatsoever.

Distiller condenser (center), test tank (left), double effect evaporator (right).
(Official U. S. Signal Corps Photo.)



The typical distilling plant used aboard transpacific troopships throughout the war was a double effect evaporator of the low pressure type which distilled an average daily output of 80 tons of water. Through numerous heat transferring units, the low temperature steam employed to operate the plant is made to work at maximum efficiency to render the entire installation a very economical one to operate.

In the case of ships which are fitted with steam auxiliaries, the supply steam to heat the water in the first effect is taken from the auxiliary exhaust line and reduced down to a pressure of approximately four pounds per square inch gage. But on ships of more recent design, which for the most part have electric auxiliaries, the steam is taken from the desuperheated steam line from the boiler and reduced down to the required pressure by several reducing valves. Before this desuperheated steam is taken into the evaporator it passes through a desuperheater flange which assures saturation of the steam by injecting water into it through 36 holes 1/16″ in diameter, in a ring around the pipe. The desuperheater also prevents steam temperatures in excess of 227° F., for at temperatures exceeding 240° F. a very hard scale forms on the tubes which is difficult to remove.

The sea water feed to the evaporators is usually taken from the sea chest used for fire lines and sanitary service. It first passes through the distiller condenser and is then discharged overboard, the feed water to the evaporator being obtained from this overboard discharge by means of pumping. The evaporator feed water is then used as a cooling medium in the air ejector condenser where all non-condensable vapors from the distilling condenser are removed. Steam to the air ejectors is supplied from the auxiliary steam line. After the feed water has been

used as cooling water in the air ejector condenser it is used in the second effect feed heater to partially cool the vapors made by the first effect of the unit. In this way the feed water gradually picks up heat as it makes its way to the first effect of the evaporator. From the feed heater the sea water enters the first effect as feed, where it is vaporized around a nest of tubes which employ the low pressure steam as a heating medium.

The vapors produced in the first effect are cooled by the feed water in the feed heater which is placed over the tube nest entrance to the second effect of the unit. Feed water not evaporated in the first effect becomes feed water for the second effect, and at this point it is evaporated by the vapors from the first effect. The evaporation from the second effect, plus the condensation in the heating coils for the second effect, is then directed to the distiller condenser where the cool incoming feed water from the sea condensed them.

Condensate drains from the air ejector condenser and first effect tubes, being the total condensate of all boiler steam to be fed to the unit, are piped to the auxiliary and main condensers. Water not evaporated, which is a concentrated brine solution, is diluted with the overboard discharge of the salt water circulating pump and thus sent back to the sea. The brine pump had to be located quite a distance below the evaporator in order to provide proper submergence.

The distillate produced by the distiller condenser is then pumped into the fresh water test tank. This tank holds 1000 gallons of water, and is divided into two sections, each one holding 500 gallons. A salinity indicator was placed at the entrance to the test tank which sounded an electric horn if the salinity exceeded 0.3 grains of salt per gallon. A tank which was very popular on troopships was designed by M. T. J. Garlinger of the San Francisco Port of Embarkation, and was so arranged that the operator, upon hearing the salinity horn resound, could immediately change over his tanks with the operation of but one lever which controlled four valves. This not only saved time but it also prevented the back-fouling of good water already made.

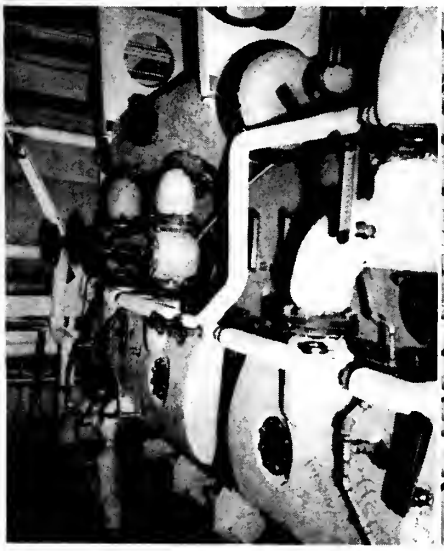
After the distilled water is tested in the tanks, it is filtered and sent into the fresh water system. It receives further treatment when used for domestic purposes, which will be discussed later on in this article.

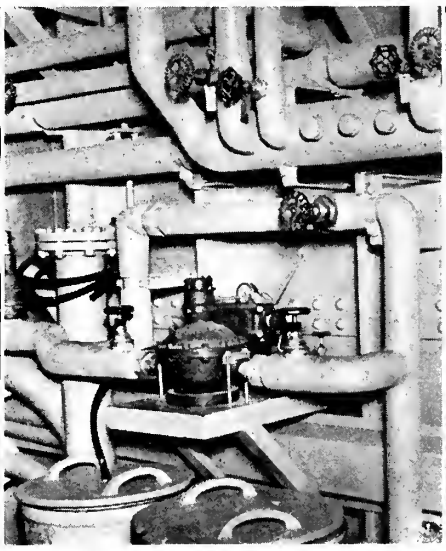
Low pressure evaporators require a great deal of care and skill in their operation to assure the efficient production of water. They will not make their rated capacity unless the personnel in charge have been given preliminary training in their operation. An evaporator tender has a very sensitive plant to care for, and should be given detailed instruction in operational procedures. Plants which are attended by trained operators will produce their rated capacity and have fewer lay-up periods than those operated by novices.

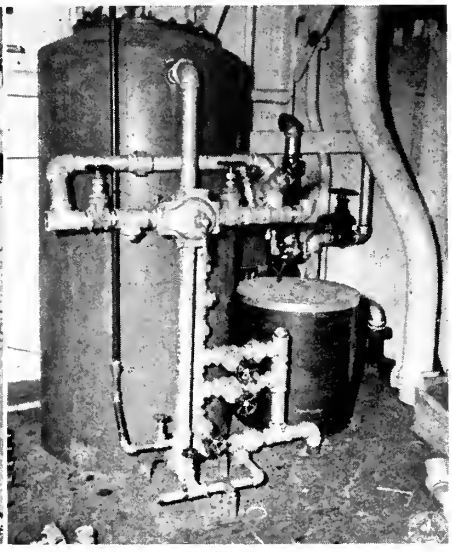
Proper operation of the distilling plant depends upon proper care by those persons who operate it and the absence of scale on the tubes of the heat transfer units. Presence of scale upsets the delicate heat transfer balance and cuts down the water-making capacity of the unit. Chemical treatment of the feed water has greatly aided in the problem of reduction of scale upon the tube nests. The evaporator is no more nor less than a boiler, and treatment of the feed water is necessary. A number of preparations designed for this purpose are on the market, most of them using corn starch and some alkaline for a base. The concentrated solution is carefully stirred and is fed into the sea water entering the evaporator.

Sea water which has been distilled by low pressure evaporating sets is not necessarily potable water. A low pressure unit may remove chemical impurities from the water, but the temperatures of the vapors formed therein are insufficient to kill harmful bacteria in the water. Evaporated water on straight freight vessels is put into tanks and its use is delayed, and while thus stored it may be purified for drinking purposes by adding chemical for that object into the tank. Agitation due to the rolling

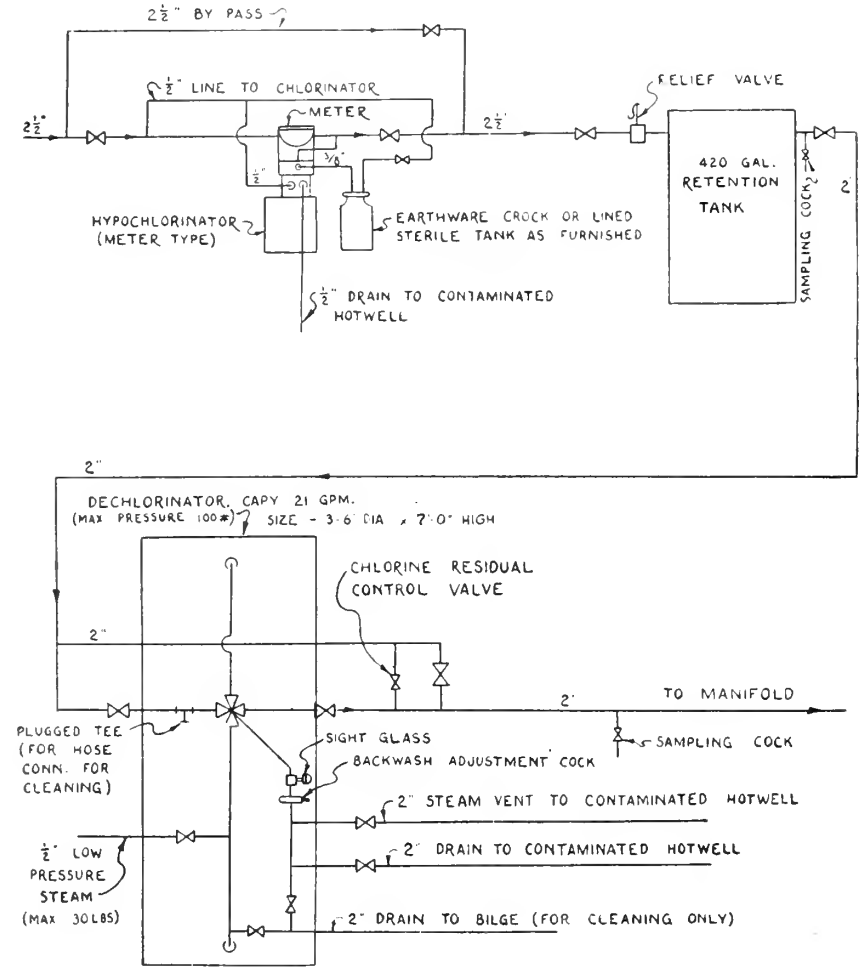
Left: Double effect low pressure evaporator installation.
Center: Water meter (front) and hypochlorinator unit.
Right: Installation of the de-chlorinator unit.
(Official U. S. Signal Corps Photos.)







SCHEMATIC CHLORINATING SYSTEM FOR DRINKING WATER

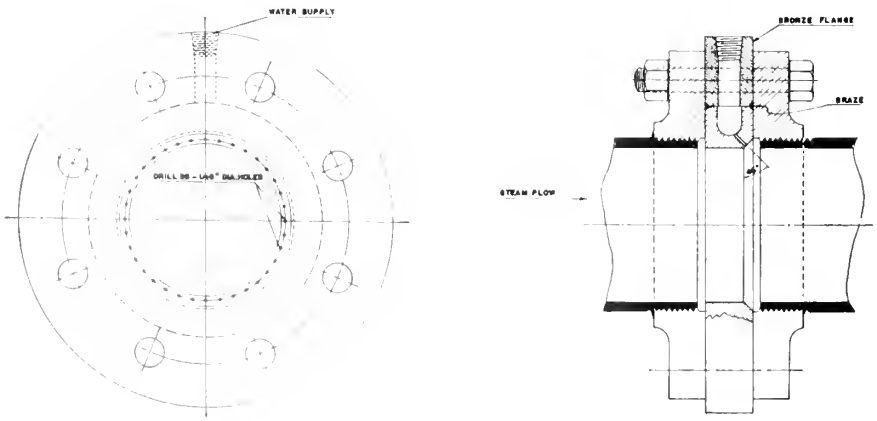


of the ship will be sufficient within a few days to bring about a dilution which will constitute purification. The problem on a troopship is very different. Water manufactured by the evaporator set is used as it is made, and although it may be momentarily stored in tanks, the period of such storage is not of sufficient length to insure proper water treatment by the mere addition of a purifying agent into the tank. The water which is used for domestic purposes must be chlorinated as soon as it is definitely ear-marked for those purposes, and that includes the water to the troop galley, the ship's galley, the hospital and the scuttlebutt.

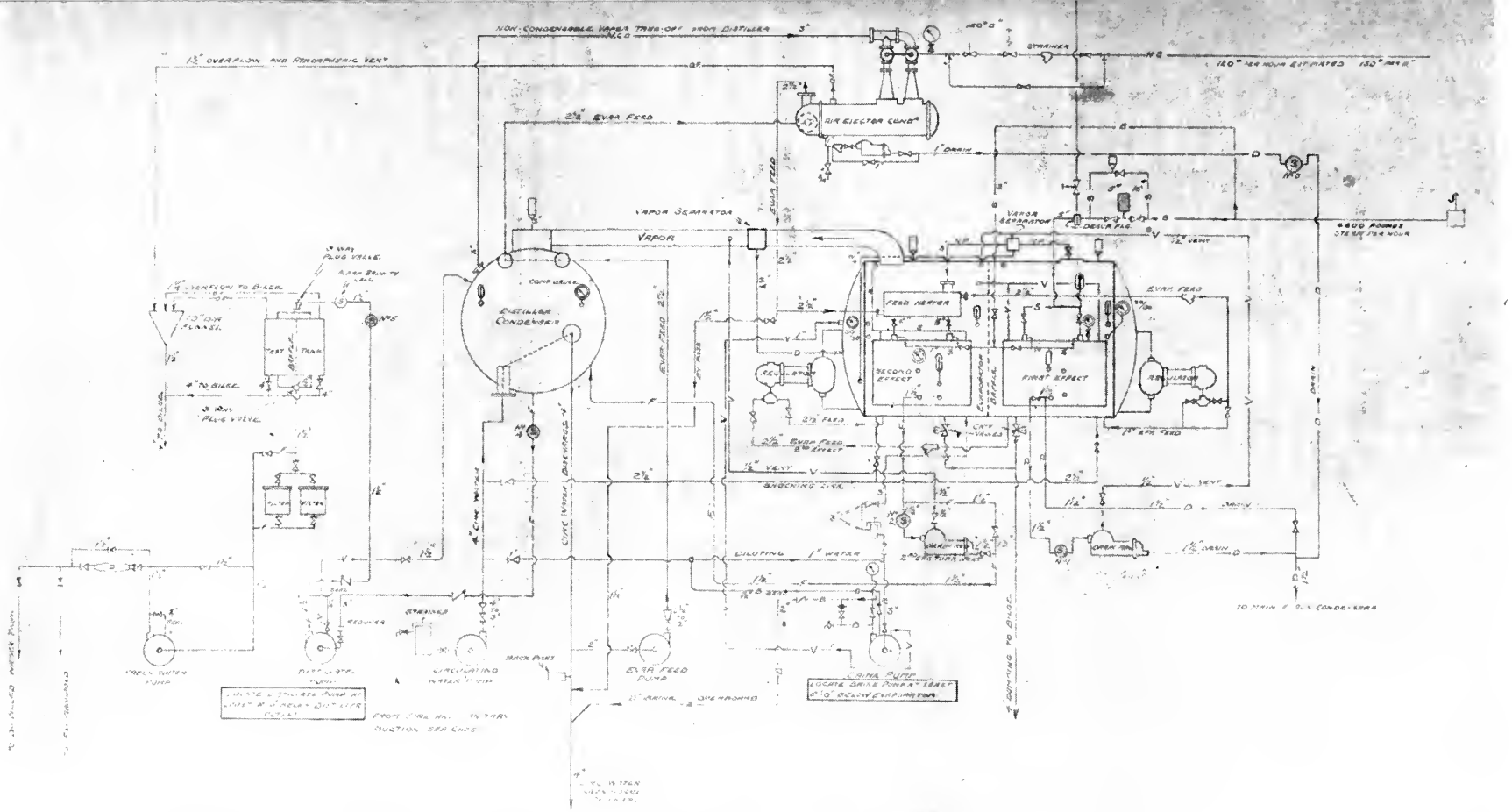
The most popular chlorinator used is one which consists of a chlorinating unit, a retention tank, and a dechlorinator. The water to be chlorinated passes through a meter where it is measured, the results of such measurement being relayed to the automatic hypochlorinator which injects the chlorine into the system according to the rate of flow of the water. The concentrated chlorine solution is kept in an earthware crock or sterile tank, and drawn from there as needed by the hypochlorinator. After the chlorine has been injected into the fresh water, it flows on into the retention tank. This unit is a large tank which holds about 25 times the flow of water in gallons per minute. Here the tank is baffled so as to make four different passes, and the water so agitated is assured of adequate mixture with the concentrated chlorine. From the retention tank the water proceeds to the dechlorinator unit, which is a device for removing the chlorine taste from the purified water. The dechlorinator is essentially a filter, and uses graded anthracite coal, charcoal or carbon, or a combination of these ingredients in its filtering system. The unit is a steel tank with a "baked on" enamel interior and is fitted with a small steam line for sterilization purposes and water service for cleaning.

The combination of low pressure evaporators and chlorinators was the answer to the problem of converting freighters into troopships. It sufficiently augmented the fresh water supply of the cargo carrier to make it self-sufficient in supplying fresh water to troops, existing tanks in the vessel constituting a reserve supply only. With proper care but few breakdowns were experienced in actual operation.

In peacetime operation on vessels where fresh water demands far exceed the ship's economical carrying capacity low pressure evaporators will do the work of making the ship's reqirements the same as they did during war.



DESUPERHEATER FLANGE



80 TON EVAPORATOR PLANT

DESCRIPTION	CU. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.
SURFACE - OUT FT.	108	44	80	45	180	240	266
"U" COEF. OF HEAT TRANSFER	142	445	443	110	220	430	203
SAT. WATER TEMP. VS. DEG.	45	45	45	45	21		
PRESSURE DROP IN WATER	.2'	6.5	11'	6.8'	45'		
NO. OF PASSES IN WATER	1	3	6	4	10		
NO. OF PASSES VAPOR SIDE	3			5			

Special Locomotive Carriers For Russia

By David Johnson

With the concern of the industry focused on conversion jobs for special services, the experience of the architects and builders in developing a locomotive carrier is of current interest, particularly insofar as it relates to bracing and strengthening the vessel.

The European and Asiatic devastated countries will need many locomotives and other heavy equipment, and specially designed ships will often be needed. The experience of designer and builder will be helpful to others.—Ed.

IN DECEMBER, 1943, the office of Joslyn and Ryan, Naval Architects, acting as design agents for Poole, McGonigle and Jennings in Portland, Oregon, was commissioned to convert five diesel motorships for the U. S. S. R., under auspices of the WSA, to carry locomotives from Portland, Oregon, to Russian ports.

The vessels were all of similar design, built in the U. S. S. R. as lumber carriers. Their principal dimensions are as follows:

Length O. A.	364′ 0″
Length B. P.	347′ 8″
Breadth	51′ 6″
Depth to main deck	27′ 3″
Displacement	9500 Tons at 24′ draft

Inasmuch as these ships are single deck vessels they were ideal for the purpose of transporting, with the exception of being a little small.

After conferences with Mr. V. I. Neganor of the U.S.S.R. Purchasing Commission and William H. Clark, operating manager for Moore McCormick Lines of Portland, work was started on preliminary plans and submitted to Mr. W. L. Martignoni of the WSA.

Basically the requirements were to provide stowage for 18 locomotives and tenders, approximately half to be in the hold and the remainder on deck.

Means were to be provided for shifting locomotives and tenders in the hold. This work was to be accomplished without too greatly altering the ships so that when the transporting of locomotives was completed the ships could be returned to service without again making extensive alterations.

No plans of the vessels were available, having been destroyed during the war. So it was necessary to lift the lines as well as the structure itself. The lines of the vessel were needed to satisfy ourselves of flooding curves, stability, etc., as well as to determine clearances for stowage. As soon as a number of dimensions had been lifted it was evident that it would be a tight squeeze all around if these ships were to be converted to carry the number of locomotives assigned to them.

Briefly the greatest problems faced were: to lengthen No. 2 hatch; devise a means of shifting locomotives and tenders in the holds; design a deck stowage that would be portable to carry locomotives and withstand huge seas with an ice load that would double the weight of the deck load.

To clarify the description of the work: while the ship has three holds and five hatches, from now on the space under each hatch will be termed a hold and numbered for the hatch.

After a number of preliminary layouts were made the best arrangement was found to be as follows: two tenders in No. 1 hold; eight locomotives in No. 2 and No. 3 holds; eight tenders in No. 4 hold; on deck two tenders over No. 1 hatch; four

Top: Looking aft from mainmast winch platform, showing outboard stowage and removable hatch sections.

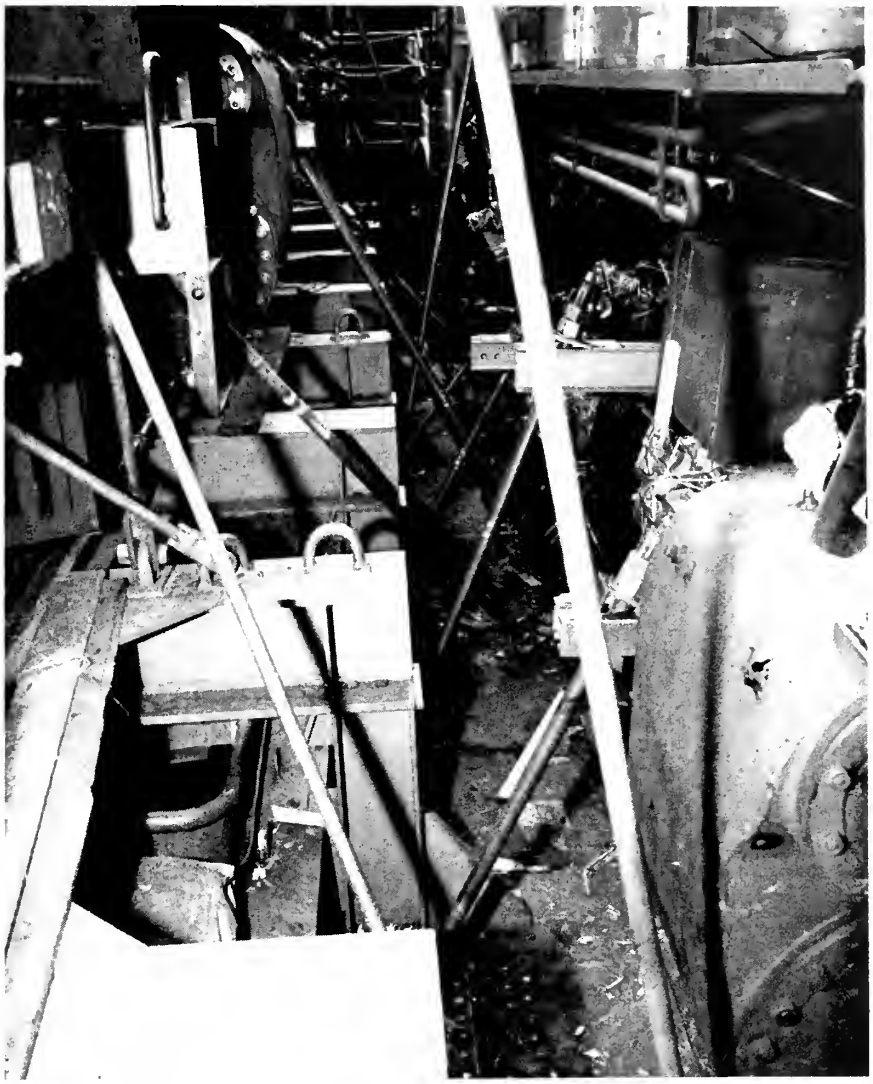
Center: Locomotive transfer table in forward hold under No. 5 hatch. Lightning holes also serve as hand holes for using grease gun on rollers, where 7 transfer tracks and 10 rollers engage each track.

Bottom: Looking forward under No. 4 hatch. This is over the shaft alley and clearance was very close.

locomotives at No. 2 hatch; two outboard and two inboard over the hatch; at No. 3 hatch two locomotives outboard and two tenders inboard over the hatch; at No. 4 hatch two locomotives outboard and two tenders over the hatch; at No. 5 hatch two tenders outboard and two locomotives over the hatch.

Following is a description of the work necessary to accomplish the stowage as outlined above: No. 1 hold was found large enough to provide stowage for two tenders with a rather large space remaining that would be available for stowage of cargo. A partial 'tween deck platform was installed on each side of the ship, extending from W. T. bulkhead 35 to frame 19. It was necessary to enlarge No. 1 hatch one frame to accommodate the tenders. Every fourth floor was reinforced with 3" x 2½" angle. One pillar, port and starboard, was installed to reinforce the longitudinal girders over. No reinforcement to the girder itself was necessary.

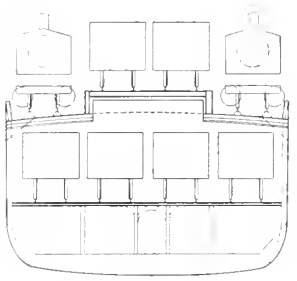
No. 2 and No. 3 holds presented the greatest problems of the conversion. First it was necessary to increase the length of No. 2 hatch, and to accomplish this it was necessary to extend it both forward and aft. To avoid making alterations too costly it was decided to let the main mast remain in its original position and remove the forward section of the winch deck house and install new winch platforms outboard. The hatch was then extended aft to within one frame of the center of main mast at frame 54. The forward end of the hatch was extended to within 12 inches of the after end of No. 1 hatch. The forward bulkhead and No. 2 hatch end beam thus forming a 13" x 16" box girder, this girder is the only tie athwartship for 75 lineal feet of hatches. To allow enough clearance for the lowering of locomotives through No. 2 hatch we had to cut watertight bulkhead 35 in the way of the hatch, this section was removed and turned forward for aft and placed one frame forward forming a jog of one frame on each side of the hatch. Watertight integrity was maintained and flood calculations altered but slightly. I believe this allowed 6" clearance each end of the locomotive,—none too much room for juggling 100 ton weights. Four pillars port and starboard approximately 14 feet on centers were required to reinforce the longitudinal girder in the way of No. 2 hatch.



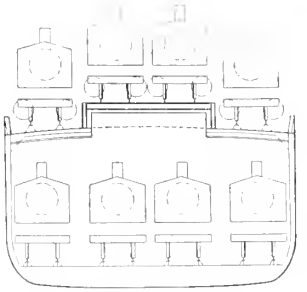
Supports over hatch and hold down fastenings.

No. 3 hold that is open to No. 2 hold is the section that was devoted to the transferring of the locomotives. The locomotives were lowered through No. 2 hatch to the center tracks and rolled aft from this position on the transfer tables. Then they were rolled transversely outboard to another set of tracks and then rolled forward. These transfer tables or sleds were fitted with seven pairs of channels running transverse to the tracks. These channels form structural members for the sled and also a means to support seven rollers to each set of channels, or 49 rollers per sled. The rollers engage a tee section fitted close to the tank top forming a transverse track for the sled to roll on. After two locomotives had been placed outboard on each side of the ship these sleds are dogged to the tank top with 28 dogs. These dogs are quick acting with a wedge type socket. The dogs were designed to take twice the combined load of a locomotive and sled, having in mind the ship rolling 30°; this meant that all loads are doubled, plus the normal safety factor added. With the outboard locomotives all in place two stationary sleds are lowered to No. 3 hold to fill the void left by the transfer sled at the two center tracks. The stationary sleds are fastened to the transverse tee sections by fitted bolts and are very similar to the transfer sled, less the dogs and the rollers. After this is accomplished the last four locomotives to be lowered are placed on the inboard tracks.

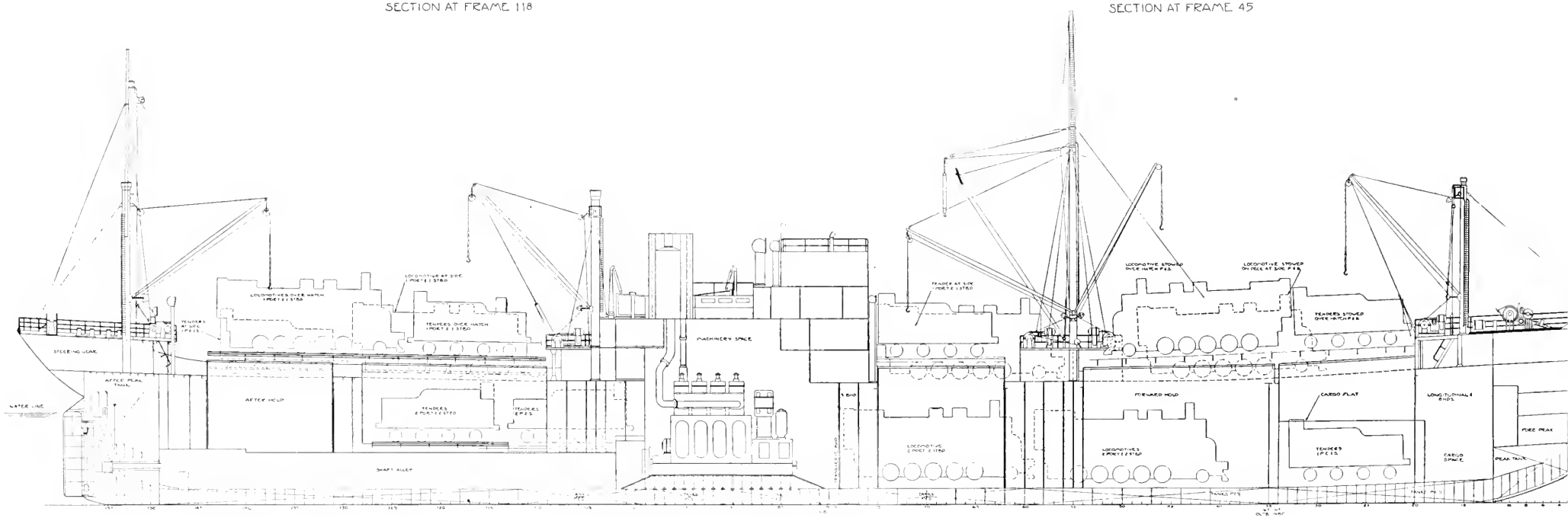
Inasmuch as the locomotive is some 40 odd feet long it was necessary to omit pillars under the deck in the



SECTION AT FRAME 118



SECTION AT FRAME 45



Profile and Sections Showing Longitudinal and Transverse Stowage.

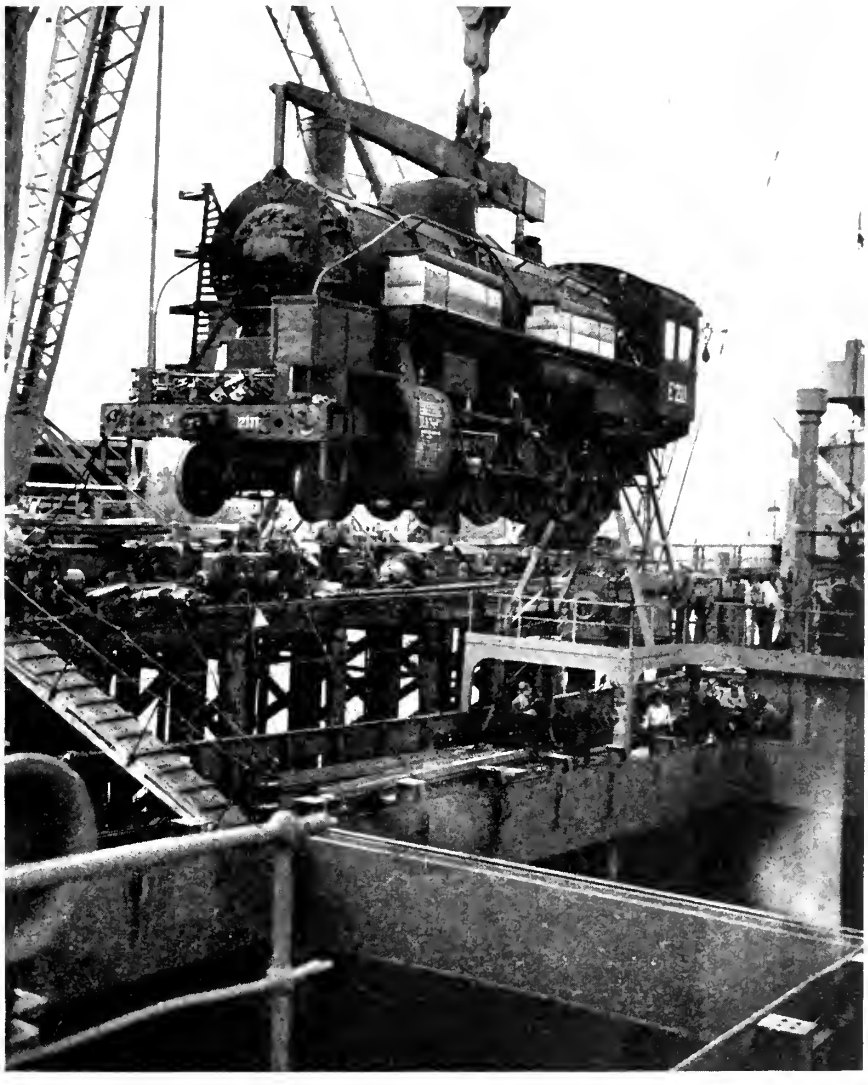
way of No. 3 hatch, so a 12″ x 30.6 pound rider plate was added to the existing girder and additional stiffening to the floors in the way of the longitudinal tracks and transverse tee sections was added.

No. 4 hold was a different problem. It was necessary to install a platform over the top of the shaft alley to gain the necessary transverse space for transferring and spotting the eight tenders that are stowed in this hold. This platform was erected by using the shaft alley as a center line support and in addition a lattice support of 5 x 5 x 16 lbs. wide flange H columns with diagonal bracing was placed approximately 11 ft. to port and starboard of the center line at every third frame. This platform was framed with 8″ wide flanged beams running transverse and fore and aft, 4″ x 3″ angles were used for racking braces. The purpose of this plating was to provide walkways. Two portable sections similar to hatch covers 12 feet x 13 feet are provided in the platform directly below the hatch. Thus two sections, each 9 feet high by 53 feet long by about 22 ft. wide port and starboard of the tunnel, are available for dense cargo. At one time in the development of the plans it was considered making this space into liquid cargo tanks, but on receiving information that Russia was to receive a large amount of aluminum ingots on Lend-Lease the cargo tanks were discarded.

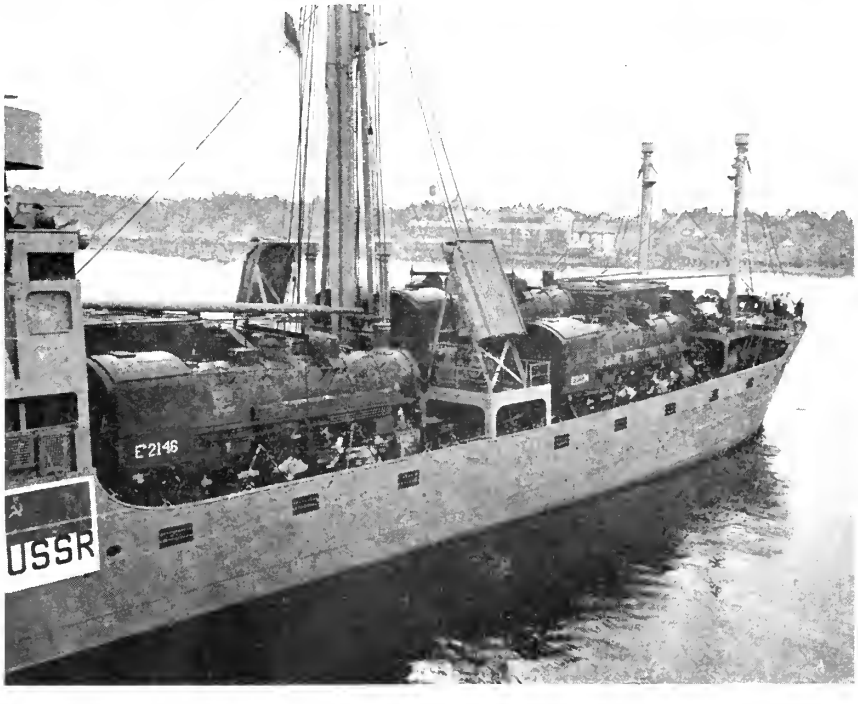
The transfer sleds for the tenders are similar to the sleds described in No. 3 hold, with the exception of size. It was necessary to enlarge hatch No. 4 six frames. Four 10″ pillars were used in holds No. 4 and 5 to compensate for deck loads over.

No. 5 hold was not altered, except for the pillars mentioned above.

To give some idea of the precision shipfitting and engineering required on this job clearances were so close that it was recommended the hand rails on the sides of the locomotive cab be removed on those to be placed in the hold. Stevedores on loading the first ship saw fit to overlook this suggestion. Needless to say they had to be removed and the bolts that were welded to the cab protruded about ½″. As the locomotive rolled down the tracks these bolts just failed to clear the pillar and had to be cut off. At another time a shipfitter must have misread his rule and a pillar was out ⅜″ and it had to be moved. In No. 4 hold at hatch end-



Transverse box beam between Holds Nos. 1 and 2 and raised winch platform. Forward end of ship, showing deck load and fastenings.



beam 109 the electricians were running a wire-way that was about 1½" deep, and this had to be moved.

Rather than upset the normal longitudinal strength of the ship it was decided not to increase the width of any hatches. So, the best arrangement in designing the hold stowage was to locate the two inboard rails as close as possible, and when No. 7 locomotive, which was next to the last to be put in place, was lowered and in a stowed position there was just 10 feet 11 inches of hatch opening left to lower locomotive No. 8, whose greatest width at the cylinders was 11 feet 1 inch. This was a tricky operation for the crane operators and they certainly deserve praise for a neat job.

In developing the stowage for the deck we had to keep in mind that everything over the hatches had to be portable and light enough to be handled by ship's gears.

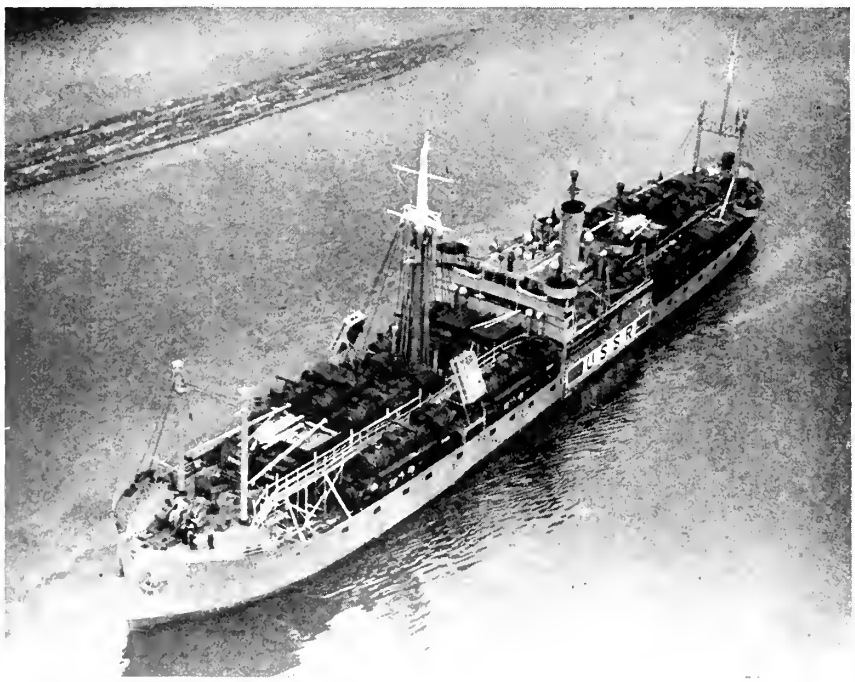
The peak on the center line of the hatches was cut down to level and hatch beams transposed or inverted, thus gaining a few inches of vertical center of gravity on the deck loads over the hatches.

The transverse beams of the hatch were fabricated H sections with a 13" x 30.6 pound plate web and a 15" x 40.8 pound plate flange and the ends placed on 10" x 10" wide flanged columns on every third frame. The deck beams below these third frames are reinforced by additional reverse tee bars 10½" x 8¼". These transverse beams were bolted each end with four 1" bolts to each column. By using a wedge system on the column and beams these bolts are theoretically in tension only, thus eliminating the use of fitted bolts.

Each hatch section is composed of four transverse beams with suitable longitudinal and diagonal bracing, two sets of 75 pound A.R.A. rails are fitted on top of the longitudinals. These sections were bolted together by clips and at the point of junction of the rails standard rail fish plates are used making each section a rigid unit on top of each hatch.

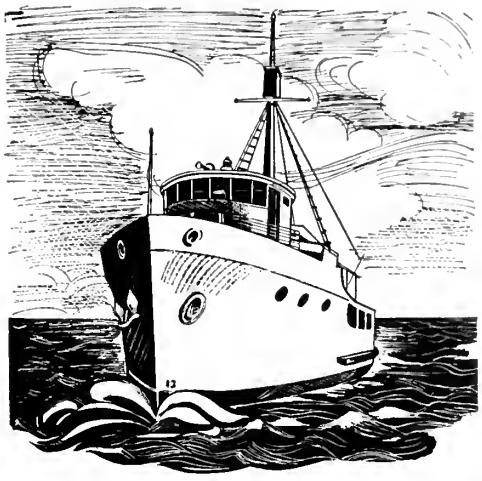
The outboard tracks consisted of a tee section welded to the decks on chocks on every third frame. The 75 pound rails were welded on top of the tee girders. It should be mentioned that these tee section girders were considered as deck reinforcing similar to a girder that would be placed below deck. At the same time the 75 pound rail sections were also considered as structural members. In fact, one of the few changes that could be made in this job would be to eliminate the 75 pound rail altogether except where locomotives have to be moved. A heavy piece of plate at the top of the tee girder could serve very nicely as a rail and dispense with the difficulty encountered in welding the high carbon steel rails to mild structural steel. At first large sections of the base flange of the rail would crack as the track was welded. This caused much concern as these ships would be traveling in just about the extremes of hot and cold climates. The designers had visions of rails breaking and locomotives careening wildly about the decks, but one of the shipfitter leadermen tried stainless steel welding rod and the problem was solved. The average time for these conversions was 45 days and the cost $1,500,000 each.

This series of conversions proved to be most successful and full credit must be shared with Poole, McGonigle and Jennings for their very excellent workmanship; Moore, McCormick for their know-how in handling cargoes of this type; Motor Body Corporation for the excellent work of lashing down; U. S. S. R. Purchasing Commission and their very capable engineers, and WSA for their approval and sanction for work of this type.



Aerial view of vessel under way.

Coast Commercial Craft



Harbor Tugs

These tugs, designed for Navy use, will find their way into commercial harbor work soon after completion.

AT THE SAN PEDRO, CALIF., yard of the Bethlehem Steel Company, Shipbuilding Division, four YTB single screw, all-welded steel hull, diesel electric, harbor tugs are under construction for the U. S. Navy. Two of these, named Acoma and Arawac, are now scheduled for delivery on the 11th and the 25th of January, 1946, respectively. The other two, which are to be christened Canarsee and Moratoc were launched on December 21st and are scheduled for delivery on February 1st and 8th, 1946.

These craft have the following characteristics:

Length O. A.	100′ 0″
Length B. P.	88′ 6″
Breadth, extreme, molded	25′ 0″
Depth, molded	13′ 6″
Displacement, full load	325 Tons
Mean Draft, full load	9′ 7″
Diesel Oil, full load (95 per cent capacity)	70.3 Tons
Lubricating Oil, full load	3.4 Tons
Fresh Water, full load	10.2 Tons

The steel hull is very sturdily built with an abundance of stiffeners and of cross bracing as will be noted from the sections reproduced herewith. In external appearance these vessels are typical harbor tugs, with a straight stem, a fantail stern covering a large rudder, and a long deckhouse with pilot house mounted on its forward end.

On the main deck forward is installed a large combined windlass and capstan. The windlass and capstan can be used jointly or independently and are driven through a vertical shaft and enclosed gearing by an electric drip-proof motor mounted below the deck. The controller of this motor provides for five speeds in either direction. An electric brake on the motor must hold 7500 lbs. rope pull on the capstan. The capstan is designed to handle 8″ circumference rope and develops a 5000 pull at a rope speed of 40 f.p.m. On the main deck aft a similar capstan without windlass is installed at the starboard side of the main towing bitt. This unit is used for warping, for boat and cargo handling and for emergency steering. Both capstans were manufactured by the McKiernan-Terry Corporation.

The steering gear, manufactured by the Sperry Gyroscope Company, is of the electro-mechanical wire rope drum type, capable of moving the rudder: from 35 per cent left to 35 per cent right, with not more than 12 turns of the steering wheel; from 45° left to 45° right in not more than 20 seconds at full speed ahead of the hull; and from 45° left to 45° right in not more than 40 seconds at full speed astern. A full follow-up steering station is installed in the pilot house and a non follow-up steering station at the after end of the deck house. In the event of electric power failure a throw-over mechanism transfers the system to manual operation.

Two water systems for fire fighting are installed. In one of these a 2000 gpm 150 psi motor driven centrifugal pump serves six 3½ inch hose outlets (three port and three starboard) and two monitors, one on top of the pilot house and one on the top of the deck house forward of pilot house. The other system is fed by a 300 gpm 100 psi centrifugal motor drive pump and serves four 1½ inch fire plugs, two forward and two aft on main deck. Both pumps were supplied by the Frederick Iron and Steel Company.

The machinery spaces are protected by a foam generator system in the engine room and a portable carbon dioxide system with two 50 pound bottles in the motor room.

Deck fittings for towing lines and other purposes include: four double barreled 9 inch bitts; one 12 inch towing bitt aft; one 12 inch single barreled bitt forward; one closed chock aft and two closed chocks forward all worked into the bulwark plating; one rail chock port and starboard forward; a 36″ towing cleat on main deck aft and cleats on the bulwark aft. A steel chafing strip is fitted on the taff rail all around the fantail.

In any tug the important feature is the propulsion machinery and in this tug the descriptive phrase "There's nothing much to her but her power plant" is very apt. Out of 60 frame spaces between perpendiculars 33 are occupied by machinery. Propulsion is on the direct current diesel electric system and comprises two General Motors diesel engines each direct connected to a General Electric generator. Each generator is electrically connected to a General Electric motor, and each motor drives one of the pinions of a Farrel-Birmingham single reduction gear set, the large gear

wheel shaft being directly coupled to the propeller shaft of the tug.

The diesel engines are six cylinder VEE type compression ignition, solid injection, two cycle, cooled by fresh water in a closed cooling system and arranged for electric starting using a starter winding on the main generator. Each engine is rated 480 bhp at 675 rpm and 600 bhp at 750 rpm

The generators are mounted on the same bed plate as the engine and are direct current two wire type with a normal rating of 410 K.W. at 250 volts. They are totally enclosed water cooled with motor driven ventilating fans, and pressure lubricated from the diesel engine lube oil pump. Each generator has a 500 watt 120 volt heater. Each generator shaft drives by belt a 25 K.W. d.c. two wire self-ventilated self-excited exciter. Each propulsion motor is rated 510 shp at 250 volts d.c.

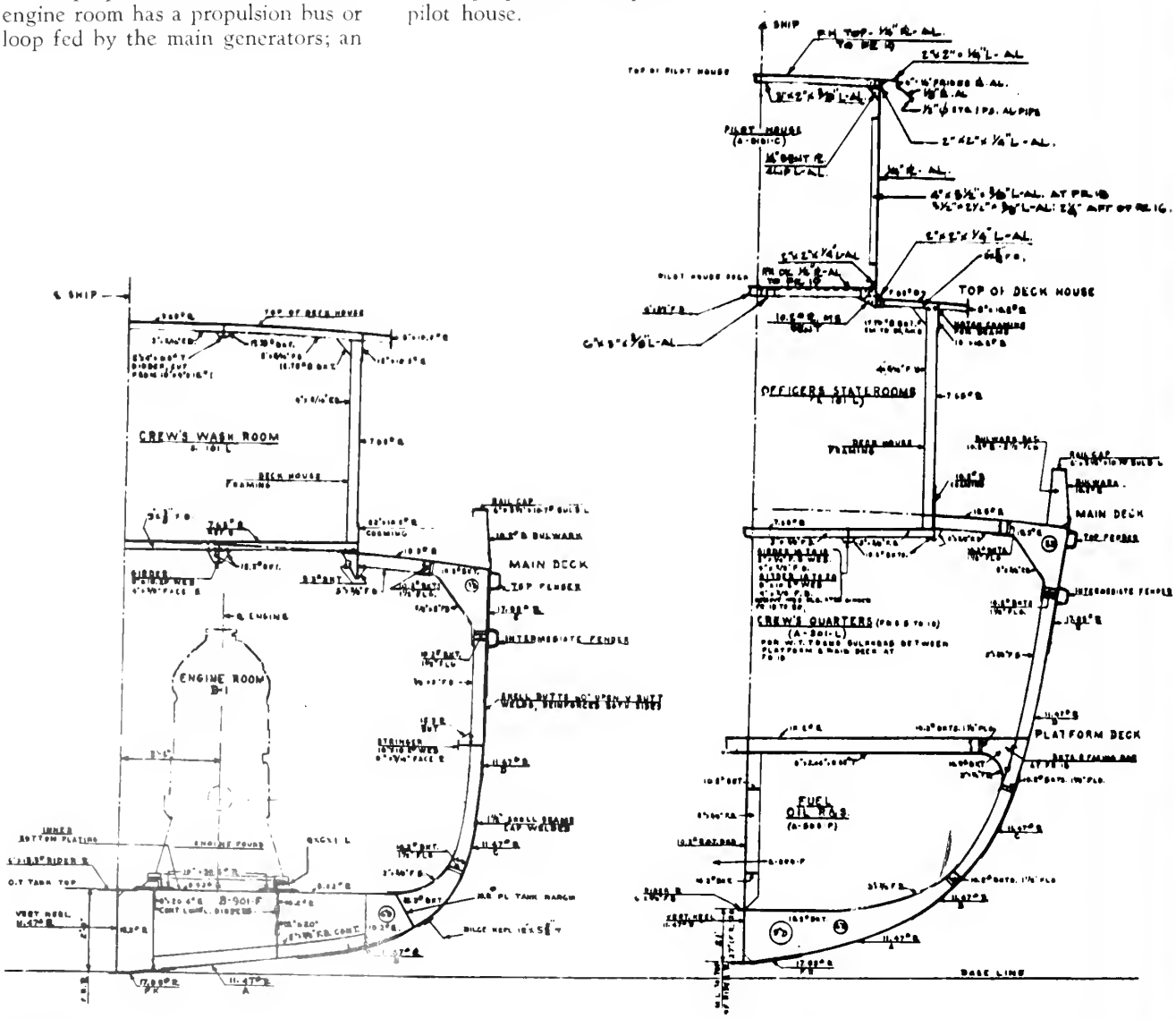
The propulsion control unit in the engine room has a propulsion bus or loop fed by the main generators; an excitation and control bus fed from either of the main exciters; and a fire pump bus fed from either propulsion generator.

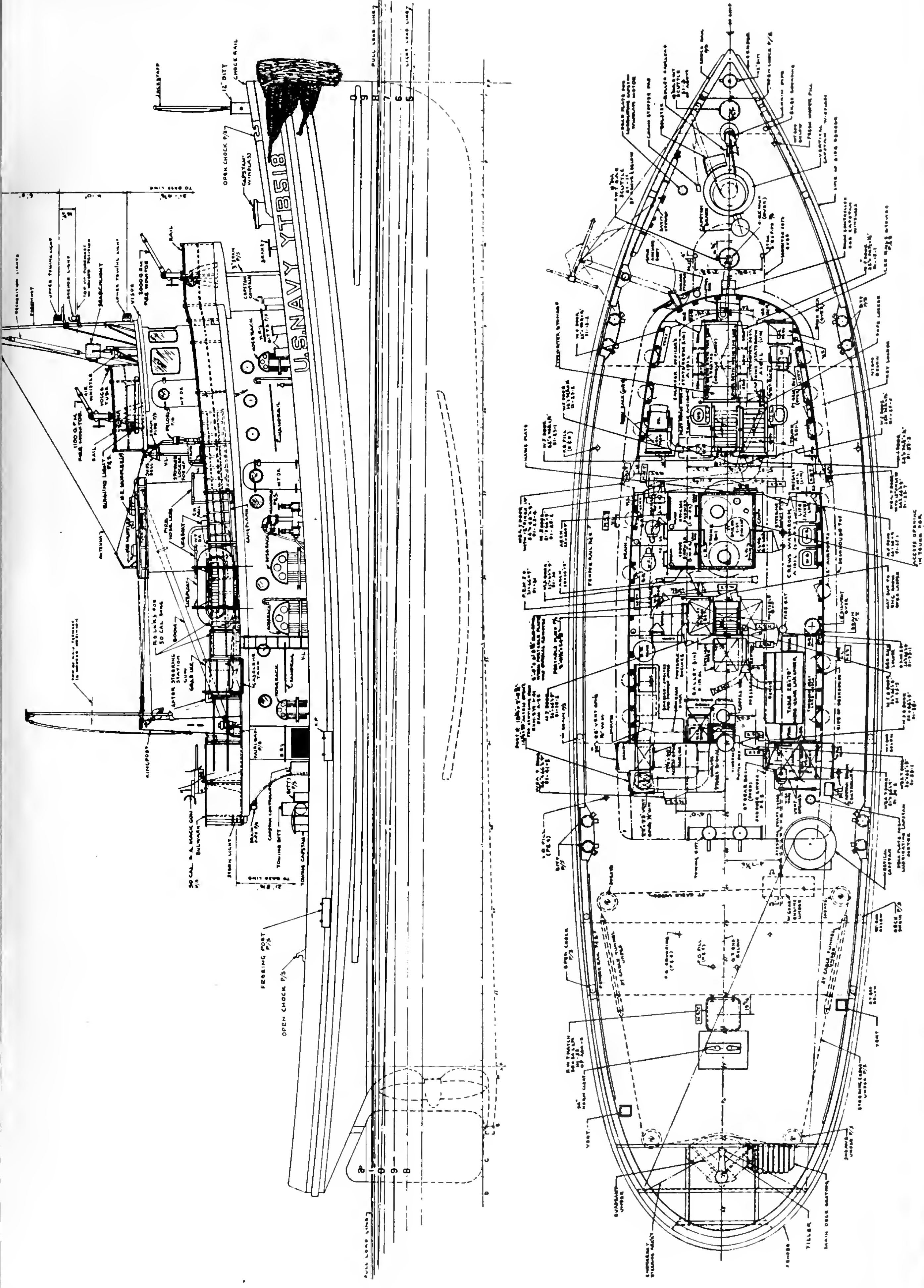
Each propulsion generator set-up switch has a "fire pump" position. The "fire pump" position on the set-up switch connects its propulsion generators together with all necessary control for fire pump service. The fire pump is started by voltage control from the propulsion generator. The field of the fire pump is supplied from the 120 volt excitation and control bus.

The propulsion control unit has an excitation transfer switch which permits either one of the main exciters to furnish ship's service power while the other is connected to supply 120 volt excitation and control power.

Two pilot house control stands are provided for remote starting, stopping and reversing, and regulation of the propeller shaft speed from the pilot house.

In addition to the pumps already mentioned each of these tugs carries a number of items in auxiliary machinery. Among these are: one 40 K.W. Buda ship's service diesel generating set with battery charging generator and starting motor, together with a Royal Switchboard Co. generator and distribution switchboard; one Williams Sales Co. auxiliary water heating boiler and controls designed to add 20,000 BTU's an hour to the hot water system; one Westinghouse Air Brake Company 20 cfm at 100 psi air compressor; one fresh water pressure system with 42 gallon tank and a Gould pump with a capacity of 10 gpm at 40 psi; one Allis-Chalmers flushing pump with a capacity of 50 gpm at 50 psi; one motor drive Kerr Machinery Co. lube oil transfer pump rotary type rated 50 gpm at 50 psi; one Gould rotary pump for fuel oil transfer 50 gpm at 20 psi




U.S. NAVY YTB518

Consolidated Launches Fourth Tuna Clipper

The Fatima, the fourth all-steel tuna clipper to be built at Consolidated Steel Corporation's Boat Division, was launched in Newport Harbor, Sunday, December 23.

The boat was sponsored by Mrs. Rosa, wife of Capt. Joe F. Rosa, skipper of the Fatima. Maid of Honor was Miss Josephine Cutri.

The Fatima is 99 feet long and has a refrigerated capacity of 200 tons. Several other fishing boats are under construction at Consolidated's 21-acre boat yard at Newport.

Steel Tuna Clippers at San Diego

The fourth steel-welded tuna clipper launched by National Iron Works since that pioneer San Diego concern began its boatbuilding activities early in 1945 slid into San Diego Bay on December 20.

Christened the Pico—for the island in the Azores from which many members of San Diego's Portuguese colony migrated to this country—the 70-foot vessel will make her maiden voyage early in 1946 for the High Seas Tuna Packing Co.

Her owners are Manuel H. Freitas, Manuel F. Soares, Joe Soares, Tiago Goulart, V. E. Sherwin and Paul E. Lovett. The craft has a fish-carrying capacity of 74 tons.

The launching ceremony followed the company's annual Christmas party for its 245 employees, who were presented 20-pound turkeys for their holiday feasts.

With Arthur Ponsford as master of ceremonies, the program included remarks by Anderson Borthwick of San Diego's harbor department; Superior Judge Gordon Thompson; William Robinson, assistant manager of High Seas Tuna Packing Co.; Paul E. Lovett, boat co-owner; and C. Arnholt Smith, National Iron Works' president.

The Pico was christened by Louise Freitas, daughter of co-owner Freitas. She was attended by Mary Soares, daughter of Joe Soares, as maid of honor, and by Mrs. Sherwin as matron of honor.

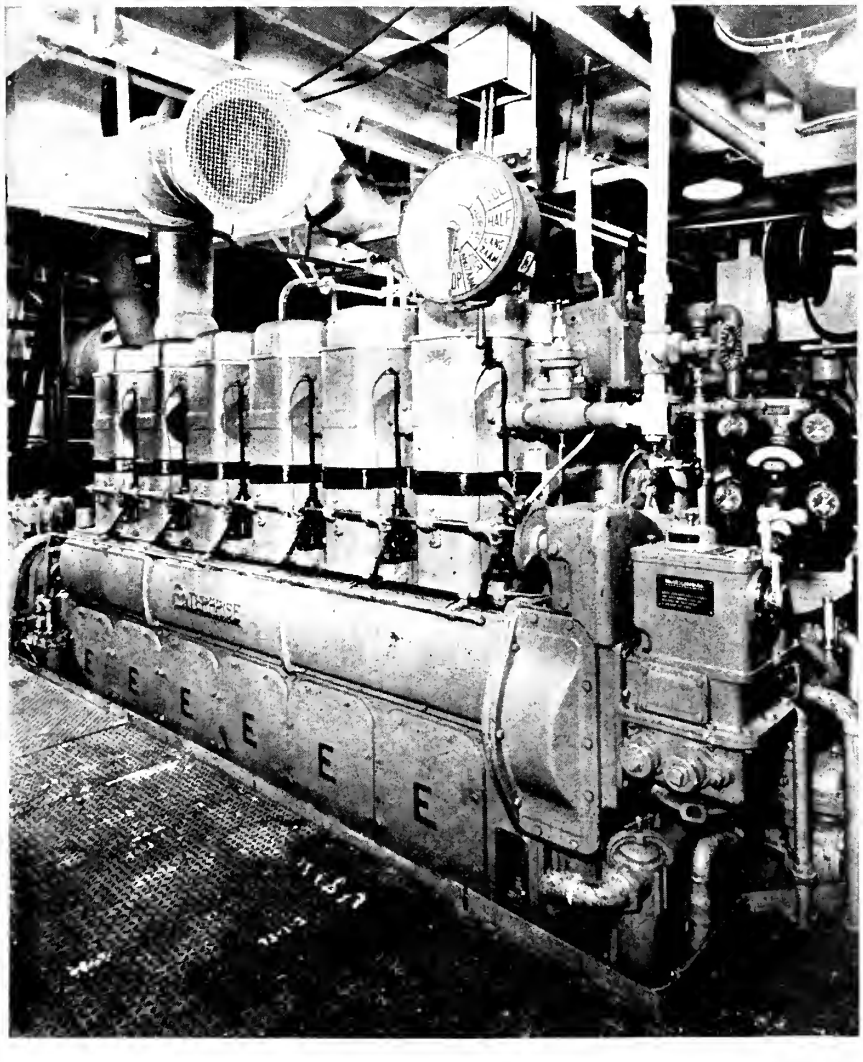
Ponsford declared that although in some quarters pessimism has been heard over the possibility that the tuna fleet is being overbuilt, "the leading canners do not think so."

"America will have an insatiable appetite for tuna, the most delectable product of the sea, and the industry's goal in 1946 is an all-time record of 5,000,000 cases," he said. "This year's output in San Diego and San Pedro will total 3,400,000 cases. In dollar value, tuna is the greatest fishing industry in the world."

National Iron Works has built three 52-foot steel clippers, and has under construction two 105-footers.

Coastal Cargo Vessel Biak

Above: The motorship Biak, shown here on her trial trip, is the second vessel to be completed by the Albina Engine & Machine Works, Inc., of Portland, Oregan, for the Netherlands East Indies Government. The contract calls for delivery of 20 coastal cargo vessels each having an over-all length of 180 feet 7 inches, a beam of 29 feet 0 inches and a depth of 10 feet 6 inches.



Left: The main propulsion unit of the Dutch motorship Biak, an Enterprise Type D.M.G.-6 diesel engine of 275 hp giving a service speed of 8.5 knots.

Admiralty Decisions

By *Harold S. Dobbs*
Of the San Francisco Bar

Salvage

In Victoria (Crew Claims), U. S. Dist. Ct., Southern Dist. of New York, 1945 A.M.C. 1199, this cause of libel concerns both claims for wages and claims for salvage. I shall only deal with the discussion of the salvage claim. The Victoria was an Argentine tank vessel which was the object of a torpedo attack on April 17, 1942, when it was approximately 360 miles from the City of New York and about 300 miles from the coast. The torpedo tore a hole about 25 feet in width and 25 feet in height under the waterline on her port side near the bow, opening up tanks 1 and 2. The captain ordered lifeboats to be made ready for use, and approximately an hour and a half later she was struck again by another torpedo which tore another hole about 25 feet wide and 25 feet high under her waterline near her stern, opening up tanks 6 and 7. The captain thereupon ordered the ship to be abandoned. Lifeboats were all ordered away and were rowed or sailed away until they lost sight of the vessel and each other. Approximately 6 hours later the United States Destroyer Owl sighted the Victoria. She went alongside the drifting derelict and placed men aboard who were able to get her under way for a short distance. Approximately a day later the Owl picked up lifeboat No. 1, transferred the crew to the Victoria under the command of her Chief Officer, and took off the men of the Owl. The Victoria thereafter was escorted by the Owl and got under way to New York under her own power. Lifeboat No. 2 was picked up by another United States destroyer and the men transferred to the Victoria. The Owl was relieved by the Navy tug Sagamore approximately two days after discovery of the Victoria, which tug continued to escort the Victoria to port. The evidence leaves no doubt that the Victoria, abandoned by officers and crew without any hope or intention of returning, was a derelict and that the members of the crew of the Owl were salvors. **(The Laura,** 81 U. S. 336.) The abandonment thereby terminated the voyage and the contractual services of the seamen. Although ordinarily seamen are not entitled to salvage awards for saving their own ship because that service is a part of their duty, yet they do become entitled thereto when their ship has been abandoned without any hope of recovery. **(Mason** vs. **Blaireau,** 6 U. S. 238.)

All who were engaged in the enterprise and materially contributed to the saving of the Victoria are entitled to share in the salvage. They are not deprived of that right because another set of salvors refused or neglected to join in the suit. **(The Blackwall,** 77 U. S. 1.)

The fact that the United States Government does not seek salvage inasmuch as the vessel and the cargo were under the flag of a sister republic of this hemisphere **(Victoria,** 1942 A.M.C. 864), does not prejudice the rights of the co-salvors to their proper proportionate share of an award. **(The Blackwall, supra.)**

The award is apportionable among all the salvors; that is, the crews of the Owl, the Sagamore and the Victoria, all of whom aided in bringing the Victoria into port.

The crew of the Owl, which discovered the derelict and started her on her voyage to her destination, supplied her with compressed air to start and run her motors, assisted in making the necessary repairs and convoyed her part way to New York, would be entitled to the largest part of the award, but seeks no award.

Though the Victoria was not an uncontrolled derelict when the libellants returned as salvors, they were called upon to assist in bringing the Victoria safely into port. They made minor repairs and rendered some services in addition to those rendered by them before their ship was struck by torpedoes. This entitles them to some award, though not to a very substantial amount.

It has been stipulated that the value of the Victoria when brought into port was $1,150,000. An award of $115,000, or 10 per cent of her stipulated value, 83 per cent distributable to the crews of the Owl and the Sagamore and 17 per cent thereof, or $19,950, to the crew of the Victoria, amounting to about $500 for each member of that crew, seems reasonable to the Court. See **The Lamington,** 86 Fed. 675, 685.

Frustration of Charter Party

Henjes Marine, Inc., vs. **White Construction Co., Inc.,** State of New York, Sup. Ct., New York County, Trial Term, 1945 A.M.C. 1240. This is an action in contract to recover moneys allegedly due for the hire of a tug. Plaintiff as lessor entered into a charter agreement with defendant as lessee on March 11, 1942, whereby the latter rented a tug on a **per diem** basis in addition to furnishing their own crew and operating the tug themselves. The agreement did not specify any particular period of time for which the tug was rented, although there was a provision reserving the right in the lessee to terminate "at any time that it appears to the Government's advantage to do so." The charter hire was paid until

July 31, 1942, the day following which title to the tug was requisitioned by the War Shipping Administration. The tug, however, was continued in use on the same project and under the same circumstances as before. The War Shipping Administration appraised the tug and made a tender of such sum, which was refused by the plaintiff, following which the plaintiff accepted 75% of the amount offered to him pursuant to Section 902 of the Merchant Marine Act of 1936, as amended, and Executive Order 9054, reserving his right, of course, to seek additional compensation from the Government. Plaintiff is seeking in this action to recover the charter hire for the period beyond August 1, 1942. Defendants have set up affirmative defenses in which they allege that the requisitioning of the tug by the Government resulted in a **frustration** of the charter agreement and thereby relieved the defendants of all obligations; that the acceptance of partial payment by the plaintiff from the Government constituted an election to look to the Government for full compensation estopped plaintiff from asserting its claim in this action. The issue may be summarized by saying that the Court was called upon in this case to determine whether the Governmental seizure of the tug **"per se** occasioned an abrogation of the charter agreement between the parties."

This question was considered in **Omnia Commercial Company, Inc., vs. United States** (261 U. S. 502). In that case, the Government, for purposes incidental to the prosecution of war, requisitioned the entire output of a steel manufacturer, thereby rendering impossible the further lawful performance of an existing contract between the manufacturer and a customer. The requisitioning of the subject matter, it was held, put an end to the contract. At page 512 of the opinion the court cites cases which indicate the universality of the rule.

One of such cases cited is **The Frankmere** (262 Fed. 819). That case involved the requisitioning by the British Government of a ship under charter. In reaching its conclusion the court stated:

" . . . the contract was thereby frustrated when the government took possession of the ship, and the rights of the charterer were absolutely ended and terminated, and those of the owner, subject, however, to the paramount power of the government to use the ship without consulting the desire of the owner, revived, as though the charter had never been entered into."

In the **Omnia case, supra,** at p. 513 it was pointed out that "the effect of the requisition was to bring the contract to an end, not to keep it alive for the use of the Government." Continuing, the court significantly stated:

"The Government took over during the war railroads, steel mills, shipyards, telephone and telegraph lines, the capacity output of factories and other producing activities. If appellant's contention is sound, the Government thereby took and became liable to pay for an appalling number of existing contracts for future service or delivery, the performance of which its action made impossible. This is inadmissible. Frustration and appropriation are essentially different things."

Applying the principles so clearly expressed in the foregoing authorities to the situation herein, I am of opinion that the taking of the tugboat by the Government in the manner and under the circumstances above disclosed effectuated a frustration of the contract sued on herein.

Jurisdiction of Public Vessels Act—Negligence of Crew

In **Roah Hook Brick Co. vs. Erie Railroad Company,** U. S. Dist. Court, Eastern Dist. of New York, (1945 A. M. C. 1197) the owners of the scow Roah Hook allege in a libel that their scow was delivered to the respondent and upon redelivery was badly damaged. Respondent seeks to implead the United States in this action, which arises upon the exceptions filed by the United States. Further allegations show that, pursuant to instructions from agents of respondent United States, the scow was delivered alongside the SS Will Rogers at a pier in North River, New York. At the time of the arrival of the scow, the only berth available was at the end of the pier. Libelant claims that the scow was exclusively in the custody of and under the control of the personnel of the SS Will Rogers, which is a public vessel. The scow was shifted around and finally broke adrift, causing damage to certain other piers in North River. The exceptions of the United States are based upon the theory that the only possible statutory basis of jurisdiction is the Public Vessels Act of March 3, 1925. (c. 428, 43 Stat. 1112, 46, U. S. C., secs. 781-790). The United States maintains that the mere delivery of the scow in the vicinity of the berth at which the SS Will Rogers lay created no contractual obligation upon the part of respondent.

The Court agrees with this contention. However, it points out that the libel under attack affirmatively alleges negligence on the part of the personnel of the SS Will Rogers. This theory as advanced by the United States is one that has already been ruled upon by our courts, namely, **Canadian Aviator, Ltd. vs. U. S.,** (324 U. S. 215, 1945 A. M. C. 265), which was decided in February, 1945. The court holds that the Public Vessels Act permits the assertion of liability in admiralty against the United States **not only** where the vessel itself is the offending thing and physically caused the damage, but also where there has been negligence **on the part of a crew of a public vessel.** In that case the District Court was affirmed and the Circuit Court was reversed even though there was no physical contact between the vessels and the only basis for jurisdiction under the Public Vessels Act was the negligence of the crew. The Court was bound to take the allegations of negligence as true for the purpose of determining the exceptions. The exceptions of the United States were overruled.

Radar As An Anti-Collision And Navigational Device

By Commander Oscar C. Rohnke
USCG

To the landlubber, the device pictured above may look like a weather - vane. However, the mariner knows that it represents a form of anti-collision and navigational radar designed to overcome the handicaps of low visibility, one of the deadliest and costliest perils of the sea since time immemoriol. Bethlehem Steel Company's New York shipyards have installed radar of this type on Liberty and Victory ships. Troopships so equipped will have a visibility range of fram 250 yards to 30 miles in the foulest of weather and darkest night. All above-water objects will be readily detected by this magical electronic "eye" even though the ship's log reads "visibility zero."

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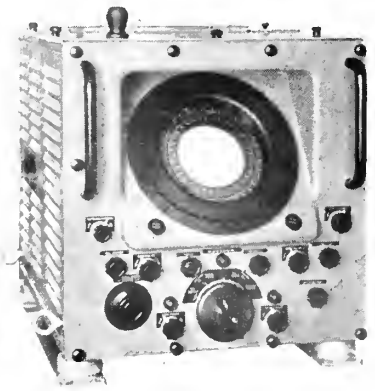
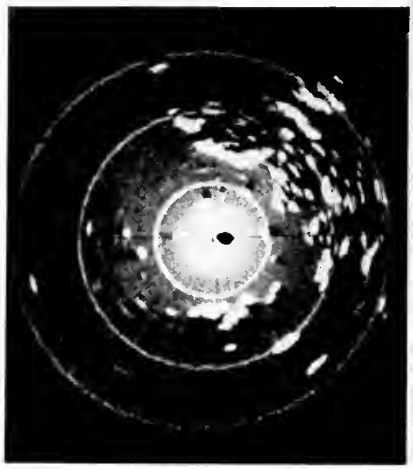
Radar direction finder manufactured for the Navy by the Submarine Signal Company.



Now that the veil of secrecy surrounding the development and use of radar has been lifted, much publicity is being given this instrument which played such a large part in winning the war. Most of the information made public, however, has dealt with the principles of radar with very little stress being placed on the operational aspects and benefits of the instrument.

The possibility of collision is one of the mariner's constant, most feared perils. It is a danger greatly increased during periods of low visibility, but it also is a peril greatly reduced by radar, which will give its operator range and bearing, I repeat, range and bearing, of an object regardless of visibility. Radar can see through fog, rain, snow, sleet, darkness and all forms of low or zero visibility. Heretofore during such periods the men on a vessel's bridge had to rely primarily on sound and the lookout's visibility for the detection of the presence of other objects in their immediate vicinity. Neither form of detection is too reliable in fog. They resulted in vessels groping their way at slow speed through low visibility areas with the danger of collision and stranding constantly present. Now this danger can be practically eliminated by the use of radar which, to put it plainly, indicates the presence of all above-water objects by reflected radio waves. These waves in turn are translated by the radar instrument into a picture form which appears on what is called "the scope."

Here is a good example of how radar can contribute to the safety of a ship already modernly equipped in the pre-radar sense of the word. Not many years ago a large passenger vessel, proceeding through a thick fog, was approaching a light vessel. Radio beacon contact had been established on the light ship by this passenger vessel. But even with the aid of the radio beacon, the exact position of the light ship was not known. Running down the radio bearing, the liner evidently intended just to clear the light ship, thereby establishing definitely the ship's position. But instead there was a collision and the light ship was cut in two, sinking with the attendant loss



Photograph of General Electric's "electronic navigator," operating on radar principle that played vital role in war, is shawn here as it would look to marine pilot peering into field of instrument to see what obstacles lie in path of ship. This new radar device is used when fog, darkness, storm or any other kind of overcast condition limits natural visibility, and it can reveal land masses, other ships, lighthouses and buoys as far away as 30 miles, distance depending on the size and shape of the object. Skilled operator can quickly determine what kind of obstacle is represented by spots in radar field.

(The author is in the Communications Division, United States Coast Guard. Text is from an address delivered on October 18, 1945, at the Nineteenth Annual Regional Meeting, The Propeller Club of the United States, and American Merchant Marine Conference (U. S. Coast Guard Merchant Marine Council Panel), held at the Waldorf-Astoria Hotel, New York, N. Y.)

of the lives of several of her crew. Had the liner been equipped with radar there would have been no collision, because the exact range and bearing of the light ship would have appeared on the radar scope. The radar presentation plus the radio bearing would have clarified the entire situation. The characteristic code of the radio beacon would have provided the identification.

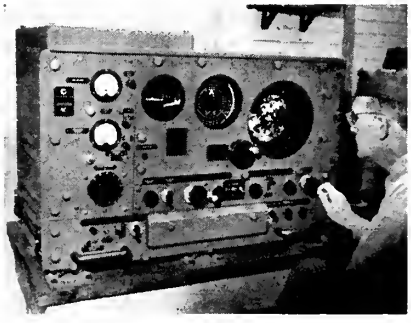
In northern waters the iceberg presents one of the navigator's greatest hazards, with the classic example of the Titantic remembered as the outstanding maritime tragedy caused by these floating ice mountains. But had the Titantic been radar equipped, she would have been cognizant of the presence of the berg which caused her death in time to avoid colliding with it. The bearing and distance of this berg, as well as of surrounding icebergs, would have been indicated as "pips" or objects on the radar scope.

An interesting speculation also can be made in considering radar in relation to the Titantic disaster. It is known that while the Titantic was sinking, another ship, the California, was nearby—so near, in fact, that her lights were visible. But because her radio officer had just gone off watch and communications were dead, the California steamed on entirely ignorant of what had happened to the Titantic. Of course, under present-day radio regulations, this situation would not occur.

However, for the sake of example, let us look at what we might have seen during those tragic minutes if it had been the day of radar. The California's radar screen would have shown relatively stationary "pips" indicating icebergs and another "pip" in motion, indicating a ship under way at good speed. The approaching "pip" blending with a stationary "pip" would have indicated a possible collision and this indication would have been more or less confirmed by the "pips" separating very slowly or not at all after their first meeting.

While on this part of my subject, I would like to repeat that icebergs can readily be seen on the radar scope. However, it must be remembered that for radar to pick up objects, they must be above water. Growlers, especially those just awash, may prove difficult for the instrument to pick up in a heavy sea. On the other hand, collision with such a growler would probably cause only slight damage.

Vessel collisions are not always the fault of low visibility. Sometimes they are due to personnel failures in which the human error in judging distances by means of the seaman's eye results in accident. It is difficult at times, and especially at night, to estimate distances. But radar does not make an estimate. Instead it indicates range and bearing with a high degree of accuracy. Thus it is reasonable to assume that personnel failures can be reduced through the use of radar.



Above is main Raytheon SG ship search radar. Operator is obtaining accurate range and bearing of target. Below is the "scope" of Raytheon SG radar, showing Cape Code, Mass.

Raytheon equipment is now being installed on harbor craft for the Army.

By careful observance of the radar scope, even the movement of an object or vessel can be noted, and by use of a plotting board the speed and exact course of other vessels can be determined. However, it is not believed generally that this latter step is necessary for ordinary shipboard navigation. The common method of determining whether vessels are on collision courses is for each to take a bearing and then determine whether that bearing remains constant or changes. If it changes the vessels will cross clear, whereas a constant bearing means that the vessels are on collision courses. But when a "pip" or vessel appears on the radar scope, its movement or bearing can be noted and attentiveness to the scope soon will reveal whether the vessels will pass clear or whether a collision course exists and a change is necessary.

Safe navigation, of course, is of paramount interest to followers of the sea. Strandings, collisions and other accidents cost lives, time and money. Our shores are littered with the skeletons of vessels lost when their operators thought themselves in safe waters, only to be brought up suddenly hard and fast aground. Strandings occur in periods of both good and low visibility, but the latter produces by far the greater hazard. However, commercial shipping must meet its schedules, perishable cargo must be rushed to its destination. Every delay in entering or leaving a port is costly to the operators. As a consequence ship operators oftentimes take chances by running at excessive speeds in a low visibility area at a time when any movement of vessels opens the way to collision or strandings. Even on errands of mercy, rescue vessels, if they ran through periods of low visibility, endangered others as well as themselves.

Down through the years many devices have been added to ships'

equipment to aid in their safe navigation. These include the fathometer, the direction finder, the gyro compass, the patent log, etc. But now we have a new device that actually sees during periods of low visibility. Perhaps another example or two can help illustrate the real importance of radar.

Typical of American radar equipment which smashed both German and Japanese armed might in the conflict begun just four years ago is this lightweight, portable unit developed by the Westinghouse Electric Corporation for the U. S. Marine Corps. Silhouetted against the sky is the unit's rotating "beach umbrella" antenna used as a reflector in sending out shortwave radio pulses and as a receiver to "catch" wave echoes reflected by enemy targets. Designed for beachhead use, the complete unit weighs only 400 pounds, can be dismantled and packed in four 100-pound cases, and has a range of 80 miles.

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P. G. Caldwell of General Electric exhibits an enlarged photo (labeled for identification purposes) taken of the viewing screen of the G.E. "electronic navigator," a commercial radar set installed on the American Mariner, a training ship of the U. S. Maritime Service, as it anchored one night off Niantic Bay in Long Island Sound. The G.E. radar set has been used recently by the ship in navigating Long Island Sound. It can detect through darkness, fog and storm the position of any above-water obstacles, such as lighthouses, buoys, icebergs, other ships and land, at distances up to 30 miles—depending upon the size and shape of the object. As a result of the successful operation of the unit aboard the American Mariner, General Electric has received an order to build additional units for installation on passenger ships now being built for the Maritime Commission.

Another example of a grounding that would probably not have happened had radar been available occurred in a harbor on the southern coast of Puerto Rico. This mishap took place because one of the navigational lights was out, and as a result a wrong turn was made. Again a radar picture would have indicated the position of the ship and no guesswork navigation would have been necessary. It might be added, too, that just a few months before this accident a tanker went aground in this same harbor and the master said the accident occurred because his charts were not up to date and he made a wrong turn.

Here again we have a personnel failure probably caused by a desire to meet the schedule assigned the ship. But once again radar undoubtedly would have prevented the accident by showing the master just where he was in relation to the beach.

Grounding in a fog is a somewhat different matter because, even though all precautions are taken, accidents still will happen. Currents, wind, sea, compass errors or lack of sights for days on end often place a vessel in a position entirely different than where she is thought to be. Even though radio beacons are available and soundings are taken, still they do not show a picture of the coastline.

There is the fairly recent example of the Henry Burgh aground on the Farallon Islands outside San Francisco with the lives of all aboard endangered and with the ship finally broken up, a total loss of ship and cargo. When she went aground a thick fog prevailed and a fairly heavy sea was running. The radio direction finder had been used but it was not properly calibrated. The fathometer was not used. The ship also was proceeding at a higher rate of speed than was prudent in making a landfall under the prevailing weather conditions. But in spite of all this, it is believed radar would have saved the ship because the instrument's picture would have outlined the islands, giving the bearing and distance offshore and showing a complete picture of the immediate surroundings.

It is difficult to conceive how a ship's officer could run his vessel aground if he intelligently compares

The German battleship Scharnhorst was hit by the second salvo at a 15-mile range with visibility of half a mile. For this miracle of range finding, even that early in the war, we have to thank radar. Five thousand ships of the Royal Navy have radar installations.

what is portrayed on the radar scope with the harbor chart.

I have given you, I hope, some idea of the tremendous contribution radar can make not only to safety at sea but also to the operating efficiency of vessels. To sum up, let me say that the distinct operational advantages of radar are:

(1) It is the best anti-collision device yet perfected.

(2) It makes for greater safety while piloting or making landfalls during periods of low visibility.

(3) It indicates continuous instantaneous accurate ranges and bearings of objects.

(4) It presents a chart-like picture of the surroundings, the presentation being in the nature of a polar chart.

(5) By observation of the scope movements of objects are indicated.

Some Disadvantages

(1) Objects cannot be readily identified. All objects of about the same size present the same size pip. However, identification can be made quite often by implication such as movement, relation to other objects, shape (used in landfalls), and sometimes initial range of detection (the latter giving an indication of the size of the object detected).

(2) Radar chart presentation on the scope requires interpretation due to line of sight characteristics which give shadow effects. In other words, larger intervening objects may blank out objects behind them.

(3) It can only be used for slightly over line of sight distance.

(4) Weather and sea return affect the picture.

(5) Objects sometimes not detected because of the movement of these objects caused by bobbing up and down in a seaway. Small vessels and buoys are particularly affected. The outgoing signals miss striking the object when it is in the trough of a wave, therefore there is no reflected wave for presentation on the scope.

(6) Non - conductors, such as wooden vessels, may give poor echo.

Coast Guard Releases Minimum Specifications for Radar Equipment for Maritime Use

The Coast Guard has released a set of recommended minimum specifications for radar for use aboard merchant ships as a result of studies made by the Coast Guard and recommendations offered by radar manufacturers and representatives of the maritime industry, which has worked in close cooperation with the Coast Guard.

The Coast Guard, by reason of its close association with the Maritime Industry in safety at sea problems, assumed the responsibility to determine the minimum specifications for radar equipment in an effort to provide simplicity of operation with optimum performance. The problem was quite extensive in its scope because of the varying operational requirements of the ship operators and the expense involved. The lifting of wartime secrecy on radar found the maritime industry limited in its knowledge of electronic navigational aids. The specifications will act as a voluntary guide for manufacturers of radar equipment and shipowners to formulate future considerations for the installation of radar equipment on all merchant marine vessels.

The first specification requires a three centimeter surface search radar primarily designed for ocean-going vessels to provide early warning of approaching vessels and navigational dangers on the open seas, as well as high resolution for navigation in restricted waters.

The second specification includes a three or ten centimeter surface search radar primarily designed for ocean-going vessels to provide early warning of approaching vessels and navigational dangers on the open sea as well as fair resolution for navigation in restricted waters.

The third specification sets forth a surface search radar primarily designed as an anti-collision device with a limited value for navigational purposes. In a letter directed to radar manufacturers, the Coast Guard said:

"These specifications have been prepared with full consideration given to the discussions presented at the meetings of radar manufacturers at Coast Guard Headquarters, Washington, and have been made as broad as possible without jeopardizing the safety value of the radar. While these specifications may seem unnecessarily explicit, many items have been included because of the lack of any performance standards in radar. As radar is a new art, and consequently is in a continual state of progressive development and improvement, these specifications are intended merely as a mutual voluntary starting point in the interest of standardization and adaptability to navigational aids."

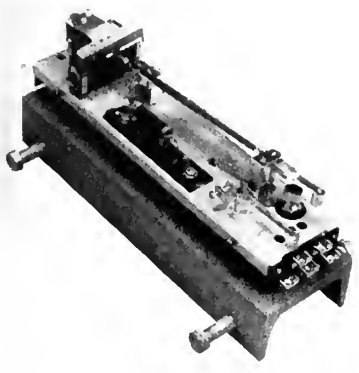
(Editor's Note: These specifications are available in our office, or can be obtained from Public Information Division, U. S. Coast Guard, Washington 25, D. C.)

Dry Storage For U. S. Navy

By David M. Ludlum

Naval scientists have turned up with a new one. Now it is dynamic dehumidification, or dry storage to the layman—a process of preservation which will keep Uncle Sam's veteran warships in fighting trim during these uncertain post-war years.

The problem of combating corrosion has faced naval men ever since man turned to iron and steel for marine construction. The time-honored method of storing a ship, employed after World War I, entailed covering all exposed parts of machinery and fittings with a thick coat of grease—



Humidity detective

a costly and laborious job—and it took several months to remove the grease, clean the machinery, and ready the ship for sea. The time lost in 1941 in preparing our 50 over-age four stackers for the British Navy was almost fatal and impressed naval authorities with the urgency of finding a solution.

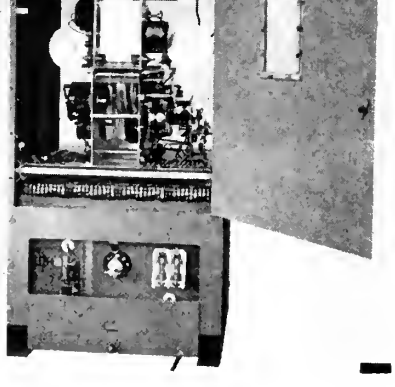
The U. S. S. Brooklyn was recently put in the Philadelphia Navy Yard for the dehumidification process. Others will follow soon. Eventually, there will be over 1000 ships of all types equipped with special air-conditioning apparatus and controls to maintain "little Sahara" climates in their holds. Officials estimate that with the aid of dehumidification it will be only a matter of days instead of months to remove these ships from dry storage berths and put to sea.

Dynamic dehumidification means lowering the moisture content of enclosed air to a desired level and keeping it there by inducing additional dry air when necessary. In the same manner as the ancient Egyptians sealed up their tombs, a ship is made air-tight; all vents, portholes, entrances, and hatches are hermetically sealed. Then dry air is pumped down the fire mains until temperature and humidity conditions reach a predetermined level. Air-tight sealing, of course, must be 100 per cent effective, so an ingenious "humidity detective" has been developed by naval engineers in conjunction with technicians of the Friez Instrument Division of the Bendix Aviation Corporation.

The humidity detective is the heart of the dehumidification process. It consists of 100 human hairs—preferably blonde, female locks which have not had a permanent wave; these are stretched between two sensitive holders. An increase of moisture expands the suspended hairs, while a decrease will cause a contraction. This slight movement is transmitted to a set of controls which sets in motion air-conditioning apparatus. Formerly, hair hygrometers were inaccurate at low humidity readings, but this has been overcome by lessening the pressure on the hairs and requiring them to do no work; the levers are actuated electrically.

Experiments have shown that humidities between 25 and 35 per cent will prevent corrosion of metal parts, yet will not cause damage to woodwork by excessive drying out. When moisture conditions vary from the set limits, air pumps are automatically set to work to return the humidity to the 25-35 per cent area. Temperature conditions, too, are regulated by this device, whose preliminary trade name is "temperature-humidity register-controller."

Front view of open temperature-humidity register controller.



Dry storage is a time-saver to install and a labor-saver to operate. It will take far less time to set up the temperature-humidity register-controller with the attendant air-conditioning apparatus than the old grease coating method formerly employed. Thus, ships will be in and out of storage in short order. They can be readied for sea or put in storage as the world political and military situation varies.

Furthermore, it will be a great labor-saver to the Navy, already hard-pressed for experienced hands. No longer will large crews of watchmen and maintenance men be necessary on every laid-up ship. As a check on the humidity detective, the engineer's control room will be equipped with a ticker tape register which will stamp at frequent intervals the temperature and humidity from numerous locations throughout the ship. In addition, the device contains an automatic calculator which adds and averages all the humidities throughout the ship. Thus the chief engineer can sit at his desk and have an up-to-the-minute over-all picture of air conditions on his vessel. All laborious psychrometer swinging will be eliminated, and the number of watchmen needed greatly reduced.

The Navy is also experimenting with static dehumidification. This form of dry storage consists in putting desiccant material into a single hold or room and then sealing up all outlets. The desiccant then absorbs moisture from the enclosed air and maintains a low humidity level indefinitely. The quality of the air can be checked by dials which register inside conditions by remote control. This method is looked on with favor by the United States Army; it plans to package individual guns and tanks by boxing them in metal containers to prevent rust and corrosion. Although satisfactory on small units, this small-scale air-conditioning process is not suitable for larger units such as ships.

U. S. Coast Guard Cutter Mendota (Owasco Class).

Turbine-Electric Coast Guard Cutters

By J. A. Wasmund

The completion of the 4000-shp, single screw, turbine-electric cutters of the Owasco Class will give the United States Coast Guard a total of 13 sister ships embodying the most advanced engineering thinking on turbine-electric alternating-current propulsion. Eleven of these cutters were contracted for at the Western Pipe and Steel yards, San Pedro, California, and two more at the Coast Guard Yard, Curtis Bay, Maryland. Several of the San Pedro cutters have been completed, and the balance are in various stages of construction. These ships, with the exception of a few small items, are completely Westinghouse equipped and are the first turbine-electric alternating-current vessels to have complete automatic control from the pilot house. They are also provided with either automatic or manual control from the engine room. Propulsion motors and generators are of minimum size because the use of regulated stability and automatic synchronizing permits the machines to be designed with very little inherent torque margin. Most of the vital propulsion auxiliaries are driven by motors taking power from a transformer connected to the propulsion bus and, therefore, operate at varying frequency and speed. Maximum economy is obtained at the steam rate of the propulsion turbine.

Each ship is equipped with one propulsion generator, which supplies power to one synchronous propulsion motor. Speed control of the motor is obtained by adjusting the speed of the turbine driving the propulsion generator.

(The author is a marine engineer with Westinghouse Electric Corporation, East Pittsburgh, Pa.)

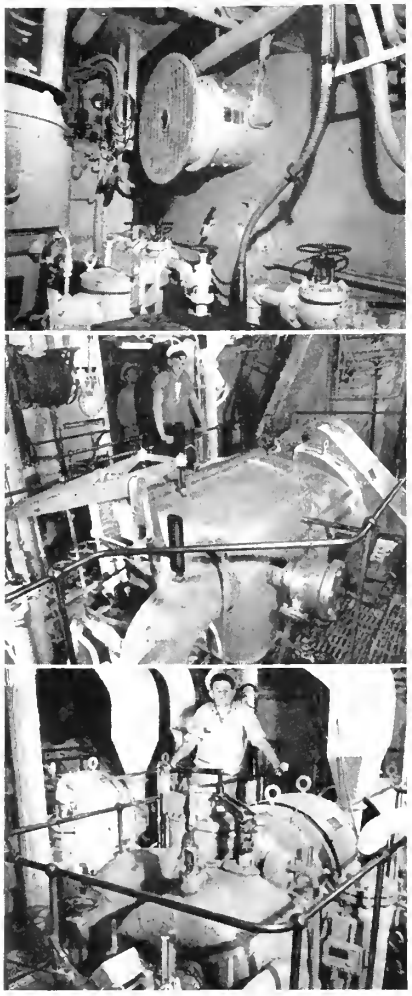
Propulsion Turbine

The propulsion turbine is of the single-flow complete-expansion, combined impulse and reaction type directly connected to the generator by means of a flanged coupling.

Steam at 600 psi, 750° F. total temperature is admitted to the chest through an oil actuated manually controlled throttle valve and the exhaust vapor is discharged downward into a surface condenser mounted below the turbine and bolted directly to the exhaust flange.

The entire turbine is supported at four points; one on the forward end, one on each side of the exhaust end, and one on the horizontal centerline at the exhaust.

The support on the centerline at the exhaust end is anchored solidly to the foundation, and the two on the side of the exhaust are supported by



Top: Forward end propulsion motor.

Center: Main propulsion turbine generator set.

Bottom: Auxiliary turbine generator sets.

flexible beams which permit transverse expansion of the unit. The high-pressure end of the cylinder base is supported on a short I-beam section placed in a transverse direction. The web of this I-beam furnishes the necessary flexibility to allow for any longitudinal movement due to expansion and contraction of the cylinder.

The turbine "brain" or governor consists of essentially three parts: a fly-ball mechanism, which responds to changes in speed; a governing oil valve, which transforms the changes in force from the fly-ball into oil pressures acting on the control relay; and a hydraulically operated mechanism for actuating the steam valves.

Speed of the turbine is controlled by altering the setting of the governor through the speed changer mechanism, which is connected to

Plans of this vessel will be published in the February issue.

the engine room control cubicle and actuated by remote control from the bridge or from the engine room by automatic or manual means.

In order to obtain a satisfactory heat balance for the equipment, the propulsion turbine is provided with an opening through which steam may be extracted for feed heating when there is not enough auxiliary exhaust for the purpose, or through which steam can be taken into the turbine from the auxiliary line when there is more auxiliary exhaust than is needed for heating purposes.

The main condenser is located beneath the propulsion turbine unit. The condenser is bolted directly to the turbine exhaust flange and is supported by the turbine foundation structure. The condenser is of the "radial flow" type, which provides steam access to the entire circumference of the tube bank.

Circulating water is supplied by scoop injection and in part by the main circulating pump, which is in operation at all times but performs its principal service during standby periods and when running astern.

Generator

The propulsion generator is rated 3200 kw, 3 phase, unity power factor and is capable of supplying full power to the propulsion motor as well as approximately 100 kw to the variable frequency auxiliary bus at the same time. The generator is direct connected to the turbine shaft and has a rated speed of 5400 rpm, supplying 2400 volts at 90 cycles when running at this speed.

The generator is of the completely enclosed type; an air cooler is located beneath the generator; and all of the ventilating air is passed through the cooler before it is recirculated through the machine by shaft mounted fans on either end of the rotor. By this means the generator is assured of a continuous supply of cool, clean air which cannot become contaminated by foreign matter. The collector is located outside of the air housing, thus preventing the circulation of brush dust which would tend to clog the ventilating spaces and reduce the creepage insulation. An unusual feature is that the cooling medium is fresh water condensate instead of sea water.

Temperature detectors embedded in the stator winding of the generator are connected to a bridge type indicating meter on the control board. A multi-pole switch permits the operator to observe the temperature at two points in each phase of the winding. An unusual rise in temperature is, of course, a warning of impending trouble. In addition, a temperature relay indicates by audible and visual alarm any overheating of the generator winding.

Strip type space heaters are located inside the cover at the bottom of the frame. These heaters are energized manually whenever the machine is out of service for more than a few hours, their purpose being to keep the internal temperature a few degrees above atmospheric, thus preventing condensation of moisture inside the enclosure.

Propulsion Motor

The propulsion motor is rated 4000 shp when running at 180 rpm, which corresponds to 5400 rpm of the turbine-generator set. It is of the synchronous type with heavy pole-face damper windings for maneuvering and is provided with two bracket type tapered roller bearings which make the motor unusually short and insure very low "break-away" torque.

The motor is of a semi-enclosed type and is waterproof in the lower portion up to the bearing seals on the shaft. Being in a separate motor room, it was not considered necessary to provide a completely enclosed machine. Motor driven, axial flow fans mounted on the upper part of each endbell take ventilating air from the motor room and force it through the motor winding. The heated air is passed through coolers mounted on the upper part of the motor frame and the cooler air discharged to the motor room for recirculation.

Temperature detectors, alarms and space heaters are supplied as described for the propulsion generator.

The purpose of the propulsion control is to regulate the flow of energy from the turbine through the generator to the motor. Since both the motor and generator are synchronous, speed variation is accomplished by varying the speed of the turbine-generator set. Direction of propeller rotation is reversed by interchanging

the connection of two of the three leads between the motor and the generator.

For normal running operation, the motor and generator field circuits are connected in series across a common exciter. During starting the motor operates on the heavy pole-face damper winding as a squirrel-cage induction motor with its field circuit short-circuited through a starting resistance. At the same time the generator is heavily over-excited in order to prevent collapse of the generator voltage and to provide high synchronizing torque.

The propulsion control is designed to perform the following functions:

(1) Start, stop, reverse and control the speed of the propulsion motor from the bridge or engine room.

(2) Provide automatic synchronizing which takes into account slip frequency of the propulsion motor.

(3) Provide automatic stability control over the entire speed range except during the synchronizing period.

(4) Maintain a generator field of not less than 60 per cent of the off position, so that sufficient excitation for driving the auxiliary motors will be maintained when the propulsion controller is in the stop position.

(5) Provide for communication from pilot house to engine room by means of an engine order telegraph whenever control is delegated to the engine room.

The above list of control functions is indeed remarkable when it is remembered that this is the first alternating-current turbine-electric vessel to be provided with anything except manual engine room control. By means of a single lever, located on the pilot house control stand, the operator has full control in ahead and astern directions. A movement to the first point in either direction will synchronize the propelling motor and rotate it at minimum speed. Additional movement of the same lever will bring the motor up to the selected speed.

In order to utilize the better fuel economy provided by the main turbine, provision is made to drive the boiler feed pump, forced draft fan, main circulating pump and propulsion motor ventilating fans from a variable frequency bus energized through a 125 kva, 2400/600 volt air cooled transformer. The transformer is designed to operate satisfactorily over a frequency range from 90 cycles to 15 cycles. Three high voltage fuses are mounted in a compartment adjacent to the transformer.

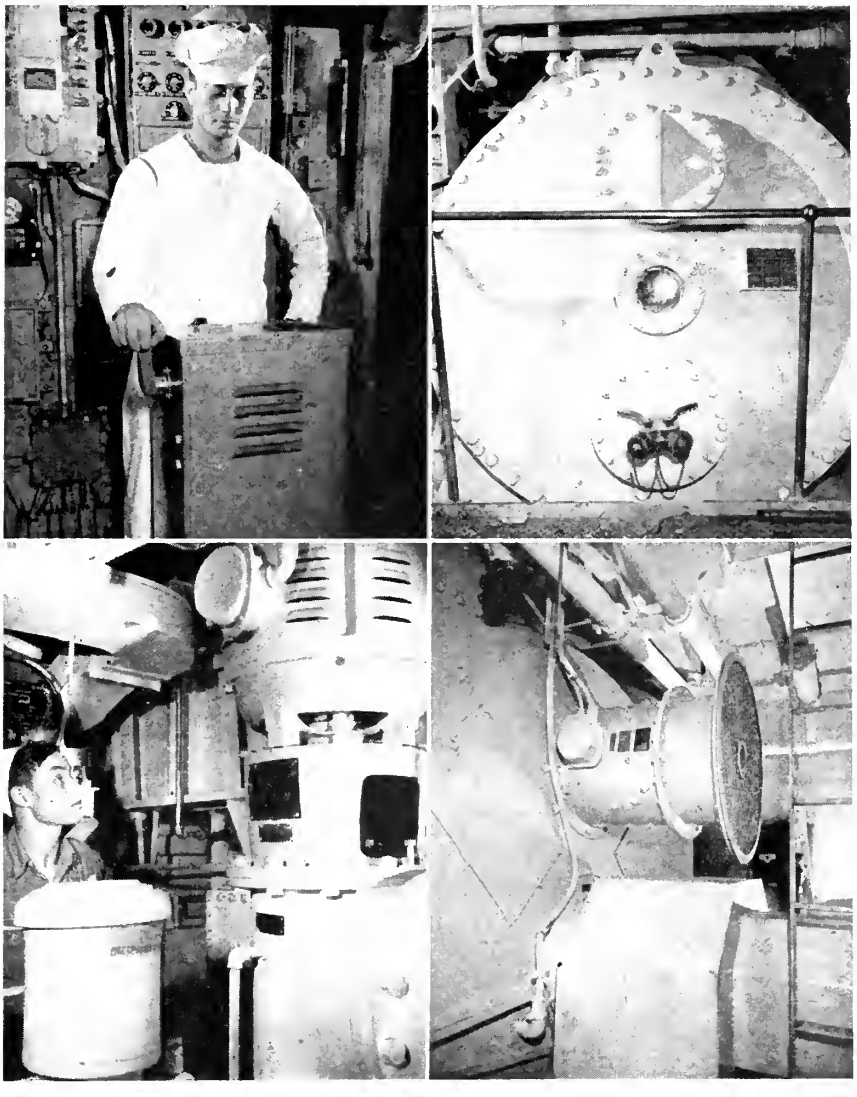
Bus transfer equipment is provided on the auxiliary switchboard for the purpose of transferring the variable frequency auxiliary bus feeders from the transformer secondary bus to a constant frequency 60-cycle, 450-volt ship's service bus. Transfer can be made manually, but is normally accomplished automatically by a relay which operates when the transformer voltage drops below a predetermined value. From experience it appears that transfer will not often be required.

Satisfactory operation can be obtained on the constant frequency bus up to two-thirds propeller speed, which corresponds to 60 cycles on the propulsion bus. Beyond this point transfer must be made to the variable frequency bus in order to obtain sufficient speed from the auxiliary motors.

Two identical ship's service turbine-generator sets are located on the port side of the engine room adjacent to the propulsion turbine-generator set. Each set consists of a high speed non-condensing turbine arranged to drive, through the medium of a reduction gear, a 219 kva, 80 per cent power factor, 450-volt, 60-cycle, 1800 rpm alternating current generator; a variable voltage propulsion motor and generator exciter having a normal rating of 56 kw, 250 volts with a special maneuvering capacity of 750 amperes at 275 volts; a constant potential 30 kw, 125 volts ship's service d.c. generator; and a 3 kw, 125 volt exciter for the 219 kva a.c. generator.

Two generator and distribution switchboards are divided by the propulsion control board, and all three are located fore and aft on the starboard side of the engine room. The automatic combustion control board

Upper left: Pilot house control stand. Upper right: Main condenser. Lower left: Circulating pump for main condenser. Lower right: After end of propulsion motor.



Propulsion control and auxiliary switchboard.

for the boilers is also in line with and at the forward end of the electrical switchboard.

There will, of course, be many applications where automatic control cannot be justified because of first cost, lack of trained personnel for maintenance purposes, or simply because such refinement does not fit in with the performance expected of the vessel. However, to any operator familiar with manual operation the rapidity with which reversals can be made without abuse to motor and generator due to synchronizing at the optimum moment will seem almost unbelievable.

In the automotive world, hydromatic transmission probably never will replace the gear shift lever on a tractor; it does seem a safe assumption, however, that most post-war automobiles will introduce a refinement of that sort. Similarly, it is to be expected that automatic synchronizing will find an important place in alternating-current electric ship propulsion.

TABLE

AUXILIARY MOTORS AND CONTROL

U. S. COAST GUARD—TURBINE ELECTRIC—OWASCO CLASS CUTTERS

		Motor						Control			
Application	Number Per Ship	Hp.	Volts	Phase	Frequency	Speed	Horizontal or Vertical	Enclosure*	Type†	Number Speeds	Function‡
Forced Draft Fans	2	20	600	3	90	1800/1200	H	DPSE	L-M	2	LVR
Boiler Feed Pump	2	25/7.5	600/440	3	90/60	1800/600	H	DP	L-M	2	LVR
Main Circulating Pump	1	11	600	3	90	740	V	DP	L-M	1	LVR
Propulsion Motor Blower	2	5.5/1.63	600/440	3	90/60	2650/1770	H	WP	L-M	1	LVR
Propulsion Motor Circulating Pump	1	1.5	600	3	90	1800	H	DP	L-M	1	LVR
Lubricating Oil Pump	2	3	440	3	60	1165	V	DP	L-M	1	LVR
Windlass-Capstan	2	30/7.5	440	3	60	1800/450	V	DP	L-M	2	LVP
Steering Gear Pumps	2	7.5	440	3	60	880	H	SP	L-M	1	LVR
Fuel Oil Service Pumps	2	5	440	3	60	1140	H	DPSE	L-M	1	LVR
In Port Fuel Oil Service Pumps	1	1.5	440	3	60	520	V	DP	L-M	1	LVP
Fuel Oil Transfer Pump	1	10	440	3	60	1160	V	DP	L-M	1	LVP
Fire Pump	3	20	440	3	60	3500	H	DPSE	L-M	1	LVP
Main Drain Booster Pump	1	4	440	3	60	3500	V	DP	L-M	1	LVR
Fire Sprinkler Pump	2	15	440	3	60	1750	V	DP	L-M	1	LVP
Air Compressor	2	15	440	3	60	870	H	SP	L-M	1	LVP
Evaporator Feed and Brine Overboard Discharge Pump	1	3	440	3	60	1740	H	DP	L-M	1	LVP
Oil Cooler Circulating Pump	1	½	440	3	60	1730	H	SP	L-M	1	LVR
Sanitation Pump	2	1½	440	3	60	3450	V	DP	L-M	1	LVP
Fresh Water Transfer Pump	1	1	440	3	60	3450	H	DP	L-M	1	LVP
Auxiliary Condensate Pump	1	5	440	3	60	3500	V	DP	L-M	1	LVR
Air Condensate Circulating Pump	2	3	440	3	60	3500	V	DP	L-M	1	LVP
Fresh Water Pump	2	1½	440	3	60	3450	V	DP	L-M	1	LVP
Main Air Exhauster	1	½	440	3	60	3450	H	DP	L-M	1	LVR
Auxiliary Circulating Pump	1	7.5	440	3	60	1155	H	SP	L-M	1	LVR
Distiller Fresh Water Pump	1	1/3	115	1	60	3450	H	DP	L-M	1	LVP
Hot Water Circulating Pump	1	½	440	3	60	3450	H	DP	L-M	1	LVP

* DPSE—Drip Proof, Semi-Enclosed. DP—Drip Proof. SP—Splash Proof. WP—Water Proof.

† L-M—Line-Magnetic.

‡ LVR—Low Voltage Release. LVP—Low Voltage Protection.

Pacific WORLD TRADE
Reg. U. S. Pat. Off.

By T. Douglas MacMullen

Industrial Cooperation Shapes Character of New World Market

By R. D. McManigal
Vice President,
Westinghouse Electric International Company.

R. D. McManigal

Looking toward the markets of the Pacific and those of Central and South America, one important concept can be used in estimating the extent of future trade. This is the idea of national industrialization which has taken hold in these areas as firmly as it gripped this country during the latter half of the 19th century. Westinghouse and many other concerns interested in these markets are planning to establish representation on the West Coast which will become increasingly more important as a center for closer contact with these sectors.

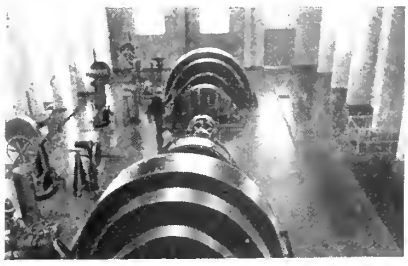
Because of conditions caused by war, task forces of American merchant vessels will carry materials for immediate rehabilitation to all corners of the world, but part of their cargo will consist of equipment destined to assist in shaping a new and permanent industrial economy. And there will also be an invisible cargo—our technical skill—one of the most important commodities we have for export, which will materially aid the growth of foreign trade.

For many years, Westinghouse has been conscious of the need for greater world-wide industrialization as an answer to many regional economic problems, and has recognized that this industrialization cannot be brought about purely with machinery. Accordingly, a policy has been adopted of exporting technical "know-how" through a series of technical assistance agreements with established or new electrical manufacturers in many parts of the world.

These agreements involve not only the delivery of engineering drawings, calculations and designs to associates abroad but also provide for the training of key operating personnel in the factories of Westinghouse to permit them to carry to their plants the most modern and efficient manufacturing methods. The success of this plan has more than attested to its correctness, and it is intended to continue this type of aid in addition to more direct help to broaden the scope and meaning of foreign trade.

In the Far East there is the great potential market of China, where an ancient nation is planning to rebuild on a new footing, relegating the agrarian nature of its former economy to a secondary position. Adequate sources of cheap power will be developed. Modern equipment for manufacturing industries will be supplied to replace and augment existing facilities, a large part of which has been broken into small units and thrust far into the interior under a policy of military dispersal. Development of electric power plants, and adequate transportation systems, machines and machine tools, will be the keys that unlock the rich natural resources of this country, convert them into useful products and help elevate living standards of a primitive people.

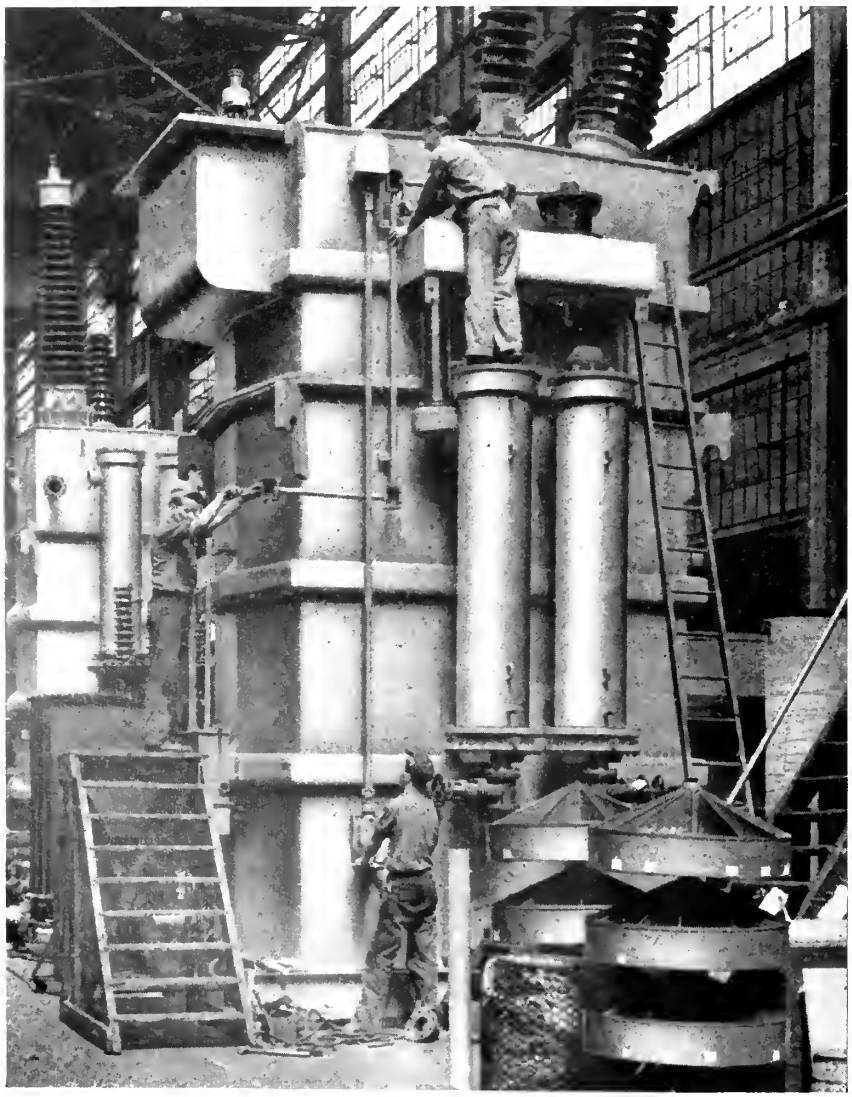
Also in the Far East are the Philippines and the Netherlands East In-



CHILE (Above): Two 10,000 kva, 3 phase, 50 cycle, 6600 volt, 300 rpm Westinghouse horizontal waterwheel generators, driven by double overhung Pelton impulse turbines installed in the Los Quilos plant of Fabrico de Cemento, El Melon. Power is transmitted at 66 K.V. to Chile's largest cement production plant at La Calera, 55 miles away.

MEXICO (Left): First of three 31,000 kva, 600 rpm vertical Westinghouse waterwheel generators driven by Baldwin-Southwark reaction type turbines supplied to Comision Federal de Electricided for the Ixtapantongo plant, located approximately 50 miles from Mexico City.

URUGUAY—One of the thirteen 11,000 kva, single phase, oil insulated, forced circulation, water cooled Westinghouse power transformers supplied to Comision Technica y Financiera de los Obros Hydroelectricos del Rio Negro, to step up the generating voltage of their 128,000 kva station at Rincon del Bonete to 161 kv for transmission to Montevideo, where 13 similar Westinghouse transformers step the voltage down to 34.5 kv for primary distribution.



dies, which also will need help of a similar nature if not as great in scope. Combined with other markets of the world this presents the greatest job ever handed to the ingenuity and productive genius of the United States.

While this policy of industrial cooperation and over-all planning is essentially different from the normal, superficial understanding of foreign trade, the need for operations of this type has long been realized by many American businessmen. Even the general public, long separated from actual facts about foreign trade, is taking new interest in this form of international cooperation because it is grasping the meaning of its importance in stimulating world commerce, knowing that the latter has an important relation to its own economy.

Generally exploded is the myth of this country's self-sufficiency, which was based on the statistics that we consume 90 to 93 per cent of our own production. These statistics were proved to be deceptive during the war when the public was made aware of the critical rubber shortage; when we began to scrape bottom on tin deposits; when the daily living of everyone was affected in some manner by the shutting off of world markets. More general thought was given to foreign trade, and even our own industrialization was traced to a background of international trading. Other facts became obvious about the 7 to 10 per cent of our goods which we exported. Industries employing thousands of workers were almost entirely dependent on foreign trade for existence. Foreign buyers were taking from 60 to 65 per cent of our raw cotton, 22 to 41 per cent of our leaf tobacco, and a great percentage of our electrical machinery.

Two-way trade is considered the answer to greater foreign trade, and two-way trade can find no more logical source than in mutual assistance to help countries of the world get on their feet and begin producing. In line with this thinking, Westinghouse is pioneering with the establishment of an Import Department. This department is being organized as an exclusive distributor in the United States for a number of foreign sources of supply. Its program calls for a "long-pull" development and relationship with foreign manufacturers, to which Westinghouse brings an intelligent knowledge of American markets and ample financial resources to handle distribution backed up by energetic salesmanship. This development of "the other street" in foreign trading is a realistic approach in helping to shape the character of the new market.

In the markets of Central and South America Westinghouse will continue to be active in extending technical help and equipment in the establishing of a greater industrial capacity. In Brazil Westinghouse has

(Continued on page 62)

Pacific WORLD TRADE

What Will the Industrialization Of Asia Mean for America?

By *Dr. Eugene Staley*

Dr. Staley is Director of the Institute of Pacific Relations for the San Francisco Bay Region, and, as announced elsewhere in this issue, will instruct a class in world trade in the Stanford Graduate School of Business. In a recent address before the Foreign Trade Association of the San Francisco Junior Chamber of Commerce, he made a most comprehensive analysis of potential trade with Asia. He has revised and supplemented it for this publication.—Ed.

Dr. Eugene Staley

Across the Pacific Ocean to the west there are 1.2 billions of people. That is more than half of all mankind. In the Europe-centered world of the past, these people have counted for relatively little in world politics and world commerce. In the future they are going to count for much more.

Yet, if you talk with their leaders you get the very strong impression that they are going to modernize, that they are going to adopt modern industry, and that quite soon. What will Asiatic industrial development mean to American foreign trade, labor standards, and living standards?

Where can the United States look more appropriately than here to the West Coast for intelligent, well-considered judgments on these problems, and for constructive leadership in transpacific relationships?

Let me turn now to the question, "Is Asia **going** to industrialize?" There are a number of reasons for answering "Yes." One is the intensity of determination on the part of the peoples of Asia, or at least their leaders and those of them who are politically conscious, for industrial development. There are two reasons for that.

First, they want to raise their living standards, and they know as well as we do that the only way to be able to consume more year after year is to produce more. We can best help other peoples to raise their living standards, not by giving them charity—though gifts are necessary for a time, to meet relief and rehabilitation problems in the wake of war—but by helping them to produce more efficiently. That means equipment and know-how. Production is the key to higher living standards, and the peoples of Asia are, at least through their politically conscious leaders, very much set on getting higher living standards through improved capacity to produce.

Secondly, they realize that ability to resist aggression and to swing some weight in the politics of the world depends on military power. An essential basis of modern military power is industrial capacity. That is another reason why the peoples of Asia are interested in industrial development.

In China, a large-scale plan for railroads and ports, factories and improved agriculture was put forward right after the first world war by Sun Yat-sen, the founder of the Chinese Republic. It received little attention at the time, but in recent years the government of Chiang Kai-shek has come forward with a modernized and extended version setting very ambitious goals twenty or more years ahead. Minister Wong Wen-hao, an eminent Chinese geologist who is Minister of Economic Affairs and now Vice-Premier, has called for a total gross investment in Chinese development of the equivalent of ten billion dollars over the next four to five years, the funds to come partly from domestic savings and partly from abroad. One-third would be devoted to improvement of transportation, one-third to industry, and one-third to agriculture. The Chinese government is now seeking equipment and technical aid with which to embark on many concrete development projects scheduled for the next year and the next three years.

You have probably heard of the famous Bombay plan for rapid economic development on India put forward by a group of Indian industrialists. The avowed aim is to double the per capita income of the people of India in fifteen years. Other plans, some evidently designed to outbid the Bombay plan, have come from other groups in India. The government has been impelled to put forward projects of its own.

Soviet Asia, under successive five-year plans, has already made remarkable development, and will make more.

So, all through Asia there are hopes and ambitions and very intense

desires for industrial modernization. That is the first reason why I would answer "Yes" to the question, "Is Asia going to industrialize?" There is a more intense desire than there has ever been before, and the will to do it.

A second reason for answering "Yes" is that the requisites of modern industry are at least potentially present in Asia. These might be classified under four headings: men, materials, money, and markets.

The first of these—men—is the most fundamental. Modern industry depends on trained man power. Can the Chinese, for example, handle modern techniques and run modern production enterprises? I think the answer is clearly "Yes." The Japanese learned how. Chinese students in this country have made excellent records in many fields, including sciences, engineering and economics. Last year in Kweiyang I met a man named Wang, who was the manager of a truck maintenance shop. He was trying hard to keep trucks operating on the road from Kunming, where military supplies were landed by air, to Chungking and forward bases. He had terrific problems. I saw men making bolts by hand: heating an iron rod and shaping the head with a hammer, putting it in a vise, and then using one of those hand-threading devices to cut the threads. They made the nuts in the same laborious way. There were many other handicaps from lack of modern equipment and materials. Mr. Wang, who was thoroughly alive to all of these problems, was doing the best he could. An American lend-lease man who had formerly worked for Standard Oil of New Jersey was stationed there, trying to help the Chinese in their truck maintenance problems. He told me that he would be willing to put this man Wang up against any American that he had known in similar kinds of work, so far as general competence and efficiency were concerned. Where Chinese have had a chance to learn modern technology, they have produced excellent men. I am thinking of persons I know in such fields as public health, and in economic research, which is my own field. There is no lack of capacity in the men of Asia. There is no color line in ability to do a good job with modern techniques.

Materials. Some of the earlier views about the natural endowments of China and of other Asiatic countries may have been on the optimistic side. But these countries do have enough resources of the right kinds to give them a solid basis for at least a very considerable industrial development. This rather dogmatic statement will have to suffice, for amplification of it would carry us into too much detail.

Money. The less-developed countries of Asia certainly lack a large flow of savings which can be tapped for capital investment. They would like very much to have loans from countries with more savings. That would make their task of modernization much more rapid and less painful. But even without loans from abroad, as peoples have learned from the example of the Soviet Union, it is possible to build transport lines and factories by squeezing the capital out of the standard of living of the people and by deliberately holding consumption down in order to "plow back" the first results of improved productive power in the form of still more industrial equipment. This process would necessitate tremendous human suffering if industrial development had to be financed that way in the countries of Asia, and it could only be done by totalitarian regimentation. Still, it could be done. I am convinced that it would be done, in view of the tremendous stake the people of Asia see in achieving rapid industrial development.

As for markets, the potential capacity of the peoples of Asia to afford goods that they now lack depends on their ability to produce and distribute. Certainly there is no lack of need. It is hardly necessary to dwell on that.

A third reason for thinking that the people of Asia are going to adopt modern production methods is that they now have several successful examples to follow. Only recently Japan and the Soviet Union have achieved very rapid industrial development. So I would answer "Yes" to the question, "Is Asia going to industrialize?"

But that doesn't answer the more difficult question: "When?" "How soon?" As you all know, that great Asiatic market, 450,000,000 Chinese customers, has been "just around the corner" for decades. It is still just around the corner. How long is it going to remain there?

Of course, any forecast on such a point is speculative. I think that the answer depends primarily on factors that, after you have analyzed them and summed them all up, could be labeled, broadly speaking, "political." In other words, the natural resources, the human capabilities, the markets, and the ability to get capital by domestic savings or foreign borrowing are potentially ready to jell into rapid industrial development in Asia, and especially in China. The two things that might stop that process or retard it are lack of internal unity, which would prevent the development of strong government capable of providing leadership, and serious world political complications, threatening a new outbreak of war. This latter might cut down the amount of technical aid and equipment which Asiatic countries could get from abroad, or it might conceivably have the opposite effect by leading one or more great powers to promote industrial development in Asiatic countries in the hope of building up military allies. You can speculate about these matters at leisure. But these are the real factors you have to weigh in deciding how soon industrial development is really going to take place on a considerable scale in Asia. Given internal and external security, Asia is on the verge of a very considerable advance.

Now, let's turn to the question, "What is industrial development in Asia going to mean to the United States?" First, let me dispose of three wrong ideas. One is that there is not enough work in the world to go around, and if the peoples of Asia acquire machines and learn how to work more efficiently, that will throw our people out of jobs, undercut our living and labor standards, and generally work havoc with our economic system. In order to see the fallacy of that rather crude conclusion, you simply have to look at the need for production in the world. There is little danger of producing too much for a long time to come. Of course, there is danger of getting an unbalance in production, by which too much of some things are produced and not enough of other things. But to produce too much of things in

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general is unthinkable for the near future.

There are five basic needs that the world's productive system should meet: food, clothing, shelter, health care, and education. How well are these needs being met?

Food. Sixty per cent of the world's gainfully occupied people are normally engaged in the production of food.

Clothing. If all people used as much cotton per person for apparel and household furnishing as was used before the war in the United States, cotton consumption would be three times its highest point in the past and textile output would have to be increased in proportion.

Shelter. Just look at the houses that people call home in China or the Philippines or any other Asiatic country, and it is obvious that the limit to useful house production is simply ability to produce more and hence to afford better accommodations. Today in California no one is likely to argue that the world has too much housing!

Health care. Soap we take for granted, yet it is a vital health commodity. For the people of the world in general to be able to use half as much soap per person as Americans now use, the soap output of the world would have to be more than doubled. Hospital beds are a rough index of availability of modern medical care. In the United States, where we think many rural areas are undersupplied, there were 11 hospital beds per thousand people before the war. In China, the average is something like 11 per 165 thousand, and the Chinese National Health Administration has an ambitious program for raising that to one hospital bed per five thousand people.

Education. A high level of popular education is impossible in a country living near the margin of subsistence. People must be able to spare the time of their children and to afford a fairly heavy investment in equipment and in the training and maintenance of teachers.

Past history does not lead us to expect that improved ability to produce will, after a time, lead Asia to stop buying or even to buy less. Quite the contrary. As the United States developed industrially, it bought more than the rest of the world rather than less, and sold more to the rest of the world, too. The

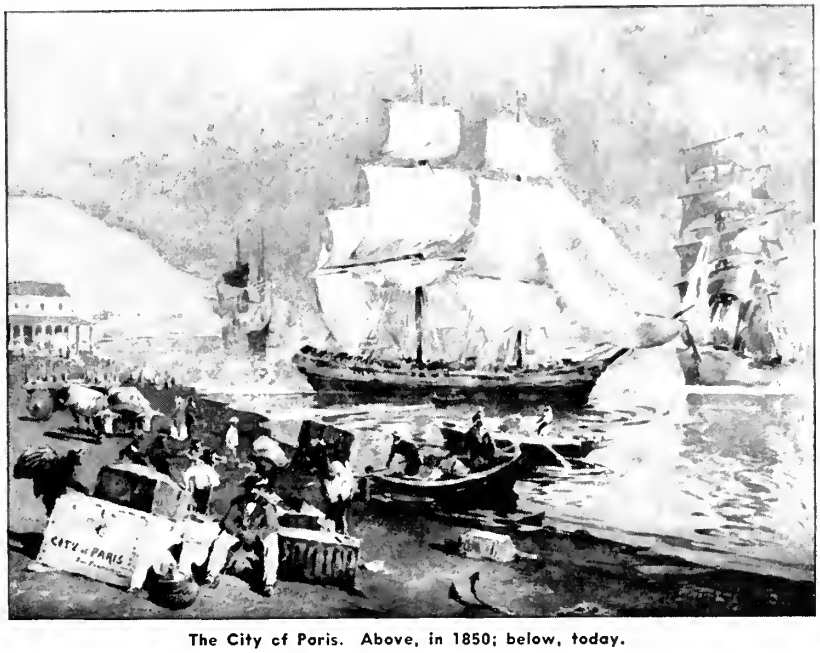
(Continued on page 50)

A Great Department Store Started on a Ship

In 1850 the Ville de Paris, a chartered ship of adventure, sailed into San Francisco Bay with a cargo of silks, laces, shawls, trinkets and wines, which were sold to the people on beaches from the decks of the ship by Felix Verdier.

San Francisco's City of Paris Department Store, operated by Paul Verdier, is an outgrowth of that early "steamer day."

Nearly every business establishment in any port city owes its origin or development, in some measure, to its shipping activities.



The City of Paris. Above, in 1850; below, today.

INDUSTRIALIZATION OF ASIA

(Continued from page 49)

same thing has happened in the case of most other countries that have undergone rapid industrial development, with some possible qualifications about Japan, and with the one exception of the Soviet Union, where there were special reasons related to military insecurity and divergence of systems that made the Soviet Union deliberately pursue a policy of self-sufficiency.

Look at the difference between Canada and Latin America as markets for American products. Canada has 12,000,000 people, Latin America has more than 120,000,000 — more than ten times as many. Yet Canada normally buys almost as much from the United States as does all of Latin America. The main reason is that Canada is a modernized, industrialized, highly productive country, with larger incomes per person, and therefore high purchasing power. As Latin America develops its productivity it, too, is likely to buy more, rather than less, if history is any guide.

The United States, and this applies to the West Coast of the United States in particular, is in a very favorable position to take advantage of the new commercial situation that will develop as so-called backward countries learn to produce more. Why? Because the United States is preeminently the country that is able to produce, and to produce efficiently, the kinds of goods that are wanted in an environment where people are building and developing. This includes electrical equipment, vehicles, transportation equipment, earth-moving equipment, and many other things of that sort. Also, America is particularly able to cater to peoples who are able to afford radios, refrigerators, and similar goods. We are in a better position than any other country to profit in immediate commercial terms from an increase in the average income level of other peoples. On the other hand, we are not very good at competing in the ultra-cheap markets of impoverished peoples.

Some years ago a German inquiry compared the amounts of various kinds of goods sold in international trade in 1913 and 1929. Some goods, such as cheap textiles, increased relatively little in total trade value. Others, especially new items such as phonographs, radios, and electrical goods, showed very great increases. They were "dynamic" goods. The same inquiry then compared the percentage of these different kinds of goods in the exports of England, Germany, and the United States. The result was striking. The "dynamic" goods which had increased more than 150 per cent in international trade between 1913 and 1929 comprised only four or five per cent of the exports of England and Germany in the latter year. But they made up about 30 per cent of United States export trade.

We are pre-eminently a country equipped to produce the "dynamic" kinds of goods that will be demanded in a world that is making economic progress. Thus, it so happens—and this may prove very significant—that the United States, whose governmental policies and business decisions will have the greatest influence in determining whether or not there will be vigorous economic development throughout the world, is also a country whose direct commercial prospects are most favorably influenced by world economic development and rising income levels in the rest of the world.

Now, what will the development of new productive capacity in Asia mean in terms of new competition for American producers? For, as I said, there will be both new competition and new market opportunities. The new competition will manifest itself in certain lines and the new markets in others. That gives the clue to what our policy ought to be. We ought to be adaptable, ready with initiative and adjustability, and we should expect to shift gradually, year by year, out of certain lines which will be more cheaply produced by other peoples, and into lines where new market opportunities will develop as incomes rise. That, I think, is the essence of a wise policy for American business, labor and government. It will benefit both us and other peoples.

The lines we must expect to abandon, gradually, are those that require a large proportion of more or less crude labor power. We should expect to import rather than export them. The lines where American industry can expect to expand to compete successfully are those requiring highly complex machines, scientific research, much capital in relation to the amount of labor, highly trained labor and highly skilled technical management. We can also excel in development of new products and new processes. Our true competitive strength is in keeping at least one jump ahead of the game.

The great lesson from the history of organic evolution is that it is the adaptable animal that survives and prospers, not necessarily the biggest, or the one with the thickest skull. The same principle applies in a changing world economic environment.

Rubber Is Coming In

The first shipment of crude natural rubber to arrive in New York from the Straits Settlements and Java since 1942 reached port on December 22 with the arrival of the SS Canton Victory, for which the Isthmian Steamship Company, United States Steel Subsidiary, is berth agent. The shipment contains over 8000 tons.

Shipments of crude rubber to this country were cut off by the Japanese invasion in the Pacific early in 1942. The last shipment to arrive from Java was also an Isthmian vessel, the SS Steel Worker, which arrived on February 25, 1942. Company officials said another vessel is due to arrive in January with a rubber cargo, and it is anticipated that there will be regular arrivals thereafter.

In the June, 1945, issue of Pacific Marine Review we published an analysis of the prospects for post-war rubber consumption. In our February issue there will appear a further analysis prepared in the light of subsequent developments.—Ed.

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Chinese Commodities

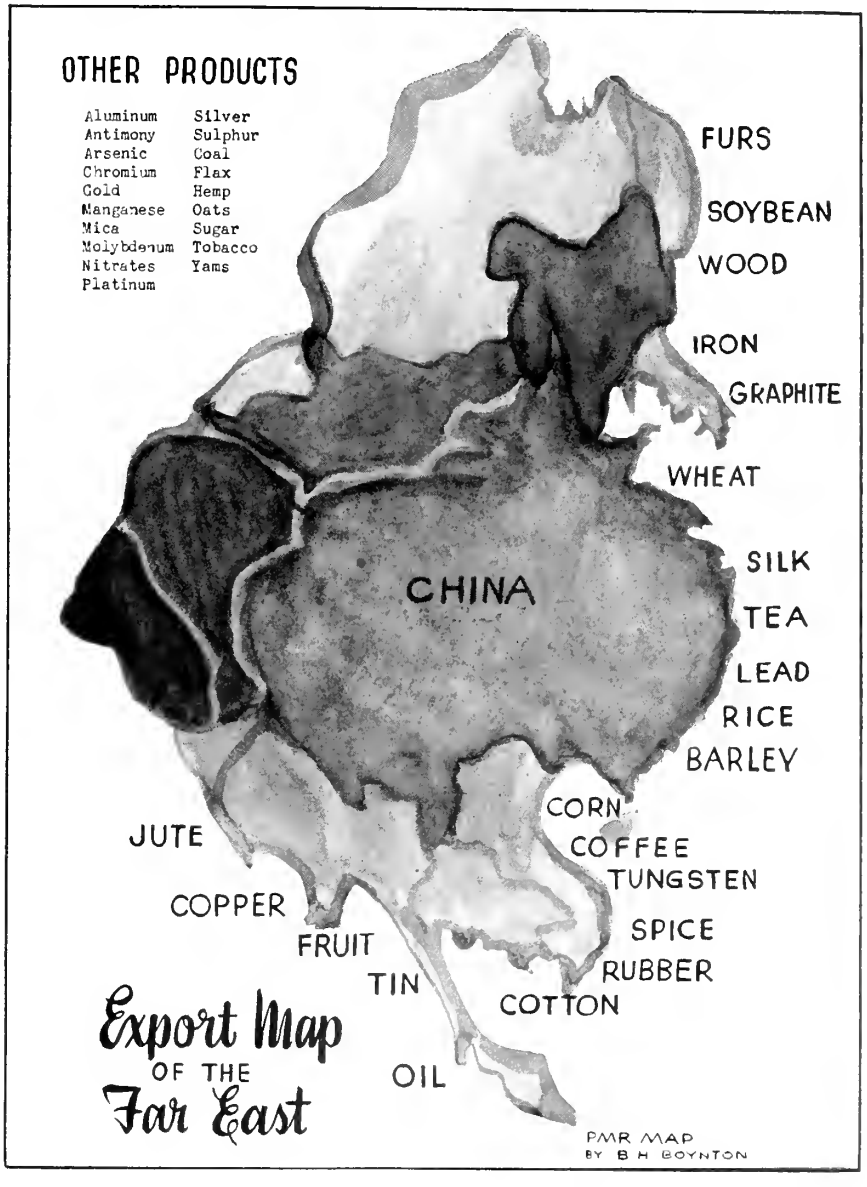
Estimates of the volume of Chinese commodities available for shipment from China have been received by the China - America Council of Commerce and Industry from official Chinese sources. These figures, which are the first official estimates of post-war Chinese exports to be received in this country, show that after a transition period to allow for revival of production and transportation in the formerly occupied areas, China will be able to ship considerably larger quantities of her basic export commodities than before the outbreak of the Sino-Japanese war in 1937.

Estimates of available export commodities were requested of the Chinese government for two main reasons. In the first place, many of the Council's import member firms are vitally interested in obtaining Chinese commodities for sale in the American market at the earliest possible moment. Secondly, the availability of export products will be the major factor in China's ability to service the large loans and credits she is expected to receive in this country and also to make cash purchases here. Because of the tremendously difficult problems involved in taking over the formerly occupied areas in Eastern China and surveying the available resources and plant facilities there, it has not been possible to get any realistic estimates up to this time. The report just received from China indicates encouraging possibilities, although many obstacles will have to be overcome before the Chinese export trade reaches its pre-war levels.

Importers in the China - America Council are encouraged by the fact that since V-J Day the Chinese Government has taken a number of significant steps to stimulate China's export trade. These include elimination of wartime government monopoly controls on the wholesale trade and export of tung oil, tea, bristles, silk and wool; lifting of embargoes on 29 export articles; cancellation of all wartime rulings regarding blockade lines and occupied areas, and the establishment of customs collections only at national boundaries.

It is expected that to an increasing extent the Chinese export trade will be handled by private interests. Chinese authorities state, however, that the commodity testing bureaus set up by the government for the purpose of improving the quality of the principal export items will be continued in operation after the war. These bureaus are expected to be of great value in helping Chinese exporters process, style and pack export prod-

Exports from the Orient. This tells only part of the story. Also from China come tung and other wood oils, peanuts, walnuts, egg products, fish, toys, hair, ivory, jade, bristles, bamboo, works of art—and firecrackers.



ucts meeting the requirements of foreign markets.

Tung Oil, Silk, Wool, Tea, Tin, Hides

Among the major Chinese export commodities for which considerably increased shipments are predicted in the post-war years as compared with the pre-war period, 1935-1937, are tung oil, bristles, raw silk, wool, tea, egg products, tin and antimony. Large shipments are predicted also of other well-known Chinese staples, such as sausage casings, hides and skins, oil seeds, beans, feathers, medical substances, hemp, jute and ramie, and tungsten ore. Certain manufactured products which have found a large market abroad before the war are also expected to figure prominently in the post-war export list. This applies particularly to such items as handkerchiefs, linens, embroideries, lace and hairnets.

In the three years before the Sino-Japanese war, exports from China proper (not including Manchuria and Formosa) averaged $222,000,000. Judging by the latest estimates, it should be possible to exceed that total within a few years. In the first year after resumption of regular trade, however, shipments are expected to be considerably below the pre-war figure for most items.

In the 1935-1937 period the United States took a little over a quarter of China's exports. Chinese authorities agree that in the post-war period a much larger proportion of their exports will go to this country. To help pay for the vastly increased purchases planned in the United States for the Chinese industrialization program, China will make special efforts to develop the export of those items which are in good demand in this country.

A continuing favorable market, for example, is predicted for tung oil, shipments of which to the United States averaged $14,000,000 a year in the pre-war period. The same is true of wool, of which the United States formerly imported more than $4,000,000 worth a year from China; and of various furs, hides and skins, of which we purchased more than $10,000,000 worth a year. China before the war exported raw silk to this country to the value of more than $4,000,000 a year. Despite the decreased over-all consumption, it is believed this figure can be considerably exceeded because of weakened Japanese competition. Similarly, hog bristles, of which China formerly shipped to this country around $4,000,000 worth a year, are expected to find a brisk demand notwithstanding the recent development of the synthetic variety in the United States.

Vegetable seeds and oils, including tea oil, sesame seeds, perilla oil, peanut oil and cotton seed oil, are expected to enjoy substantial sales in this country. In 1935-1937 U. S. imports of these Chinese items exceeded $6,000,000. In the pre-war period, China shipped to this country each year handkerchiefs, embroideries, laces and trimmings and hairnets to the value of approximately $6,000,000, and American importers are again actively in the market for these materials. Egg products from China, which added another $2,000,000, are also expected to have a large sale. Certain minerals and ores of which China is the major producer, particularly tin, antimony and tungsten ore, will again be available. The United States formerly took from China more than $5,000,000 a year of these three items.

Manchuria

In addition to China proper, Manchuria and Formosa, now under Chinese control, will provide a large volume of goods for export. In the three years prior to the "Mukden incident" Manchuria alone exported an annual average of $150,000,000 of its products to other nations and to China proper, most important of which were soya beans, bean oil and cakes, coal, millet and corn, and iron and steel. In the years before Japanese occupation, Manchuria enjoyed a substantial excess of exports over imports and helped to balance the total trade of China. Under Japanese domination exports continued at a high level, but Japan took an increasing proportion of the total, amounting to 55 per cent in 1939. About 15 per cent was exported to China proper.

Although exports from Manchuria will probably decline in the first post-war years, due to decreased production, increased domestic consumption, and reduced shipments to Japan, they will still be substantial. In the past years only an insignificant proportion of Manchurian exports went to this country.

It is expected, however, that in the future such products as raw silk, and hides, skins and furs will be shipped to the United States in increased quantites.

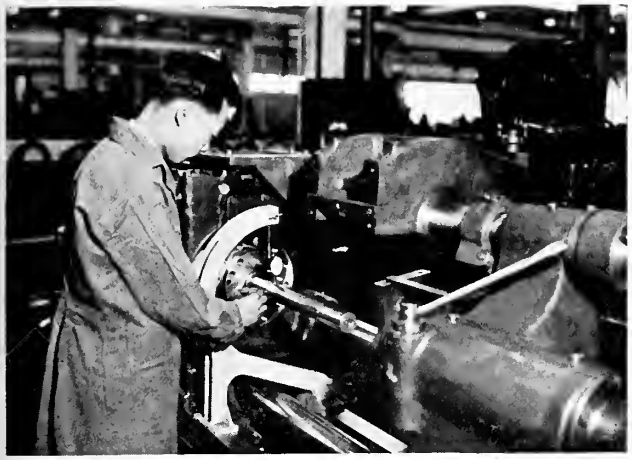
Formosa

In 1936-1937, Formosa's exports, mainly agricultural products, were valued at an annual average of $115,000,000. The bulk of these shipments went to Japan in exchange for manufactured goods. Formosa's exports in post-war years will continue to be large but for some time much of her sugar, rice, forest products, and alcohol, which constitute the bulk of her exports, will be required for shipment to the mainland of China. Nevertheless, it is predicted that exports of tea will be expanded and that the United States will buy more than in pre-war years.

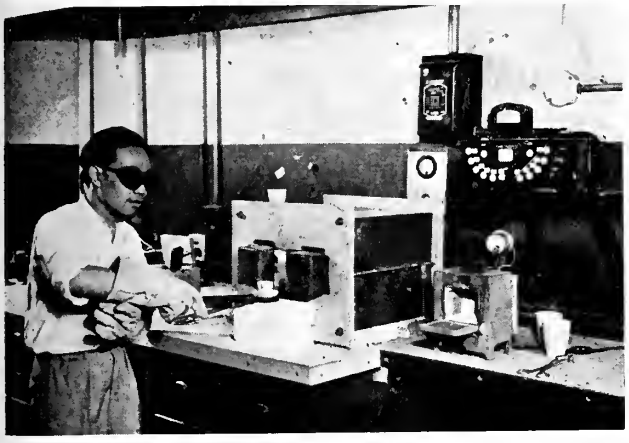
While the import trade from China presents promising possibilities, the China-America Council points out, a number of obstacles must be surmounted before trade relations can be resumed on any substantial scale. Important among these is the question of stabilization of Chinese currency and the establishment of a reasonable exchange rate for the American dollar. Reports from China indicate the government is taking temporary measures to ease this situation so that exporters may begin to resume shipments abroad in the interim period before a new exchange ratio is finally established.

Another current stumbling block to resumption of trade is the lack of transportation facilities both within China and for overseas shipments. Although limited cargo space has recently been made available for shipments from this country to China, the problem of cargo space for shipments in the opposite direction is still to be worked out.

Pacific World Trade



Yi-Kyieh Wong testing a Fay automatic lathe, Janes & Lamsan Machine Co., Springfield, Vermont.



Kuan Han Sun experimenting with optical glass in the research laboratories of the Eastman Kodak Company at Rochester, New York.

Training of Chinese Technicians in U. S.

Every engineer, every mechanic, every industrial planner who returns to China with American training will have a part in influencing the use of American machinery and other American products in China's brightening future. Those who aid in the training of Chinese students are promoting foreign relations—and foreign trade.

—Ed.

The United States played a major part in training the technicians urgently needed for China's war effort and for her tremendous post-war rehabilitation and industrialization program. Since 1942, approximately 1000 senior Chinese technicians have been sent to this country to gain practical experience in American technology and industrial management. In addition, at the outbreak of the war about 2000 Chinese undergraduate students were registered in American colleges and universities.

The industrial training work has been financed and supervised by the American and Chinese governments, by UNRRA and by unofficial organizations. Programs financed from American lend-lease funds have been supervised by the Foreign Economic Administration in cooperation with Chinese authorities. Those paid for originally by the National Resources Commission of China have been conducted by the Chinese-government-owned Universal Trading Corporation, though the State Department and FEA also extended their good offices. Ather programs have been supervised by various agencies of the Chinese government, including the Chinese Supply Commission and the U. S. representatives of the Ministry of Agriculture and Forestry, the Commission on Aeronautical Affairs and the Chinese Naval Construction Mission.

In 1945 Congress appropriated $4,800,000 to enable FEA to bring Chinese professional and technical workers to America for fractional crafts training in industry. Selection of the technicians in China was by examination held by Chinese governmental agencies. Three types of training courses of different lengths up to eighteen months, were designed: (1) professionalizing courses for top management in functional engineering fields; (2) industrial supervisors, and (3) technical visual education to pre-

(Continued on next page)

Montgomery Heads World Trade Association

William L. Montgomery, regional director, China-America Council of Commerce & Industry, Inc., has been elected president for the year 1946 of the World Trade Association of the San Francisco Chamber of Commerce.

Other officers elected were for first vice president, Fred B. Galbreath; for second vice president, R. J. Roesling; for third vice president, L. I. McKim; for treasurer, P. A. Kinnoch; for secretary, Alvin Eichholz.

William L. Montgomery

TRAINING OF CHINESE TECHNICIANS

(Continued from preceding page)

pare the trainees for the development of training courses in China. All lend-lease trainees were obligated to return to China to reengage in work contributing to the war effort. Trainees were not permitted to accept salaries while in America. Where agreements with unions provided that apprentices must receive pay, the wages were automatically turned back to the FEA Training Section. FEA provided $5 per day per trainee for maintenance and also insurance coverage. The length of service with any company depends upon the particular type of training.

Under contract with both FEA and the National Resources Commission, the International Training Administration has been engaged to handle arrangements for living accommodations, transportation, clearance with governmental agencies and related details, as well as assistance in placing trainees in industrial enterprises. The China-America Council of Commerce and Industry has cooperated with both American and Chinese authorities in bringing the programs to the attention of member firms and in facilitating placement of trainees.

Many of the Chinese trainees who arrived during 1943-1944 had completed their schedules prior to V-J Day and were returning to China as rapidly as transportation facilities could be made available. Other senior personnel were recalled immediately after the sudden Japanese surrender, some leaving by plane for China in September and others following by steamer in October. Paradoxically, the largest groups of Chinese trainees, totaling 850, arrived in the United States almost at the war's end. Because of transportation restrictions incident to the deployment of American troops, most of this large group of trainees has been placed initially with American industrial concerns on the east coast.

The Ministry of Education has decided to hold an examination for students going abroad to study in the early part of 1946. The examination is open to government as well as privately supported students. The number of government-supported students will be increased to 1000 and the countries for study will no longer be restricted to the United States and Great Britain, it has been announced. The Ministry is recalling the students who have completed their studies abroad to aid in the rehabilitation of China.

These wartime training programs and the fact that a large proportion of all Chinese engineers are American-trained, constitute a solid foundation for Sino-American industrial collaboration in the future.

Pacific World Trade

Bottleneck In Financing Foreign Air Cargo

By *A. M. Strong*

Vice President, American National Bank & Trust Company of Chicago

International trade by air cannot be developed without adequate financing, the author states. To finance air shipments banks require an airway bill conveying title to the merchandise. He points out that airway bills presently used are not instruments of title, and recommends immediate steps to remedy the present situation.

Three basic elements play an important part in the development of modern commerce; the demand and supply of goods, availability of credit, and transportation facilities. The history of transportation is the history of commerce. A close parallel can be drawn between the development of primitive barter into modern international trade, and between the development of transportation from the camel caravan to the modern plane.

A. M. Strong

The role of air transportation in foreign trade cannot be measured by present standards. There are sufficient indications that carriage of goods by air will have a profound effect on international commerce. It will bring changes in our marketing methods and in our methods of financing. It will release capital tied up in merchandise in transit and in inventories. It will reduce the speculative element in foreign trade by making it unnecessary to purchase goods long in advance of seasons and it will reduce the cost of financing by reducing the turnover time between purchase and distribution.

Financial facilities are of paramount importance to the development of international air cargo. Foreign trade is not conducted on a cash basis. It is arranged primarily on a credit basis. Banks have established an efficient mechanism for these transactions. Through the Irrevocable Letter of Credit they underwrite a buyer's promise to pay for the goods. Through collection arrangements they retain custody of the goods shipped until payment is received.

American importers as a rule establish Letters of Credit in favor of the foreign sellers. The Letter of Credit is an undertaking by a bank to pay drafts accompanied by shipping documents or other documents

of title. The importer pays for the goods when the draft and documents are received by his bank. Quite frequently the credit is established on a time basis; that is payment is made within a specified time after the documents have arrived. Exports are usually made on a draft basis; that is, the exporter draws a draft on the foreign buyer and turns over the draft and shipping documents to his bank for delivery to the seller against payment. Such drafts are frequently discounted by the seller's bank, enabling him to receive cash long before the foreign buyer pays for the goods. In either case, the underlying merchandise is used as security for the transaction through the hypothetication of the shipping documents.

The documents in ocean traffic give the bank as consignee, or holder of the negotiable bill of lading, title to the goods. Unless a bill of lading conveying title is employed in air traffic, banks will not be able to finance air cargo on the same basis as they finance ocean cargo. The non-negotiable bill of lading used by air carriers consigning foreign cargo to an intermediary does not meet the requirements of bank financing as the document does not convey title to the goods.

The problem of financing of air cargo did not arise during the war period because most of the commodities transported by air were for Government account. The volume of private shipments was rather small. Air transportation of cargo, however, is entering the international field on a wide scale.

Three leading air lines have recently obtained permission to fly across the oceans to many foreign lands. These lines will operate throughout Europe, the Near East, India, Turkey, North Africa, Egypt and other countries.

A warning that the non-negotiable bill of lading employed by air carriers does not meet with bank requirements, was sounded at the Annual Convention of the Bankers Association for Foreign Trade, held at Montebello, Canada, in June of last year. A report submitted by the Committee on Uniformity in Documents and Practices pointed out that bank financing normally requires suitable documentation, including an airway bill giving the consignee clear title to the goods and that the airway bill presently used does not meet these requirements. The report further pointed out that the provisions made by certain airlines for consignments to intermediary agencies may create legal complications in the event of a dispute between the bank and the ultimate consignee. The report recommended that a coordinated effort be made to devise a uniform negotiable or non-negotiable airway bill, suitable for bank financing, and that comprehensive uniform laws be adopted with regard to international air shipments and the documents relating to such shipments.

International air traffic between the United States and the leading foreign countries is governed by the Convention for the Unification of Certain Rules Relating to International Transportation by Air, concluded at Warsaw on October 12, 1929, and known as the Warsaw Convention. The articles of the Convention deal only with the non-negotiable airway bill as the financing of air cargo was not a problem in 1929.

Pacific WORLD TRADE

Some doubt, therefore, exists as to whether under the rules of the Warsaw Convention, a negotiable bill of lading would be effective when the place of departure or arrival is situated in a country that is a party to the Convention. Air carriers should clarify the situation without delay, and if a modification of the Warsaw Convention is necessary, no time should be lost in bringing about such a modification.

The matter of air shipping documents was sadly overlooked in recent international conferences on air traffic. It is most important that air carriers take cognizance of the fact that lack of proper documentation has created a bottleneck in the financing of air shipments which may constitute a major obstacle in the development of air cargo. Steps should be taken through the existing international organizations or if necessary, through a special committee to devise and introduce a uniform negotiable airway bill.

Stanford and U. C. Offer World Trade Courses

Stanford

With the return of full pre-war enrollment, the Graduate School of Business at Stanford University is offering a course in International Trade — January through March — for second-year graduate students. Dr. Eugene Staley, lecturer in international trade at the Graduate School, and Director of the Institute of Pacific Relations for the Bay region, will be the instructor.

The course will include export-import practices, supplemented by visits to trading and shipping firms in the Bay Area, together with industrial development plans abroad.

U. C.

To meet the increased demand for current information on the techniques and regulations in the conduct of import and export trade, the Bay Area World Trade Promotion Committee, under the chairmanship of Charles Romanowitz and in cooperation with the Extension Division of the University of California, has completed arrangements to hold an Institute of World Trade, January 24, 25, and 26, at the Extension Division's auditorium, San Francisco.

With the increasing awareness of the importance of world trade in the future business economy of the Bay Area, executives of hundreds of manufacturing concerns plan to avail themselves of this practical information. A description of the services and facilities available in the Bay Area to assist in the promotion and handling of world trade will also be presented.

More than a dozen experienced foreign traders will give the benefit of their practical experience to assist manufacturers at the sessions in establishing their foreign trade policy immediately, and plan now to enter foreign markets.

Registration fee for the series, including copies of all talks, will be $12, with special consideration being given to servicemen interested in this field, whose registration fee will be $7.50. A brochure outlining the series of talks will be available on request shortly.

Latin America Offers Huge Market for West Coast Products

Grace Line Official Returns with Optimistic Report

In our December issue we featured the post-war ships and routes of the Grace Line. Mr. Thompson's report indicates real prospects for the Line.

Vast markets for Pacific Coast industrial products, including household appliances, foodstuffs, machinery, chemicals and metal products, await the Pacific Coast manufacturer and distributor in Latin America.

This is the message that Harry Thompson, freight traffic manager of the Grace Line, brings back from a 25,000-mile trip in which he visited 600 firms and prospective buyers in 13 Central and South American countries.

"Almost without exception every area I visited requires large quantities of consumer goods," said Mr. Thompson upon his arrival in San Francisco, "and primarily important, the majority of the countries have adequate gold credits in the United States to buy and pay for the goods they want.

"Prior to the war, shipments from the Pacific Coast states consisted largely of raw materials. The war years went a long way toward transforming this area from an agricultural to an industrial area. The Latin American buyers now are beginning to realize that they can make the purchases they want from Pacific Coast firms and feel that with fast, regular service and the ability to make shipping connections they can purchase advantageously on the Pacific Coast.

"My travels, beginning in August and continuing into December, convince me that Latin American exports and imports will shortly exceed the pre-war tonnage by a wide margin. The importers and exporters in many of the countries are definitely looking to the West Coast of United States and Canada as a source of supply of manufactured goods and as a market for their own raw materials. Many representative Latin American firms, however, do not realize that a tremendous change is taking place on the Pacific Coast in the manufacture of new products, although quite generally they express preferences for purchasing on the Pacific Coast when materials are available. Through the years they have enjoyed a very satisfactory relationship with West Coast business and now they evince a desire to extend this relationship into manufactured products of all kinds."

Harry Thompson, Freight and Traffic Manager, Grace Line, San Francisco.

In discussions with Latin American buyers, Thompson stated that he found a deep interest in such items as chemicals, hardware, refrigerators, radios, electric irons, building materials, iron and steel products, petroleum products, foodstuffs, flour, canned goods, wheat, machines for fish canneries, hydraulic and sanitary equipment, newsprint, paper, paper products and pulp. His records really show hundreds of items which the Latin American countries may be expected to buy in the early post-war period. These items he tabulated in his travels through Mexico, Guatemala, San Salvador, Honduras, Nicaragua, Costa Rica, Panama, Canal Zone, Colombia, Ecuador, Peru, Bolivia and Chile.

"Any firm interested in selling new lines of merchandise in the Latin American markets," said Mr. Thompson, "will find it advantageous to send their representatives with complete information on the new merchandise into these areas. I feel that they will find many opportunities and

that everywhere they will be favorably received."

Looking to an upsurge in trade between Pacific Coast and Latin America, Fred L. Doelker, vice president of the Grace Line, San Francisco, said that Grace Line will definitely assign a minimum of five C-2's to this trade, providing two sailings a month. These vessels have a carrying capacity of approximately 10,000 tons each, with ample refrigeration space. They are to sail in regular service between Canada, the Pacific Northwest, San Francisco, Los Angeles and ports on the coast of Latin America. They will serve every market from Manzanillo, Mexico, to San Antonio, Chile.

R. Ranney Adams, new president of Grace Line.

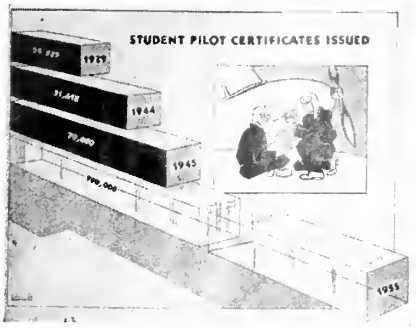
First "Santa" Ship Returns to South American Service

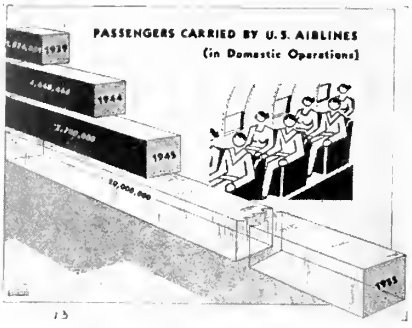
The arrival of the Grace Line freighter, Santa Leonor, in New York December 23 with 8 passengers and 9300 tons of copper from Chilean ports marked the first of the famous "Santa" fleet to return to Latin-American service. Regular passenger service on this route, however, will not be resumed until later in the year.

From her launching in April, 1944, until her present trip, the Santa Leonor had been assigned by War Shipping Administration to transportation of military supplies. She completed six voyages to the European theater of operations with U. S. Army cargo and recently returned to San Francisco from Okinawa on her first Pacific venture.

At all ports of call in Central America, Colombia, Ecuador, Peru, and Chile, the Santa Leonor was hailed enthusiastically as a symbol of the return of Inter-American trade to peacetime channels. Since the ship is designed for cargo carrying and has no troop accommodations she has been allocated by War Shipping Administration to continue in the New York-West Coast of South America service.

In command of the Santa Leonor is Captain Olaf Berg of Seaford, L. I., who was Master of the Santa Catalina, a sister ship, which was torpedoed and sunk on April 23, 1943, in the Caribbean.





The Growth of the Airlines

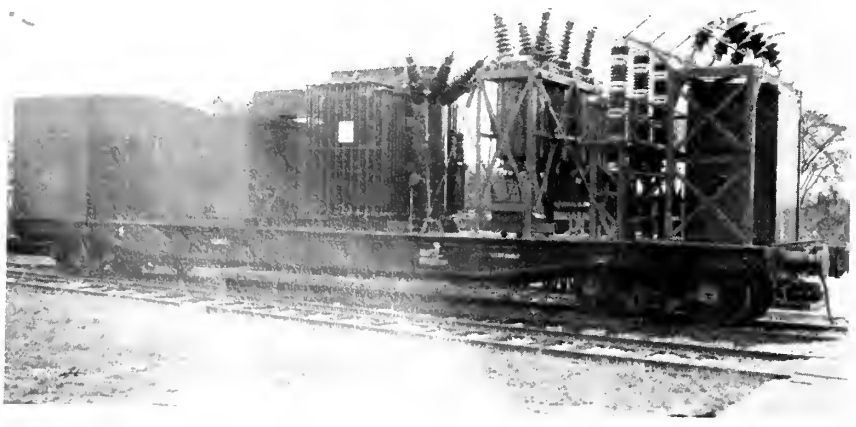
Railroad-Mounted Unit Substations For U.S.S.R.

The first of 15 railroad-mounted unit substations, recently completed at General Electric's Pittsfield Works for the Union of Soviet Socialist Republics, will be used in the rehabilitation of towns and cities that were devastated by war. It is believed that these are the first complete distribution substations of the railway-type to be built in America. Completely mobile, they will serve the electrical needs in war-torn areas and maintain service until permanent substations can be built for these areas.

The entire unit substation, permanently mounted on a flatcar, weighs 111,000 pounds. It contains a 46-kv incoming disconnecting switch, an oil circuit breaker, lightning arresters, a power transformer, and three outgoing 15-kv metal-clad switchgear circuit breakers and feeders, which include potential and current transformers for metering and relaying. Outgoing cable connections are through the floor of the car. There is also an auxiliary generator with control equipment to supply auxiliary power, heat and light while the unit is being readied for service. On one end of the car is the storage compartment containing tools required for maintenance and repair, and also such spare parts as bushings and lightning arresters. The unit is rated 1800 kva with a high voltage of 35,000 volts, which can be stepped down to 3150 or 6300 volts.

While being moved on American railroads, the trucks on the car are standard American gage, but wider Russian trucks are being shipped with the unit to be installed at the port of entry.

G-E mobile unit substation permanently mounted on railway car. Rated: 1800 kva, 3-phase, 50 cycles, 35,000 to 3150/6300 volts.



For Sale! . . . Lend-Lease Machine Tools

American lend-lease machine tools are being offered for sale in Australia on the same general formula as they were sold in Britain—at roughly a quarter of their original cost. Eighteen months ago the British Government made an over-all agreement for all categories of lend-lease tools and bought them at less than 25 per cent of their original value. Allowance was made in this price for heavy depreciation on machines supplied early in the war, also for machines lost on the Atlantic. In Australia, depreciation does not represent such a large figure, since all such tools are late models and little was lost crossing the Pacific. Thus, although the formula will be the same, the over-all price will work out at more than 25 per cent of the original cost.

Royal Navy Opens Hong Kong

Hong Kong, most important port of the Far East, has now been cleared, and is receiving commercial traffic. Six weeks after arrival, the Royal Navy cleared a wreck and debris from the drydock and docked an 8000-ton oiler for screw repairs, in spite of the fact that most of the dock yards had been destroyed.

Building work has recommenced on a 1000-ton ship which was left unfinished on the slipway. Harbor fairways are now cleared and are being re-buoyed and lighted. Twenty visible wrecks in the harbor and a large number of sunken wrecks are being moved. Minesweepers clearing the approaches to the harbor swept and sank 23 moored mines in one day.

In Congress—

Some Good Points Raised by Representative Welch on the Ship Sales Bill and on Ship-Air Operation in the Following:

Mr. Speaker, the bill under consideration, H. R. 3603, has for its principal purpose the sale of surplus war-built vessels. During its protracted consideration by the committee I endeavored at all times to use as my chart the declaration of policy contained in the Merchant Marine Act of 1936, referred to as the magna carta of the American merchant marine. This policy is reaffirmed in section 2 of the present bill. It cannot be referred to or read too often:

Sec. 2. (a) It is necessary for the national defense and development of the foreign and domestic commerce of the United States that the United States have a merchant marine (1) sufficient to carry its domestic water-borne commerce and a substantial portion of its water-borne export and import foreign commerce and to provide shipping service on all routes essential to maintaining the flow of such domestic and foreign water-borne commerce at all times; (2) capable of serving as a naval and military auxiliary in time of war or national emergency; (3) owned and operated under the United States flag by citizens of the United States; (4) composed of the best-equipped, safest, and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel; and (5) supplemented by American-owned facilities for repairs, marine insurance, and other auxiliary services.

(b) It is hereby declared to be the policy of this act to foster the development and encourage the maintenance of such a merchant marine, and to facilitate the adjustment of the merchant marine from war service to peacetime operations.

Mr. Speaker, before the war the world had about 74,000,000 deadweight tons of shipping. At the present time the United States alone has between 56,000,000 and 57,000,000 tons of shipping, costing $17,000,000,000. Before the war we had 11,000,000 tons. The following number and types of ships are now owned by the United States Government and are under the control of the Maritime Commission:

C-1 type	110
Concrete C-1	22
C-2	218
C-3	146
C-4	75
P-2	19
Special and combinations	34
Liberty	2,500
Victory	527
Tankers	530
Liberty tankers	60
Small type tankers	90
Total	4,324

Out of this total of 4,324 ships there should be a ready domestic market for the 2, 3, and 4 C-types of ships, the special and combinations, and, perhaps, the tanker types. This is about 25 per cent of the ships owned by the Government.

The Libertys and other types of ships are far less desirable. They are either too slow or do not contain the desirable cubic space. They were built for the war and did a good job, but are not economical or best suited for peacetime trade in competition with other maritime nations.

For nearly a year before the collapse of Germany, Britain was building specially designed ships for her peacetime trade. Further than that, she was not only building for herself, but she was also building ships for neutral Portugal's peacetime trade.

It is well known that Sweden took advantage of her neutrality and has built over a million tons of the finest merchant ships afloat.

For months past we have been building ships for the Netherlands. The Sun Shipbuilding Co., in its Philadelphia plant, is building ships for that country that are comparable to our C-3's, which is the best type of ships we have.

During the hearings on this bill lasting over a year, your committee has been confronted with two schools of thought with particular reference to sections 8 and 9 of the bill. Section 8 provides for exchange of war-built vessels by allowing a turn-in credit for old or antiquated ships. Section 9 provides an adjustment for prior sales to citizens, and it also contains an exchange provision.

Both sections are highly controversial.

One school of thought maintains that if the turn-in price is too low, owners of old vessels requisitioned by the Government will not negotiate with the Maritime Commission for war-built vessels, but will hold the Maritime Commission to its charter contract to put their old ships in class by reconditioning them. It was testified by the chairman of the Maritime Commission that this cost might run as high as $20 a ton. This would defeat the very purpose of the Merchant Marine Act of 1936.

The second school of thought holds the opposite view. Their conclusion is that if the Government allows too much for the turn-in value of old or antiquated ships, then the net return to the Government will be too low.

Mr. Speaker, while we are duty bound to get the best possible price for our surplus ships, we should also keep in mind that there is no law which compels an owner to turn in old ships for new ones. He will only do so if he feels he is getting just compensation for his old ship.

Mr. Speaker, the committee's task has been more complex due to the fact that the shipping interests themselves lack unity. They were divided into three groups — the subsidized operators, the nonsubsidized operators, and those not wanting a ship sales bill of any kind, in the absence of which they believed they would be able to buy our ships at any old

price, as was the case following the First World War.

During the First World War it cost the Government $200 a ton to build ships, and they were sold after that war for as low as $5 a ton. That should not happen again.

Mr. Speaker, the Maritime Commission has sent four bills to committees of Congress having this legislation in charge in both bodies. I am unable to state which of these bills is better or worse in some of their provisions. The first bill absolutely discriminated against American ship owners in favor of foreign-flag operators. This discrimination was, of course, rejected by the committee. The last bill contains a big-stick provision which would allow the Maritime Commission to give preference to purchasers of our vessels who, in the judgment of the Commission, play ball, as against those who have the courage of their convictions. This discriminatory provision, if written into law, would establish a precedent which could be used by every department of Government in the sale of surplus commodities and the settlement of war claims.

With all of our vast tonnage we will not be as well equipped as foreign nations to meet the needs of foreign trade. Their scarcity of tonnage will be rapidly remedied by building new ships specially designed to meet the requirements of the routes they are to travel. This fact in itself will place the American merchant marine at a competitive disadvantage.

But further than that, Mr. Speaker, the interpretation placed on the Civil Aeronautics Act of 1938 by the Civil Aeronautics Board has completely denied American ship operators equal opportunity of competition with every other maritime nation in the world. In denying the use of the air to our shipowners in foreign trade they have placed handicaps on the American merchant marine that create an unwarranted situation that can only be overcome by increased subsidies paid out of the pockets of the taxpayers of this country. This particularly applies to passenger and fast-express traffic.

There is no doubt that the Government through the Maritime Commission would have received very much higher bids for the American President Line, which it took over, were this line permitted the right to operate air travel parallel to its surface routes. This is the only American flag shipping company that has maintained an around-the-world passenger service and it had done this for many years prior to the war. As another result of the unwarranted action of the Civil Aeronautics Board there is no demand from American ship owners for the 19 P-2 war-built vessels owned by the Government. These ships cost $304,000,000. They are excellent fast passenger ships, built to carry more than 500 passengers. They are not desired by American ship operators because they expect the action of the Civil Aeronautics Board will reduce transoceanic passenger travel in American ships to a minimum.

How much longer will Congress permit the Civil Aeronautics Board to hold the American merchant marine in a straitjacket and lash it to the mast of restriction? No other maritime nation has or would tolerate such a board.

Those who would interpose objections to a ship sales bill have yet to raise their voices anywhere in defense of an American merchant marine, such as is proclaimed in the Merchant Marine Act of 1936, against bureaucrats in high Government positions who would reduce the American merchant marine to the level of a fleet of tramp steamers. The need for an adequate American merchant marine for our national security and peacetime economy is more necessary now than at any time in our history.

On Airport Bill (and Ship-Air Operation)

Mr. Speaker, I yield 10 minutes to the gentleman from California (Mr. Welch).

Mr. Welch: Mr. Speaker, I shall support this Federal-aid airport bill—H. R. 3615—which proposes to provide aid for the development of public airports.

The bill authorizes an aggregate appropriation of $650,000,000 to be spent over a period of 10 years beginning with the next fiscal year.

I have always been a strong advocate of the development of our air facilities to their maximum efficiency. Air development is a guaranty toward our national security, as the history of the recent war clearly proves. It is likewise a valuable asset in the development of our peacetime economy.

Mr. Speaker, it will be a relief to every Member of Congress who is interested in the development and maintenance of the American merchant marine to know that this act will be administered by the Civil Aeronautics Authority rather than the Civil Aeronautics Board. As I have heretofore pointed out, there are four interdependent principal links in the chain of our national defense—the Army, the Navy, the merchant marine, and our Air Forces. By its action in refusing the right to American ship operators to operate air lines parallel to their surface routes, the Civil Aeronautics Board has clearly demonstrated its inability to recognize this fact. On the contrary, its policies and actions tend to destroy one with the other. Too few people realize the seriousness of this situation. The United States Maritime Commission at the present time has 19 excellent passenger ships to sell which cost some $304,000,000. Each of these ships will carry more than 500 passengers. They are excellent ships to compete with foreign ship operators on surface routes. Because the Civil Aeronautics Board will not give the right to operate air lines parallel to surface routes, the Maritime Commission cannot find American ship operators to purchase these 19 ships. This is but a single illustration of the vast harm being done to our American merchant marine by the Civil Aeronautics Board.

Mr. Speaker, it was hoped by many Members of Congress that this bill might have been brought in with a rule sufficiently broad to lift the heavy hand of injustice that has been placed upon the American merchant marine by the action of the Civil Aeronautics Board in denying American shippers equal opportunity with every other maritime nation in the world. No other nation would tolerate such action.

It is to be hoped that first consideration will be given by the Civil Aeronautics administration in administering this act to publicly owned

and financed terminal airports, which are international in their service.

The city of San Francisco has been one of the most forward-looking in regard to airport facilities. Strategically located at the air crossroads of the Occident and the Orient, it has one of the finest airports in the world. Although some $20,000,000 has already been spent in its development, the voters of San Francisco will go to the polls next month to authorize another $20,000,000 bond issue for the further development of its airport facilities. Just as the port of San Francisco has been one of the world's greatest ports of embarkation in the war, so its great airport will be one of the keys to our future national defense in the air.

Mr. Speaker, this bill should be speedily enacted into law.

Advantages Claimed For Ceylon's New "Tea-Tablet" Method

Tea can now be reduced to tablets, which are cheaper to produce and transport than tea in bulk, according to the foreign press.

Rising costs of tea production in Ceylon led to an intensive inquiry by the Ceylon Tea Research Institute into manufacturing processes in that country, and this has resulted in the inauguration of a new method of producing fermented tea.

The new method is simple, eliminates withering, rolling and grading, and it takes only 2 hours as compared with 24 hours for the old method. The green leaf, on arrival at the factory, is pulped between stainless steel rollers, and the fermentation thus initiated is completed in an hour. The pulp is then dried in an ordinary tea drier and compressed in tablet form.

Tea tasters have reported the brew made from the tea tablets to be of unimpaired flavor and quality, and stronger than that made with loose tea.

Baker Announces South American Representative

The Baker Industrial Truck Division of The Baker-Raulang Company, Cleveland, Ohio, announces the appointment of George S. Forman as direct factory representative in Latin America for its line of power industrial trucks, tractors and cranes. Mr. Forman's wide experience in the export field and his knowledge of material-handling problems will be of definite assistance to prospective users of this type of equipment in the Latin-American countries.

Mr. Forman got an early start in the export business working as a boy for export commission houses specializing in Latin-American trade. After spending the years from 1915 to 1922 with the Pan American Trading Company, the G. Amsinck & Company, and in the U. S. Navy during World War I, he commenced traveling in Latin America, first for the Firestone Tire & Rubber Company, and during the past 17 years for Colt's Patent Fire Arms Manufacturing Company.

P. G. & E. Advertisement in Pacific Coast Newspapers Which Indicates the Kind of Industrial Cooperation That Will Build the West and Its Foreign Trade

Australia Seeks All-Time Record Food Production

An all-time record food production of at least 4,000,000 tons is demanded of Australian farms and factories this year. The total does not include grains or fresh vegetables for home consumption. Ending of the Pacific war is estimated to have increased the demand for food by at least 2,000,000 tons, bringing world food shortages to 8,000,000 tons. Half a million extra people have to be fed from the Australian Army cook-houses alone until Japanese prisoners can be sent home and civil administration restored in reoccupied territories.

Brady Brought Home Idea to Grow Rice

Because John Brady, Australian fruit farmer, noticed that the climate, soil and irrigation conditions in rice-growing areas of California were identical with the Australian Murrumbidgee river irrigation district, he has been awarded a Government grant of £300 (about $1000) for "special service in the establishment of the rice industry in Australia." In 1921 he visited California, became convinced that rice could be grown on the Murrumbidgee, and planted his first crop later that year. By 1924-25 production was 16,000 bushels, or 104 bushels to the acre—higher than the yield in some California districts. Last year's harvest of 75,000 tons helped feed starving native peoples in the Pacific.

Siam Replaces Thailand

The kingdom of Siam, which became Thailand on its own motion back in 1938, has officially become Siam again, and all mail to points therein should be addressed accordingly.

Excluding Liberty ships, the average speed of American merchant ships is today 25 per cent greater than in 1939.

Brazil to Buy Railway Material and Locomotives In the United States

The Government of Brazil has opened a credit of $19,550,000 for the purchase of railway material and locomotives in the United States. Of this sum, $7,250,000 is to be used for equipment and material necessary for assembling 2900 cars in Brazil.

Forty locomotives are to be type 4-8-4 and 10 locomotives are to be type 2-6-6-2.

Pacific Coast Rubber

GR-S synthetic rubber, the type used in tire making, is now being produced in sufficient quantities to supply all Pacific Coast factories. In the local operation, both rubber and latex are made from petroleum products piped from adjacent plants operated by Standard Oil Company, Shell Chemical Company, Dow Chemical Company, and the Southern California Gas Company.

The water clarification system, also included in the Rubber Reserve's investment, consists of an intricate series of skimmers and settling basins which eliminate all extraneous material from the waste water. Water is used in vast quantities to control temperatures in the reactor systems. The new clarification system purifies the water before it is run off.

The California Synthetic Rubber Project, consisting of six operating companies, was completed in 1943 and has produced almost 200,000,000 pounds of rubber since operations began.

Pacific WORLD TRADE

INDUSTRIAL COOPERATION

(Continued from page 46)

supplied many of the tools for their new industrial economy, including equipment for steel mills, for power plants, and for the electrification of their railroads, all of which will have important reflections on the lives of the people in that country. In cooperation with the Corporacion de Fomento of Chile, Westinghouse is aiding their plans for hydro-electric projects such as Sauzal and the Pilmaiquen plants. Work is being done with the Empresa de Energia Electrica of Medellin, Colombia, to expand industry in that country, most important at the moment being the Riogrande hydro-electric project. In Peru, also, Westinghouse equipment and technical ability is being made available to the Corporacion Peruana del Santa on projects such as the Canon del Pato hydro plant on the Santa River.

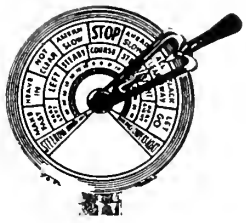
In Mexico the new industrial economy has made great strides. Westinghouse has supplied electrical equipment for large generating plants, including Ixtapantongo and Nonoalco, and will continue to cooperate with the Comision Federal de Electricided, who have undertaken a $20,000,000 electrification program. With this cheap public power made available, industries in Mexico which have been hampered by lack of power will expand and thrive, creating useful employment and greater purchasing power.

In line with the policy of industrial cooperation, Westinghouse will also aid in the establishment of a new $15,000,000 manufacturing plant in Mexico. To be called Industria Electrica de Mexico, this plant will manufacture all lines of electrical equipment under Westinghouse patents and designs. Technical assistance in the layout and engineering of the plant, together with a program to train a large group of operating personnel, will permit Mexicans to manage and operate their own business and thus enable them to incorporate locally available materials and labor into the products they consume, at the same time increasing their living standards and purchasing power. Incidentally, they will become intimately acquainted with American styles and standards and provide a wide market for precision subassemblies and other equipment made in the United States.

When this policy of industrial cooperation becomes more widespread, the United States will reach new levels of prosperity in company with other nations of the world. The export of technical skill, our most valuable resource, will bring a greater interchange of goods and keep our merchant ships busy plying the trade routes with full cargoes.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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The Sextant

Chapter I

The evolution of the present-day sextant more than likely began with the astrolabe, used by early Greek and Arab astronomers. This astrolabe consisted of a circle suspended in the vertical plane by means of a ring at the top. The circle was graduated, or marked off, in equal divisions. The sighting bar was secured to the graduated circle somewhat as a compass needle, and by sighting along this bar at a celestial body and noting the scale on the circle, the altitude of the body could be measured. In the 16th and 17th centuries many variations of the astrolabe were in use.

In about 1594 a British navigator by the name of Captain John Davis developed a quadrant which had two arcs and required sighting in two different directions. Later a type of quadrant was used which required the observer to stand with his back to the sun. Other instruments depended on the use of a plumb line.

About 1729 one Pierre Bouguer devised an instrument which needed only a sight of the horizon while a beam from the sun was kept visible in line on a wooden peg. Another type of instrument shaped something like a T square was also in use about this time. In using this T square instrument the sun and the horizon had to be sighted separately. It could also be used either in facing the sun or with the observer's back to the sun.

In 1674 both Robert Hooke, a professor of geometry in London, and Sir Isaac Newton, working independently, worked out the principle of the double reflecting mirror instrument, but there seems to be no record of any models having been made.

Along about 1730 one Thomas Godfrey of Philadelphia, and John Hadley, a British astronomer, each working independently, constructed the first double reflecting instruments a good deal like our present-day sextants. In 1757 a Captain Campbell enlarged the arc used so as to make the instrument a true sextant. Up to about 1775 all sextants used were made of wood. Successive improvements in the sextant were made, and in the early nineteenth century the first all-metal sextant made its appearance. They were more or less crude affairs, accurate measurement of altitudes not being possible until the vernier used on the present-day vernier sextant was invented by Pierre Vernier.

In 1812 Commander Hull of the U.S.S. Constitution used a sextant which was fitted with shade glasses, a telescope, a vernier, and an ivory arc. Nathaniel Bowditch used a similar instrument, but with a silver arc substituted for the ivory arc. Some minor improvements followed, but the vernier type sextant is not radically different today from those used more than one hundred years ago.

A sextant is an instrument used to measure angles, whether the angle be (a) the angle of a celestial body above the horizon, (b) a vertical sextant angle, or (c) a horizontal sextant angle. **Regardless of what use it is put to it will only measure angles in degrees, minutes and seconds.** A sextant is particularly suitable for use at sea in deep water navigation for measuring the altitude (that is, the angular distance above the horizon) of celestial bodies because it may be held in the hand and accurate measurements of the angle obtained even though the ship be rolling or pitching. Inasmuch as the sextant may be used for observing angles in any plane or level, vertical and horizontal angles may be measured, and for this reason it is used in coastwise navigation.

The sextant derives its name from the length of its limb, which is the sixth part of a circle, or 60° (from the Latin **sextans**—"the sixth part"). There are two types of sextants in use. However, the difference between the two types is not in their principal construction, but is entirely concerned with fixing the index arm and reading the angles concerned. For convenience these models, or types, may be called:

(a) The Vernier Sextant.

(b) The Micrometer Sextant.

The vernier sextant is still greatly in use, and it differs from the other type in that accurate readings must be made by use of a vernier (to be described later), and, inasmuch as the divisions on the vernier are so fine and so close together, a magnifying glass must be used in order to "read" the sextant. Furthermore, considerable practice and skill must be used in order to read the vernier sextant accurately. Figure 1 shows the principal parts of the vernier sextant.

The micrometer sextant is the most modern type of instrument. It is equipped with a combined clamp and endless tangent screw by which means the index arm can be moved along the arc to show whole degrees of the measured angle, while the micrometer drum records the minutes, and tenths of minutes (which on the vernier type sextant are shown by the Arc and Vernier combined). The micrometer drum has the readings very clearly marked on it, and the observed angle can be read without the aid of a magnifying glass or any previous practice. Figure 2 shows

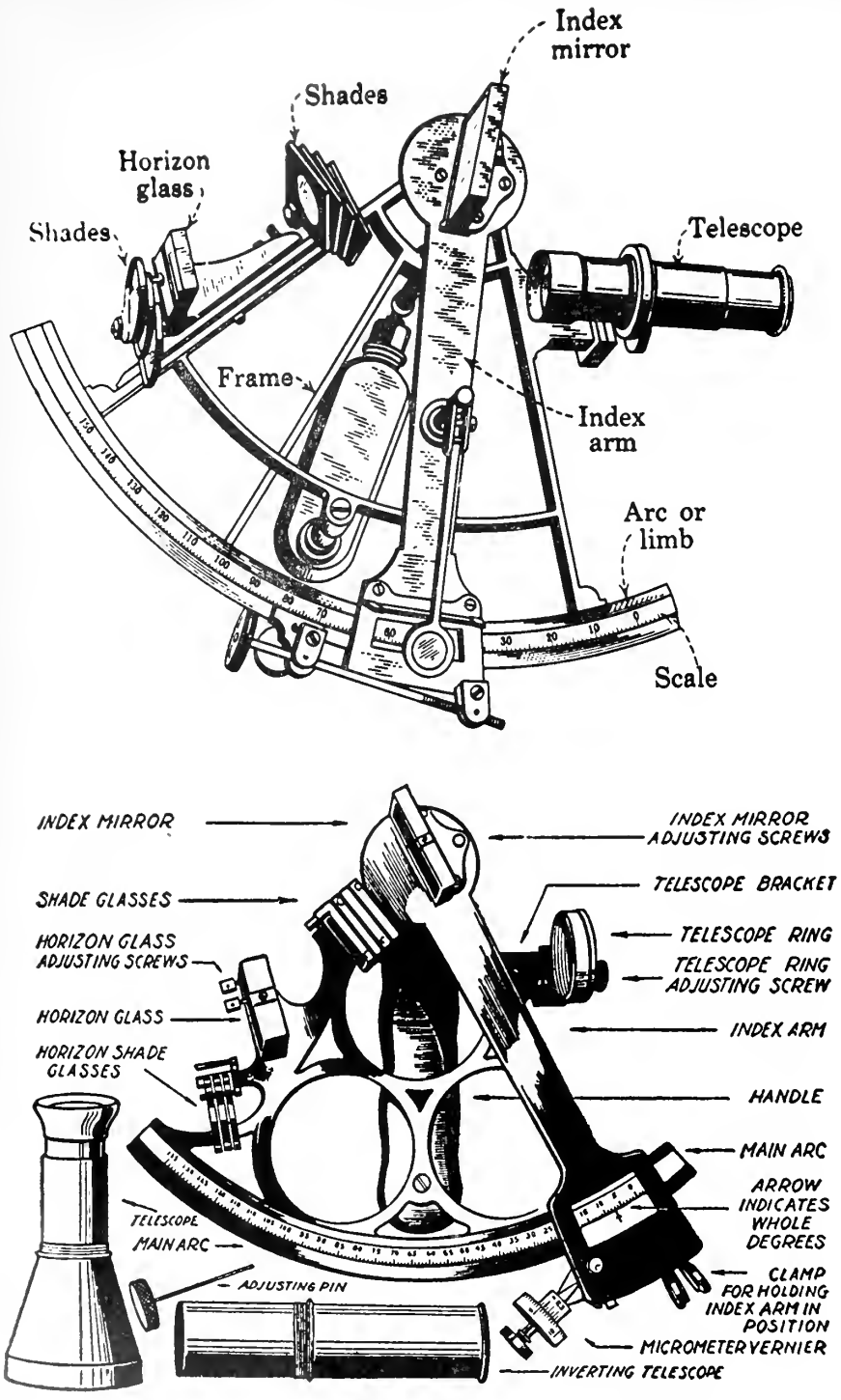


Fig. 1, upper: Vernier sextant. Fig. 2, lower: Micrometer sextant.

the principal parts of the micrometer sextant.

Description of Parts of the Sextant

Figures 1 and 2 show modern sextants in which most of the parts have been named. The upper flat surface of the sextant is called the **plane** of the **instrument.** The sextant itself may be said to consist of three main parts:

(a) The **Fixed** Parts.
(b) The **Movable** Parts.
(c) The **Removable** Parts.

The Fixed Parts of a Sextant Are:

(1) **The Frame.** The actual metal frame of the instrument may be one of several patterns, which are selected to give the greatest strength and rigidity. There is no advantage in having a very light sextant, as a fairly heavy instrument gives greater steadiness when taking observations on a rolling ship. At the back of the frame is fixed the handle, which may be of wood or Bakelite. The handle is important, as it must be able to be grasped—possibly for longish periods — easily and without fatigue.

The sextant should only be held by the handle or by the frame.

(2) **The Limb and Arc.** The limb of the sextant is really the lower margin or the whole of the curved circular portion of the sextant into which the graduated arc is bedded.

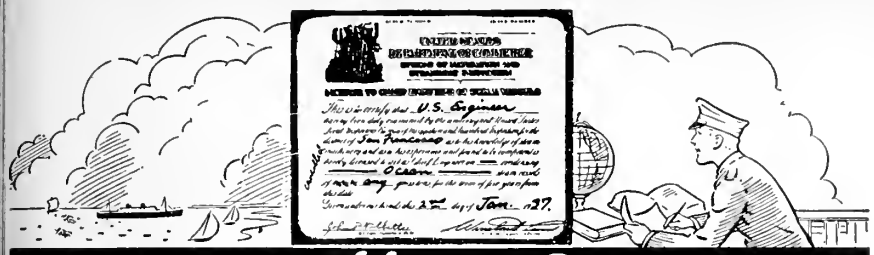
The **Arc,** on which the graduations are cut, is circular and made of metal with a low coefficient of expansion. It is usually made of a thin piece of silver (sometimes platinum) set in flush with the face of the sextant limb.

The Arc Proper is graduated in degrees from right to left from 0° (zero point) to 120° (and frequently to 130°, 135° or 140°). It should be mentioned that inasmuch as a sextant is an instrument of double reflection (as explained further on in the discussion on the Principle of a Sextant), the instrument is graduated to 120° or more, although the limb is actually only one-sixth part of a circle, i. e., 60°, as may be seen by reference to Figs. 1 and 2. To the right of 0° or zero on the arc, the arc is graduated from 5° to 10°, which is said to be **"Off the Arc,"** and is sometimes called the **Arc of Excess.** Readings to the right or left of 0° are therefore distinguished by being "off" or "on" the arc, respectively.

In the case of the vernier sextant, each degree on the arc of the sextant may be divided into two divisions of 30′ each; three divisions of 20′ each; four divisions of 15′ each, or six divisions of 10′ each. However, in most vernier sextants the degrees on the arc are divided into six divisions of 10′ each.

In micrometer sextants, however, each whole degree is cut boldly on the arc, each 10° being numbered and each 5° being indicated by a longer cut than those marking each degree. The micrometer in one revolution of the drum moves the index arm along the arc **one whole degree.** The micrometer itself is divided into **minutes,** and, when a vernier is used,

(Continued on page 80)



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Seating of Brushes

A most common and reliable method of ascertaining that the face of the brush is in contact with the commutator over the entire area of the brush is by the use of sandpaper. To insure contact between commutator and brush over the whole face of the brush, cut sandpaper in strips slightly wider than one brush and lay this paper strip against the commutator with the brush riding on the sanded side. A coarse grade of sandpaper can be used for hard brushes until approximately full contact is obtained, but the final surface should be formed with sandpaper of a fine grain. It is important not to disturb the angle of the brush to the commutator and to the holder, as it must have the same position in the holder during sanding that it will have in operation. It is quite essential that the brush will show a substantial area of contact from the leading to the trailing edge. This area should be at least 75 per cent of the total area of contact end of the brush.

While roughing-in, using coarse sandpaper, it should be drawn back and forth under the brush face, but it is preferable during the final stage to draw the paper only in the direction in which the commutator moves. If the brush shows signs of tipping under the high friction of the sandpaper it must be held firmly against the side of the brushholder, against which it will ride when in operation. It is also important to see that the sandpaper is in contact with the commutator during the entire stroke, otherwise it tends to round off the edges of the brush.

Some machine operators prefer to use a brush-seating stone rather than sandpaper for fitting brushes to commutators or collector rings. This stone is a fine grain free-wearing stone of a special composition available from manufacturers of commutator equipment. It is held against the commutator or ring, close to the brush so that the commutator in moving tends to push the stone into the brush; pressure on the brush should be increased during this seating operation. The fine particles of stone worn away are carried under the brush face and grind it to the exact curvatures of the commutator. The stone therefore wears away very rapidly—almost like a chalk on a rough board. Although this method of brush seating may, and probably will, affect the commutator surface film, it is claimed by most authorities that no appreciable abrasion of the commutator surface proper results. A brush seating stone is considerably easier to use than sandpaper, and grinds the brush face to the exact contour of the commutator. Furthermore, it is not at all unlikely that in seating the brushes of one stud considerable effect will be found on the brushes of all the other studs as the particles of stone carry around the commutator and the temporarily roughened surface of the commutator also aids in finishing off the brushes.

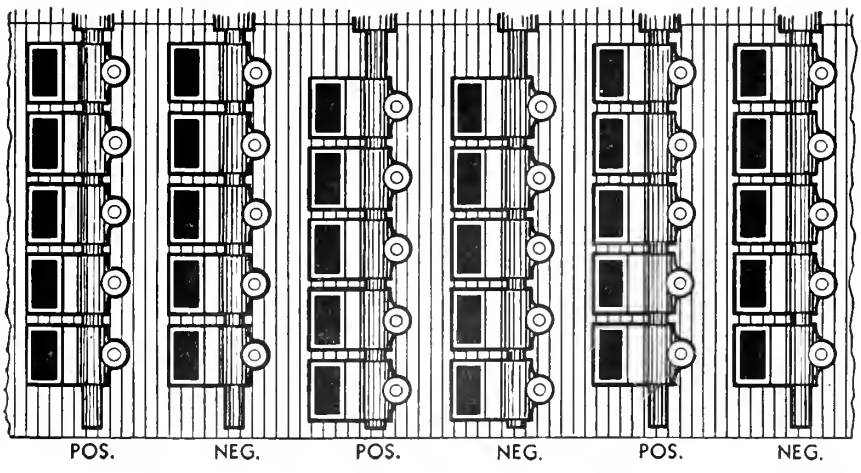
In organizing a brush-seating program, it should be noted that even though the contact area may be 1/2 or 2/3 when finished, it probably will be a matter of only a few hours of operation before the normal wear of the brush will have brought the seat to a 100% contact.

Brush Pressure

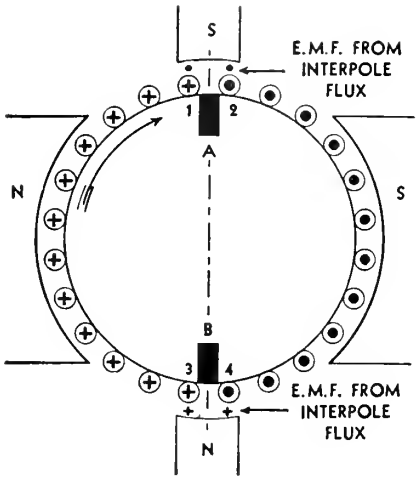
The spring pressure applied to brushes has a marked influence on the performance—after a new set of brushes has been installed and seated, the spring tension of all the holders should be adjusted to perform as closely as possible to the value desired. This spring pressure should be equalized among various brushes.

There is a natural tendency on the part of many operators to keep the spring tension low in order to reduce friction losses and brush wear, but the resulting effect may be exactly opposite to that intended. Too light a spring pressure may cause what is

Fig. 1



Correct Method of Staggering Brushes



Interpole Generator with Brushes at Neutral Point

Fig. 2

called "electrical wear" of the brush, which is caused from "sparking," resulting from lack of firm contact, which causes the brush to erode more rapidly than normal. Furthermore, lack of pressure on one brush as contrasted to that of another may cause unequal distribution of current among several brushes. It should be noted that the brushes of one polarity are electrically in parallel. The overloading on a brush may cause trouble which could be traced to lack of spring pressure on another brush.

Where severe mechanical vibration is encountered, a spring pressure considerably higher than what might be considered normal should be used. The more severe the vibration, the higher the spring pressure necessary to maintain firm contact at all times.

A small spring scale should be used for measuring spring pressure on brushes. The reading of the scale should be observed just as the brush leaves the commutator. A good method is to slip a strip of paper under the brush face and pull on it gently while lifting the brush spring with the scales. Reading of the scale should be taken when the paper is released by the brush pressure.

Brush pressures are recommended in terms of lbs. per sq. inch of area of the brush. This is not intended to refer to the area of the contacts at the commutator surface. It is to be noted that contact area will be larger than cross section area of the brush by the amount of the sine of the angle of the brush from a perpendicular line.

For general industrial and marine service, it is customary to hold not less than two and perhaps more in the order of three lbs. per square inch of brush area for the electro-graphitic brushes—less than this for the carbon and carbon-graphite brushes and a soft graphite brush, which are not usually found in marine service. A good figure for the marine engineer and electrician to keep in mind is 2½ to 3½ lbs. per square inch.

Location of Brush Position

Staggering of brushes has long been considered one of the most important factors in successful commutator life. However, this conception of brush location originated during the days when some polishing or erosive action was necessary. It was customary to mix in with the brushes a polishing medium, such as fine pumice stone or other material which would continually polish and burnish the commutator which was being continually spotted by sparking; therefore a continuous wearing away of the commutator was expected and it was natural that an attempt should be made to equalize the commutator wear and prevent ridges in the commutator from standing up, due to the fact that all of the commutator surface was not covered by brushes, if they were not staggered; thus by staggering of brushes, all parts of the commutator would be covered by brushes an equal amount and the wear would be uniform.

Modern brushes and commutators, however, should not under normal conditions require this polishing effect; the normal motor or generator should run along with a commutator having a nice polished dark film and years of life obtained without more than just the very slightest amount of wear. While the brushes may wear, the commutator should not require resurfacing, turning or grinding for many years of useful life, and the necessity of staggering the brushes has therefore been eliminated.

It has, however, been noticed that the appearance of the commutator, when the brushes are not staggered, will show dark brown in the brush tracks and the normal copper-colored narrow track between brushes. There may be no ridge or physical disturbance of the surface between these two tracks, but the appearance sometimes makes the operator nervous and gives the impression of a ridge. And of course there are commutators which due to some cause or other, such as a disturbing factor, may have slight wear, and it would appear to be desirable to distribute the wear uniformly over the commutator. In former days it was customary to see that the armature had a definite axial movement or end-play; on machines which would not necessarily float back and forth in the sleeve bearing, an end-play device was put on the end of the shaft to push it back and forth deliberately and keep it in motion, thus unifying and leveling the commutator wear. Since the advent of ball bearings which do not permit any end-play or axial movement, and also the non-abrasive brushes, this factor has also disappeared from the picture and axial movement is no longer expected nor required, although if present it should be considered as having no serious or undesirable effect. If possible, therefore, it is desirable to stagger the brushes as indicated in Figure 1.

With the brushes equally spaced around the commutator and aligned with the axial line of the commutator bars and otherwise properly adjusted, there remains only the question of circumferencial location of the brush studs, or the so-called "No-Load Neutral."

Machines having interpoles or commutating poles, and in marine service there are practically no exceptions, have a fixed neutral point. It is preferable from other considerations besides commutation that the brushes be set at this neutral, or at some specific point near it; for instance, with a direct current motor it is desirable to run at the same speed in either direction which would be determined by this brush setting; or with generators, it is desirable that they parallel properly, and this brush position determines paralleling characteristics quite decidedly. If commutation were the only factor influencing position of brushes, it would be a simple matter to shift the brushes backwards and forwards until the point of best commutation and minimum or no sparking was obtained. For instance, by the black-band method the brushes would be shifted in one direction until a slight amount of sparking was indicated at a given load, and then they would be shifted in the other direction until

the same amount of sparking was observed. The center, or halfway between these two points, would be considered the proper point from the standpoint of good commutation. If no spot can be found in which there is no sparking, then a problem of disturbing factors is involved, and an attempt should be made to find the trouble. This point will be discussed in later articles.

There are many ways of locating the so-called "No-Load Neutral," but the voltage method will be discussed, and the other methods only referred to. For the voltage method, it is advisable to use a multi-range voltmeter with scale 15, 1½ and .15 volts, or values of that order. Always start the readings on the high scale, changing to the lower scale only when such change is needed. With the machine operating without load, and at full speed and voltage, either as a motor or generator, the terminals of the voltmeter leads are placed in contact with the commutator at the assumed location of the neutral point, which should be approximately opposite the center of the main pole-phase. This test can be made with the brushes lifted, but would ordinarily be made with the brushes riding in a normal manner, operating as a motor or generator. These voltmeter contact points should be maintained at a fixed distance apart, preferably by pushing the probes through a cork or some other improvised method. The distance apart might be about the width of one bar or it might be the brush thickness. As this pair of contact points are moved back and forth, a position will be found at which the voltmeter shows the lowest reading. Centering the brushes on this position, the test should be repeated and the point so found marked as the "No-Load Neutral" of the machine. Sometimes it might be desirable to make a further check for this same point with the direction of rotation reversed if the machine is reversible.

The inductive kick method involves the measurement of a voltage induced in the armature windings when the main field circuit is opened or closed. This is done with the machine shut down.

The running neutral method is used only when the machine can be driven mechanically, such as with generators. It cannot be used on motors—current for excitation of the main field and also for interpole field is necessary.

The speed method involves operation of the machine as a motor and shifting brushes so that the exact speed in both directions is the same for a given load. A different neutral may be found for no-load and for full-load under this test.

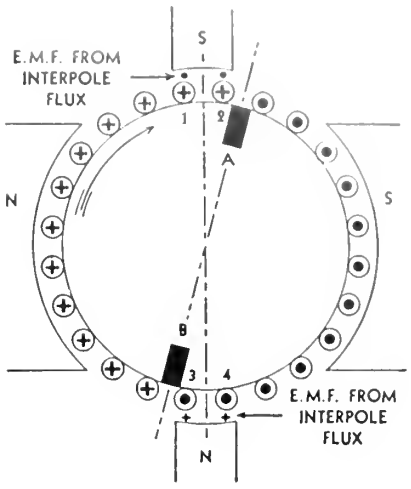
The terminal voltage method involves running the machine as a generator at exactly the same speed in each direction and adjusting the brush position so that the same voltage is obtained at this speed. Note that in reversing direction it is necessary to reverse the field with respect to the armature.

The torque method, useful on small motors, operates the machine as a series motor and adjusting the brushes so that the torque is the same in each direction for a given current.

One of the most important factors involved in brush shifting is the compounding effect of the inter-pole field; in other words, it is important to locate the brushes in a position in which the proper compounding effect is obtained regardless of other factors, unless the shift is too great and the borders of the commutating zone are past.

With the brushes of a generator on exact neutral, as indicated by the brushes "A" and "B" in Fig. 2, the voltage generated in the armature conductors under the inter-pole neutralizes itself. The inter-pole voltage in conductors 1 and 4 opposes that generated by the main field pole, but that in conductors 2 and 3 augments the main field voltage by a like amount and the terminal voltage of generator is not affected.

With the brushes shifted in the direction of rotation to the position shown in Fig. 3, this balance is destroyed and the inter-pole voltage in all the conductors under the interpole operates with the main pole voltage, reducing the terminal voltage of the generator. Shifting the brushes against the direction of rotation augments the main pole flux and causes an increase in terminal voltage; were the machines shown by the diagram in Fig. 3 operated as motors in the direction indicated, the polarity of the inter-pole would be opposite that shown and the sine on the conductors would indicate the direction of the back voltage not the direction of current. It is obvious therefore that when the brushes on an inter-pole motor are shifted in the



Interpole Generator with Brushes off Neutral Point

Fig. 3

direction of rotation, back voltage will be augmented and the motor speed decreased. Conversely, shifting the brushes against direction of rotation increases the motor speed. A very slight shifting of the brushes from the neutral point, even as little as 1/16 of an inch on a machine of average size, may produce noticeable compounding effects. Compounding effects are sometimes purposely obtained by shifting the brushes off neutral which is a perfectly standard practice provided caution is used that they are not moved so far as to endanger commutation.

The parallel operation of generators is profoundly affected by brush position, and even when all other factors are adjusted properly, such as equalizers and field rheostats, the brush position must be exactly right in order that correct parallel operation be obtained, because the position of these brushes determines the compound characteristics — that is, the amount of voltage drop with increasing load.

Many serious cases of lack of proper parallel operation of generators have been cured by careful, judicious shifting of the brushes of the proper machine.

Our next article will discuss brush terminology and method of ordering brushes.

Wartime Developments In Compression Distillation

Commodore R. V. Kleinschmidt, USNR, who initiated large scale development of compression distillation at the research laboratories of Arthur D. Little, Inc.

Low fuel consumption in distillation has been made possible by the wartime development of the Kleinschmidt compression method. By this method, which essentially involves distillation by application of mechanical energy instead of external heat, an average of at least 175 pounds of distilled water may be obtained for each pound of fuel consumed; this ratio is three to four times greater than can be obtained with efficient conventional systems using fuel to generate heat. Although the compression principle has been known in theory for many years, it was first developed to the point of large scale use during World War II for the United States armed services.

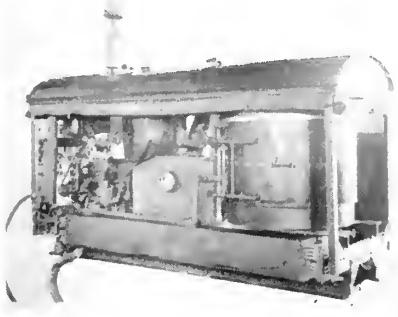
After several years of wartime secrecy, the principles of this method were described by Allen Latham, Jr., in a paper presented at the annual meeting of the American Society of Mechanical Engineers in New York. The Kleinschmidt compression distillation system was originally developed in the laboratories of Arthur D. Little, Inc., Cambridge, Mass., by a group headed by Dr. Robert V. Kleinschmidt, until Dec. 1, Commodore Kleinschmidt, U.S.N.R., but now again associated with Arthur D. Little, Inc. Mr. Latham, author of the ASME paper, directed wartime development of the system by Arthur D. Little, Inc., and its modification to fit a variety of practical needs.

During the war, E. B. Badger & Sons Co. of Boston, Mass., manufactured, under license from Arthur D. Little, Inc., Kleinschmidt stills for the U. S. armed forces. Many thousands of these stills were used aboard naval vessels—submarines, destroyer escorts and landing craft—to supply pure water from seawater. On land, several thousand gasoline-engine-driven portable units were used with great effectiveness, especially in the South Pacific, to supply our fighting men with water for drinking and other purposes where the sea was the only readily available source of water. By the end of the war there was enough Kleinschmidt compression distillation equipment in service to produce pure distilled water for the daily needs of over a million men.

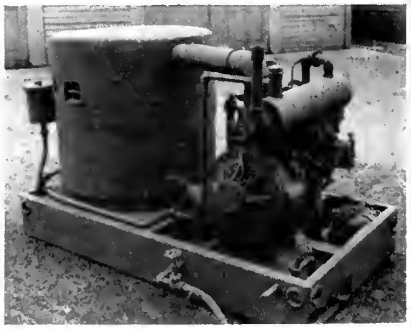
The value of this source of water to our forces is well indicated in Stf. Sgt. Jack Vincent's article in the October "Marine Corps Gazette" entitled, "Water on Iwo," quoted in part: " . . . Iwo was probably the most barren island ever invaded by such a large American force. There were no streams, and the few hot sulphur springs gave up water too brackish to drink . . . The Iwo Japs depended on rainfall for most, if not all, of their water . . . Reports that the Japs were desperate for water began reaching American lines as early as D + 10 . . . The Japs had nothing comparable to our mobile waterworks . . . " In Naval vessels, too, the high fuel economy of Kleinschmidt compression stills permitted many craft to make their water as needed rather than carry it as cargo, thus releasing space for fighting equipment and in some instances extending the vessels' cruising range markedly.

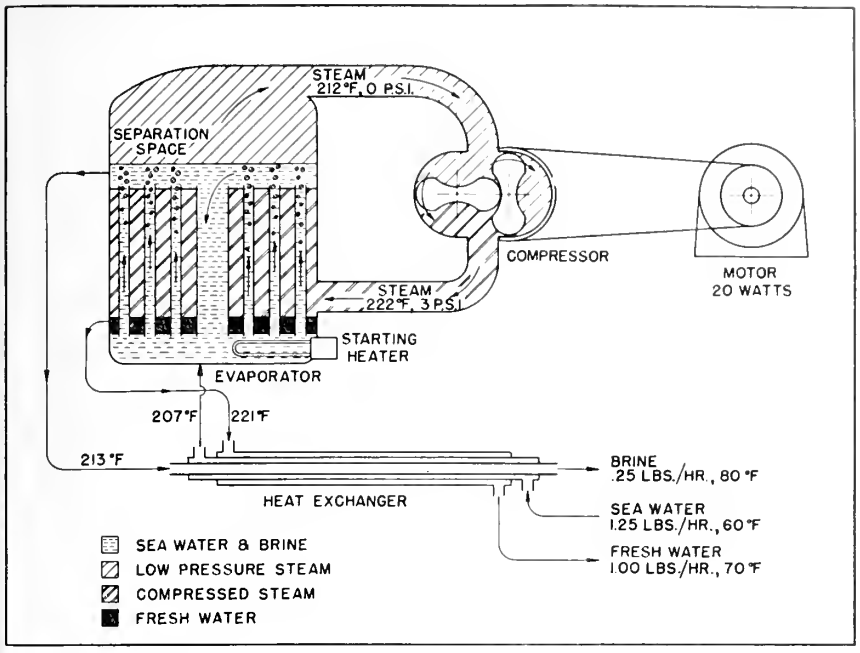
Compression distillation depends upon mechanically compressing the steam or other vapor leaving the evaporation compartment of the still. This compression raises the temperature of the steam a few degrees. At the higher pressure, the steam condenses at a temperature somewhat higher than the boiling point of the evaporating raw water, so that heat can flow from the condensing steam to the raw water and boil it. In engineering terms, the condensing vapor is used to supply heat inside the steam chest of the still in place of steam from sources outside the unit. Efficient provision for reducing heat loss to the atmosphere and recovering heat from the distillate and the concentrate carrying out waste as they cool down to room temperature completes the system. No separate condenser or cooling water is need-

The first gasoline-engine-driven compression distillation unit.



Recent Kleinschmidt compression distillation unit. This gasoline-driven model produces 1800 gallons of distilled water per day from sea water.





Diagrammatic representation of compression distillation as applied to the distillation of sea water.

ed. The over-all fuel economy of the most recent Kleinschmidt compression stills — averaging at least 175 pounds of distillate for each pound of fuel consumed—is believed to be the highest of any self-contained system of evaporation.

Technical Detail

After a compression still and its contents have come to operating temperature and the evaporator is filled with steam, the still may be turned on stream for continuous operation. In normal operation, for the production of fresh water from sea water, for example, the feed enters by way of a triple passage heat exchanger which heats the feed by extracting heat from both the outgoing distilled water and from the brine concentrate which carries out the solids of the sea water in a concentrated solution. The feed at about 207° F. is then introduced to the evaporator, where it mixes in a relatively large volume of brine which circulates naturally through vertical tubes. Steam from this boiling brine at, or slightly above, atmospheric pressure is led from the evaporation space through an entrainment separator to the compressor, which raises the pressure to about 3 lbs. per sq. in. gage, thus raising the temperature at which it condenses to about 222° F. Since the brine in the evaporation space boils at 213° F., there is a temperature differential of about 9° F. between the compressed steam and the boiling brine to permit transfer of heat from the former to the latter. Substantially all the latent heat, which is the heat given up by the compressed steam upon its condensation to water, is used in maintaining the necessary temperature level for continuous boiling in the evaporation space; thus no separate condenser or cooling water is required.

With a compression distillation unit of 1000 gallons per day capacity, the production of one pound of distilled water requires about 20 watt-hours or 68 BTU's energy input. A conventional single-effect evaporator requires about 300 watt-hours or 1020 BTU's per pound of distilled water. In multiple-effect evaporators the steam evaporating from the first "effect" is used, on condensing, to supply heat for the second effect, and so on up to three and occasionally four effects. The Kleinschmidt compression distillation system as applied to sea water distillation uses only one-fifteenth the energy of the single-effect evaporator and thus has an economy equivalent to some 15 or more effects, far more than could be practically operated. A compression distillation unit is far more simple to operate than a multiple-effect unit. The connections, heat transfer apparatus and controls are as simple as those on a single-effect evaporator. Ordinarily, control of the operation is made solely through adjustment of the flow of feed.

Compression distillation is now sufficiently advanced to justify its recognition as a major contribution to the techniques of distillation and evaporation. The Kleinschmidt still, by virtue of its low fuel consumption and its simplicity, shows promise in industrial applications of distillation and evaporation, both of water and other materials. With the wartime needs satisfied, the Kleinschmidt still will be manufactured under license for sale to industry.

Dutch Engine Room Telegraphs

Durkee*Marine Products Corporation of San Pedro, Calif., builds engine room telegraphs and voice tubing and accessories that have been selected for the 20 Dutch coasters now being built by the Albina Engine & Machine Works, Inc., Portland, Oregon.

The engine room telegraph transmitters and receivers are the Durkee* Marine standard single engine, single face, but the dials, marked in Dutch, are of special translucent porcelain.

The company has supplied a great many of the vessels built on the East and West Coasts, and the Gulf, with its well-known engine room telegraph systems.

All voice tubing accessories are of brass and bronze, with highly polished mouthpieces, and meet all governmental requirements.

Certified Alloy Valves

Certified Alloy Valve Company has been formed as a new division of The Cooper Alloy Foundry Co., Hillside, N. J. The new company will specialize in the manufacture of stainless steel valves for which it will furnish a certified analysis of every part which comes in contact with liquid. P. C. Shaffer is chief engineer. Products will be sold through Cooper.

This arrangement brings the entire metallurgical engineering and manufacturing process under one roof, including casting, heat-treating, machining and testing. The new division will have all the advantages of Cooper's more than 15 years' experience in the design and engineering application of many types of stainless steel valves and fittings.

Keep Posted

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Ingalls Vessels Protected by "Magic Eye" Which Finds Smoke in Hold

It is natural that due to building ships of an all-steel construction we assume there is no need for fire-fighting equipment aboard them. But we have assumed incorrectly. For each ship built at the Ingalls Shipyard is equipped with one of the finest fire extinguishing and protective systems available. The system is not particularly for the protection of the ship as much as it is for the holds and the cargoes which are carried in them.

On every Ingalls-built ship fire hazards are cut to a minimum. Due to modern fire detecting and extinguishing methods, there is no danger of a fire smoldering for days undetected in cargo holds until it is beyond control.

One of these new fire detecting systems used on Ingalls ships is known as the C-O-Two and installed by the C-O-Two Fire Equipment Company of Newark, New Jersey. This system, like others used in Ingalls ships, is so accurate and sensitive that the indicator responds to the lighting of a match and the puff of a cigarette in the most remote section of any hold.

The C-O-Two smoke detecting system provides a means of detecting smoke automatically in any hold, an arrangement for visual indication of the exact location of the threatened space and an alarm to give audible warning the instant smoke appears. Cargo holds, bosun's stores, paint lockers and other spaces under comparatively infrequent surveillance of personnel are the sections most commonly assigned this kind of mechanical protection.

With the smoke detecting system, there is often combined a fire extinguishing system using carbon dioxide.

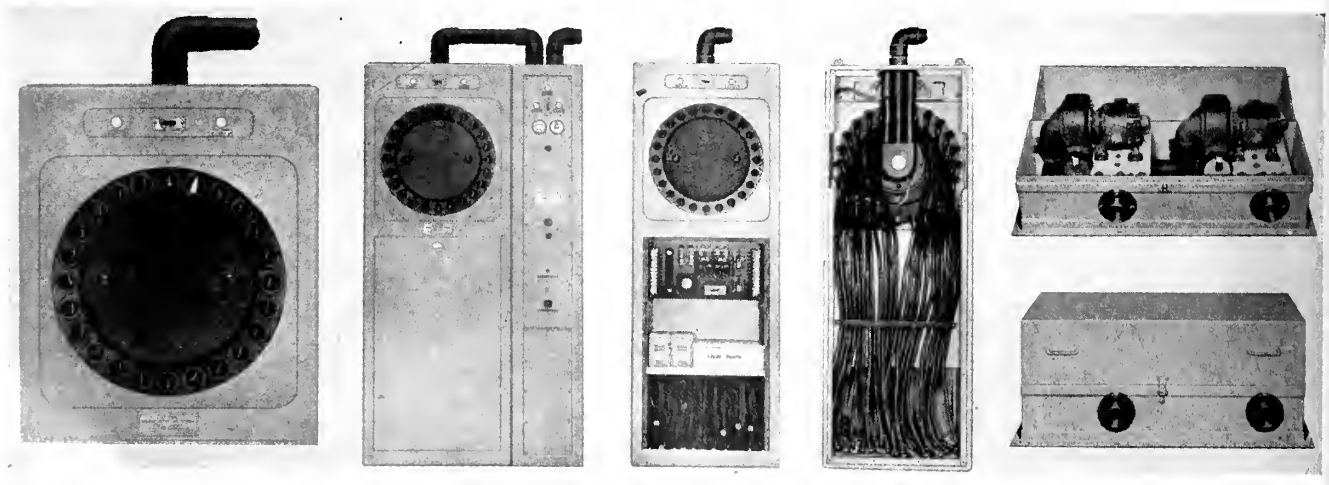
The nerve center of the smoke detecting system is the smoke detecting cabinet, in the wheelhouse, where it is under constant observation. One or more smoke accumulators are installed and located so that no overhead point lies outside a given radius from an accumulator.

A simple piping system connects the accumulators with the detecting cabinet. Duplicate electrically driven exhauster units, mounted on the deck above the wheel-house, continuously draw air samples from the accumulators through the piping system into the cabinet.

When a sample of air enters the cabinet it is conducted to a detecting chamber, with individual observation windows numbered to correspond with the protected spaces, where it is exposed to a considerable beam of light. If there is a trace of smoke in the air, it becomes immediately visible through one of the chamber's observation windows. The same smoke-bearing air, after leaving the window, is drawn through a photo-electrically controlled device, also in the cabinet, the operation of which instantly causes an audible alarm to sound. A chart near the cabinet identifies the spaces endangered.

The accumulators and piping of the detection system in the protected spaces can be utilized for discharging carbon dioxide when detecting and extinguishing functions are combined in a single system. A centrally located station containing three-way control valves and a battery of carbon dioxide cylinders are added to the system. The three-way valves make it possible to shut off the flow of sampling air to the smoke detecting cabinet and direct the flow of

C-O-Two smoke detecting system cabinets. Extreme left: Visual type. Arrangement of individual non-glare observation windows. Smoke is visible in observation window No. 13 and exact location of fire is instantly indicated. Second from left: Visual and audible type. Center: Visual type with front removed. Second from right: Visual type with back removed. Extreme right: Smoke detecting system blower box with duplicate blower units.



carbon dioxide from the cylinders to the space on fire.

The cylinders are released by local manual control for cargo protection. When the engine room is included in the extinguishing system, a remote manual control is used for this space. They are manifolded in sufficient quantity to provide "total flooding" of the largest space under protection on the ship. Cylinders may be arranged for discharge individually or collectively.

The fastest release of the discharge is achieved by systems equipped with two pilot or control cylinders and an arrangement which utilizes the carbon dioxide pressure from these two upon their being released manually, to actuate the discharge of the other cylinders in the bank. For "total flooding" installations, carbon dioxide pressure is used also to shut down ventilation, sound an alarm and close vents by means of pressure operated switches and trips.

Copies of the instruction chart posted near the smoke detecting cabinet, near the control valve station and at the cylinder location identify the protected spaces and likewise list the numbers of carbon dioxide cylinders recommended for the initial discharge and the number of cylinders subsequently to be discharged at specific intervals to insure complete control of fire in a particular compartment.

New Surface Preparation

The Amercoat Division of the American Pipe and Construction Co., P. O. Box 3428 Terminal Annex, Los Angeles 54, California, announces two new products supplementary to its line of Amercoat plastic coatings.

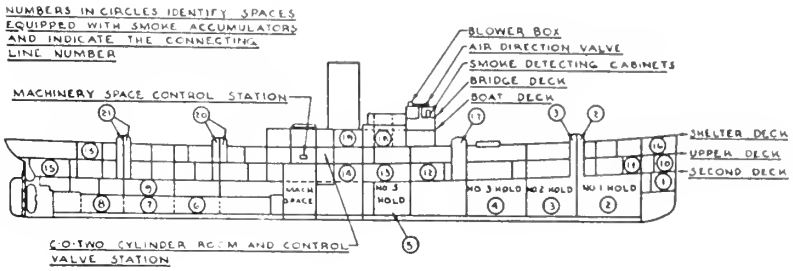
Amercoat No. 59—Surface Preparation for Zinc, is a treatment for galvanized metal surfaces prior to application of a protective coating.

Amercoat No. 60—Surface Preparation for Copper and Brass is a similar treatment for these metals.

These surface treatment solutions are for use where shot or sandblasting are impractical. The resulting adhesion of the protective coating is excellent where applied over a zinc, copper or brass surface properly prepared by these methods.

Printed application instructions are available upon request to the manufacturer.

C-O-TWO SMOKE DETECTING AND FIRE EXTINGUISHING SYSTEM



FOR FIRE IN MACHINERY SPACE

1. STOP BLOWERS, SHUT OFF FUEL OIL SUPPLY, AND CLOSE ALL DOORS AND HATCHES.
2. GO TO C-O-TWO CONTROL STATION FOR MACHINERY SPACE.
3. SOUND ALARM.
4. MAKE SURE THAT NO PERSONS ARE IN MACHINERY SPACE.
5. OPEN PULL BOX.
6. PULL HANDLE HARD-THIS SIMULTANEOUSLY RELEASES CARBON DIOXIDE FROM (27) CYLINDERS.
7. OPEN DIRECTION VALVE TO MACHINERY SPACE.

FOR FIRE IN CARGO SPACES

1. DETERMINE LOCATION OF FIRE-AFTER SMOKE IS SEEN IN AN OBSERVATION CHAMBER IN THE SMOKE DETECTING CABINET, NOTE LINE NUMBER AND REFER TO TABLE AND DIAGRAM OF SHIP TO DETERMINE NAME AND EXACT LOCATION OF FIRE. SILENCE ALARM GONGS.
2. MAKE SURE THAT NO PERSONS ARE IN SPACE ON FIRE.
3. CLOSE ALL OPENINGS AND STOP ALL VENTILATION TO SPACE BEFORE DISCHARGING CYLINDERS. THIS WILL CONFINE AND REDUCE LOSS OF CARBON DIOXIDE GAS AFTER IT HAS BEEN RELEASED INTO THE CARGO HOLD.
4. CLOSE THE AIR SHUT-OFF VALVE AND TURN THE CONTROL VALVE TO THE FIRE EXTINGUISHING POSITION FOR SPACE ON FIRE. VALVES ARE LOCATED AT THE MAIN CONTROL VALVE STATION.
5. RELEASE CARBON DIOXIDE GAS AT THE CYLINDER LOCATION FROM THE NUMBER OF CYLINDERS LISTED FOR THE INITIAL DISCHARGE OF GAS. CYLINDERS ARE ARRANGED TO DISCHARGE IN GROUPS OF TWO OR LESS. EACH GROUP IS NUMBERED WITH A NAME PLATE INDICATING THE TOTAL NUMBER OF CYLINDERS UP TO THAT POINT. THE FIRST TWO CYLINDERS ARE ARRANGED FOR INDIVIDUAL DISCHARGE. ONE CYLINDER OF EACH GROUP IS A CONTROL CYLINDER FITTED WITH A QUICK DETACHABLE COVER. DISCHARGE OF CONTROL CYLINDER SIMULTANEOUSLY DISCHARGES GAS FROM THE OTHER CYLINDERS IN THE GROUP. CYLINDERS SHOULD BE PROGRESSIVELY DISCHARGED IN GROUPS BEGINNING WITH THE LOWEST NUMBER TO PREVENT DISCHARGING MORE GROUPS OF CYLINDERS THAN DESIRED.

   TO DISCHARGE CYLINDERS - REMOVE QUICK DETACHABLE COVER AND STRIKE KNOB HARD.
6. MAINTAIN AN INERT FIRE EXTINGUISHING ATMOSPHERE IN SPACE ON FIRE BY DISCHARGING ADDITIONAL CARBON DIOXIDE GAS INTO SPACE AT INTERVALS. TO DETERMINE TIME BETWEEN DISCHARGES, CONSIDER THE DISTANCE FROM PORT WHERE A SUPPLY OF CARBON DIOXIDE CAN BE OBTAINED. DISCHARGES SHOULD BE MADE AT CLOSER INTERVALS WHEN SMOKE APPEARS TO INCREASE IN INTENSITY.
7. KEEP ALL OPENINGS IN SPACE ON FIRE SEALED WITH WET TARPAULINS AND ALL FANS STOPPED. HATCHES SHOULD NOT BE OPENED OR VENTILATION STARTED UNTIL ARRIVAL AT PORT. KEEP AIR SHUT-OFF VALVE CLOSED TO PREVENT FLOW OF AIR TO THE SMOKE DETECTING CABINET.
8. IF FIRE OCCURS IN TWO SPACES WHICH ARE LOCATED ONE ABOVE THE OTHER, FOLLOW INSTRUCTIONS FOR EACH SPACE AS GIVEN, BUT ALWAYS DISCHARGE CARBON DIOXIDE GAS INTO THE LOWER SPACE FIRST. THIS APPLIES TO BOTH THE INITIAL AND DELAYED DISCHARGES.

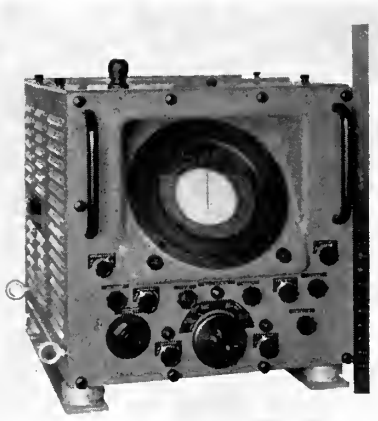
LINE NO.	SPACE	NUMBER OF CYLINDERS TO BE RELEASED FOR VARIOUS FILLING LEVELS OF HOLDS: HOLD FULL	HOLD ½ FULL	HOLD EMPTY
1	FOREPEAK STORES, HOLD DECK	NOT CONNECTED TO C-O-TWO FIRE EXT. SYS.		
2	#1 HOLD & TRUNK HATCH	6	10	14
3	#2 HOLD & TRUNK HATCH	6	12	18
4	#3 HOLD	10	18	27
5	#5 HOLD & DRY STORES	4	8	10
6	#7 HOLD TANK TOP P & S	2	4	6
7	#8 HOLD TANK TOP P & S	2	4	6
8	#9 HOLD TANK TOP P & S	2	4	6
9	CARPENTER SHOP - HOLD DECK	NOT CONNECTED TO C-O-TWO FIRE EXT. SYS.		
10	FOREPEAK STORES 2ND. DECK	2	4	6
11	PAINT ROOM-LAMP ROOM 2ND.DECK	2	2	2
12	CLOTHING STORES-LINEN STORES 2ND.DECK	4	8	10
13	2ND. DECK-STORES	NOT CONNECTED TO C-O-TWO FIRE EXT.SYS..		
14	ENGINEERS STORE ROOM-2ND.DECK	2	4	6
15	STORES AFT-2ND.DECK P & UPPER DECK S.	2	2	2
16	FOREPEAK STORES-UPPER DECK	2	4	4
17	TRUNK HATCH-#4 HOLD	2	4	4
18	PROJECTION BOOTH-SHELTER DECK	PROTECTED BY INDEPENDENT C-O-TWO FIRE EXT. SYS.		
19	FILM STORAGE, SHELTER DECK	" " "	" " "	" " "
20	TRUNK HATCHES #6 & #7 HOLDS	2	4	6
21	TRUNK HATCHES #8 & #9 HOLDS	2	4	6

MAINTENANCE

SEE INSTRUCTION BOOK LOCATED IN THE VISUAL SMOKE DETECTING CABINET.

C-O-TWO FIRE EQUIPMENT COMPANY

NEWARK, NEW JERSEY



Unique Direction Finder Located Enemy Radar

American naval vessels easily located and identified Nazi and Jap radar installations through the use of an automatic radar direction finder. This ingenious electronic instrument, which was manufactured exclusively by the Submarine Signal Company, revolutionized the entire search technique for enemy radar sets. By means of its visual display of the direction finding information on a cathode ray tube, the operator could actually see the presence of the enemy installations.

Developed in the closest connection with the NDRC Division 15 Radio Research Laboratory set up at Harvard University, the Submarine Signal radar direction finder was one of the most versatile instruments that came out of the war. It measured the frequency of the intercepted signal as well as the direction from which it came, and was the only direction finder that could receive successfully the ultra-high frequency signals produced by the very latest radars.

This instrument is so sensitive that the experienced operator can look at the picture produced by the intercepted signals, tell what kind of radar had produced the signals and deduce the size and class of the ship sending these signals.

In the course of its first trial run aboard a destroyer escort the equipment clearly demonstrated its remarkable capabilities. During maneuvers offshore at night the radar operator of the DE made contact with a target at a certain range and bearing. The countermeasures operator, meanwhile, picked up a number of different signals all having the same bearing. From the characteristics of these signals, as well as from the frequencies at which they were tuned in, he deduced correctly that the vessel detected must have been a U. S. cruiser.

Oxweld-Unionmelt CM-37 Machine Carriage

A new heavy-duty, straight-line machine, known as the Oxweld-Unionmelt CM-37 machine carriage, has been developed by The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation. It can be used for carrying Unionmelt electric welding equipment, the CMA-21-B attachment for plate-edge preparation, single- or multiple-blowpipe set-ups for straight-line cutting, flame-hardening equipment, and the Oxweld C-45 blowpipe for cutting extra-heavy sections.

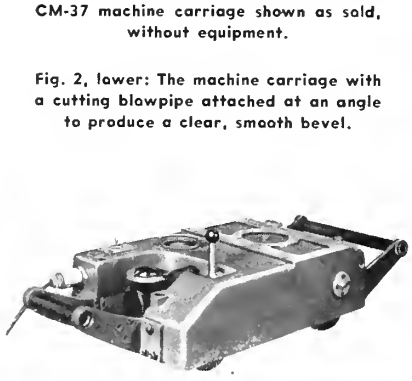
The use of high-strength aluminum alloys in the construction of the machine provides it with an ideal strength-weight ratio. Its weight as sold, without equipment (see illustration), is 87 pounds; thus it can be moved readily from job to job. Its over-all dimensions are 32 in. long, 12½ in. wide, and 9 in. high, plus 2⅞ in. for the forward-reverse lever.

The standard machine is equipped with a 110-volt a.c. unidirectional motor of ¼ rated electrical horsepower. Reversing is accomplished mechanically through gears. Machines are supplied with speed ranges of 2 to 50 in. per min. for general industrial use; and 7 to 210 in. per min. for use with the Unionmelt welding process. An electric speedometer is located in the machine cover so as to be within easy view of the operator at all times.

The CM-37 will operate on CM-21 track or, where accuracy of travel is not important, it can be operated on a standard 10 in., 25.4-lb. I-beam. It also can be operated directly on the steel plate or other flat workpiece, if desired.

Fig. 1, upper: The Oxweld-Unionmelt CM-37 machine carriage shown as sold, without equipment.

Fig. 2, lower: The machine carriage with a cutting blowpipe attached at an angle to produce a clear, smooth bevel.



Aer-A-Sol Insecticide Bomb

The Bridgeport Brass Aer-A-Sol insecticide bomb, containing a nonflammable formula developed by the U. S. Department of Agriculture, is an economical and effective new method for ridding commercial, public and private buildings, and also ships, of most types of insects. According to U. S. Public Health Service Supplement No. 183, the percentage of DDT is a desired concentration that offers no health hazard if used according to the maker's instructions.

Insecticide bomb in use, showing valve in open position.

The Bridgeport Brass Company, Bridgeport, Conn., made over 2 million insecticide bombs for the U. S. Navy during the war.

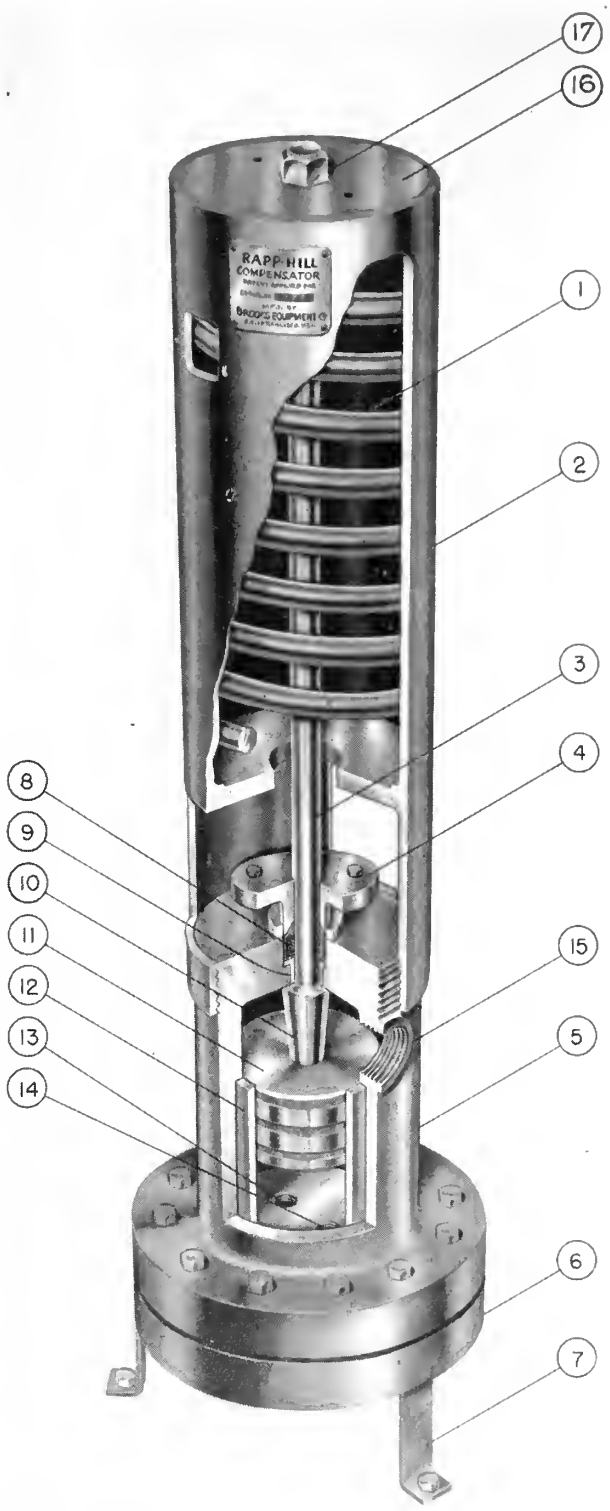
This bomb will be sold through the usual jobber supply and retail channels.

The Rapp-Hill Pump Compensator

The problem of excessive water hammering of the check valve in the feed water line, where a reciprocating type of feed water pump is installed, has for some time caused considerable concern to marine engineers, to the shipyard personnel and to the U. S. Maritime Commission. The noise, and particularly the vibration, resulting from this condition, which is due to the tendency of this type of pump to slam at the end of each stroke, puts an unnecessary load on the boiler economizers and tubes. In fact, according to information recently presented in a paper before the Society of Naval Architects and Marine Engineers in New York by D. S. Brierley, Director of the Division of Maintenance and Repair of the U. S. Maritime Commission in Washington, "prudent operating personnel on the vessels involved became aware of these unsatisfactory conditions very early, and as a result the majority of the vessels are now operating safely by utilizing the turbo - multo - stage feed pump for sea use, and retaining the reciprocating pumps for standby purposes."

About nine months ago two well-known San Francisco marine engineers, Walter B. Hill and Lawrence Rapp of C. C. Moore & Co., Engineers, became deeply interested in the problem. Rapp had the basic idea for the present design, which is a cylinder with water pressure on one side of the piston, steam pressure on the other side, and the unbalance taken care of by a spring. The advantage of this type of construction is such that the compensator will operate regardless of how boiler pressure varies, since the spring loading takes care of the unbalance between the feed water pressure and the steam pressure only.

On the first trial of the original idea, fitted on the S. S. Arcadia Victory, a single cylinder with a piston and a spring in the steam space was used, but the spring was found to be too weak. The strongest spring possible for the space available was then substituted, and very good operation was obtained up to about 15 double strokes per minute. Above this, however, the piston rod would hit the cylinder head, an indication that the spring was still too weak. In order to obtain heavier loading, and at the same time be able to vary the load-



1—Pressure Equalizing Spring, 2—Spring Guide Cylinder, 3—Piston Rod Externally Loaded, 4—Packing Gland, 5—Pressure Cylinder, 6—Pressure Cylinder Head, 7—Supports, 8—Hi-Pressure Packing, 9—Bushing, 10—Piston Stop, 11—Piston, 12—Monel Cylinder Liner, 13—Steam Inlet, 14—Drain, 15—Water Inlet, 16—Movable Spring Bearing and Adjustment Plate, 17—Lock Nut.

ing, a cylinder was built above the piston cylinder, in which was enclosed a spring of the required strength.

After many demonstrations on board a Victory ship, which were attended by the senior members of the engineering staffs of the various shipping companies, the U. S. Maritime Commission, the shipyards and the War Shipping Administration, the Final Guarantee Survey Board was favorably impressed with the results. In its report on the ship to Washington it included without solicitation the following:

"While aboard was inspecting the engine room. The operator was observing tests of the Rapp-Hill Main Reciprocating Feed Pump Compensator, and they observed the tests of the experimental unit installed on the water discharge of the after feed pump. As far as the observed demonstration of the apparatus is concerned the Board expressed the opinion that this equipment may possibly solve the problem of the excessive water hammer, which has prevented the installed reciprocating feed pumps being used as main feed pumps as originally intended. Refer to Engineer Plan Approval."

The apparatus shown in the adjoining pictorial drawing operates as follows:

(1) Desuperheated steam at full boiler working pressure enters the bottom of the cylinder at (13).

(2) Water from the discharge of the pump enters the upper part of the cylinder at (15).

(3) Top plate (16) and screw (17) are used for making any necessary adjustments on spring (1), which takes care of any unbalance or differential in pressure between steam and water in the lower cylinder.

(4) As the feed water pressure increases during the pump stroke, the piston (11) moves down, compressing the spring (1) until balance is achieved.

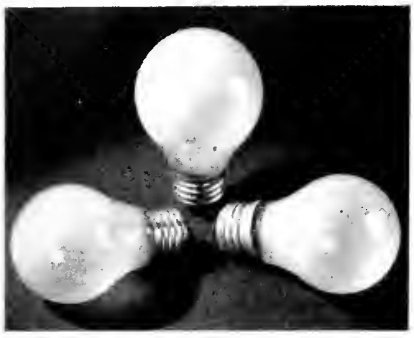
(5) As the feed pressure decreases at the end of the pump stroke, the piston (11) moves upward, unloading the spring feeding water back into the feed line through (15).

The discharge pressure from Simplex Feed Pumps on Victory ships varies from 55 psi to 250 psi, but with the use of the Rapp-Hill Compensator it goes from 500 psi to 450 psi minimum, thereby eliminating the extreme variation in pressure, and consequently the disturbing noise and vibration.

The Rapp-Hill Pump Compensator is manufactured and distributed by the Brooks Equipment Co. of California, 636 Potrero Avenue, San Francisco, Calif.

Low Voltage Incandescent Lamps for 6, 12 and 30 Volt Service

Low voltage inside frosted lamps in standard bulb sizes with medium bases and rated at 1000 hours' life are now available from Sylvania Electric Products Inc., Salem, Mass. Six



and twelve volt lamps in 15, 25 and 50 watt sizes are designed specially for battery-generator sets used in small boats, camps, farm lighting, Windcharger equipments, buses, small planes and portable battery-operated lighting. Used with standard extension cords, six volt lamps make a handy trouble light which may be operated anywhere directly from an automobile battery. Thirty volt lamps in 15, 25, 50 and 100 watt sizes are designed for use with battery-generator circuits averaging between 28 and 32 volts used on large farms, railway cars, tug and workboats and medium sized commercial planes.

Hydraulic Governors Service Stations

The Marquette Metal Products Company has originated a unique service to users of its hydraulic governors in establishing service stations in strategic locations, making it possible for Government agencies and commercial vessel operators to get prompt, dependable servicing of governors.

The service stations are conveniently located at 4512 San Pablo Avenue, Emeryville, California; 835 Howard Avenue, New Orleans; and 47-49 Wooster Street, New York. The stations are devoted to service only. All matters pertaining to sales are directed from the company's home office at 1145 Galenwood Drive, Cleveland, Ohio.

Interior view of the Marquette Governor Service and Training Station, New York shop. Similar shops are in New Orleans, Los Angeles and Emeryville, California. At the right a reconditioned governor is being tested on a diesel engine.

"Bean Soup" Smothers Fires

Resembling luscious whipped cream, the Navy's fire-fighting "bean soup" smothers even the toughest fires at sea or ashore with a thick blanket of foam derived from mixing a special liquid made from soy beans with water and air. A five-gallon can of liquid produces nearly 900 gallons of airfoam in a few seconds to form a tough, gas-tight blanket which cuts off oxygen and snuffs out flames. Airfoam (as shown) flows freely, yet sticks to vertical surfaces as well as flat areas. And while the Navy's traditional beans are far more nutritious, this "bean soup" looks more appealing — and spells safety. National Foam System, Philadelphia, has just processed its 4,000,000th gallon of the basic liquid, known technically as Aer-o-foam. It is particularly effective in combating petroleum and chemical fires.

Oil Conditioners Make Big Saving

An estimated saving of 44 thousand dollars per year in the operation of 14 large cranes through the successful adoption of revolutionary oil conditioning practices is shown by records from the files of a well-known engineer in charge of mechanical equipment at one of the big West Coast shipyards.

Oil consumption was cut from approximately 18,000 gallons per year down to approximately 6000 gallons, and the full-time labor of five men was saved through the use of lubricating oil conditions designed and built by the Winslow Engineering Company.

Other benefits include the fact that the 200-horsepower Cummins and Buda diesels which power the cranes are now showing a remarkable degree of efficiency by operating without overhaul for periods of 16,000 hours or more. Previously, overhaul schedules called for "time down" every 10,000 hours or less.

Troubled by the fact that a five-man crew was required on a full-time basis merely to change the oil in the engines of the 14 cranes every 150 hours, and that waste oil was disposed of at the rate of 1000 gallons per month, this engineer installed high capacity industrial and marine type Winslow oil conditioners on a test group of four of the cranes. Results immediately justified similar installations on the remaining cranes.

Now oil is changed only after 500 to 650 hours of operation on each of the engines. Filter elements are changed at this time, but flushing oil, which was previously used, is no longer necessary. Waste oil disposal has dropped from approximately 1000 gallons per month to an average of about 166 gallons per month, a cut of 83 per cent, at an estimated saving of about $6000 per year.

Oil changes are now handled by the men who clean and oil the cranes while the cranes are tied up. Estimated labor cost savings amount to about $38,508 per year. Added to oil savings, this comes to $44,508 per year. Against this alone, Winslow oil conditioner installation costs are considered negligible.

Estimated time and dollar savings do not include the man-hours and equipment time previously lost every 150 hours when operators and slingers had to stand by during oil changes. Figures are based on 24-hour-per-day operations.

Each of the oil conditioning units consists of a steel cylindrical container which encloses seven replaceable sock-type filter elements. The Winslow Engineering Company of Oakland, California, has designed and built this type of conditioner to provide sufficient capacity to accommodate the full flow of oil, so that only filtered oil reaches the bearings. Larger as well as smaller units to meet specific oil flow requirements have long been in successful operation in many industrial as well as marine applications throughout the country.

Gas Detection and Analysis Instruments

The Davis Emergency Equipment Co., Inc., Newark, N. J., announces an extended line of gas detection and gas analysis instruments. The new line will include the company's combustible gas alarm systems, along with safety equipment for the detection and analysis of combustible gas or vapor in air.

It will also detect and analyze any one gas, whether combined or not with other gases. All of the instruments will be available with a variety of chart recorders.

On the Ways — SHIPS IN THE MAKING

LCM's ON RE-ASSEMBLY LINE

Hulls of LCM's. Some of 52 landing craft built on the Pacific Coast, cut into sections there and sent East on freight cars for re-assembly, take shape once more alongside big tanker in drydock at Todd Shipyards Corporation's Brooklyn division. Believed the first project of its kind, the craft were shipped in parts across continent when Navy decided to use them for amphibious training in Florida.

Europa at Todd Yard For Repair

The 49,730-ton former Hapag-Lloyd liner Europa, which was seized from Germany by the Allies in Bremerhaven last May 8 and put into service as a United States Navy troop transport, went into the Hoboken division of Todd Shipyards Corporation for extensive voyage repairs, after making three trips with troops to New York. The Europa is the largest vessel ever to be repaired in the Todd Hoboken yard, and is probably the largest ship that ever entered any private American repair yard.

The Europa (AP-177), as the Navy knows her, had lain at her pier in Bremerhaven since soon after the outbreak of the war in 1939, and not all of the ailments of long disuse were straightened out when she was partially converted to a Navy transport and arrived in America on her first trip under the American flag, with a Navy skipper, on September 25.

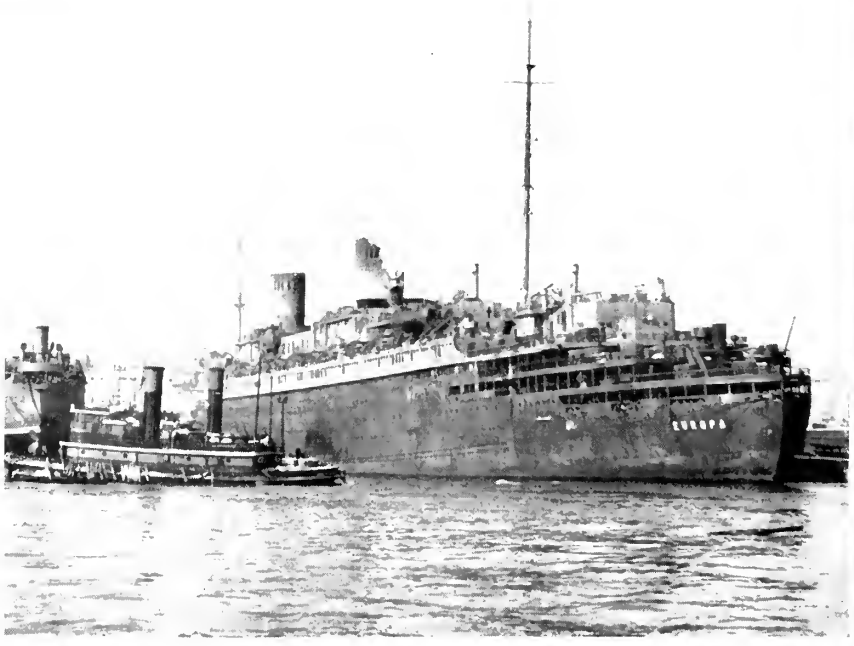
On September 27, the Europa went to the Navy Yard Annex in Bayonne, N. J. It had been planned to make a complete conversion of the vessel, in 45 days, into a transport capable of carrying more than 10,000 men. Because of the immediate need of her services, however, it was decided not to perform the full conversion.

The ship presents a wide variety of repair problems.

They Get Around

A 100,000 mile voyage that included seven crossings of the International Date Line and eight crossings of the Equator was revealed recently when the log of the Socony-Vacuum Oil Company tanker SS Mobiloil was examined.

The tanker, skippered by R. C. Doull, Master, traveled through the Suez and Panama Canals, around the Cape of Good Hope and Cape Horn and in the waters of the Atlantic, Pacific, Antarctic regions and Indian Ocean as well as the Gulf of Mexico, Persian Gulf, Gulf of Aden, Gulf of Oman, the Arabian, Red, Tasman and Caribbean Seas.



Europa, former Hapog-Lloyd liner, arrives at Hoboken division of Todd for repairs, after making three trips with troops.

The Month's West Coast Shipbuilding Record

West Coast shipyards delivered 16 vessels, or 38.3 per cent of those turned out in the United States during the month of November, according to figures released by the U. S. Maritime Commission. West Coast tonnage delivered totaled 127,699 deadweight tons. Atlantic Coast shipyards delivered 10 vessels and Gulf yards 15 ships.

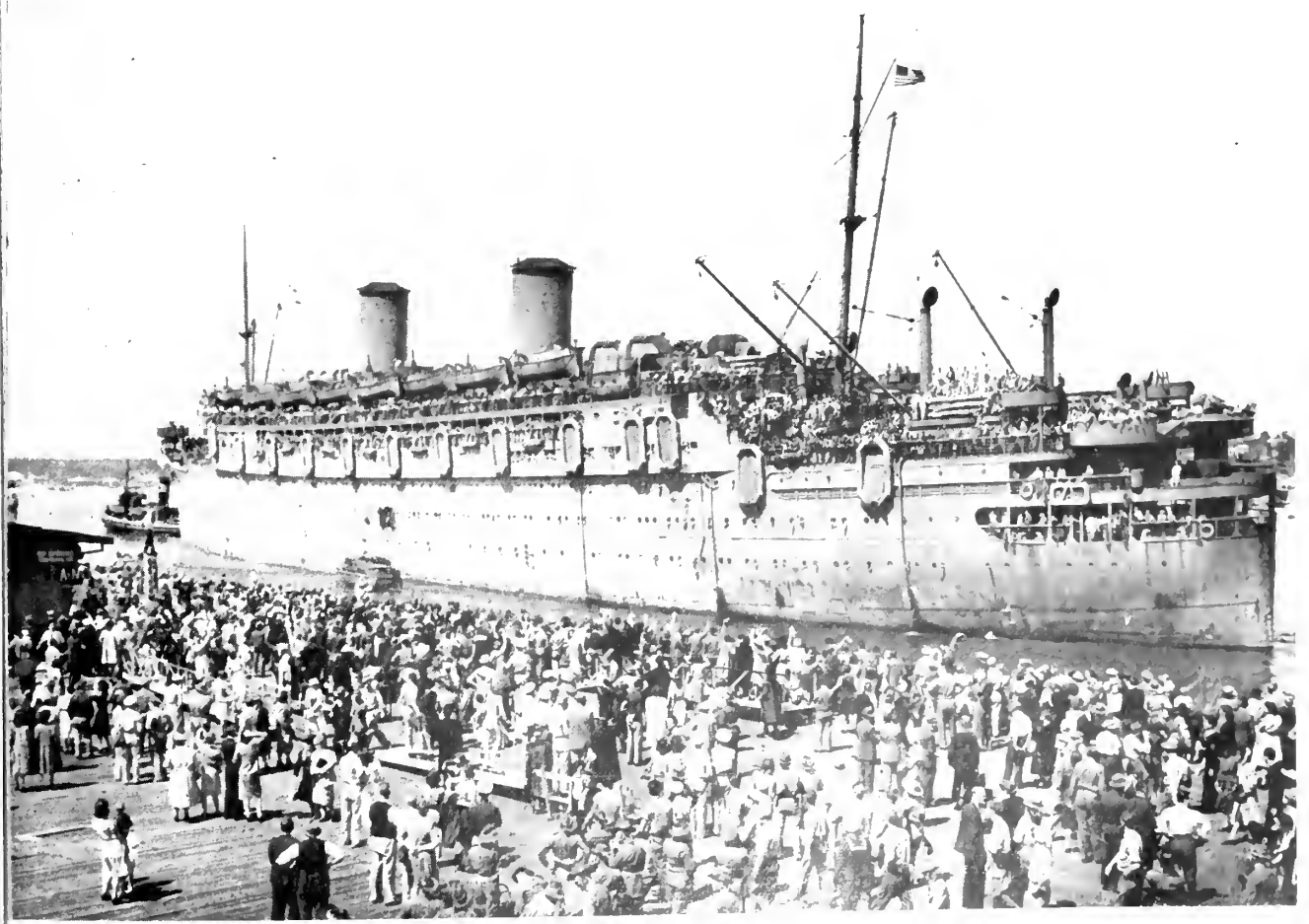
The Albina Engine & Machine Work of Portland delivered 3 coastal cargo ships, and the Oregon Shipbuilding Corporation 5 Victory cargo carriers. The Kaiser Company yard at Swan Island delivered 2 T2 tankers and the Kaiser Vancouver Yard one C-4 Transport for the Army. In Wilmington, California, the Consolidated Steel Corporation delivered 4 coastal cargo carriers.

Of the 42 ships delivered from the United States shipyards in November, 5 were Victory cargo carriers, 7 C-type cargo ships, 16 coastal cargo carriers, 2 private coastal cargo carriers, 5 standard tankers, two transports and 5 coastal tankers.

MATSON SHIPS DURING WAR

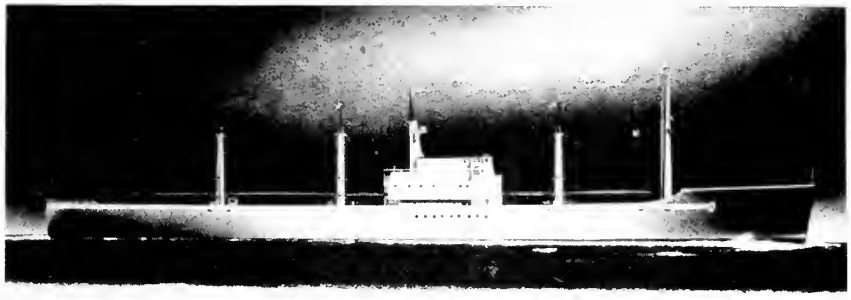
Above: Home Again! SS Mariposa disembarking troops at Port of Boston.

Below: The SS Lurline leaving the dock of Brisbane on September 11, 1945. This was the first Matson liner to leave an Australian port since the cessation of hostilities. The former luxury liner was booked to capacity, carrying a grand total of 3560 persons bound for San Francisco. This voyage of the SS Lurline was known as the "War Bride Voyage," as there were over 500 wives and over 200 children aboard.



Above: Commander Carvalho (center) is shown with, left to right, J. H. Morris, assistant machinery superintendent; R. I. Ingalls, Jr., vice chairman; A. M. Swigert, works suprintendent, and Pierce Archer, Ingalls' representative at Rio.

Below: A model of 12,000-ton cargo ship built for Brazil.



Ships Built for Brazil

Note: These ships were featured in several recent issues of Pacific Marine Review.

All fourteen 12,000-ton cargo ships being built for the Brazilian government by the Ingalls Shipbuilding Corporation at Pascagoula, Miss., at a cost of $37,000,000, are being equipped with Hagan automatic combustion control, according to J. M. Hopwood, president of Hagan Corporation.

Brazil, it was learned, is building a total of 24 cargo ships, at a cost of $54,000,000. The remaining ten are being built in Canadian yards. The ships are being built for the Brazilian government through its agent, Lloyd Brasileiro.

Hagan Corporation pioneered in designing systems for automatic fuel-air proportioning for industrial boiler plants and for utilities power plants in the latter days of World War I. It designed the first combustion control system ever put aboard ship when the Standard Oil tanker R. P. Resor was so equipped in January, 1936.

New Barge for Tracy Fleet

The Cape Low, first of four new 142-foot hopper barges for M. & J. Tracy Company of New York, was launched recently at the Wilmington, Delaware, yards of Dravo Corporation.

NEW BARGE FOR TRACY FLEET LAUNCHED

The sponsor's party: D. R. Berg, admin. manager of Wilmington Yard, Dravo Corp.; A. A. Low, vice president of Consolidated Edison Company of New York; H. S. Sutton, exec. asst. to the president, Consolidated Edison; Mrs. A. A. Low, sponsor; W. J. Lane, superintendent of construction, M. & J. Tracy, Inc.; Mrs. William J. Tracy; J. A. Lennon, secretary of M. & J. Tracy, Inc.; W. J. Tracy, president; H. C. Dean, executive vice president of New York and Queens Electric Light and Power; Warren Brewer, asst. admin. mgr., Dravo Wilmington yard; R. E. Dennis, fuel agent Consolidated Edison; and J. H. Murray, superintendent of floating equipment B & O Railroad.

Brazilian Visits Ingalls Yard

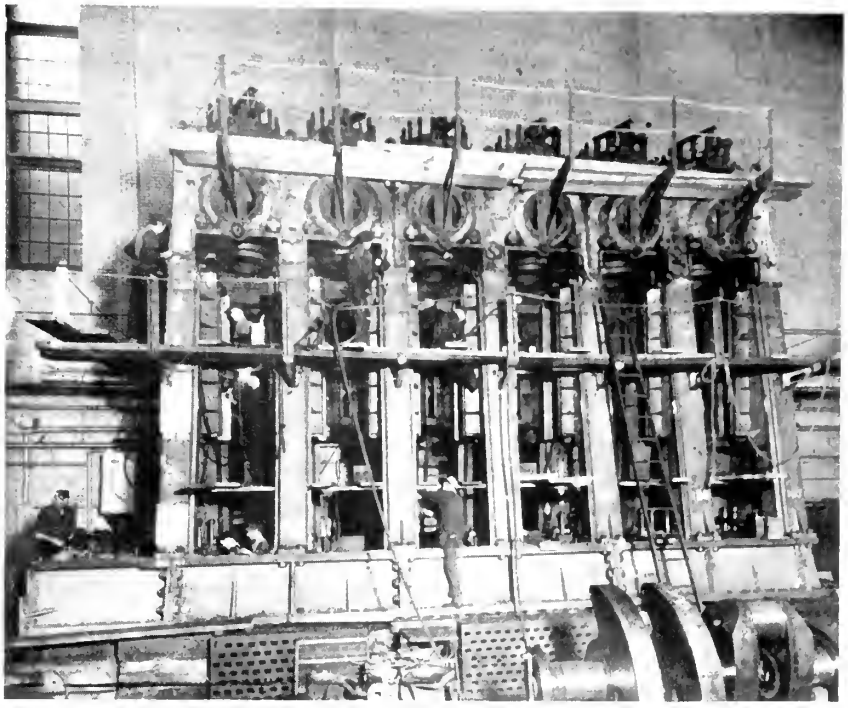
Commander Enrico Magno de Carvalho, of Rio de Janeiro, special representative of the Brazilian minister of transportation and public works, recently inspected the Ingalls Shipbuilding Corporation yards at Pascagoula, Miss. Commander Carvalho, of the Brazilian Navy, is connected with SNAPP (Service De Navegacao Da Amazonia E De Administracao Do Porto Do Para) as a marine engineer and naval architect. The organization is in charge of developing 3400 miles of river transportation along the Amazon. The Ingalls yard, with a backlog of $120,000,000, is building 14 modern cargo ships at a cost of $37,000,000 for the Brazilian-owned Lloyd Brasileiro Lines.

First Visit to U.S.A. of New Swedish Motorship

The newly-commissioned Johnson Line motorship Biobio, one of the most luxurious combination, fast passenger and cargo carriers ever assigned to this trade under the Swedish flag, was dispatched from Gothenburg on November 28. She is due to arrive in Seattle, Portland, San Francisco, Los Angeles and British Columbia ports around the end of December, with a full cargo of Swedish paper and pulp, as well as other Scandinavian products.

Delivered to her owners on November 12, the Biobio is the second modern motorship assigned by the Johnson Line for the resumption of their post-war European-Pacific Coast passenger, refrigeration and freight service.

Pacific Coast agents W. R. Grace & Co. state that the motorship has spacious accommodations for 30 passengers, as well as features that combine the most modern shipbuilding ingenuity in handling all varieties of fresh, dried and canned fruits and fish.



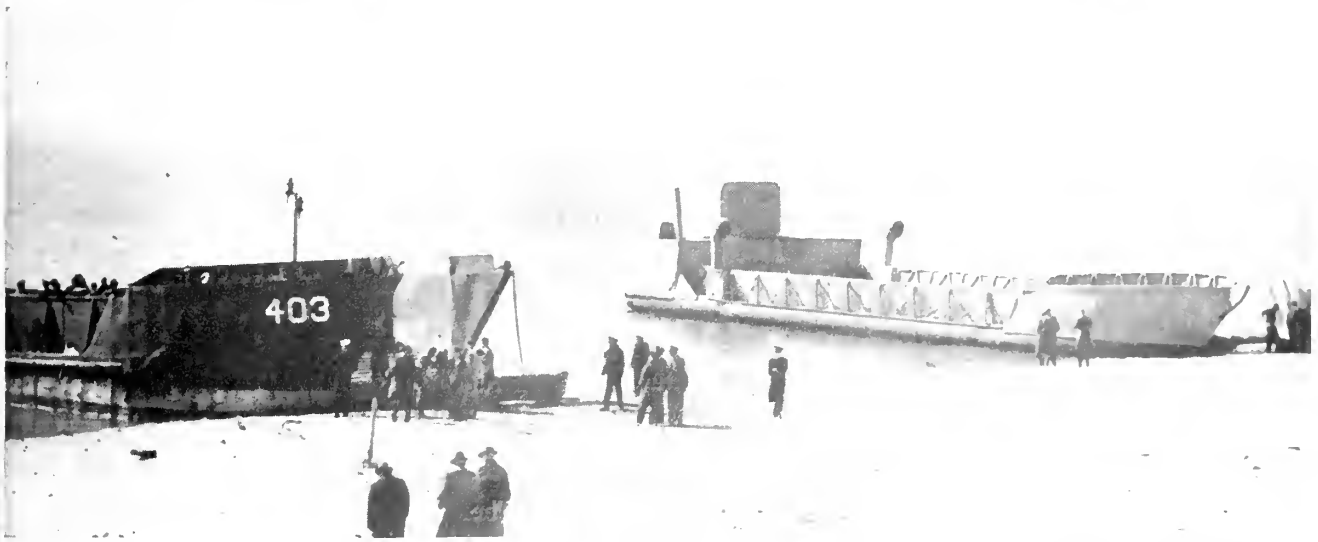
200-TON KRUPP DIESEL ENGINE REBUILT IN U. S. A.

One of the biggest jobs of its type in this country, Bethlehem Steel's Staten Island shipyard rebuilt this 200-ton Krupp diesel. It was removed section by section from the 10,871-ton tanker M. S. Peter Hurll. After repairs, which included installation of four new 20-ton bed plates and 14 fabricated steel housings of new design, the motor was again disassembled and replaced in the tanker.

Chinese Get 10 Coastal Cargo Steamers

The Chinese Supply Commission was awarded 10 coastal cargo vessels of the N3 type by the United States Maritime Commission. The bids ranged from $410,000 to $451,000 for each of the vessels. The Supply Commission was the only bidder submitting sealed bids at the opening held Wednesday, December 19, 1945. The freighters, 258 feet long and of 2,750 deadweight tons, were built in 1944-45. All of the vessels are now at Los Angeles, California, with the exception of one at San Francisco.

LAUNCHING A DECOY RUBBER LANDING CRAFT



This collapsible pneumatic rubber craft, made by United States Rubber Company, was part of the "ghost army" developed and operated by Army Engineers to fool the Germans in important European operations. The decoys were easy to send to combat areas because they were collapsible, packed compactly, could be inflated quickly in the field and deflated easily for moving to a new location.

STEADY AS YOU GO

(Continued from page 64)

these minutes are further divided into **tenths of minutes,** or **six seconds.**

(3) **The Horizon Glass.** This is rigidly fixed to the frame perpendicular to the plane of the instrument and parallel to the index mirror when the index arm is set at zero. The horizon glass is fixed in a metal frame and one half (the half farthest away from the instrument frame) is plain glass and therefore transparent, so that objects may be seen directly through it by the telescope; while the other half (the lower half near the frame) is a silvered reflector or mirror. This mirror receives the rays of the object reflected from the index mirror and transmits them to the observer through the telescope. The horizon glass is fitted with two small, capped adjusting screws so that the horizon glass can be kept perpendicular to the plane of the instrument.

(4) Horizon shades of colored glass (usually three) of different densities and different colors are fitted so that they may be turned up as required beyond the transparent part of the horizon glass to tone down excessive glare on the horizon of the direct rays of the sun.

(To be continued)

Radio Direction Finder

Fishing craft owners, yachtsmen and navigators of almost any vessel will be interested to learn that the very compact and trustworthy "Turret" radio direction finder is again available to other than Government users.

The Paulsen-Webber Cordage Corporation manufactures this instrument in its Marine Electronics Division, and maintains in the current model the features that made the set so popular during the 1930's. The space occupied is small enough to give it a place in the smallest chart room or wheel house. It is completely self-contained, and avoids all battery troubles by operating directly from any standard marine lighting circuit.

Its efficiency ranks with that of direction finders selling for as much as four times the price, yet its mechanism and electrical circuits are so worked out as to eliminate the complexity of knobs which often slows down the taking of bearings with other sets. This simplicity, plus a rugged construction, reduces service needs to a point where years frequently elapse before any technical attention is needed.

A characteristic of the "Turret" direction finder is the dial on the front of the instrument, from which bearings are taken in the compass points or degrees around the outline of the ship—where no part of the card is obscured and where both light and line of vision contribute to accurate navigation.

A Plastic Sealer Compound

A material for filling or sealing ends of pipes or tubes through which electric cables are strung has been developed by The Dolphin Paint & Varnish Company, Toledo, Ohio, and is known as No. 3984-3 Dolfinite Plastic Sealer Compound.

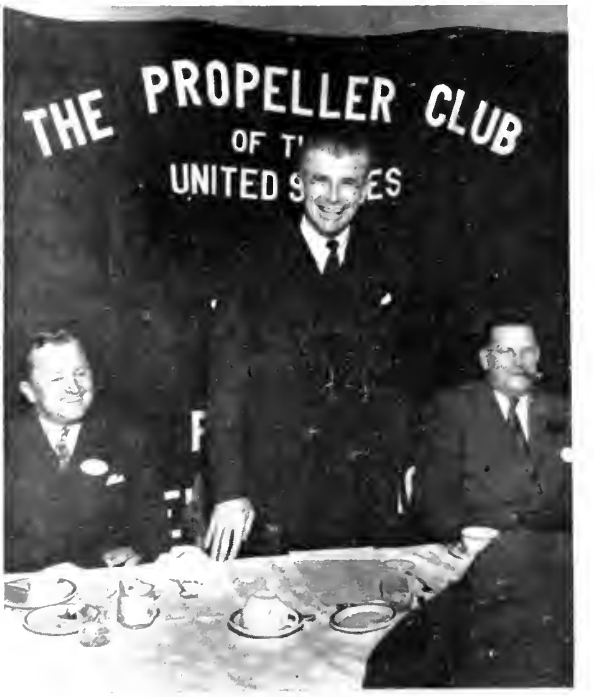
It has sufficient stiffness to hold cables away from the steel tubing, and is used mainly on U. S. Navy and Coast Guard ships. It has the consistency of putty and remains plastic so that cables may be easily removed when replacement or repairs are necessary. Generally applied by hand or with ordinary putty knife, it is waterproof and unaffected by either heat or cold.

It conforms to Navy Department Specification 17-1-15, meeting all the requirements of Type H (Heat Resistant) for use when cables are located on decks or weather exposed surfaces requiring water and weather resistance, and Type HF (Heat and Flame Resistant) for application in engine, boiler rooms and hot places.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton



Above: Propeller Club officers of Los Angeles Harbor. Left to right: E. A. MacMahon, 3rd vice president; Leonard Backus, 2nd vice president; Leo Archer, 1st vice president; Herb Pickering, president; Howard Woodruff, secretary-treasurer.

At right: Broad smiles on faces of Leonard Backus and Herb Pickering reflect audience response to humorous presentation of subject, "Don't Drift—Row," by Rev. James Whitcomb Brougher, Jr. Jimmy Brougher is Club "Sky-Pilot."

Los Angeles Propeller Meeting Honors the Marine Exchange

Program Chairman Leonard Backus gets facts and figures on operations of newly reopened Marine Exchange lookout station at San Pedro. Left to right: Hugh Middleton; Gus Grom, assistant manager of Marine Exchange; Leonard Backus; and A. L. Allyn.

The Marine Exchange at Los Angeles Harbor is in full swing again, after a four-year silent period, back on the job of reporting ship movements about the port to shipping and related agencies. The Exchange is under operation by the Los Angeles Chamber of Commerce, under **Howard W. Woodruff**, manager. Woodruff is well known around the Port and with the Propeller Club activities in Southern California.

At the lookout station atop Warehouse No. 1 at San Pedro, **Gus Gram** is in charge of a staff of six, most of

At San Pedro, aloft Warehouse No. 1.

HOWARD L. WOODRUFF, manager Marine Exchange at Los Angeles.

them veterans of the Exchange. "Old timers" at the station besides Gram are: Al England, Ross O'Laughlin, Bill King and John O'Donnell; and two experienced former Navy signalmen, Leo Riley and Kenneth Moore, have been added.

The guest speaker on the program for the December meeting of the Los Angeles Propeller Club was Sky Pilot James Whitcomb Brougher, Jr., whose remarks on his experiences during the war operations were entertaining as well as enlightening.

ELECTION of Wilson H. Moriarty, vice president in charge of sales of National Malleable & Steel Castings Co., was announced by President Charles H. McCrea. Mr. Moriarty has been assistant to president.

Scenes from Joslyn-Ryan Holiday Banquet

At right: Michael Ryan and Paul Joslyn at annual Christmas banquet.

Center: During the program Paul Joslyn and Mike Ryan were each presented with a beautiful leather brief case as token of appreciation from office staff.

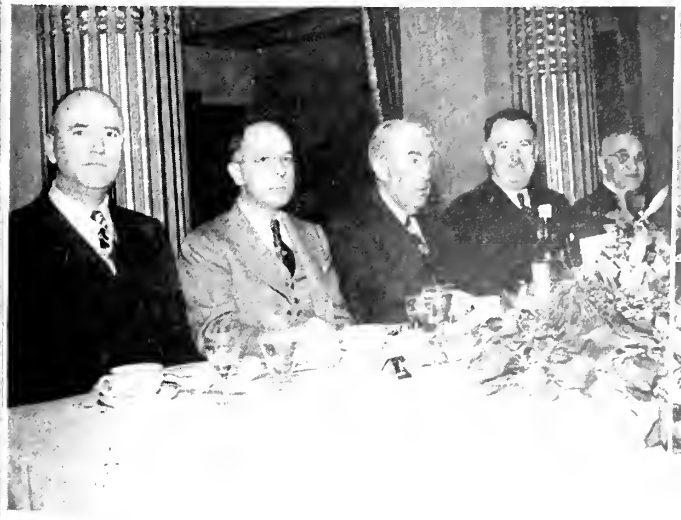
Joslyn-Ryan Observe Yule Season

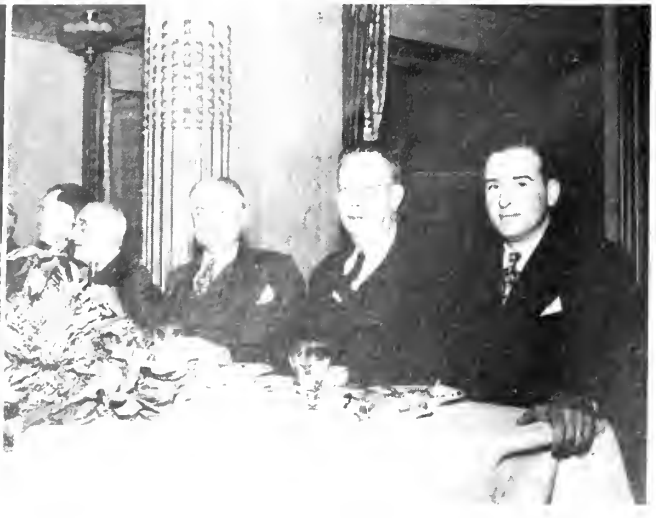
The staff of Joslyn and Ryan of San Francisco, naval architects and marine engineers, held their annual Xmas party on December 21 in the Colonial Ballroom of the St. Francis Hotel.

There was an attendance of over two hundred staff members and a very creditable program of entertainment was provided by the talented members of the party.

All arrangements were well handled by a committee under the guidance of Charles King.

Accompanying Paul Joslyn and Michael Ryan at the speakers' table were the following gentlemen: Roger Murray, Fairbanks, Morse Co.; E. S. Schulters, U.S.M.C.; Sheriff Daniel Murphy of San Francisco; Thomas S. Meehan, the Cracker National Bank; Carl W. Flesher, Joshua Hendy Co.; Charles M. Laring, Supervisar's Office, U. S. Navy; and Leslie L. White, Matsan Navigation Company; Jack Radford, Fairbanks, Morse.





Yule Season Feted At Groves Party

The Hosts at the Frank Groves Christmas Party. Top, left: Mr. and Mrs. Frank Groves. Mr. Groves is president and general manager. Center, left: Mr. and Mrs. H. T. Waldron. Waldron is manager of the San Francisco branch.

Top, right: Jovial twosome, seated, is C. T. Solomon, port engineer, General Steamship Corp., Ltd., and reaching for high C is J. F. "Joe" Gisler, port engineer, Interoceon Steamship Co.

The Frank Groves Company of San Francisco held its annual Holiday party for port engineers and steamship company officials at El Jardin Restaurant on December 15. Almost two hundred guests were in attendance for the dinner party and entertainment.

SHORESIDE PERSONALITIES

COMMANDER JOHN R. PAGE has been loaned by General Steamship Corporation to the UMA in London to act as assistant to Ernest J. Bradley, United States UMA representative in that city. Page recently returned to General Steam, after his discharge from the Navy, as manager of its European department.

CHIEF OF ECLIPSE DIVISION, BENDIX, is Frank T. Christian. He was appointed chief engineer of the Eclipse Machine division of Bendix Aviation Corporation. Mr. Christian has been associated with the staff since 1929. During the last five years he has directed engineering for the company's commercial production of Bendix starter drives and bicycle coaster brakes.

MANAGERS OF FRANK GROVES COMPANY

Left to right: Ed Thirkell, manager of Portland Branch; Frank Graves, president and general manager; and H. T. Waldron, manager of San Francisco Branch.

HARRY A. BURDORF, vice president in charge of Sales for the Lunkenheimer Company, recently visited the Pacific Coast offices and the distributors of the firm. This was his first trip to the Coast since 1939.

Edward H. Johnson is now in charge of Sales for the company in the Northern California and San Francisco Bay Areas. Republic Supply Company of California, who have distributed the Lunkenheimer products for many years in Southern California, was appointed distributor for Northern California with headquarters in Emeryville. Robert Temple is the manager.

John Eldridge Cushing

COMMANDER HARRY A. SHAWK, back after four years and 10 months on active duty with the Navy, has assumed his old duties with The Tide Water Associated Oil Company of San Francisco, as consulting engineer and supervisor of Marine Sales. During the war he was commanding officer, U. S. Naval Section Base, Humboldt Bay, and Section Commander of Northern California Sector, Eureka and Monterey.

THE SANTA FE RAILWAY'S San Francisco ferry service recently announced the retirement from active duty of Captain Wilfred John Osborn, who entered the service as a first officer in 1910 and served as captain since 1911.

CUSHING AND LAPHAM BACK AT AMERICAN-HAWAIIAN

The turn of the year saw John E. Cushing (at left) back as president of American - Hawaiian Steamship Company, after spending the war years on leave to the War Shipping Administration, as Deputy Administrator for the Pacific Coast.

In a new position at American - Hawaiian is Lewis A. Lapham, Jr. (at right), who became assistant to President Cushing.

THE POSITION LEFT VACANT by the resignation of John E. Cushing as Assistant Deputy Administrator of the War Shipping Administration has been filled by Felix Isherwood, who has held the post of special assistant to Mr. Cushing. Isherwood will take charge of the War Shipping Administration offices in the Pacific Ocean area.

THE GRACE LINE announces the appointment of Captain Roy A. Steimer as Master of the SS Pierre La Clede and Robert R. Spurling as chief engineer of the SS Cape Gaspe.

ELLINWOOD INDUSTRIES, Los Angeles, manufacturers of farm, marine, home and office equipment, have added five new executives to the staff. According to President Ray Ellinwood, **Orrin Broberg** is chief engineer of the marine equipment division; **Colin Chambers** is sales manager of furnace brazing and heat treating; **D. W. Morgeson** is superintendent of the farm equipment division; **Palmer Wentworth** is personnel manager, and **John H. Williams** is project engineer with the farm equipment division.

RAY W. TRUMBULL, president, Edison General Electric (Hotpoint) Appliance Co. was elected vice president of National Electrical Manufacturers Association in New York. He is a member of the board of governors of the association.

M. G. Gamble, who succeeded B. B. Howard as general manager of Marine Operations.

Esso's Marine Management Appointments

M. G. Gamble, widely known marine and shipping authority, is now general manager of marine operations for Standard Oil of New Jersey. He succeeds B. B. Howard, recently elected to the board of directors.

As assistant general manager during the war, Mr. Gamble was active in coordinating the operations of the Esso tanker fleet under the WSA.

John J. Winterbottom, manager of the marine traffic division, until recently on leave with the WSA, is assistant general manager, and E. H. Le Tourneau continues as assistant general manager.

B. B. Howard, who has been with Standard Oil Company (New Jersey) since 1920, is now an Esso director.

J. J. Winterbottom is new manager of the marine traffic division.

Mr. Gamble, a native of Louisville, Georgia, left the Navy to join the construction and repair division of Esso's marine division after the first World War. An Annapolis graduate, he had served during the war years in both engine and deck officer duties. In 1937, as assistant in the traffic division, he handled marine affairs in Venezuela and lake tanker shipments in Caribbean ports. The following year he became manager of the newly created Caribbean division, and in 1939 went to Aruba as marine manager directing activities in Venezuela and the Caribbean. He was appointed assistant general manager in New York in 1942.

E. H. Le Tourneau, who served as a Navy Lieutenant in World War I, joined the company in 1921. He entered the repair division, later became assistant manager of construction and repair, and then manager of the repair division. Appointed acting assistant general manager of the marine department in May, 1943, he succeeded the late H. J. Esselborn as an assistant manager the following March.

John J. Winterbottom entered the foreign shipping department of Jersey Standard in 1916. In 1930 he went to London as adviser to marine managements of European subsidiaries. He was made manager of the traffic division in 1940. Back from his WSA job, he has taken up duties as assistant general manager.

The election of Bushrod B. Howard to the board of directors of Esso on August 31, makes him the eleventh director, following the retirement of Wallace E. Pratt. Mr. Howard is widely known in the shipping world, having been associated with Jersey's large tanker fleet since he joined the company in 1920. He has been general manager of the marine group throughout the war period.

E. H. LeTourneau, who continues as Assistant General Manager.

Two cadets at extreme left of head table are P. D. Kollasch and W. F. Schill. New president of San Francisco Propeller Club J. J. Geary; Admiral Scammell, U.S.C.G., talking to Hugh Gallagher; Arthur Poole of American President Lines talking with Captain Molcolm Crossman, superintendent of Alameda Officers' School; E. H. Harms, operating manager, McCormick Lines, and Dr. R. C. Dwyer, California State Maritime Academy, and Eugene Hoffman.

S. F. Propellers Christmas Program

Joseph A. Moore, Jr.

Retiring president of the San Francisco Propeller Club, Joseph A. Moore, Jr., has been elected national vice president for the South Pacific Coast Region of the Propeller Club of the United States. Captain Wallace S. Langley of Seattle was reelected vice president for the North Pacific Coast Region, and Professor A. L. Lomas of the University of Oregon was reelected vice president for Student Ports.

One of the outstanding social events of the holiday season was the Propeller Club's Fifth Annual dinner-dance held in the St. Francis Hotel Colonial ballroom. Personnel from the armed services, War Shipping Administration and the Maritime Commission were in attendance.

Edward H. Harms was general chairman and heading the reception committee was Mrs. Frazer A. Bailey, who was assisted by Mesdames Edward H. Harms, Robert Spear, Harry Parsons, George E. Sweet, Hugh Gallagher, Bernard N. De Rochie, George Cooley, Carroll Reeves, Edward J. Schneider, D. N. Lillevand, Edward Martin, Joseph A. Moore, Jr., Joseph J. Geary, Charles L. Wheeler and Eugene Hoffman.

At the December 19 meeting, Joseph J. Geary, prominent West Coast admiralty attorney, took over the presidency and gavel from Joseph A. Moore, Jr., for the 1946 term of the San Francisco Propeller Club.

Other officers are: W. Miller Laughton, 1st vice president; John E. Cushing, 2nd vice president; W. R. Chamberlin, 3rd vice president; and Eugene F. Hoffman, secretary-treasurer.

New gavel swinger of S. F. Propeller's is Joseph J. Geary, prominent West Coast admiralty attorney.

Mariners Club Yuletide Festivities

The annual cammunity sing, sumptuaus turkey feed, and javial good fellowship was the best ever, when the Mariners and friends packed the El Jardin Restourant on December 20, to celebrate Christmas.

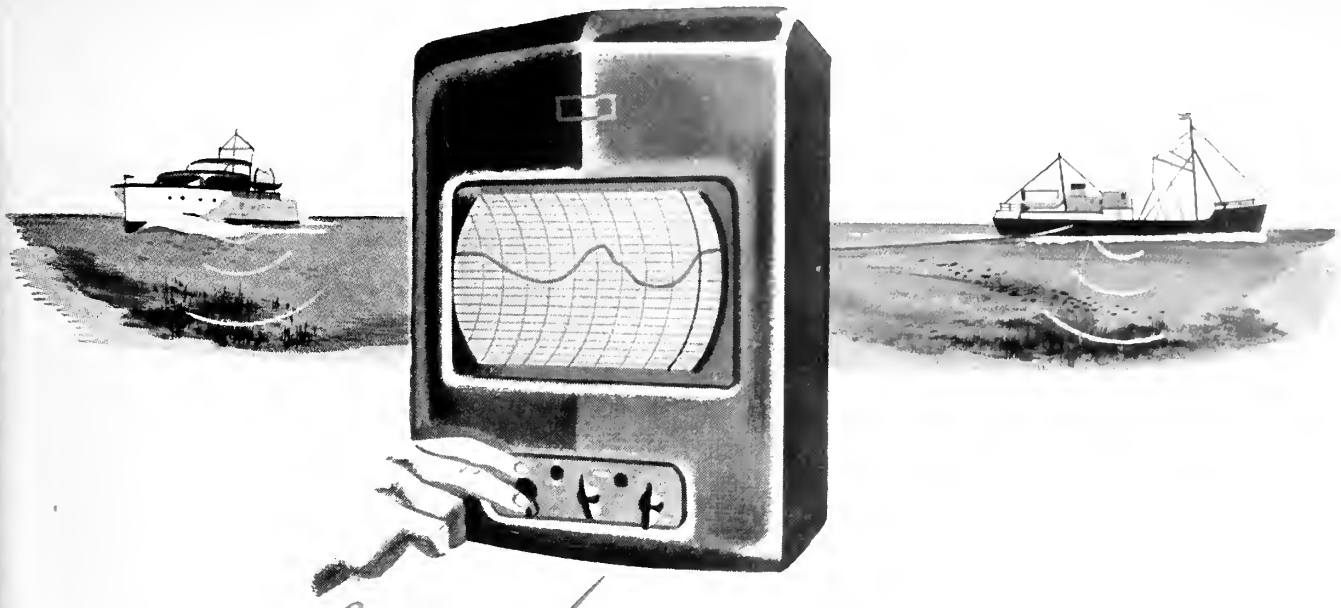
Captain Mervyn C. Stone, recently released from WSA, has taken over Part Captain duties of the Matsan Lines.

Matson's New Port Captain in San Francisco

After gathering well-rounded sea experience from the beginning of World War I until 1930 when he joined the Matson Line, Captain Mervyn C. Stone has served on all types of ships, with Matson, and before on the Pacific Mail vessels and the ships of the Panama Mail.

In 1939 he was promoted to Master at Matson and has had command of several vessels. Before Pearl Harbor his runs took him to Suez with lend-lease material for the British during the critical North African campaign. In 1942 on a voyage to Murmansk his ship, the Olapana, was sunk. The survivors were landed by rafts on an island in the Barents Sea and subsequently rescued.

Shortly after Captain Stone's return to New York in 1942, he was released by Matson to become a representative of the WSA in the South Pacific. After 21 months' service and a short leave, he was reassigned to the Central Pacific as assistant regional director.



at a glance!

A CONTINUOUS HORIZONTAL RECORDING OF THE OCEAN BOTTOM WITH THE

NEW BENDIX-MARINE SUPERSONIC DEPTH-SOUNDER

The Bendix-Marine* supersonic depth-sounder has won the acclaim of fishermen all over the world for its simplicity, accuracy, ruggedness and low cost. Both in fishing and in navigation it provides a graphic, faithful reproduction of bottom conditions at all times. *Supersonic* emission prevents false recordings from extraneous sound sources.

Detailed technical information on the performance of this highly valuable navigational aid will be sent you upon request.

No other Depth-Sounder has ALL these features:

Lightweight • Portable • Lower First Cost • Easier Installation • No Relays Required • No Keying Adjustments • No Demagnetizing of Projectors • Uses Dry Recording Paper • Large Unobstructed Viewing Window • Horizontal Graphic Chart • Good Bottom Coverage at All Depths • Works on All Available Voltages • Graphic Recorder in one Compact Unit • Component Parts are Accessible for Maintenance, Quickly and Simply Replaced.

INSTRUMENTS Bendix-Marine CONTROLS

MARINE DIVISION, BENDIX AVIATION CORPORATION
NORWOOD, MASSACHUSETTS

PRODUCT OF Bendix AVIATION CORPORATION

*TRADEMARK

APL Officials Returning

for the Big Job Ahead

Henry E. Frick, vice president in charge of new construction, American President Lines.

At right: Eugene D. Flaherty, general office manager, American President Lines.

Long time vice president and operating manager of American President Lines, **Henry E. Frick,** who was loaned to the War Shipping Administration for the period of the war, returns to the company on January 15. He will be vice president in charge of new construction. He has a big job ahead.

For his outstanding job as commanding officer of the Armed Guard Center (Pacific), **Eugene D. Flaherty** has been returned to inactive duty with both a commendation and a promotion to the rank of Captain. The letter of commendation was from Commodore R. W. Cary, who commands Treasure Island, home port for gun crews of all merchant ships in the Pacific.

Captain Flaherty took leave from APL at the beginning of the war to organize the Armed Guard Center and build it into one of the largest separate commands in the Navy—over 47,000 officers and men.

Captain Flaherty came to the West Coast in 1922 to become secretary to the late Senator W. G. McAdoo in Los Angeles. He came to San Francisco in 1938 when McAdoo became board chairman of American President Lines, and he was promoted to general office manager shortly before the war. During war years this post was one of those occupied by Gene Hoffman.

New Packing Service Announced for Pacific Coast

The France Packing Company, pioneer metal-packing manufacturers, have recently announced the appointment of John Cordes of Cordes Bros., San Francisco, as their sales representative. Simultaneously, they announced a new system of priorities in their plants which will give West Coast customers the same delivery as enjoyed by East and Gulf Coast ship operators.

In making the appointment, E. A. France, president of the firm, stated he "was impressed with John Cordes for his high integrity, his very broad experience, and his wide acquaintance. . . . We want to sell the prospects to whom our packing gives the greatest value for their dollar. That is the company's policy, and we feel John Cordes is best qualified to represent us to the trade in that light."

A new merger will soon make France Packing one of the largest of its kind in the country.

San Francisco Navy Base

The Navy Department announces that all naval installations in the general vicinity have been consolidated into a single administrative unit known as the San Francisco Navy Base, with a new flag officer in command.

Rear Admiral Mahlon S. Tisdale, USN, is commander, U. S. Naval Base, San Francisco. Headquarters of his staff are in the Ferry Building, while Admiral Tisdale's office is Mare Island.

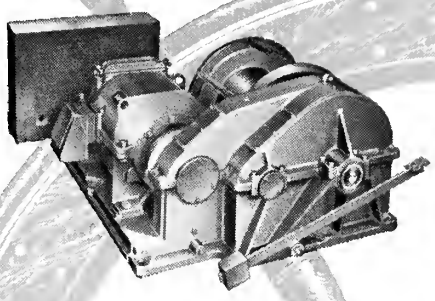
In command of the Mare Island yard is Rear Admiral Grover C. Klein, USN, commander of Naval Shipyard, Mare Island.

San Francisco Naval Base includes 24 Bay Area activities under the command of the district commandant, Rear Admiral Carleton H. Wright, USN.

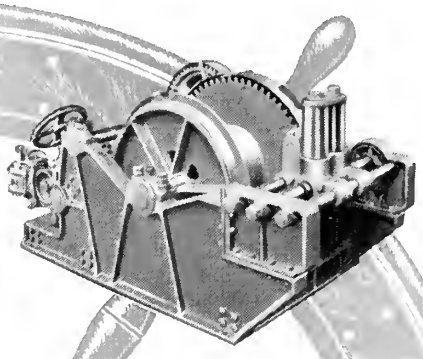
New Helmsman At Penn Maritime Academy

A popular Pacific Coast maritime skipper, Commander Bennett M. Dodson, USNR, has recently taken over the supervision of the Pennsylvania Maritime Academy. Prior to coming to PMA he was foreign supervisor for the U. S. Merchant Marine Cadet Corps in the Pacific Area.

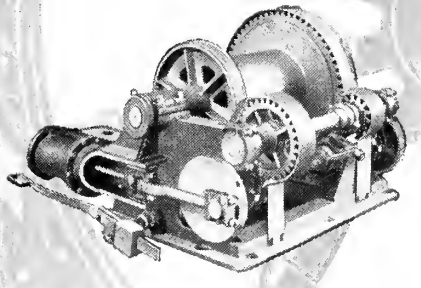
1946 Æ Winches now better than ever



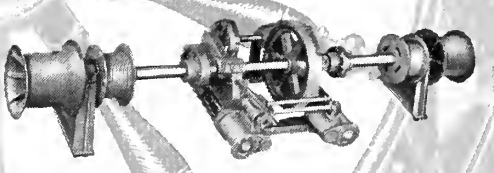
ELECTRIC CARGO WINCH—Single drum, compound geared, one or two mechanical speeds. Built right or left hand with one or two winch heads on close up or extended shafts. Gears totally enclosed.



ELECTRIC TOWING OR MOORING WINCH For towing barges or other vessels at a fixed distance. Single drum, single speed, non-automatic. Non-chafing rollers. Powerful brake bond. Two speeds also available.



STEAM CARGO WINCH—Single drum, compound geared. One or two mechanical speeds. Built right or left hand. One or two winch heads mounted close up or on supported shaft extensions.



STEAM WARPING WINCH—Single or compound geared. Large warping heads on extended shafts or close up . . . Grooved drums for auxiliary steering if desired. Center drum can be incorporated.

Ask about quiet, compact electric types for passenger and passenger-cargo service

Æ winches were always characterized by extreme care in design and manufacture. Now Æ winches are available of Meehanite construction, resulting in stronger, denser, more uniform parts. Consult us for full details of the improved Æ winches.

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AMERICAN ENGINEERING COMPANY

2450 ARAMINGO AVENUE • PHILADELPHIA 25, PA.

Pacific Coast Representative: Hough & Egbert, Inc., Robert Dollar Building, San Francisco, Cal.
Gulf Coast Representative: Sintes Sales Engineers, 332 So. Diamond Street, New Orleans 13, La.

OAKLAND CONSTRUCTION OFFICE CONSOLIDATIONS

The Hull Technical Section of the Oakland construction office of the U. S. Maritime Commission supersedes the Hull Plan and Approval Section in respect that the Allowance List Section and Cost Review Section have been consolidated into the Hull Technical Section.

The same is true with the Engineering Technical Section. This section supersedes the Engineering Plan and Approval Sction, and consolidates the Machinery Plan and Approval Section and the Electrical Plan and Approval Section into the Engineering Technical Section.

Above: H. E. St. Clair, chief of the Hull Technical Section, Oakland Construction Office, U. S. Maritime Commission.
At right: E. L. Swain, chief of the Engineering Technical Section, Oakland Construction Office, U. S. Maritime Commission.

Heads Army Transportation

Major General Edmond Harrison Leavey, U.S.A., has been appointed Chief of Transportation, succeeding Major General C. P. Gross, retired. He assumed his new command on December 1.

General Leavey returns to the United States after nearly four years of continuous overseas service during which he displayed outstanding logistical skill in both the European and Pacific theaters.

General Leavey accepted the surrender of Japanese forces in the Philippines from General Tomoyuki Yamashita and Vice Admiral Denhici Okochi for General MacArthur, while he was Deputy Commander and Chief of Staff of U. S. Army Forces in the Western Pacific, with headquarters in Manila. He held this post from May, 1945, until November, when he received his new appointment as Chief of Transportation.

As the Chief of Transportation, General Leavey commands all the Army's ports of embarkation, transportation zones, holding & reconsignment points, depots and other fixed installations. The fleet of Army transports, plus others allocated to the War Department by the War Shipping Administration, come under his direction.

Major General Edmond Harrison Leavey, who on December 1, succeeded Maj. Gen. C. P. Gross (retired) as the Army's Chief of Transportation.

Marine Exchange Elects Officers

H. H. Pierson, Pacific Coast manager of the De la Rama Steamship Company, Inc., has been elected president of the Marine Exchange of the Port of San Francisco for the year 1946.

Other officers elected are John Parker, American Marine Paint Co., first vice president; A. E. Kihn, Standard Oil Co. of California, second vice president; Joseph A. Moore, Jr., Moore Drydock Co., third vice president; J. Harding Jensen, Matson Navigation Co., treasurer.

In the recent balloting to select members of the executive committee of the Exchange for the years 1946 and 1947, there were elected W. J. Bush, J. Harding Jensen, A. E. Kihn, L. A. Lunny, H. N. Middleton and J. A. Moore, Jr.

Members continuing to serve on the executive committee during 1946 are L. P. Bailey, W. F. Minehan, John Parker, H. H. Pierson and Roy C. Ward.

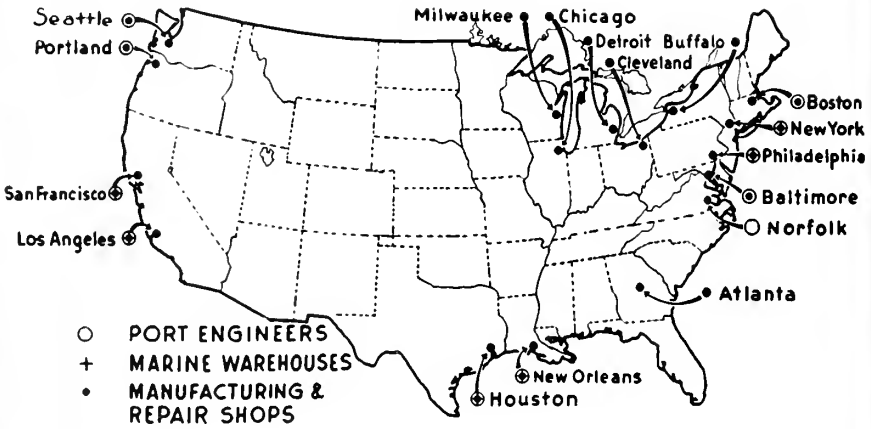
Westinghouse Merchant Marine Service Plan

With the expansion of world trade, the American Merchant Marine will need strategically located service stations at major ports, with engineers and warehouses stocked of spare parts.

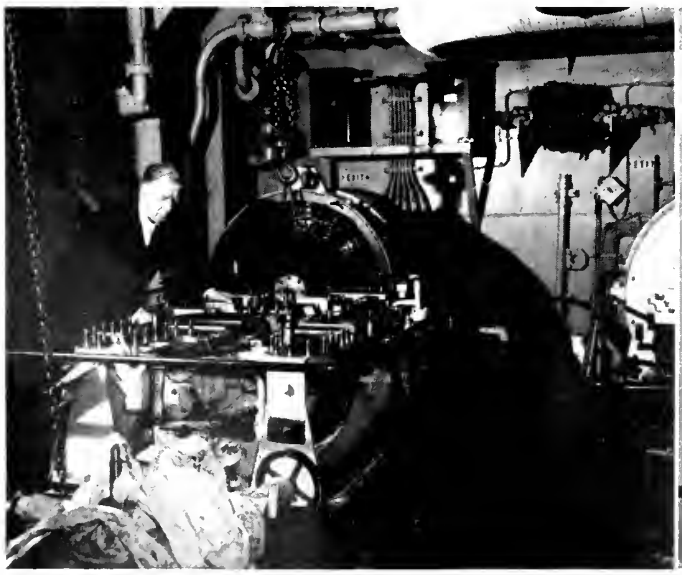
Westinghouse Electric Corporation has provided a plan with port engineers, warehouse stocks of replacement parts and equipment, competent service, repair engineering and shop personnel; and well-equipped repair shops, in each port as shown on the map.

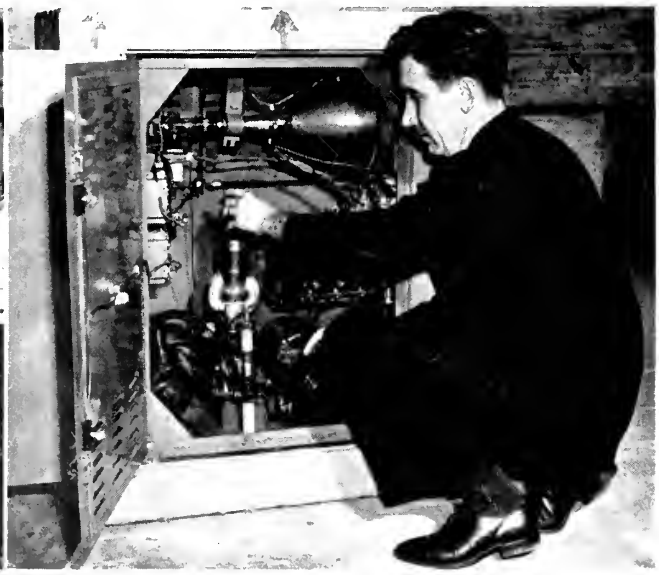
John Baer, part engineer at Las Angeles, is shown inspecting brushes on a 3300-hp main motor abaard an APA-type Navy transpart.

Above: C. D. Singer, part engineer at Seattle, Wash., is pictured inspecting the generator end of a 300-kw Westinghause turbine-generator abaard a Victary ship in Puget Saund.

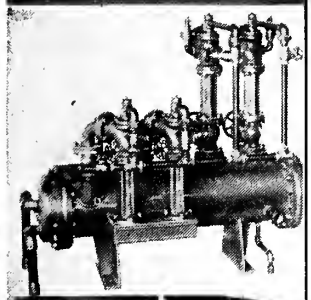


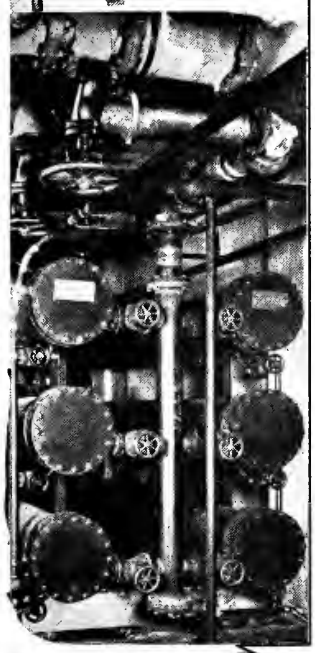
Westinghause Marine Service map showing lacation af Port Engineers, Marine Warehouses and District Manufacturing and Repair Shops canvenient for marine work.

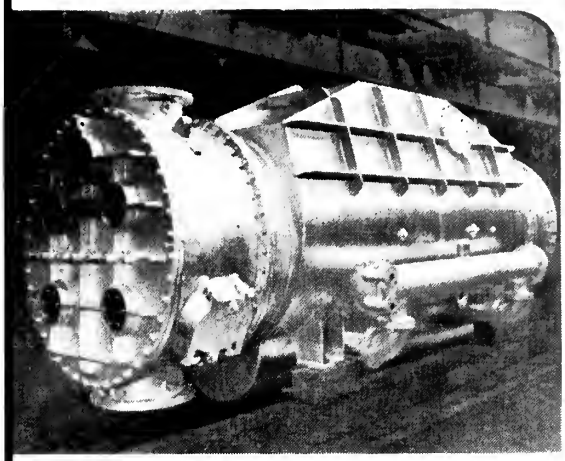


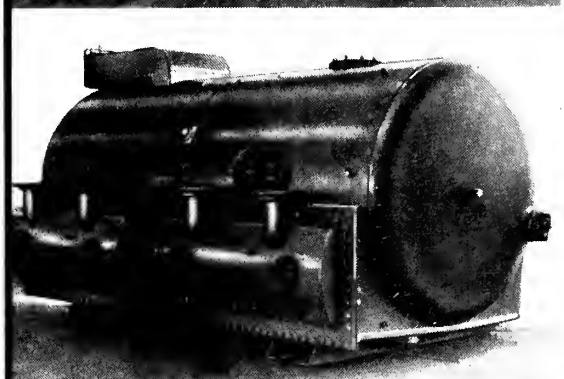


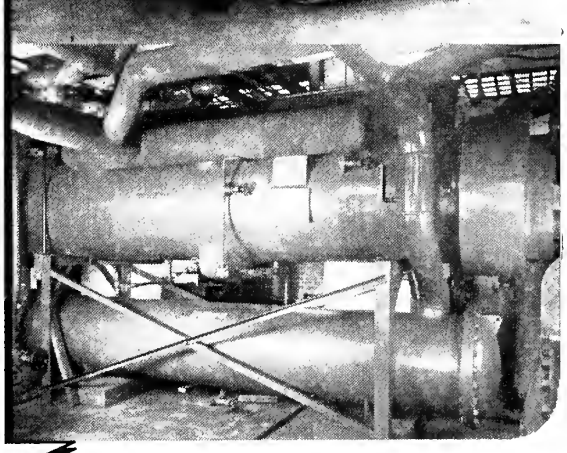
Henry Andrews, abave left, part engineer for the Marine Division at Portland, Oregan, is inspecting the internal canditian af a 300-kw turbo-generator on the SS Berry Victary. At right, William N. Harnberger, port engineer at San Francisco, is adjusting a surge tester used ta check coils an large marine electric matars.











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Conseco maintains a highly-trained service organization equipped with special tools developed by us to save time, labor and material, ready for action any time of day or night. Condensers, lube oil coolers and other heat exchange equipment are retubed or repaired in the shortest possible time. Years of intensive specialization in retubing work assures best results at lowest cost. Tube sheets, tubes, ferrules, metallic, fibre or corset lace packing, and other necessary materials are always stocked, ready for instant shipment.

Conseco maintains the most modern facilities for calibrating and repairing instruments. Other services include lead coating to increase service life of copper main injection pipe and circulating pump housings, and metallizing to build up worn or broken parts.

The keynote of our service organization is dependable, accurate, *FAST* service performed by competent, properly equipped men working under qualified engineering supervision. Why wait for an emergency? Write for details of our service now .

DEPENDABLE ACCURATE *FAST*

A highly skilled, specially equipped service organization, ready for immediate action anywhere on the continent, backed by engineering and manufacturing facilities producing over 3,000,000 sq. ft. of heat exchangers annually.

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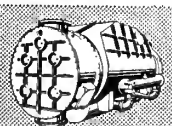
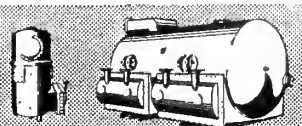
TERCO PRODUCTS CO. — *West Coast Representatives* — **941 Howard Street, San Francisco 3, Calif.**





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TUBE CLEANING GUNS AND PLUGS
AIR AND EROSION ELIMINATORS
BEVEL GEAR UNIVERSAL JOINTS
STRAINERS, GREASE EXTRACTORS
WIZARD INJECTORS, FILTERS

Shoreside Personalities

Ex-Servicemen Back in Shipping

Al Gatove, former Major in the U. S. Army with the Transportation Corps, has joined the Allocations Division of the War Shipping Administration. Major Gatove was formerly operating manager at Los Angeles Harbor for the Interocean Steamship Corporation.

Another ex-service man returned to the shipping fold recently when Lieutenant-Commander James A. Sullivan, USNR, rejoined the Balfour, Guthrie & Co., Limited, in his former position as manager of the steamship department.

Sullivan was attached to the Port Director's staff at San Pedro, Bermuda and the Canal Zone during the three and a half years he was in the service.

Re-election of John M. Franklin as president has been announced by the United States Lines Co. Mr. Franklin, who held the rank of brigadier general, was recently discharged from the Army where he was in charge of the troop transport division of the Army Transportation Service. After serving as president of the line during the war, Basil Harris has been named chairman of the board.

Major General John M. Franklin, re-elected president, United States Lines Company.

NEWLY APPOINTED EXECUTIVE SECRETARY

Of the Pacific American Tank-Ship Association is Charles H. Robertson. After 25 years with Standard Oil of California, and four war years battling the oil complications in Washington, Mr. Robertson has taken on new problems in the tanker industry. The Association and the industry in general will be well served.

The American-Hawaiian welcomes back Joseph F. Blackett, who returns to his former position the first of January after serving as chief clerk in the operations department of the War Shipping Administration.

Appointment of Allen C. Brown, former Major in the Army Transport Service, as assistant freight traffic manager, has been announced by M. F. Cropley, Matson Navigation Company traffic manager. He succeeds Eugene H. Hurst, who recently retired due to ill health.

Brown, who is a native of Honolulu, worked closely with Matson during the war in coordinating cargo shipments between the Pacific Coast and Hawaii, serving as a liaison officer for the War Shipping Administration.

After four years of Army service, Colonel H. E. Nicholl has rejoined the American-Hawaiian Steamship Company as assistant in Intercoastal WSA service. He will assist A. E. Stow, operating manager.

Colonel Jack A. Fraser, who served served during the war in the Transportation Corps, has joined the marine claims staff of Fireman's Fund Insurance Company in San Francisco. Before entering the Army, Fraser was district manager of the American-Hawaiian Steamship Company at Baltimore, and he was general claim agent for the same line in San Francisco before moving to the East Coast.

After three and a half years of service as traffic manager, handling embarkations for the Army Transport Corps at Fort Mason, San Francisco, **R. G. Dinwoodie** returns to the civilian transportation field as district passenger agent for the American President Lines. He will represent the APL in Southern California, Arizona and New Mexico, reporting to Ronald M. De Long, general passenger agent, Los Angeles.

Another ex-service man to come back to the shipping fraternity is Lieutenant Colonel Leonard Formosa who, after four years of service, has returned to the American-Hawaiian Steamship Company as general freight agent.

Allen H. Jones has joined the Jones Stevedoring Company and Western Freight Handlers, Inc., as vice president following his discharge

from the Army Air Forces where he held the rank of major. Allen is the son of W. Ernest Jones, president of Jones Stevedoring and Western Freight, and the brother of Capt. Gordon Jones and Ernest Jones, Jr., vice presidents of the companies.

After completing special training in the Military Government School, George Latham, former general passenger agent for the Japanese Mail Line in Los Angeles and more lately an Army Captain, has shipped overseas to Japan for duty in the civil affairs division of the occupational forces.

Captain Latham served as Transportation Officer in both Denver and Omaha.

Book Review

Marine Electricians' Library

By J. M. Dodds

In three volumes with a total of 1316 pages 5¼ x 8¼, hundreds of illustrations, tables, and diagrams; bound in red buckram with black and gold stampings; published by McGraw-Hill Book Company, Inc., New York. Price, Volume I, $3.00; Volume II, $4.00; Volume III, $4.00.

This is a very fine piece of compilation by the author and of bookmaking by the publisher. Mr. Dodds is a field engineer of the Pacific District Engineering Division of the General Electric Company and has specialized in recent years on marine applications and installations. He has worked into this library of three volumes the answers to the questions that have been raised by his experience in the marine field, also by his experience as an instructor in the wartime courses given for training marine electricians and the operators of marine electrical power plants.

The result is a library that will, we are sure, prove indispensable not only to the marine electrician but also to any electrical engineer whose work in any way includes the marine field.

Volume I reviews mathematics, physics, mechanics, and electric theory as they apply to marine installations; treats the application and installation of shipboard cable; and discusses communication circuits and devices.

Volume II covers the general subject "Electric Power Sources in Marine Service." Its seven sections treat: the electric machine; the alternating current generator; the direct current generator; the storage battery; controlling and protective devices; switchboards and meters; and installation kinks.

Volume III treats the topic "Electric Power Uses in Marine Service." There are six sections covering: a.c. motors and control; d.c. motors and control; analysis of control circuits; light sources; electric propulsion of ships; and maintenance.

Godfrey Macdonald,
Passenger Traffic Manager,
Grace Line, Inc.

Grace Line Appoints New Passenger Head

Officials of Grace Line, Inc., recently announced the appointment of Godfrey Macdonald as passenger traffic manager. Mr. Macdonald received his promotion after eight years as assistant passenger traffic manager. He has been in the inter-American travel and trade with various Grace interests for a total of 23 years, after leaving Princeton in 1922. Since 1930, he has been associated with the Grace Line, and has been district manager of the company's Philadelphia office, and freight traffic manager of the intercoastal service, which was discontinued in 1938.

Elliott Names New Products Manager

The appointment of **Bingham H. Van Dyke** as manager of the New Products Department has been announced by the Elliott Company, Jeannette, Pa.

Previously assistant to the director of Research and Development, Van Dyke came to the Elliott Company from the War Production Board where he was deputy chief of the Heat Exchanger and Pressure Vessel Branch.

Educated at Cornell University and the University of Pennsylvania, he was graduated from the latter in 1933 in chemical engineering. After graduation he was with the Atlantic Refining Company and The Griscom-Russel Company.

U. S. MARITIME COMMISSION NEWS CORNER

Max Kimball, WSA representative, awarding medal to Martin F. Horeni, assistant to Port Captain at Pacific Tankers, Inc.

Merchant Marine Citation to Two Men Aboard SS Juan Cabrillo

A recent addition to Pacific Tankers, Ltd., as assistant to the Port Captain, is Martin Franklin Horeni, former radio operator aboard the SS Juan Cabrillo, who was awarded a citation and medal for bravery by Admiral Emory Land. The citation said in part: "His courageous acts and utter disregard of personal safety in the face of possible death will be a lasting inspiration to all seamen of the United States Merchant Marine."

Chief Mate Jack Wilson presented medal on SS Kansan: The Merchant Marine Meritorious Service Medal, second highest award of the U. S. Maritime Commission to merchant seamen, was presented at Pier 26, December 18, 1945.

Wilson won the medal while serving aboard the SS Juan Cabrillo in the South Pacific. The freighter was discharging ammunition when a nearby ammunition dump exploded showering fire and shrapnel over the Juan Cabrillo and other nearby vessels. Wilson immediately took charge supervising the fire fighting and clearing his vessel from the pier to a safe anchorage.

WSA ACTS TO STABILIZE TANKER OPERATIONS

As the result of the United Maritime Executive Board's decision to return to American owners 300 tankers of more than 3000 gross tons that were under requisition by the WSA, more than 200 tankers already have been restored to private operation. Prospective voyage charterers of WSA-owned or controlled tanker tonnage must furnish the WSA Tanker Division by the fifteenth of each month with detailed statements of requirements for the following month's operation which cannot be supplied in the open market.

This will include certification that the open market has been thoroughly canvassed and found unable to supply suitable U. S. flag tonnage.

The WSA states that allocations will be for single voyages only, every effort being made to prevent employment of WSA tankers in commercial trades to the detriment of private tanker owners.

USMC Offers Surplus Small Craft

Twenty-five small vessels ranging from sea sleds to subchasers and motor launches which have been declared surplus by the Navy and Coast Guard will be sold under competitive sealed bids by the U. S. Maritime Commission in Washington, D. C. Bids will be opened December 21.

The boats range in size from three subchasers, 110 feet long, to a 35-foot Chris Craft cruiser. Two PT boats and two PT trainers are also included, the first of this type of vessel to be declared surplus and offered for sale. Six of the boats, a cabin cruiser, two Navy launches, and three rescue launches, are located in Los Angeles. A sea sled and six Navy launches are in Seattle. All are being offered on an "as is, where is" basis.

Prospective bidders may obtain invitations by applying to Acting District Manager, 220 Bush Street, San Francisco; Acting Director, 1488 Dexter Horton Bldg., Seattle 4; or to other district offices of the U. S. Maritime Commission.

Steel Barges For Sale

Two hundred and sixty-nine new surplus knockdown steel barges, part located at Lathrop and Yermo, California, and Auburn, Washington, are to be sold by the U. S. Maritime Commission. The barges originally cost the War Department $9,119,000. They are prefabricated, crated and ready to assemble upon delivery. All parts have been marked, and complete blueprints for rapid and simplified assembly are included with each unit. All have been constructed of the best materials under rigid Army inspection and specifications.

Permission to inspect and complete information concerning equipment, specifications, and selling price may be obtained upon application to the Materials Disposal Section, U. S. Maritime Commission, Washington 25, D. C.

New Idustrial Relations Section at Socony-Vacuum

Establishment of an industrial relations section in the Marine Operating Division was announced by the Socony-Vacuum Oil Company, Inc.

Arthur M. Dodge, who is returning to Socony-Vacuum after serving throughout the war in the Coast Guard, will do liaison work with the inland fleet, and **Edward S. Bischoff,** who served for some time as a ship's officer, will act as contact man between the deep sea fleet and the industrial relations section.

J. H. Cox is the newly appointed Engineering Manager.

Westinghouse Engineering Manager at Emeryville Plant

J. H. Cox has been appointed engineering manager for the Westinghouse Electric Corporation's Pacific Coast Manufacturing and Repair Division, with headquarters at Emeryville, California. This announcement was made recently by P. L. Lenz, the division's district manager.

Mr. Cox joined the company in 1923 as a service engineer in New York, later being transferred to the General Engineering Department at the company's East Pittsburgh plant. There he was engaged primarily in lighting, and research investigation of transmission lines and transformers. From 1930 and until his recent transfer to Emeryville, he had been acting as manager of the mercury arc rectifier engineering section in the Transportation and Generator Division.

A native of Nebraska, Mr. Cox received his engineering training at the Massachusetts Institute of Technology, graduating in 1923. A Tau Beta Pi at M. I. T., he received an award in 1926 from the American Institute of Electrical Engineers for the best first paper.

D. E. M. A. Elects

E. J. Schwanhausser, vice president of Worthington Pump & Machinery Corporation, was elected president of Diesel Engine Manufacturers Association at the annual meeting, held December 11 in Chicago.

Gordon Lefebvre, president of Cooper - Bessemer Corporation, and J. E. Peterson, vice president of General Machinery Corporation, were elected vice presidents of D.E.M.A.

Reelected as Treasurer was Robert H. Morse, Jr., vice president and general manager of Fairbanks, Morse & Co.

Harvey T. Hill, executive director of the Association, was likewise reelected to serve through 1946.

New directors are: A. W. McKinney, vice president of National Supply Co., and G. F. Twist, vice president and general manager of Atlas Imperial Diesel Engine Co. Continuing on the Board are: George W. Codrington, vice president of General Motors; Charles E. Brinley, chairman of the Board, Baldwin Locomotive Works; Robert E. Friend, president of Nordberg Mfg. Co.; Norris H. Schwenk, president of Busch-Sulzer Bros. — Diesel Engine Co.; Mr. Schwanhausser, Mr. Morse and Mr. Lefebvre.

Knoll Joins McGee

George Knoll, who was recently released from the Navy, has become associated with the San Francisco office of Wm. H. McGee & Co. as an underwriter.

Mr. Knoll has a fine background for his new position. He started his insurance career nineteen years ago with the ocean marine office of Union Insurance Society of Canton, Ltd.

When the Pacific National opened their marine department in 1937, Mr. Knoll went with them in their Home Office as an underwriter, and remained there until he joined the Navy in 1942.

New Manager Bendix Eclipse Plant

Appointment of Maurice P. Whitney as acting general manager of the Eclipse Machine division of Bendix Aviation Corporation is announced by Malcolm P. Ferguson, vice president and group executive of the corporation. Mr. Whitney, who has been chief engineer of the division, succeeds T. W. Tinkham, recently resigned.

The ship-supply firm of West, Elliott & Gordon—which has been inactive since the start of the war—will resume operations under the ownership of John West, son of the late James West, and **Raymond Flood**, son of the late James Flood, who for many years operated the firm of Flood Bros. in San Francisco. Flood was a Lieutenant-Commander in charge of naval activities at Port Hueneme, California, during the war.

West Coast Engineer to Handle the Davey Line

A veteran West Coast engineer, **S. Herbert Lanyon** of San Francisco, has been selected to handle the Davey Compressor Company's line of air compressors in the northern half of California, according to an announcement by Paul H. Davey, president of the firm at Kent, Ohio.

Mr. Lanyon's organization will be direct factory agents for the Davey concern and will supervise dealer activities in the area north of San Luis Obispo, Kern, Mono and Inyo counties. C. B. Smith, who has had considerable experience in the compressor field, will assist Lanyon.

A mechanical engineer by profession, Lanyon is prominent in the design, manufacture and installation of refractory structures. He also is active as a sales engineer, handling steam power plant equipment, industrial gas burners, oil refinery apparatus, chemical equipment and supplies, and, now, Davey air compressors.

Mr. Lanyon is located at 58 Sutter Street.

H. Norman Miller,
newly appointed Portland, Oregon, manager
for the Westinghouse Electric Corp.

Portland Resident Named New Manager

H. Norman Miller, electrical engineering graduate of Oregon State College and a member of the industrial sales staff of the Westinghouse Electric Corporation for the past 19 years, has been named manager for the company in the Portland area. Announcement of Mr. Miller's appointment was made by Chas. A. Dostal of San Francisco, vice president in charge of the company's Pacific Coast District.

As Portland manager, he will succeed L. G. Fear, who will act as the company's special representative in both the Seattle and Portland areas to better coordinate the expanding scope of all Westinghouse activities throughout the entire Pacific Northwest and Alaska.

Mr. Miller will have charge of affairs of the company in Portland and will direct the numerous Westinghouse men who are being assigned to more adequately serve the increasing fields of specialization, the result of the war's research in the needs of customers, in this important area. These fields include electronics, induction and dielectric heating, welding, communications and others.

A native of Maine and a Naval veteran of World War I, Mr. Miller joined Westinghouse as a graduate student at East Pittsburgh, Pa., in 1925, two years after receiving his electrical engineering degree at Oregon State.

Robert Digges

Marinship Executive Changes

In order to fill the administrative post held by William E. Waste, who has taken over duties as President of Bechtel-McCone Company, construction and engineering firm in San Francisco, Robert Digges, former administrative manager of Marinship Corporation for the past 3½ years, has been named General Manager. Suceeding Mr. Digges as administrative manager is William R. Ayers, who has been administrative engineer. K. K. Bechtel will continue as president of the corporation and Mr. Waste will remain a vice president and director.

Paul W. Eberhardt

Paul W. Eberhardt

The Board of Directors of Walter Kidde & Company, Inc., announced that Paul W. Eberhardt has been elected to the office of a vice president. His principal duties will include management of domestic sales of the company's fire-fighting equipment in aviation and general industry, together with general supervision of field selling activities.

Mr. Eberhardt joined the company in 1926 as manager of the Public Utility Department to assist in the development and sale of fire protection equipment for this field. In 1928, in recognition for the development of valuable markets, and wide customer goodwill, he was made manager of the Industrial Department (the Public Utilities Department being merged therein) and in the early part of 1944, Mr. Eberhardt was given in addition full responsibility for the activities of the field sales force. This latter field now covers all industrial and utility sales in the United States for Walter Kidde & Company.

Todd Delivers 1000th Vessel

The mark of 1000 ships completed during the wartime period by Todd Shipyards Corporation was reached November 28 with the delivery of the Raccoon Bend, a T-1 tanker of 4200 tons, to the Maritime Commission by Todd Houston Shipbuilding Corporation. The tonnage of these ships totals 6,183,600 deadweight.

The delivery of the Raccoon Bend brought to more than 115,000,000 deadweight tons, representing nearly 22,000 ships sent to sea by Todd Shipyards Corporation from December 7, 1941, to V-J Day.

Todd shipyards during the wartime period repaired and constructed virtually every type of vessel. Besides repair work, the corporation constructed destroyers, aircraft carriers, liberty ships and submarine and destroyer tenders.

J. Fraser Rea, head of Plastics Division, Western Fiberglas.

Personnel News at Western Fiberglas

Gayle R. Dutton, president, announced that **J. Fraser Rae,** former plastics instructor and consultant for the University of California, has joined the firm as chief of its Plastics Division. Besides his work for the University of California, Rae, who is a graduate of Scotland's famed Aberdeen University, has been special consultant on plastics for various technical schools, and for the U. S. Navy. He is a member of the Society of the Plastics Industry, and the author of numerous articles on plastics and their post-war applications.

E. O. Rapier, Western Fiberglas Supply Co.

Gayle R. Dutton announced further expansion of company personnel, with **Edmond O. Rapier** joining the firm in the capacity of Low Temperature Sales and Construction engineer. For the past 15 years Rapier has been engaged as sales and construction engineer of cold storage plants.

Sides to Head Todd Brooklyn Division

Andrew B. Sides, president of the Todd-affiliated New England Shipbuilding Corporation, has been appointed general manager of the Brooklyn division of Todd Shipyards Corporation, succeeding J. William Jamin.

Walter L. Green, vice president and general manager of the New England yard at South Portland, Me., will become operating manager of the Brooklyn plant, succeeding Henry F. Gelhaus. Mr. Jamin and Mr. Gelhaus assumed new duties effective January 1 in the corporation's peacetime plan of operations.

Dean P. Hunter, president, Port of Portland, Propeller Club.

Assistant Chief at Caterpillar

R. R. Robinson has been named assistant chief engineer in charge of engine design at Caterpillar Tractor Co., it is announced by G. E. Burks, chief engineer of the company.

Mr. Robinson joined Caterpillar in 1934 as an engineering apprentice of the college graduate training course after his graduation from the University of Nebraska.

Upon completion of his training in 1936 he joined the engineering department. He became supervisor of engine design and after serving in various positions throughout the department, was appointed general supervisor of the engine design division.

R. R. Rabinson, assistant chief engineer, in charge of Engine Design.

Portland Port Meeting

Frank Gillard of Portland, Oregon, speaking on behalf of the Portland Port, extended an invitation to hold the 1946 National Propeller Club meeting in that city. The invitation was supported by letters from the Governor of the State of Oregon, the Mayor of Portland, and the President of the Chamber of Commerce.

The Portland invitation was endorsed by delegates from Seattle, Tacoma, Los Angeles-Long Beach, San Francisco and Boston. President Gehan expressed the appreciation of the national organization for this warm invitation, and suggested that the matter be referred to the National Board of Governors or the Advisory Committee, with a decision to be made, depending on travel and other conditions, by March, 1946.

SAVERITE'S DISTRICT REPRESENTATIVE

A. K. Granrud, left, recently appointed district representative of Saverite Engineering Company, made a tour of the plant in Las Angeles. While on tour he greeted Fred M. Smith (right) of Lee Smith & Don, distributor for Saverite products in Eureka, California.

Rose Queen Sponsored Consolidated Steel Ship

The SS National Eagle, the fourth of a fleet of ten huge C-2 cargo vessels, was launched from Consolidated Steel's Wilmington shipyard December 21. The sponsor was Miss Patricia Auman, Queen of the 1946 Tournament of Roses. Master of ceremonies was Everett H. Seaver, assistant to the vice president of Consolidated Steel Corporation.

The SS National Eagle, together with her nine sister ships, are the largest vessels to be built at Consolidated's Wilmington yard.

These C-2's are 460 feet long, have a beam of 63 feet, and a molded depth of 40′ 6″.

NECROLOGY

The De Laval Separator Company announces with deep regret the death of Dr. Alan Estes Flowers, 69, on December 3. Dr. Flowers, for more than 20 years head of the Research and Development Department for the company, was highly regarded in engineering circles, and a member of several societies.

He was associated for many years with the leading electrical companies and was well known as a teacher. He served for five years as professor of electrical engineering at Ohio State University. He was an inventor, author and authority on many subjects, and his best-known writing is the chapter on centrifuges in the Chemical Engineers Handbook.

Dr. Alan Estes Flowers

C. Harold Wheeler, Jr., 63, vice president and general manager of the C. H. Wheeler Manufacturing Co., Philadelphia, passed away on November 24. Mr. Wheeler succeeded his father, who founded the firm, as general manager in 1923. He had pioneered many developments in the steam condenser industry.

He was a director of the National Bank of Germantown and Trust Co., a member of the Pennsylvania Advisory Board of American Mutual Liability Insurance Co., the American Society of Mechanical Engineers, the Union League and the Whitemarsh Valley County Club, where he was one-time golf champion.

WESTINGHOUSE BRANCH AT TACOMA

Top: General view of offices and display floor at the new Westinghouse branch at Tacoma, located at 1930 Pacific Avenue.

Below: Group of guests and officials at the open house held an November 19.

WELL-KNOWN WATERFRONT PAINT SALESMEN

Left: Tom J. Surface, and (right) Frank D. Requa, Southern California salesmen for General Paint Corp.

T. J. Surface and Frank D. Requa, two Southern California marine salesmen for General Paint Corporation, are doing a fine paint-selling job along the waterfront in Wilmington.

Tom Surface came to the company in 1940, after completing a four-year hitch in the Navy. It was during his enlistment that he made up his mind to sell paint to the marine trade, stating that he would rather sell paint to the Navy than apply paint to the Navy's ships.

He worked his way up from the bottom to manager of the Wilmington branch, where he in cooperation with Frank Requa, have covered the waterfront, building trade and industrial accounts.

Frank D. Requa started in 1926 with the Bradley Wise Company, which was later absorbed by the General Paint Corporation in 1929. When he first came to the firm he was employed as chemist, later promoted to salesman, then branch manager, where he had charge of the Huntington Park branch for many years.

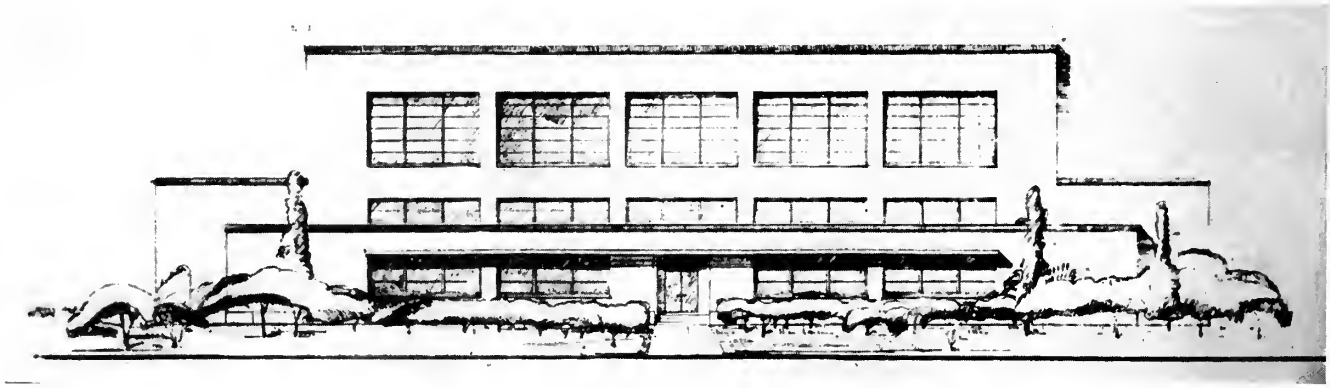
During the war, he was drafted back to the Lacquer Plant to keep this plant in operation, after the loss of so many key men to the Army. Now he is back on the waterfront in Wilmington, offering expert advice on paint problems.

Enters Chemical Engineering Firm

G. S. Myers, of the chemical engineering staff of Eshelman & Potter.

To the staff of Eshelman & Potter, combustion and chemical engineers, of Birmingham and Charlotte, N. C., comes G. S. Myers. As a member of the chemical engineering staff, Myers' work will involve both Hagan combustion control and Hall Laboratories water conditioning in Southern Areas, including the marine field. Myers is a graduate of Georgia Institute of Technology.

G. E. Plans Expansion at Anaheim



General Electric Company glyptal plant at Anaheim, California.

The General Electric Company plans to build an additional factory on the 12 acres of land they purchased some months ago in Anaheim, California. The new project, now in the designing stage, will be given over to the manufacture of Glyptal alkyd resins for paint base, and will operate as part of the G. E. Chemical Department's Resins and Insulation Materials Division.

Although at the same location, the new plant is in addition to the factory being designed for the plastics division of G. E. Chemical Department.

Both projects are part of the expansion that General Electric plans in anticipation of the vast increase in the industrial growth of the Pacific Coast region.

Admiral Bowen Honored

Honorary membership in the American Society of Mechanical Engineers was conferred upon Rear Admiral Harold Gardiner Bowen, USN, Chief of the Navy's Office of Research and Inventions. The highest award of the Society was granted specifically to the Admiral's daring and radical innovations in the application of high pressure, high temperature steam which resulted in decidedly changed construction of U. S. ships and naval power plants. New boiler designs which embodied super heat control, economizers, air casings and a capacity for 40 per cent overload were adopted.

Hot off the Press

Coolant Filter Bulletin

Cuno Engineering Corporation of Meriden, Conn., has just published a bulletin on its new Coolant-Klean filter, designed to remove abrasive and metallic particles from grinder coolant. It is a compact, replaceable-element type filter applicable to unit machines or centralized system. It may be applied to any type of grinder or any machine using a coolant or cutting oil.

Average cost of operation is reported to be a few cents a week. Installation is accomplished in about 15 minutes, because no alteration of the grinder is required and in most cases only two hose connections are needed. The filter does not require extra pumps, electrical work, plumbing, valves, by-passes, or filter aid.

De Laval Steam Turbine Co. have published a booklet entitled "Useful Shaft Data," which should be a great time saver for any one whose work involves determination of required shaft sizes. It includes tables, curves and formulas for computing torque, deflection angle of thrust, bending moment, and other factors in solid, hollow, keywayed and stepped shafts.

Bulletin W-204-B10 has been released by Worthington Pump and Machinery Corporation and covers their low level jet condensers mounted on horizontal single wet vacuum pumps, for steam engine, small turbine or process applications.

J. A. Zurn Mfg. Co. has published a 68-page illustrated catalog of its marine products. This book should serve as an authoritative reference text for marine designers and engineers, purchasing officials, shipbuilders and operating and maintenance mechanics.

"Schloemann Extrusion Presses" is the title of a folder from Schloemann Engineering Corporation. It illustrates the presses and shows samples of sections extruded by them.

"How to Get More Elevator in Less Space" is the title of a new Roto Drive bulletin announced by Sedgwick Machine Works. This bulletin explains how the Roto Drive operates and gives its advantages. Text and illustrations show why the elevators cannot overtravel and how they can be installed entirely within the trunkway without run-by zones penetrating valuable deck space.

Selby, Battersby & Co. have available a folder on their product, "Komul," a cold-applied, anti-corrosive coating, which locks moisture out, resists acids, alkalies, gasoline, oils and greases, and seals concrete tanks.

Catalog M-6, covering "Varec" approved marine equipment, is a 64-page recent release of The Vapor Recovery Systems Company. The book is indexed alphabetically and numerically; contains diagrams of installations; sizes and dimensions; price lists; and approximate net and shipping weights.

"Bestco Tackle Blocks," catalog #45, published by the Bestco Mfg. Corp., contains the latest list prices and descriptions of the various sizes of tackle blocks manufactured by that firm, one of the best equipped block manufacturing plants in the West. During the war period production was 100 per cent for the Maritime Commission, War Shipping Administration, and the U. S. Army and Navy. Now the plant is ready for service to industry.

Catalog 452, a new bulletin describing industrial machinery, castings, mining machinery, marine winches, and specialized industrial products, has just been issued by Lake Shore Engineering Company. It shows the wide range of the company's products from tourist camp stoves to 15-ton castings, and also the company's facilities for manufacturing products on contract or building special equipment.

Wilber & Son have released a new 1945 catalog of Wilco life preservers and sleeping bags. Some of the items may not be immediately available, due to the heavy demands made by the war, but all of them should be within a reasonable length of time. The catalog contains a list of life-saving devices for pleasure craft and commercial vessels and gives the Government requirements.

Hot Off the Press

Ideal Commutator Dresser Co. has available a 36-page booklet featuring motor-generators maintenance and repair equipment for reconditioning war-weary machinery. It has sections devoted to commutator care, troubles and remedies; resurfacers; precision grinders; mica undercutters; commutator saws and milling cutters; coil winder drives and heads; and many other phases. The specifications are comprehensive and the booklet is fully indexed.

American Flexible Coupling Co. has published a folder on its couplings covering engineering data, construction features, lead factors, and dimensions and maximum bores.

Victor Equipment Company has published a 34-page booklet, in full color, covering its cutting torches and cutting attachments. It carries full specifications and price lists and is a very convenient and informative reference booklet. Also available is Form No. 1, entitled "Setting Up a Victor Welding or Cutting Unit." This is a 46-page, fully illustrated publication describing in simple language how to assemble a welding or cutting unit. The company has also published Bulletin W-2, which contains 32 pages of text and illustrations describing the Ampco-Trode Welding Technique.

Reliance Electric & Engineering Company recently published an instruction sheet (#3042) covering the grease lubrication of anti-friction bearings. The 4-page bulletin details construction, maintenance and lubrication recommendations for double-shielded ball, open ball and spherical roller bearing types.

"The Dillon Dynamometer" is the title of a folder from W. C. Dillon & Co., descriptive of their Model "AN," which speedily and accurately measures tensions or applied stresses.

Clipper Manufacturing Co. has prepared a practical index to cutting information for the operators of all Clipper masonry saws. The book is well illustrated and fully indexed and contains many helpful suggestions for masonry construction.

A 24-page illustrated booklet describing the many applications of the chemical melamine in the plastics, textile, paper, leather, chemical, paint and allied industries has been published by the American Cyanamid Company.

Rogers Machine Works, Inc., has recently released a catalog descriptive of the "Perfect 36" vertical turret mills. It contains the inside story, shows boring, turning, drilling and thread cutting set-ups, and illustrates the mills in operation.

A new 16-page illustrated catalog, No. 45, has been published by Shook Bronze Corporation, and covers ready-to-use bushings and machined bronze bars made of a special phosphorized bearing bronze. It lists over 800 stock sizes of machined bushings of this new bronze.

Hendy Series "50" is a 16-page booklet released by Joshua Hendy Iron Works, descriptive of their 350- to 675-hp marine diesels. The publication is generously illustrated, including a dimensional drawing as well as general specifications and chart of power rating curves.

"Remote Control Equipment" is a 40-page booklet published by Piezo Manufacturing Corp., which lists 108 different remote control gears, joints and accessories. It includes engineering drawings showing dimensions of equipment and technical data, also photographs of remote control units and accessories, and tabular data on sizes and specifications. It is a useful book to anyone interested in remote controls of valves, machinery or equipment in industrial and chemical plants, power stations or ships.

The De Laval Steam Turbine Company has available a new catalog, No. 1181, describing its complete line of steam turbines, helical gears, centrifugal pumps, centrifugal compressors, worm gear speed reducers, and IMO oil pumps.

"Marine Mufflers" is a four-page bulletin available from The Fluor Corporation, Ltd. It illustrates and describes the Fluor air-cooled muffler and its application on main propulsion engines and individual power units for such auxiliaries as driving pumps and generators; also its use to ventilate and heat engine rooms, other compartments, and pilot house.

Seven manuals to help foremen, supervisors and department heads solve employee relation problems during reconversion and post-war production are described in a catalog available from Elliott Service Company, Department M-28, 219 East 44th St., New York 17. A sample set of the booklets will be sent without charge to executives who are in charge of 15 or more supervisors, or their training, upon written request on their company letterhead.

Hot Off the Press

The Darcoid Company has published a folder on its Edgetallic gaskets. It contains lists of sizes, types, and prices, and covers the complete line of gaskets, which provide perfect seal against high pressures, high temperatures, steam, oil, gases and liquids.

A new 12-page booklet, entitled "Faster, Better Finishing of Metal, Plastic and Glass," describes the 3-M Wetordry Method of precision grinding and finishing at high speed. This booklet from Minnesota Mining and Manufacturing Company is generously illustrated, shows actual industrial applications, and explains how this method keeps operating heat at a minimum; eliminates distortion, discoloration and plastic flow; greatly increases the life of abrasive belts; and eliminates the hazard created by dust.

The effects of vibration on plants, equipment and personnel, and methods of controlling it, are explained in a new 12-page bulletin, "Vibration in Industry," published by The Korfund Company, Inc.

General Electric has available a folder covering its new semi-interference-type mechanical interlocks, a-c magnetic reversing starting, for full-voltage starting of squirrel cage induction motors.

YOURS FOR THE ASKING!

The manufacturers named in this HOT OFF THE PRESS department will gladly furnish, without obligation to you, copies of the trade literature reviewed in these pages. For quick service, please use this coupon.

PACIFIC MARINE REVIEW
500 Sansome Street - - - San Francisco

Send me this Trade Literature as mentioned in your.....edition:

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(Identify by name of manufacturer)

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BUSINESS.....

ADDRESS.....

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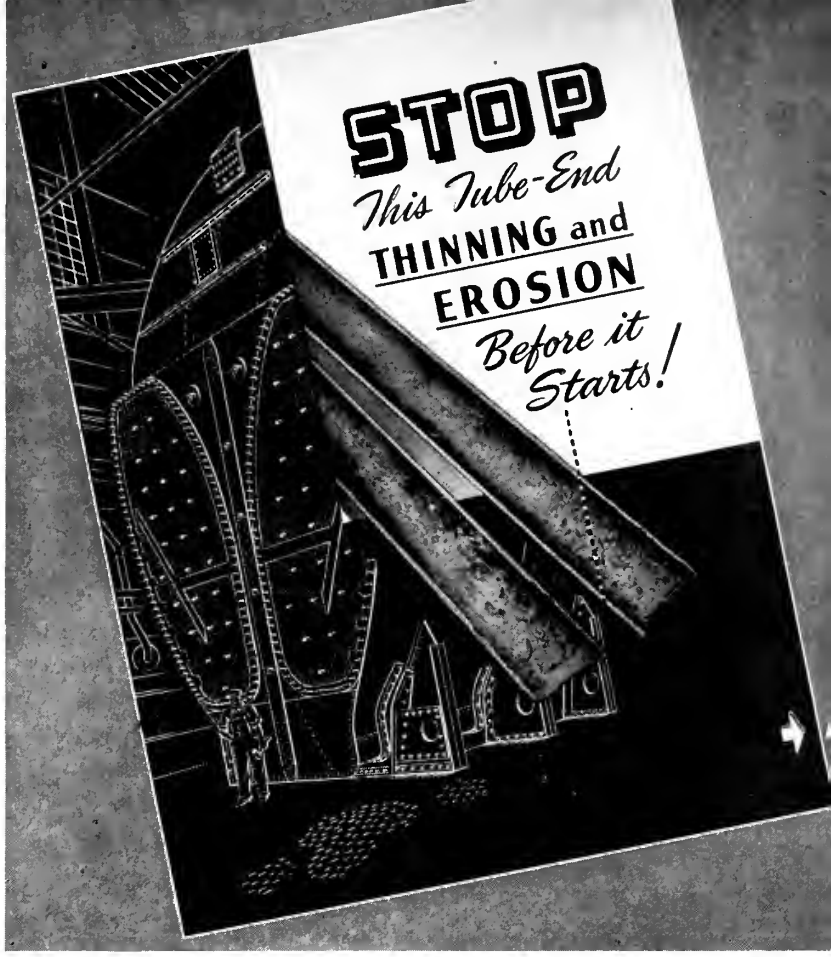
CONDENSER TUBE PROTECTORS: A new bulletin which completely describes the John Crane condenser tube protector has just been issued by Crane Packing Company, 1824 Cuyler Ave., Chicago 13. These protectors were developed after recognition of the fact that most tube failures due to thinning and erosion occur at the inlet ends of the tubes, as illustrated in the cut. The tube protector is made of a special plastic material, is highly resistant to abrasion, and armors the mouth and entrance section of the tube itself.

This bulletin is fully illustrated with typical installations and sectional views. Copies are available from the manufacturer on request.



EDCO ELECTRODES: An attractive new folder on Edco welding rods, with suggestions for their use on copper and bronze as well as on cast-iron and steel, or on combinations of these, has just been issued by Eccles & Davies Machinery Co., Inc., Los Angeles. Industrial consumers, and the welders themselves, will find useful tips in the folder's 16 pages.

Write to Eccles & Davies Machinery Co., Inc., 1910 Santa Fe Avenue, Los Angeles.

Hot Off the Press

The Deming Company recently published a 20-page illustrated booklet entitled "Facts You Should Know About Centrifugal Pumps and Impellers," applicable to all makes of centrifugal pumps. This publication might well be considered a textbook, and should be helpful to those who are directly involved in the application and selection of centrifugal pumps of all standard types.

B. F. Goodrich Company has available a broadside on its new Pressure-Sealing Zipper. It will be used on pressure ducts, dark room tents, sporting goods, footwear, luggage, weather seals and doorways. The seal will not let gases or liquids through, even under high pressures. This product has been going exclusively to the military, but it will probably be available for civilian use soon.

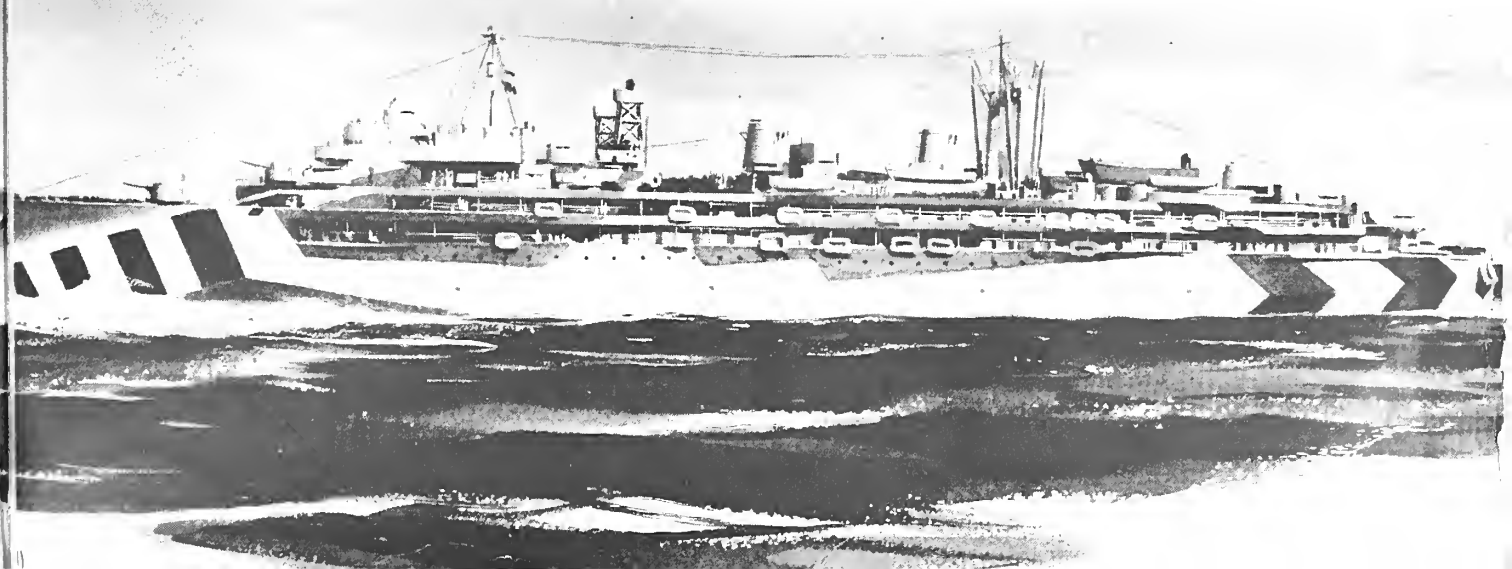
Also available is a new edition of the catalog on the properties of Ameripol D, an oil and heat resistant synthetic rubber. Properties of Ameripol are outlined in detail, and there is a page table giving the property relation of natural and various types of synthetic rubber, as well as a guide to determine where the use of Ameripol D is practical.

Pacific MARINE REVIEW

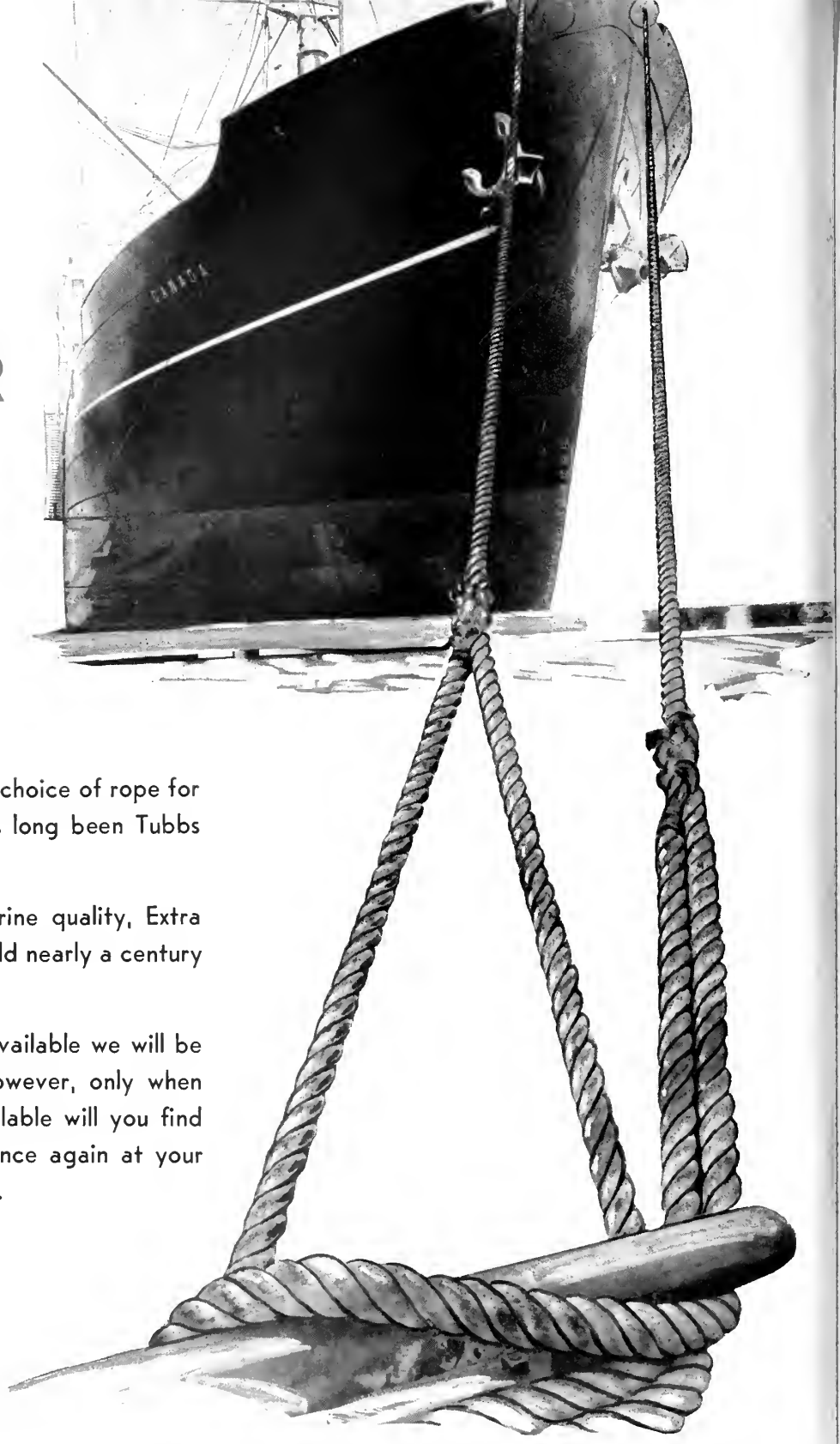
FEBRUARY · 1946

The Howard W. Gilmore, one of the latest additions to the Navy's fleet of submarine tenders. She's named for "Take 'er down" Gilmore, the noted submarine hero.

As with the other tenders of the fleet, the Gilmore carries 12,000 Diesel-Electric horsepower—power provided by engines built by the Cleveland Diesel Engine Division of General Motors.



WHEREVER THEY TIE UP



In every port of the Pacific, the definite choice of rope for dependability and ease of handling has long been Tubbs Extra Superior Manila.

Made to the highest standards of Marine quality, Extra Superior Manila brings to the Marine field nearly a century of "know how" in rope making.

As soon as Manila fiber is once more available we will be able to supply Manila rope again. However, only when the highest quality Manila fiber is available will you find the Extra Superior Manila trademark once again at your suppliers. It will pay you to watch for it.

TUBBS EXTRA SUPERIOR MANILA CORDAGE COMPANY

SOMETHING TO LOOK FORWARD TO—
THIS FAMOUS MARINE ROPE TRADEMARK

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Pacific MARINE REVIEW

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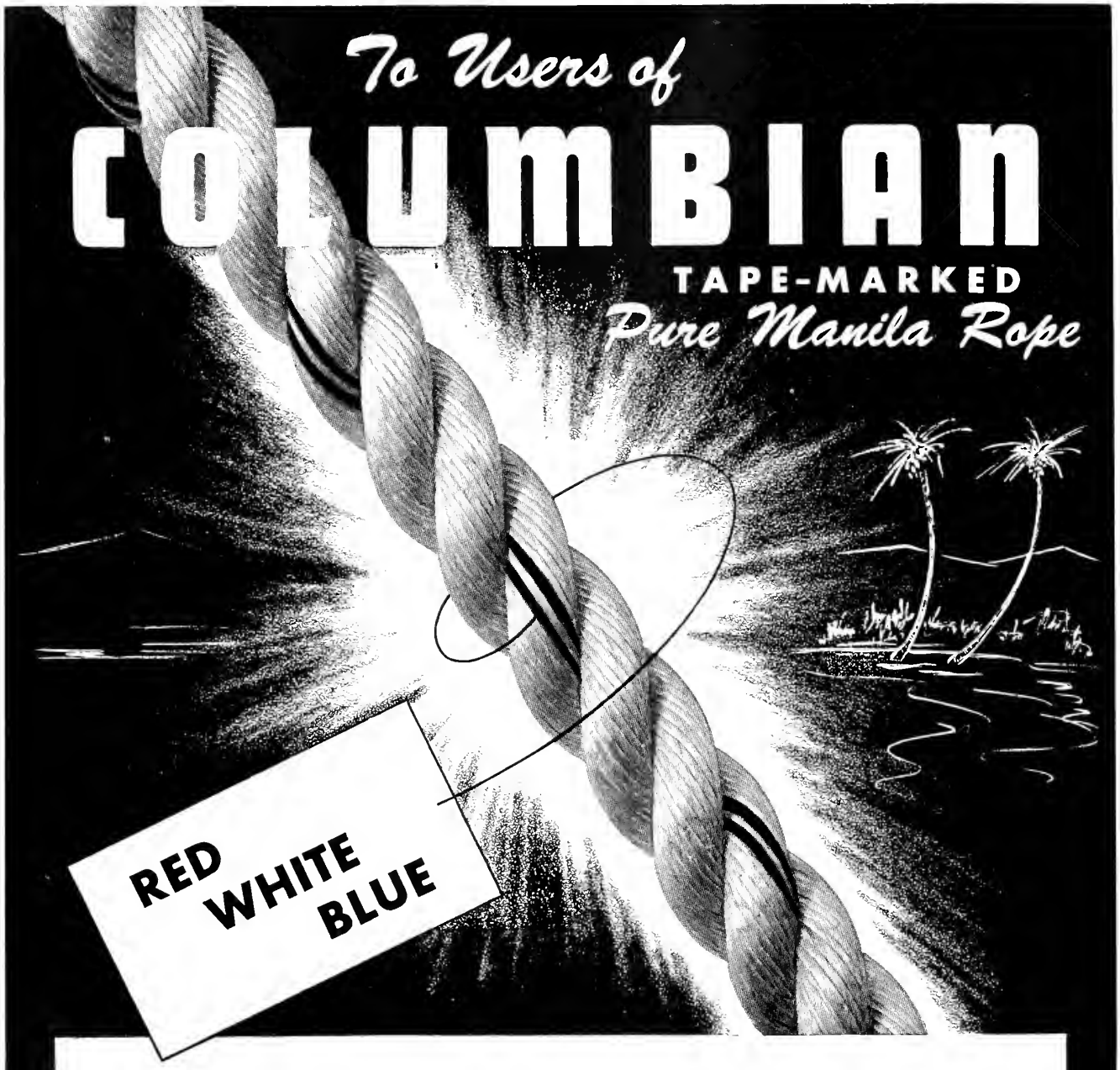


BEFORE the War, our own organization in the Philippines selected the pick of the crop of manila fibre. They bought, graded, and packed the fibre which was made into the famous COLUMBIAN TAPE-MARKED PURE MANILA ROPE. Naturally, the war destroyed that organization and its facilities as a working unit.

Today, we are busily rebuilding that organization and its facilities under the most extreme difficulties and Pure Manila fibre under the Columbian label will be among the early ship cargos of fibre from the Islands. We cannot now tell you just when this will occur nor how soon Columbian Tape-Marked Pure Manila Rope will again be available. We do want to assure our customers that we are bending every effort to hasten the day when it will be plentiful enough to supply the great need for a high-quality, completely dependable rope. We believe that that day is not far off!

COLUMBIAN ROPE COMPANY
400-90 Genesee St., Auburn, "The Cordage City," New York

New Passenger Ships—
Are Our Ports Keeping Pace?

Pacific MARINE REVIEW

In a current compilation by the National Federation of American Shipping, which represents about 95 per cent of all American steamship owners, 11 of the nation's largest steamship companies plan to obtain 89 new passenger and passenger-cargo combination ships of about 1,200,000 gross tons, estimated to cost between 400 and 500 million dollars.

Port passenger facilities will need much overhauling to match these new ships.

The 89 new vessels will have a total carrying capacity of 14,000 to 15,000 passengers, and speeds of from 16 to 30 knots against a pre-war range of 12 to 22 knots.

These vessels are in addition to 52 ships of nearly 500,000 gross tons and more than 12,500 passenger capacity which the same companies operated prior to the war and which are expected to be returned to service Nor do they include the ships of such companies as Matson whose pre-war vessels will be restored to them, but whose announcements of new acquisitions include cargo types only. The 11 lines whose programs have been announced are:

Grace Line, 9 vessels for South American routes
Moore McCormack, 5 vessels for South American and Scandinavian routes
United Fruit, 20 vessels for West Indies, South and Central American routes
Alcoa, 5 vessels for West Indies and South American routes
Agwi Lines, 5 vessels for West Indies routes
American Export Lines, 3 vessels for Mediterranean, Near East and North African routes
American President Lines, 19 vessels for Orient and round-the-world routes
Mississippi Shipping Co., 3 vessels for South American routes
American-South African Line, 8 vessels for South and East African routes
United States Lines, 6 vessels for Western Europe routes
American Mail Lines, 6 vessels for Orient routes

Passenger accommodations will be superlative in all classes, featuring innovations in design of furniture, lighting, and arrangement of interiors; air conditioning; telephones; glassed-in promenades; swimming pools, and all the results of years of careful planning. Improvements will be found in all passenger classes.

But there will be competition for the passenger trade. Airlines and railroads are also planning the best. And they are making their terminal facilities match their travel facilities. Every possible convenience is planned for the traveling public so the beginning and ending of a journey may not be unpleasant.

Seagoing passengers will not be so fortunate. They will find the same traffic-congested, hard-to-reach pier sheds, with cold, (or hot), drafty, comfortless waiting rooms. No pleasant surroundings, no ornamentation, no ordinary conveniences, often no telephones, no information services and sometimes no chairs. Recently a leading shipping executive estimated the cost of modernizing New York port in millions. The same could be said of San Francisco and many other ports. All ports require some improving.

There are extenuating circumstances, of course. The shipping industry has gone all-out for the war effort. In San Francisco, for instance, the pier facilities are owned by the State and rented out on 30 day leases. Other ports have other self-justification.

But the public must be pleased.

An airline company can announce prospective expansion in a city, and the city will go berserk to issue bonds to move main highways and build airports and appoint officials to divert traffic to the airline. **What do they do for the steamship line, which makes their city what it is?**

This is a challenge to an industry that has solved many problems. **It must solve this one too.**

Engineering Service to Customers

By George Barr

Marine Superintendent, General Electric Company, San Francisco

George Barr

George Barr, marine superintendent of the General Electric Company, has been very well known in the San Francisco Bay area for many years. A product of the River Clyde, he joined the company's Turbine Department in 1909 and has taken a prominent part in building, operating and repairing turbines ever since. He was transferred from Schenectady, N. Y., to San Francisco in 1918 to supervise installation of main propulsion machinery in 46 destroyers which were built at the Union Iron Works. His whole life's work has been in troining for the prodigious task he so aptly describes.

DURING THE RECENT shipbuilding campaign the amazing production of warships and merchant ships wrote a new chapter in the nation's history. This marvelous engineering feat was made possible by a number of factors which need not be enumerated, but behind it all was the dire necessity of self-preservation.

During the first world war the Government realized that the Allied nations would be defeated unless ships could be produced faster than they could be sunk, so they inaugurated a system of mass production, something that had never been attempted in the history of the trade. The design was frozen, contracts for machinery were distributed amongst the largest manufacturers in the country and the system worked to perfection.

The program laid out to meet the demand of World War II followed the old pattern, but on a much more comprehensive scale, as it was possible to take advantage of the improved technique in hull and machiery production which was developed in the years between.

The total output during the last four years was so enormous that there is nothing to compare it with, but the part played by some of the shipyards in the San Francisco Bay area may be used to gage the activities of other large shipbuilding centers, and now that the ships have been built and have fulfilled their most important mission, the story can be told without reservations and with a great deal of satisfaction.

In the San Francisco Bay area the General Electric Company furnished main propulsion machinery for 320 ships with an aggregate of 2,603,500 hp. They also furnished, for these ships, auxiliary turbine generators with a combined capacity of 134,350 kw. The auxiliaries alone could furnish enough power and light for a city of 70,000 inhabitants. The company also furnished experienced personnel to assist in the installation and testing of all this equipment.

After the first hundred ships were delivered the work became more or less routine, but from first to last the highest quality of workmanship was required and at no stage was the quality reduced to step up production. As evidence of this it may be interesting to note that one well-known shipyard in Oakland delivered 85 ships in a row the day after the sea trial and every ship made its official trial on schedule and without a single hitch.

As the war progressed San Francisco became headquarters of a vast fleet of ships, and wherever ships harbor, repairs must be made; so it was in this field where the most difficult and most essential part of General Electric's marine effort was expended.

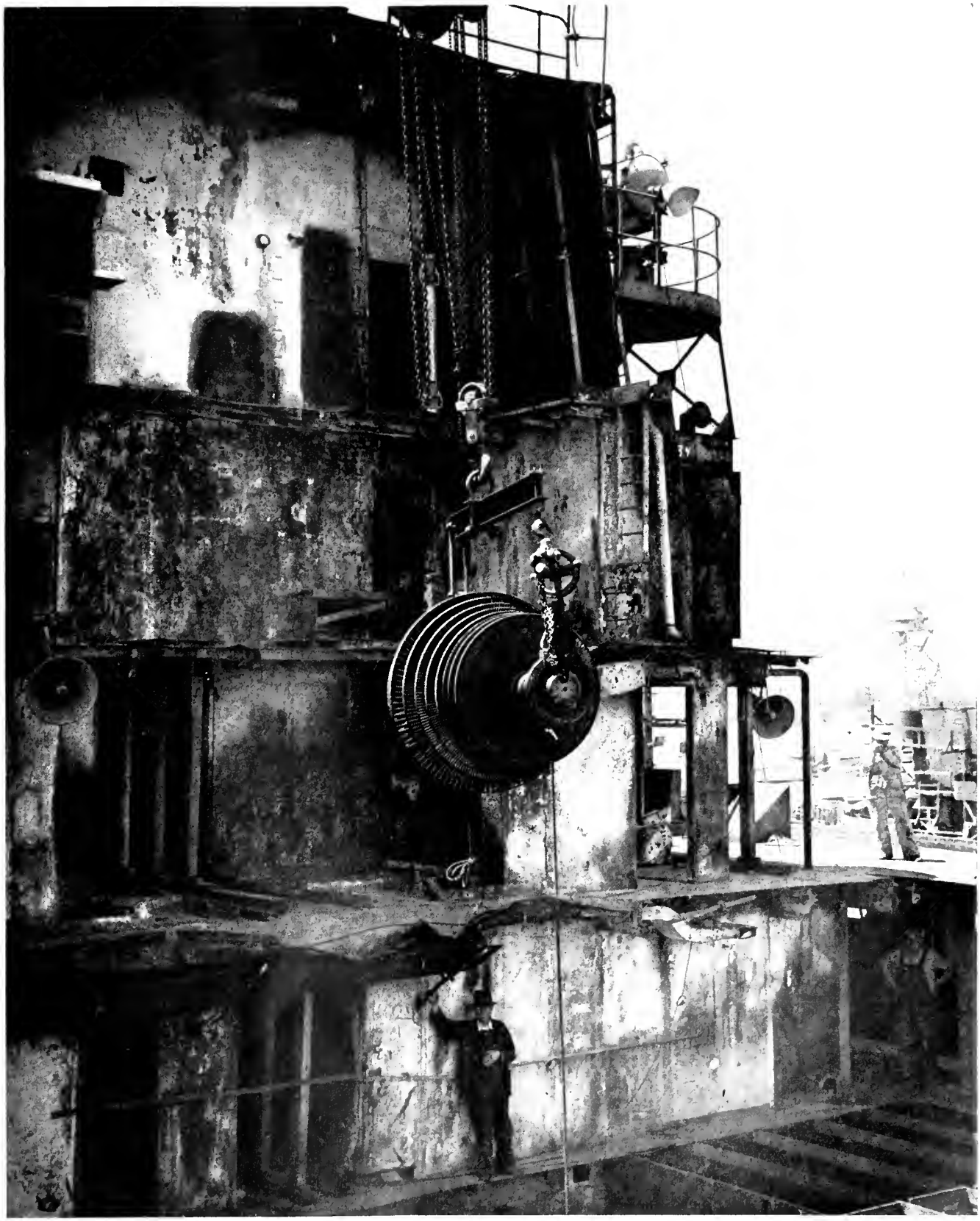
The growth of our repair work is plainly illustrated in the following table:

1942	4 vessels
1943	13 vessels
1944	221 vessels
1945	377 vessels

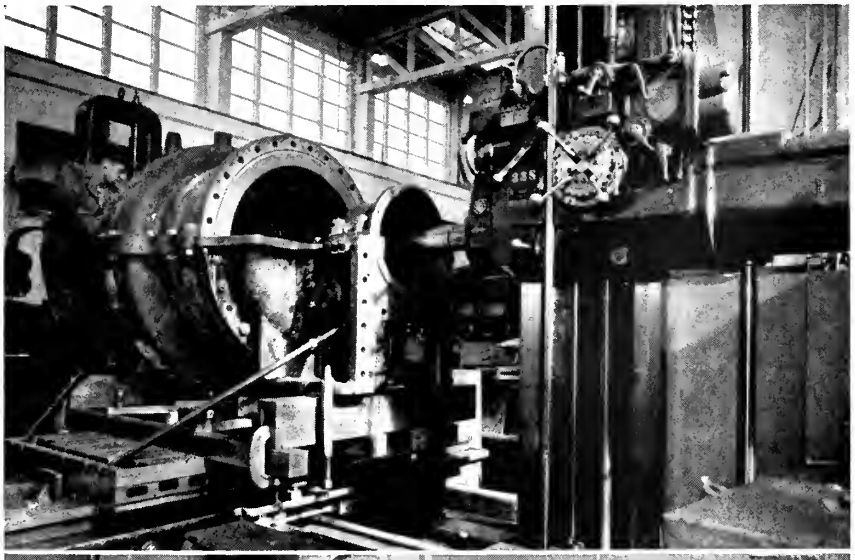
The largest list was in June, 1945, with 51 ships under repair.

This list included ships of all classes, from the largest airplane carrier to the most humble freighter, and the jobs varied all the way from a few days to a few months. The longest jobs were on battle-damaged ships, where in many cases the entire engine room was gutted.

Regardless of the huge output of new ships, the demand for bottoms was so great that at no time, before V.J. Day, were there enough to fill the demand, with the result that many an obsolete vessel was dragged from the graveyard and given new life. Some of these vessels were famous old passenger liners that circumnavigated the globe for 20 years without missing a beat. Necessity made it essential that these ships be salvaged, and so it was. They were not patched up as a temporary expedient, they were really overhauled from truck to keelson and from stem to stern, and after completion they equaled the speed and efficiency which they made on their acceptance trials 25 years ago. Furthermore, they carried thousands of troops to the far-flung battle line, and better still, they are bringing them home today and making the same fast turn-

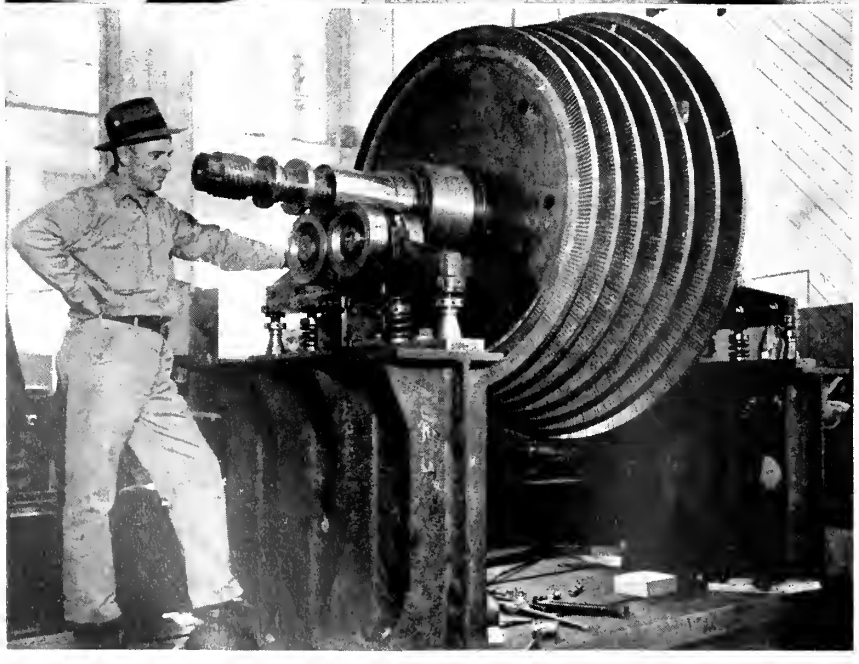


Low-pressure turbine rotor being removed from battle-damaged U.S.S. Pinkney—APH (Hospital). The ship was gravely damaged by kamikaze attack and repaired at General Engineering.



Twenty-five-yeor-old turbine casing being completely re-machined.

Complete sets of diaphragm and glond seal packing for old turbines.



Twenty-five-year-old turbine rotor being balanced on Akimoff balancer after repair.

around for which they were always famous.

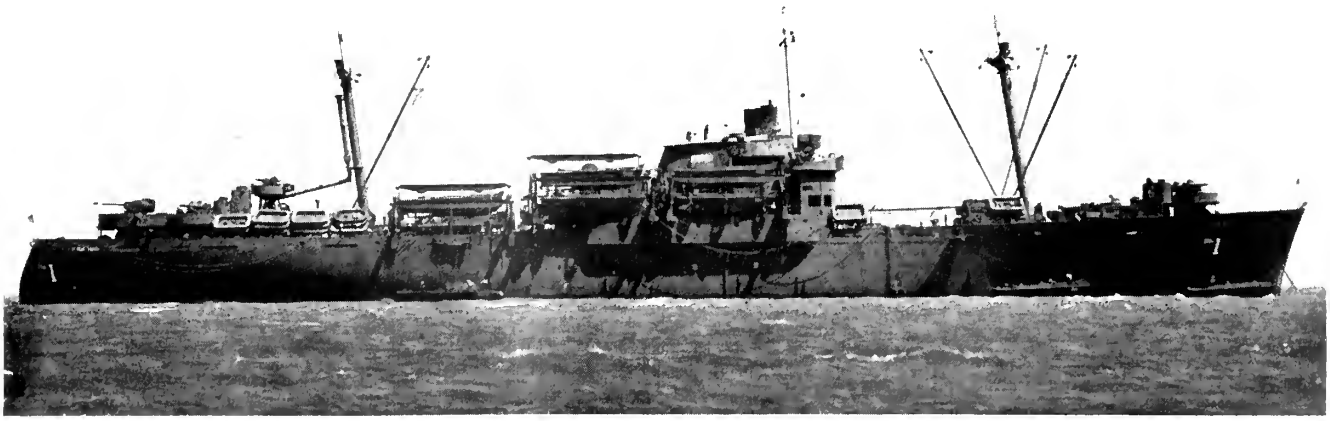
The story of one of these ships illustrates what is meant by the term, "Major engine repairs." This ship, originally christened after one of our most illustrious Presidents, but now rechristened and quite unrecognizable, came home to San Francisco to join the big parade of troopers, but her old turbines were not equal to the occasion; so, on account of the extreme importance of her mission, it was necessary to rebuild them. The job was secured by the General Engineering and Dry Dock Company, and the General Electric Company furnished an experienced turbine man to assist, although it so happened that the turbines were not of General Electric manufacture.

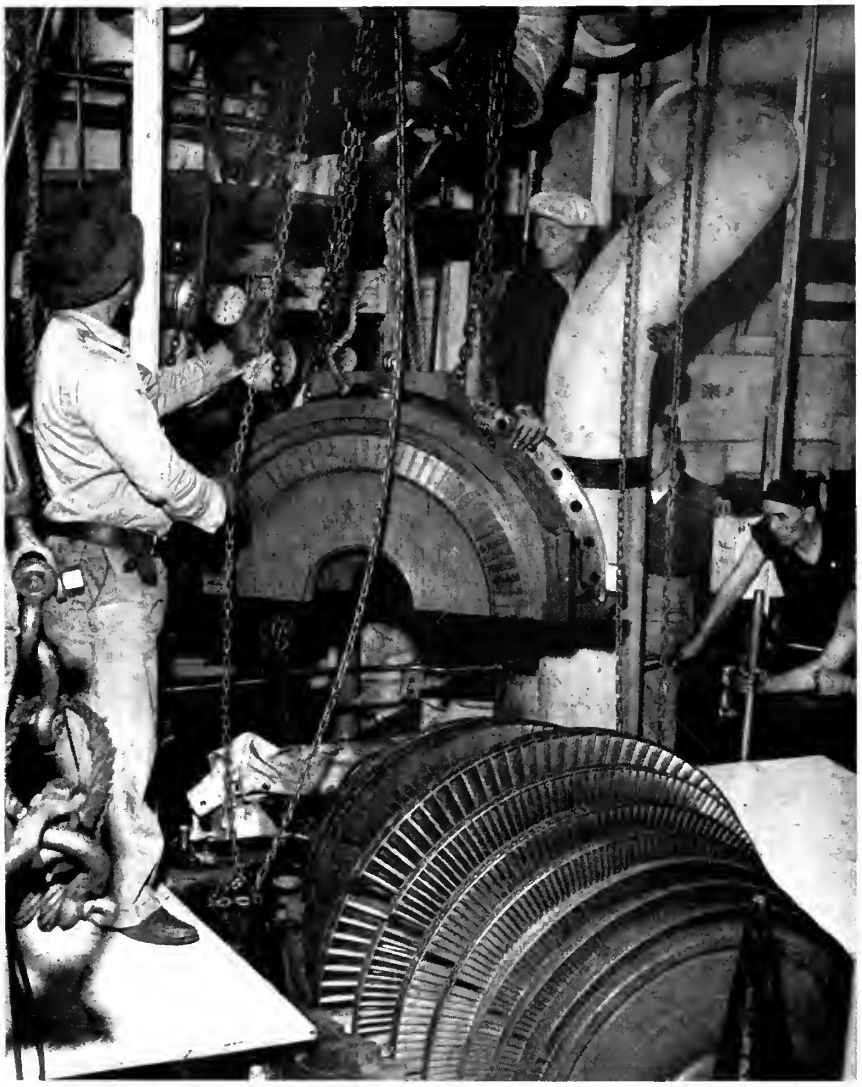
A list of the worn-out parts would make monotonous reading, but it is quite simple to list the parts that were usable — turbine casings, diaphragms and rotors. Everything else had to be replaced and no spares or renewal parts were in existence; they had to be made on the spot and from samples of the worn-out parts. The turbine castings had lost all traces of the original machined surfaces and natually their joints leaked enough steam to make the engine room unbearable, and the internal condition was so run-down that the turbines ate up steam and gave nothing in return; in other words, they were highly inefficient. The accompanying photographs show some of the detail parts in course of manufacture, but no picture or description can show the perseverance and the skill behind such an undertaking. The job consumed well over two months "working round the clock" and "round the calendar" as well, but the payoff was a set of engines that developed their normal rating at the original efficiency and turned up the same speed as they made on their acceptance trials 27 years before.

Complete set of flexible pin couplings manufactured for old turbines.

In the past the biggest bottleneck

APH 1, U.S.S. Tryan, at anchor in San Francisco Bay.





Reassembly of low pressure rotor after correction, U.S.S. Pinkney.

in this job was the lack of renewal parts, and this has always been the limiting feature in ship repair work. To do its part in rectifying this situation, General Electric has greatly expanded its marine warehouse and servicing facilities. As announced on September 1, 1945, over a million dollars was used for this purpose in New York and San Francisco alone. The expansion includes enlarged parts stocks, streamlined shop repair facilities and expert shipboard repair service.

No port in the United States has had a better opportunity to build up marine repair facilities and especially marine repair technique than San Francisco, and, as soon as the decks are cleared for action, there must be busy days ahead.

General Electric in the New American and Brazilian Merchant Marine

Rapidly approaching full-scale peacetime production, marine-turbine and gear factories of the General Electric Company are now furnishing propulsion equipment for 42 ships of America's post-war merchant fleet and for 20 Brazilian ships, it was announced by the G-E Federal and Marine Divisions.

In contrast to the wartime policy of building merchant ships to uniform design, the new vessels will have many innovations wanted by the owners to meet varied operating conditions, R. S. Neblett, G-E Federal and Marine manager, explained. He also revealed that during the war the company's marine-turbine factories produced more than 40 per cent of the merchant ship propulsion equipment.

Turbines and gears are being supplied for 22 ships which represent part of an extensive reconstruction program by Lykes Brothers Steamship Co. Seventeen of these 22 ships are C-2 6000-horsepower vessels of 9600 deadweight tons, from the yard of the North Carolina Shipbuilding Co., Wilmington, N. C. The last of these are nearing completion. During the war years this yard produced 117 C-2 vessels with G-E propulsion equipment.

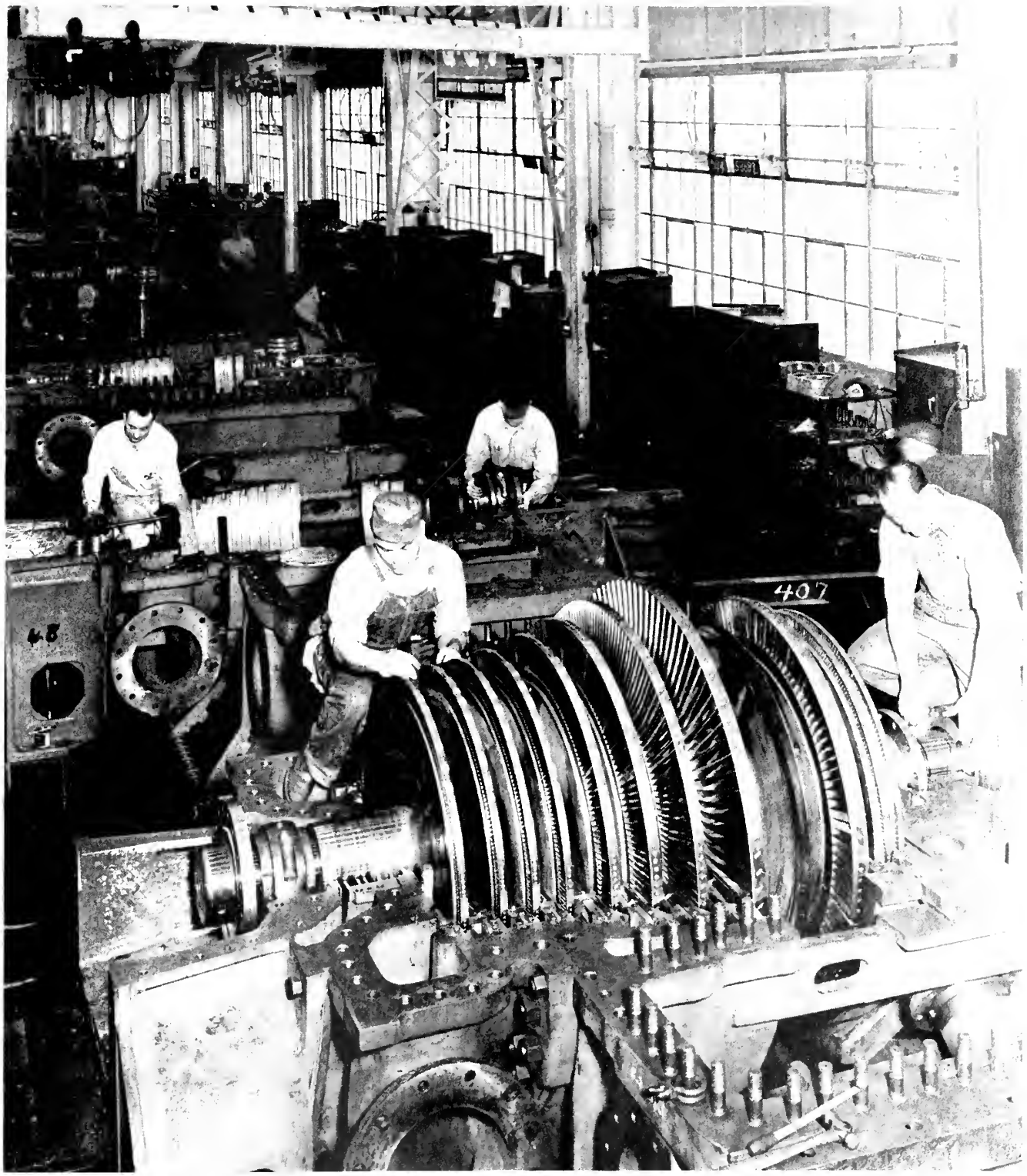
Designed for Lykes Brothers' Far Eastern service, five C-3 ships of 12,800 deadweight tons, with 8500 horsepower turbines and gears, are being designed and built by Federal Shipbuilding and Drydock Co., Kearny, N. J. The first of the group, the Tillie Lykes, recently completed trial runs. The remaining four will be delivered within the next few months. "They have many characteristics that should make them the finest and fastest cargo vessels in the Pacific," J. T. Lykes, president, said in announcing the line's post-war plans.

Six more C-3 vessels, wth 8500-horsepower turbine-gear propulsion, are being completed at the Federal Shipbuilding yards for the American South African Line for service between the Americas and Capetown.

Further additions to the post-war merchant marine are nine C-2 ships for the South American service of the Grace Lines. Six of them are nearing completion at the North Carolina Shipbuilding yards and three at the Federal Shipbuilding yards. Three new-type passenger-cargo ships of the C-3 class are being constructed at the Ingalls Shipbuilding Corp., Pascagoula, Miss., for the Caribbean service of the Mississippi Shipping Co. George G. Sharp is the naval architect.

Two high-speed single-screw tankers, to have 5000-horsepower turbine-gear propulsion, are being designed and built at the Sun Shipbuilding and Drydock Co., Chester, Pa., for the large fleet of Standard Oil Co. of California.

Brazil's Lloyd Brasileiro has contracted for 20 ships with 6000-horsepower turbine-gear propulsion of General Electric design. Fourteen of these vessels are being built at the Ingalls yards and six at Canadian Vickers, Ltd., Montreal. George G. Sharp is the naval architect.



Rapidly approaching full-scale peacetime production, marine-turbine and gear factories of the General Electric Co. are now furnishing propulsion equipment for 42 ships of America's postwar merchant fleet and 20 for Brazilian ships, it was announced by the G-E Federal and Marine Divisions. In the photo, workers in a company turbine factory are assembling a marine turbine. Steam at high pressure hits the turbine wheels, turning the turbine shaft. Through gears, the propeller shaft is rotated.

Puget Sound Navy Yard

By Robert N. Ward

Rear Admiral Ralph W. Christie, U.S.N., commandant, United States Naval Base, Bremerton, Washington. (Official U. S. Navy Photograph).

THIS IS A SORT OF Horatio Alger story—the career of a Navy Yard that started during the nineties of last century as a tidal marsh full of swamp grass and gradually became an important link in the repair units taking care of the Pacific fleets of the U. S. Navy. Then suddenly in World War II it grew up to break record after record as one of the Navy's outstanding repair bases.

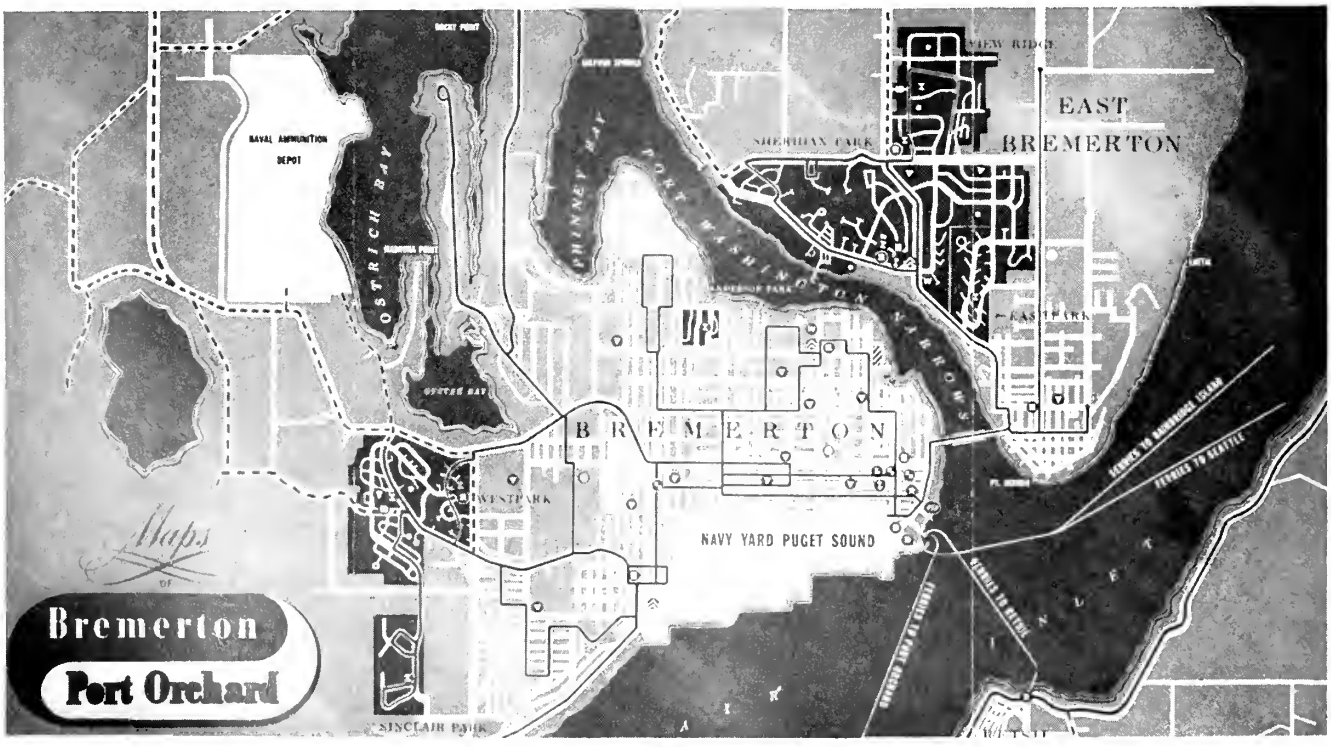
When the war began Puget Sound Navy Yard at Bremerton, Washington, was one of the smallest such bases maintained by the Navy. And even its wartime expansion did not match that of the Navy's already larger bases farther south on the Pacific Coast.

Instead, the Puget Sound yard turned to specialization in repair—the mending of battle-damaged fighting ships. And before the war ended PSNY had established a fleet-wide reputation as one of the "hottest" yards in the nation.

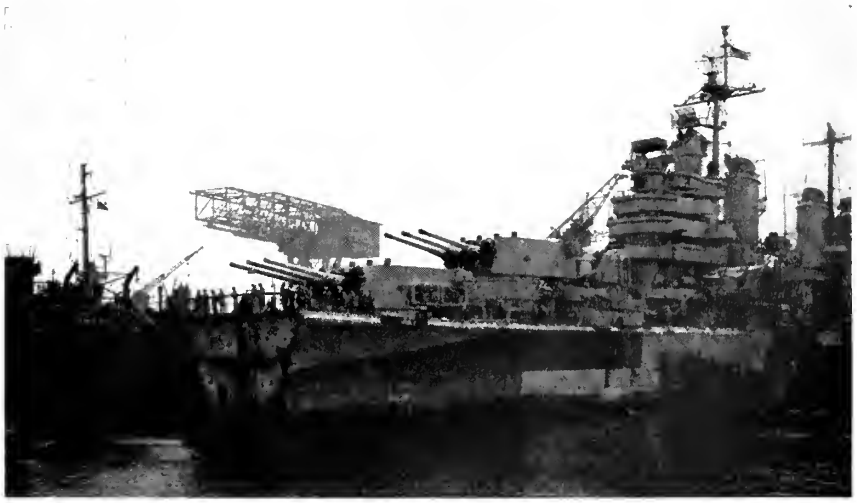
Easing of naval censorship now allows the enviable war record of the Puget Sound Navy Yard to be told.

During the war 344 fighting ships of all types, including five of the battlewagons blasted at Pearl Harbor, were repaired, overhauled or modernized there. This was in addition to 45 ships built—destroyers and smaller craft—and five escort carriers fitted out.

The yard also instilled its "know-how" in the many men it trained for the Navy's Ship Repair Units. In the combat zones SRU men worked un-



U. S. Naval Base at Bremerton, Washington. Taken from 3500 feet above Sinclair inlet, looking north, view shows four of large graving docks busy. Note floating drydock in graving dock No. 1, at right. Main section of Bremerton, center and right, is separated from East Bremerton, right background, by Port Washington Narrows. Supply and quarters section of base is left and center foreground. (Official U. S. Navy Photograph)



Cruiser Pittsburgh, her bow lost in a typhoon, noses into a Puget Sound Navy Yard drydock for repairs. Burners already have cut off most of the jury bow with which she churned 5000 miles. (Official U. S. Navy Photograph).

der fire many times to fix the Navy's "cripples."

It got to be almost routine for PSNY officials to set what appeared to naval chiefs in Washington to be impossibly fast schedules for repairing major fleet units—and then beat the schedules.

The huge aircraft carrier Saratoga, one of the most heavily-damaged ships of the war, was repaired at PSNY in record time. The job won for the yard a commendation from Vice Admiral E. L. Cochrane, chief of the Navy Bureau of Ships.

When the cruiser Pittsburgh lost 104 feet of her bow in a Pacific theater typhoon, PSNY officers looked over damage reports and offered to fix her in 42 days. Next shortest time estimate was 110 days. The Pittsburgh came to Puget Sound.

Four admirals commanded the yard during the wartime years, when it reached its high peak of repair efficiency. When the war began Vice Admiral C. S. Freeman was commandant. He was succeeded by Rear Admiral S. A. Taffinder, who was followed by Rear Admiral R. M. Griffin.

Present chief is Rear Admiral Ralph W. Christie, Navy submarine expert. Admiral Christie was yard commandant when the end of the war brought organizational changes. He now commands the Bremerton Navy Base, new name for the yard combined with other Navy activities in the area.

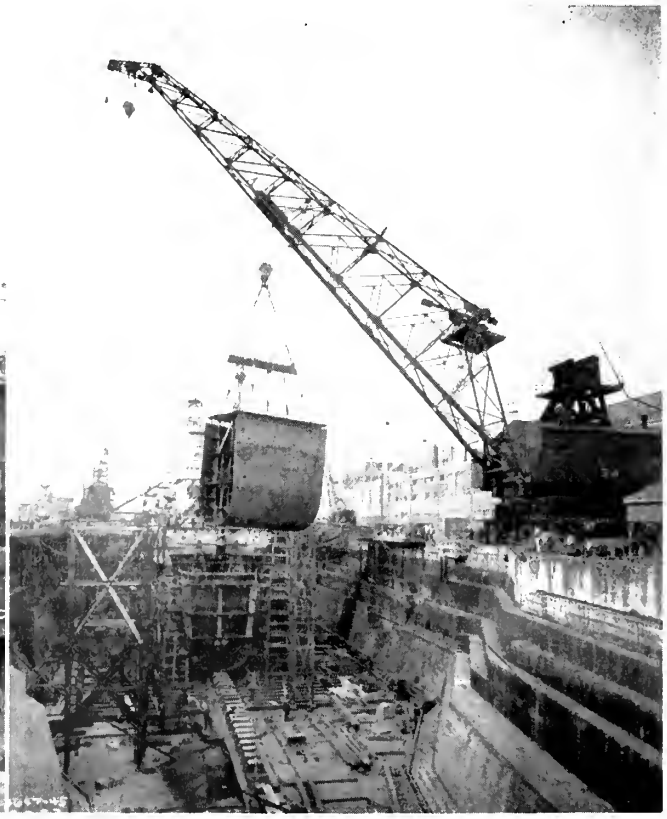
The yard portion of the base, now called the Puget Sound Naval Shipyard, is commanded by Commodore W. M. Thompson, former production officer at the Norfolk Navy Yard. Captain Paul B. Nibecker is yard production officer.

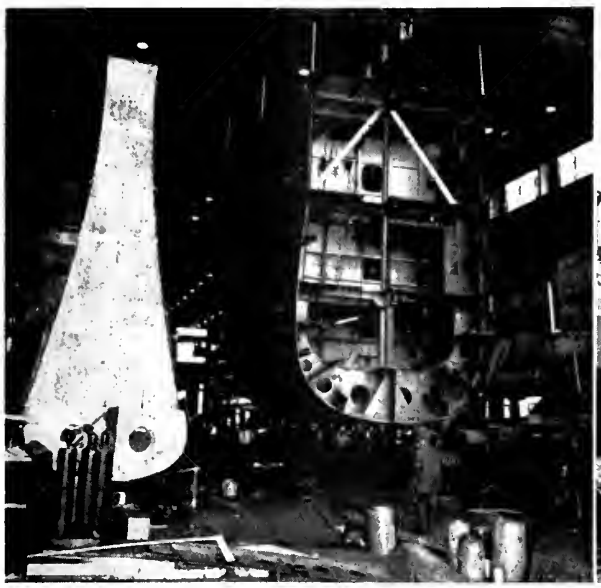
Under the press of war, commanders and engineering personnel of PSNY invented and developed special rush repair methods.

Some of them were pretty drastic. Many a skipper during the war watched, perplexed, as repair crews

Slung from a traveling crane, one of the Pittsburgh's huge bow sections moves to the drydock. (Official U. S. Navy Photograph).

The second new keel section for the Pittsburgh is swung into the drydock. Machinists, pipefitters and electricians already are working inside the first one. (Official U. S. Navy Photograph).





New bow sections for the battered Pittsburgh go together rapidly in one of Puget Sound's prefabrication shops. Most of this work was done while the cruiser still was at sea. (Official U. S. Navy Photograph).

Final keel section goes into place on the Pittsburgh. Communications, piping and wiring are already installed in the previously-fitted portions. (Official U. S. Navy Photograph).

attacked his ship with the seeming intention of dismantling it completely.

In fixing a destroyer that had been twisted out of line, engineers ordered the craft cut almost in two. Burners slashed from the keel upward to, but not through, the deck. The two sections were then straightened separately and welded back together.

One of red-headed, energetic Captain Nibecker's tricks is to cut great sections from the outer shell of a ship to get at difficult places or move heavy machinery in or out of a ship's vitals.

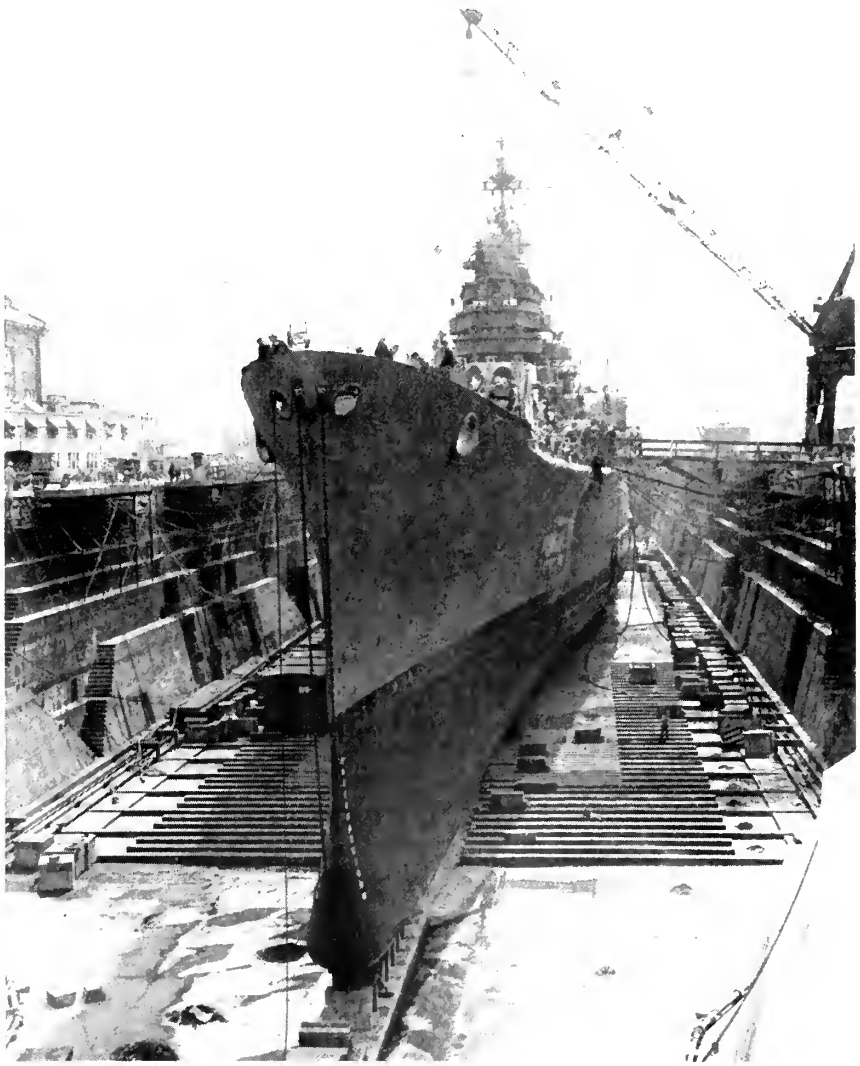
"Captain Nibecker," says Admiral Christie somewhat wonderingly, "will cut a hole anywhere he needs it!"

By doing this, the yard saved five days in repairing the destroyer Lamson, "kamikazed" during the fight for the Philippines. Large holes were cut up through the bottom plates of the craft. Through these, work crews removed debris and heavy equipment that otherwise would have had to be hoisted, a bit at a time, through small deck openings.

New methods helped set the record the yard made in repairing the Saratoga. Her balsawood docking cradle was designed to confine oil to a small area. This saved 100-man-days dock cleaning.

Yard workers cut three huge holes in the Sara's sides. They erected a stairway from the dock floor to her flight deck. An information center, installed in the hangar deck, kept

Complete! Here's the Pittsburgh's sleek new nose. The last section was welded on just three weeks after the first one, ahead of a record repair schedule. (Official U. S. Navy Photograph).



Seconds after a big carrier finishes docking, crane swings portable telephone exchange to flight deck for crew to call homes. Four telephone operators are inside—and are they welcome aboard ship! (Official U. S. Navy Photograph).

workmen from getting lost—literally—in the Sara's complicated compartments.

Vast areas of the Sara below-decks had been blackened by flame and smoke. Yard workers used sandblasters to clean up. But to sandblast they added a spray of water. This process, perfected in the yard paint shop, eliminated flying dust dangers.

These short-cuts saved more than 3000 man-days of labor and thousands of dollars on that one job alone.

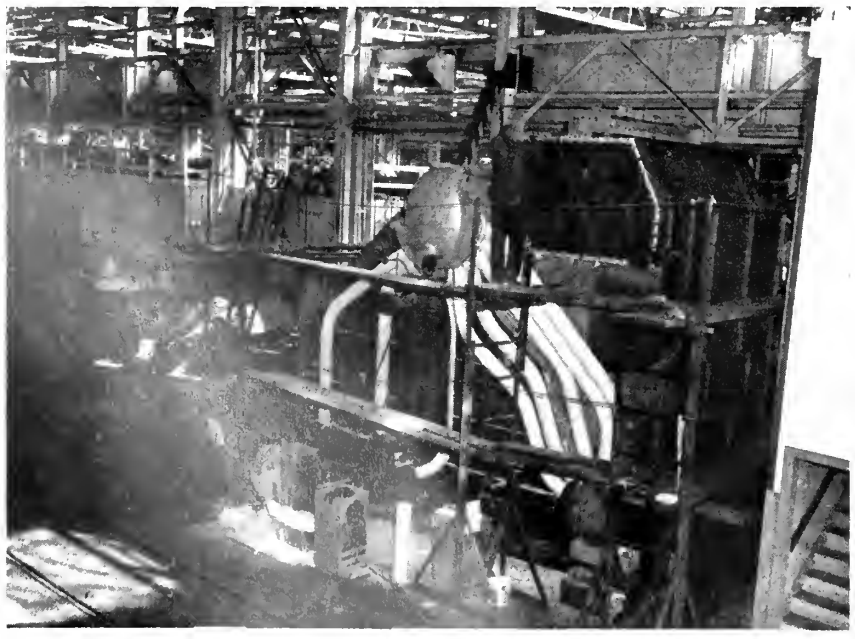
Repairing done on the Pittsburgh is a good example of the prefabrication technique which helped Puget Sound set records. When the job was awarded, engineers began immediately gathering more than 500 plans of the ship from other shipyards on both coasts.

From a preliminary radio report of the damage, engineers laid the groundwork for constructing new bow sections. An officer of the ship was flown from the Pacific to PSNY with more details and photographs.

The crippled Pittsburgh, with a blunt, thin steel jury bow welded on, started her 5000-mile trip home.

Meanwhile, the yard did all the preliminary work. In the shipfitting shop, 300 tons of steel were prefabricated. The new bow was built in eight sections and moved by traveling crane to dockside. All material and shipping tags were marked with red. The Pittsburgh was "hot."

A 10,000-horsepower boiler is overhauled in the boiler shop. One of four is the U.S.S. Charles J. Badger, a destroyer; boiler had casings collapsed as a result of a crash of the Jap suicide boat off Okinawa. (Official U. S. Navy Photograph).



The job of assembling numerous items, from all parts of the country, went ahead. Along with her bow, the cruiser had lost anchor gear, mooring equipment, capstans, water pumps, anti-aircraft guns, ammunition magazines, staterooms and storerooms containing 80 per cent of the ship's spare parts and supplies.

At Port Angeles, 80 miles down-Sound from the yard, engineers met and boarded the cruiser. It meant saving six vital hours. So, while the Pittsburgh churned along at 12 knots, PSNY experts checked their preliminary work against actual damage.

At the yard, the cruiser was rushed into a graving dock. As the chamber was pumped out burners cut off the jury bow, working bare inches above the receding water.

The preliminary work had been so thorough that the first new bow section was swung into place a few days after drydocking. As each section was welded on, pipefitters, machinists, painters and sheetmetal men swarmed through it. Three weeks later the final bow section was welded in place.

The war ended suddenly, while

the Pittsburgh was in dock. And the pressure eased off. But up to that time the work was ahead of schedule—the fastest schedule offered by any yard.

By methods like these the yard fabricated and installed 73,116 tons of steel in fighting ships during the war. Total tonnage of ships handled, in all types of work, was 3,467,677.

The yard labor force was 3189 one year before Pearl Harbor. At its wartime peak in August, 1945, it stood at 33,141.

All this was a far cry from the yard's beginning little more than 50 years ago. The Navy acquired a site on Sinclair Inlet in 1891 to establish a naval repair station there.

First commandant was Lieut. A. B. Wyckoff, who arrived in a small gunboat and found his new command to be a swamp full of willows and marsh reeds.

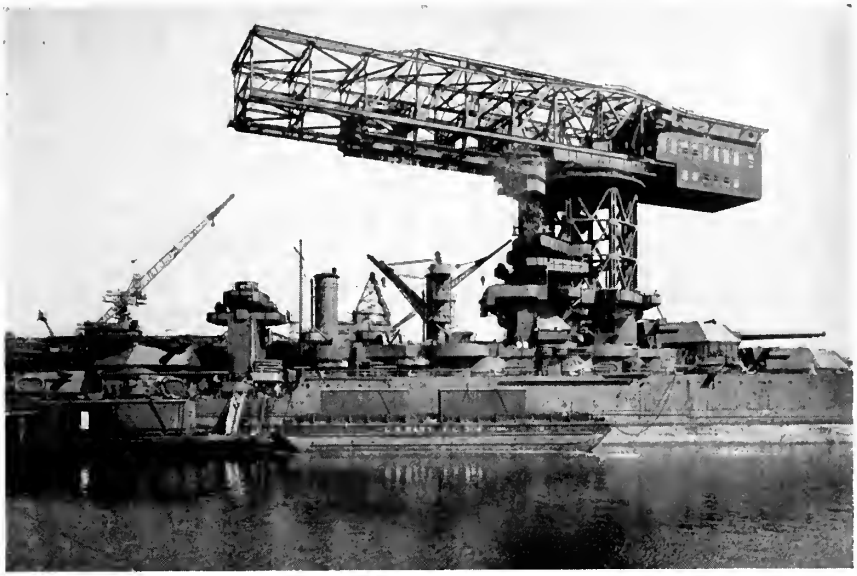
Next year work was begun on a drydock built of piling with stone sill and gateposts. Completed nearly four years later, the dock was 650 feet long, 130 wide at the top, 67 feet across the bottom and 39 feet deep—largest naval drydock in the country at the time.

First ship to be docked there was the USS Monterey. Later the early-day Iowa, of "Teddy" Roosevelt's Great White Fleet, was blocked up for overhaul. The famed Oregon was in this dock for overhaul in 1900 and came in for modernizing and was recommissioned in 1915.

There still is a drydock on the site—a modern concrete structure. But now there are four more, larger ones whose dimensions the Navy classes as restricted, plus a couple of floating drydocks. Bremerton can dock the largest ships in the Navy.

Much of the yard's equipment is outstanding or unique.

On one of the six giant piers is one of the world's largest roller circle, turntable type, revolving hammerhead cranes. Its capacity is 250 tons and it can operate to capacity in a 40-mile wind. The monster is 175 feet high, but is operated by one man.



Largest of its type in the world, this roller-circle, turntable type crane can lift 250 tons in a 40-mile wind. It's on the yard's Pier 6. (Official U. S. Navy Photograph).

The yard's inside machine shop, measuring 1080 by 310 feet, is claimed to be the largest west of the Mississippi. Biggest tool in the shop is a 60-inch lathe, 195 feet long, on which may be finished propeller shafts for our largest fighting ships.

Another feature of the base is one of the world's largest single air raid shelters. It is a four-entrance tunnel, with 2200 feet of passageways, dug into the hill behind the yard. Capacity is 10,000 persons. Equipment was stored there late in the war.

One special service is deeply appreciated by crews of incoming ships. Minutes after a vessel docks for repair, a large portable telephone exchange is swung aboard by crane. Inside are booths and four operators who command direct lines to the East, Midwest and South. Sailors call home from their own deck.

To the yard goes sole credit for increasing the population of Bremerton fivefold in the past five years. A one-industry town, Bremerton had a population of 15,134 in 1940. Now it is estimated at between 72,000 and 80,000.

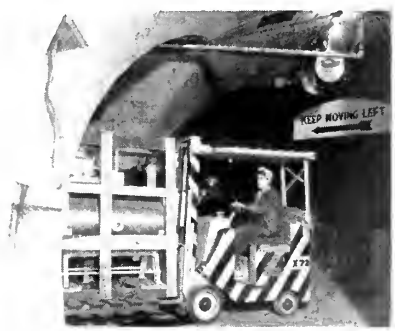
Bremerton had no railroad until last year, when the Navy decided that rail connections were vital to the yard. So the Navy built a standard gage line to a Northern Pacific track 36 miles south. It was a rush job, and expensive, averaging about $200,000 per mile.

The boom in Bremerton began in 1940, when America's defense program began to increase in tempo. In a year employment at the yard increased 500 per cent. Shipbuilding was the yard's job that year, and destroyers and escort ships went down the ways in increasing numbers.

Then one day in September, 1941, a great, gray capital ship nosed its way through morning mists and into Sinclair Inlet. Shoreside observers, familiar with the silhouettes of American battleships, were baffled.

Months later the secret came out. The newcomer was the British battleship Warspite, which had taken a beating from dive-bombers in the

When danger of air raids passed, in late stages of war, goods were stored in the giant air raid shelter, buried in hill behind base. The tunnel is designed to hold 10,000 persons. (Official U. S. Navy Photograph).



battle of Crete. She had limped three-quarters of the way around the world, from Suez east to Bremerton, for repair.

The Warspite had taken a bad bomb hit in the crew's quarters forward, with many casualties and extensive damage. At PSNY she got repairs, more armor, and boiler and communications alteration.

That was the Puget Sound Navy Yard's first big naval repair job, and the start of a new type of work for the base. For after the Warspite came the first of five grim, fire-blackened battlewagons from Pearl Harbor.

The Tennessee and the Maryland nosed into graving docks at Bremerton the last of December, 1941. They joined the fleet 53 days later. And PSNY moved into the big time.

Next in was the Nevada. She took seven months and 700,000 man-days to put her back in shape. But her new guns were ripping up the Normandy beaches one fateful day two years later.

Finally came the California and the West Virginia, most heavily damaged Pearl Harbor ships to return to the mainland. It had taken 18 months to raise them and get them home.

But before then the future of PSNY already was decided. The "old ladies" of the fleet came to Bremerton in bad shape. From the first, the yard did an outstanding job. And when the first of the battlewagons left they were more modern, better protected and had vastly-increased fire-power.

The job done on the "old ladies" impressed the Navy's braid. A few months later the Puget Sound Navy Yard was ordered to concentrate on ship repair.

Pictures taken at Puget Sound Naval Station in 1900. Reading down, they show ship carpenters, the Station, officers' quarters, and office employees.

The Fighting Diesel

THE OMINOUS offshore roar which warned both Hitler and Hirohito that their hour of doom was at hand came not only from airplanes but also from the mighty throb of tens of thousands of diesel engines.

Our final victory was the terrible climax toward which, for over four years, an ever-increasing torrent of power had been flowing from three great General Motors plants—the Cleveland Diesel Engine Division, the Detroit Diesel Engine Division, and the Electro-Motive Division.

For where the war went, diesel was there first. To conquer islands or continents, we must have landing craft, thousands upon thousands of them—little ones, big ones, to put our troops on the beaches and keep them there. And diesel did that, and more, in World War II.

But far beyond the beachheads went diesel engines. They powered submarines and submarine mother ships; SC subchasers, 131 and 171-foot PC subchasers; DE destroyer escorts, minesweepers, rescue vessels; tankers; diving tenders; landing boats and barges; tank and cargo lighters; dredges, tank and tank destroyers; tractors and bulldozers; shovels; standby and portable generator sets; dock compressors; lighthouse service; buses and trucks. So enormous was the output that by October, 1943, total diesel power passed the total steam power used by the U. S. Navy.

Before the war, General Motors was building a series of two-cycle engines with from two to six cylinders. Into these standard packages of power had been built unique features of engineering design which were destined to play an important role for the armed forces: The low weight factor of a two-cycle diesel was ideal for many military uses.

Then came war. Mass production of diesel power plants in the most efficient manner already was in existence. Stepping it up to meet the incredible needs of total war was a matter of shrewd management in increasing production facilities.

First the cry was for tanks. They were supplied, and fought gallantly during the critical days of the war in Egypt. Then the furious attempt of the Axis army to reach the Nile was repulsed. Our diesel tanks stood up at Alamein, finally smashing through the Axis defenses and joining the Allied forces from Algiers in the final drive on Tunis.

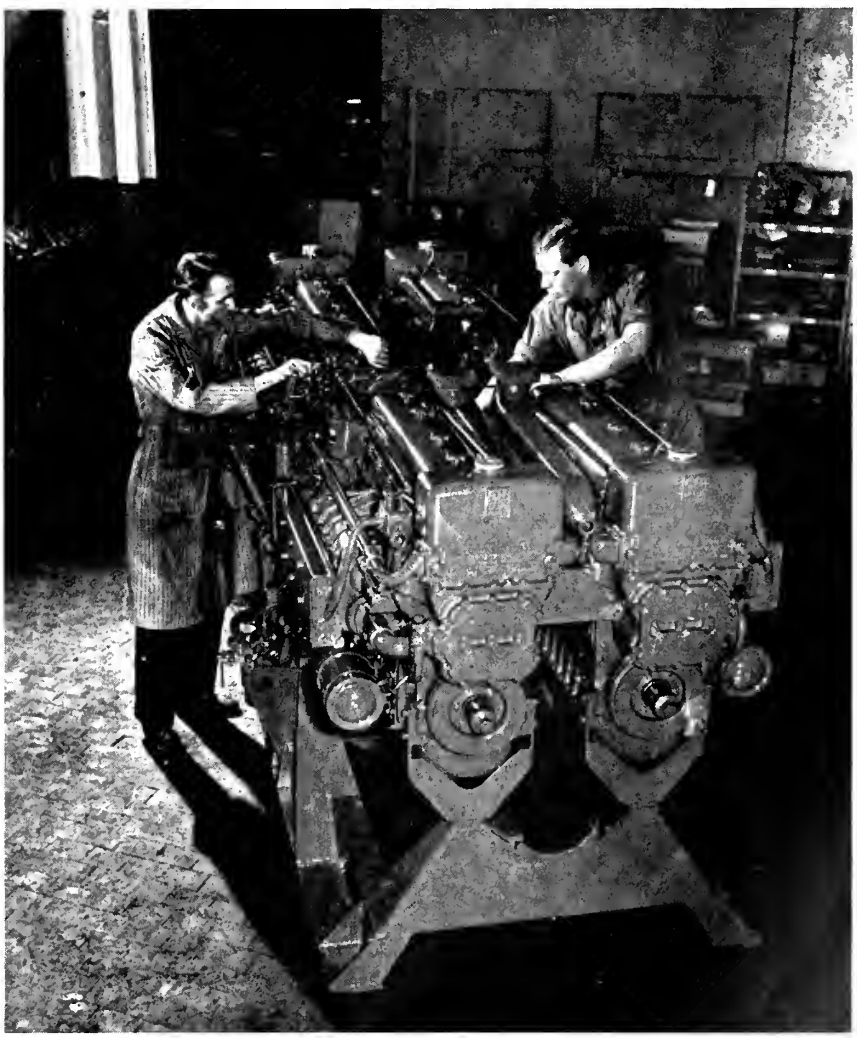
Diesels were used in small landing craft during those dark days—the LCVP (Landing Craft Vehicle Personnel) powered by one six-cylinder engine, and in the LCM (Landing Craft, Mechanized) powered by two six-cylinder units, and the LCT (Landing Craft, Tank) by three units. Each unit had its own propeller shaft, and the units could be operated individually or together.

The ability of this type of craft to extricate itself easily from the beach by a miniature erosion with its wash, together with a winch on the stern, was extremely valuable in mass transportation of troops.

These boats had pre-war engines of 165 horsepower but were stepped up to 225 horsepower. But this was only the beginning. Diesel engines were destined to play an ever increasing role in World War II.

Busy engineers at the Cleveland Diesel Engine Division and the Detroit Diesel Engine Division of General Motors hit upon a basic design of two to six cylinder engines. Most of their parts were interchangeable, engine for engine, cylinder for cylinder. Reciprocating parts such as pistons, connecting rods and valves, were interchangeable. And vastly im-

The Quad, new diesel power plant for various U. S. Navy landing barges, developed by Detroit Diesel Engine Division of General Motors.



A General Motors diesel engine being installed in an M-4 tank in a Fisher Body plant which produces America's newest type of land fighter.

GM diesel motive power for the famed M-4 and M-10 tanks being installed by Army mechanics.

portant was a symmetrical cylinder block permitting right-or-left-hand rotation with accessories on either side. This feature permitted the coupling of two basic engines by means of a transfer case to deliver the double power to a single driveshaft for the "Twin" Series 71 engine.

Consisting of a pair of 6-cylinder engines placed side by side, this unit joined exhaust manifolds, essential accessories, including blowers, fuel pump, water pumps, oil coolers, air cleaners, secondary fuel oil filters and governors—all on the exterior. A heavy junction plate joined the engines at the front end and a double clutch housing and gear unit at the flywheel end. Each engine had its own fuel, lubrication and water cooling systems.

Thus did diesel horsepower move into space originally designed for radial air-cooled gasoline engines in the General Grant (M3) tank the General Sherman (M4) tank, and the M10 Tank Destroyer.

Still more feverishly did General Motors engineers work, finally surpassing the "Twin" diesel in the now famous "Quad." This combined four six-cylinder diesels with two "Quads" powering each LCI. Each "Quad" developed 900 horsepower and had its own gear box, propeller shaft and propeller with variable pitch control. The weight was only about 12.5 pounds per horsepower developed.

The peacetime uses of both the "Twin" and the "Quad" are numerous. For example, in the fishing industry, the 20-foot boat to the 150-foot tuna clipper could utilize unit engines, singly or in multiple combination. If one engine failed, it could be immediately "cut out," the others permitting the ship to finish its catch and return. Already this multiple type engine is being installed commercially.

And these multiple high speed engines are far from short-lived. They have crossed both the Atlantic and the Pacific, giving thousands of tough hours with negligible service requirements. Every landing craft must be capable of hitting a beach hard, dumping its cargo and quickly pulling away, even with breakers running high.

That diesels achieve these punishing requirements admirably is exemplified in the following message typical of many to the workers of the Detroit Diesel Engine Division from Rear Admiral E. L. Cochrane, Chief of the Bureau of Ships, USN. Re-

ferring to the two-cycle 71-series GM diesel Admiral Cochrane wired:

"You will be gratified to know that a large majority of the invasion vessels which participated in the Sicilian campaign were powered by your diesels. That this largest invasion operation in history was executed with a maximum of precision and a minimum of casualties was in no small measure due to the reliable power plants supplied by you for our assault craft. All of you are to be warmly commended for your contribution to the victory."

And Vice Admiral R. R. Waesche, Commandant, U. S. Coast Guard, in an expression to the workers of the Cleveland Diesel Engine Division, wired:

"It will be a source of great pride to you that your Winton Marine Diesel Engines, Model-158, were in operation on the U. S. Coast Guard Cutter Icarus when she sank a German submarine and captured 33 members of her crew."

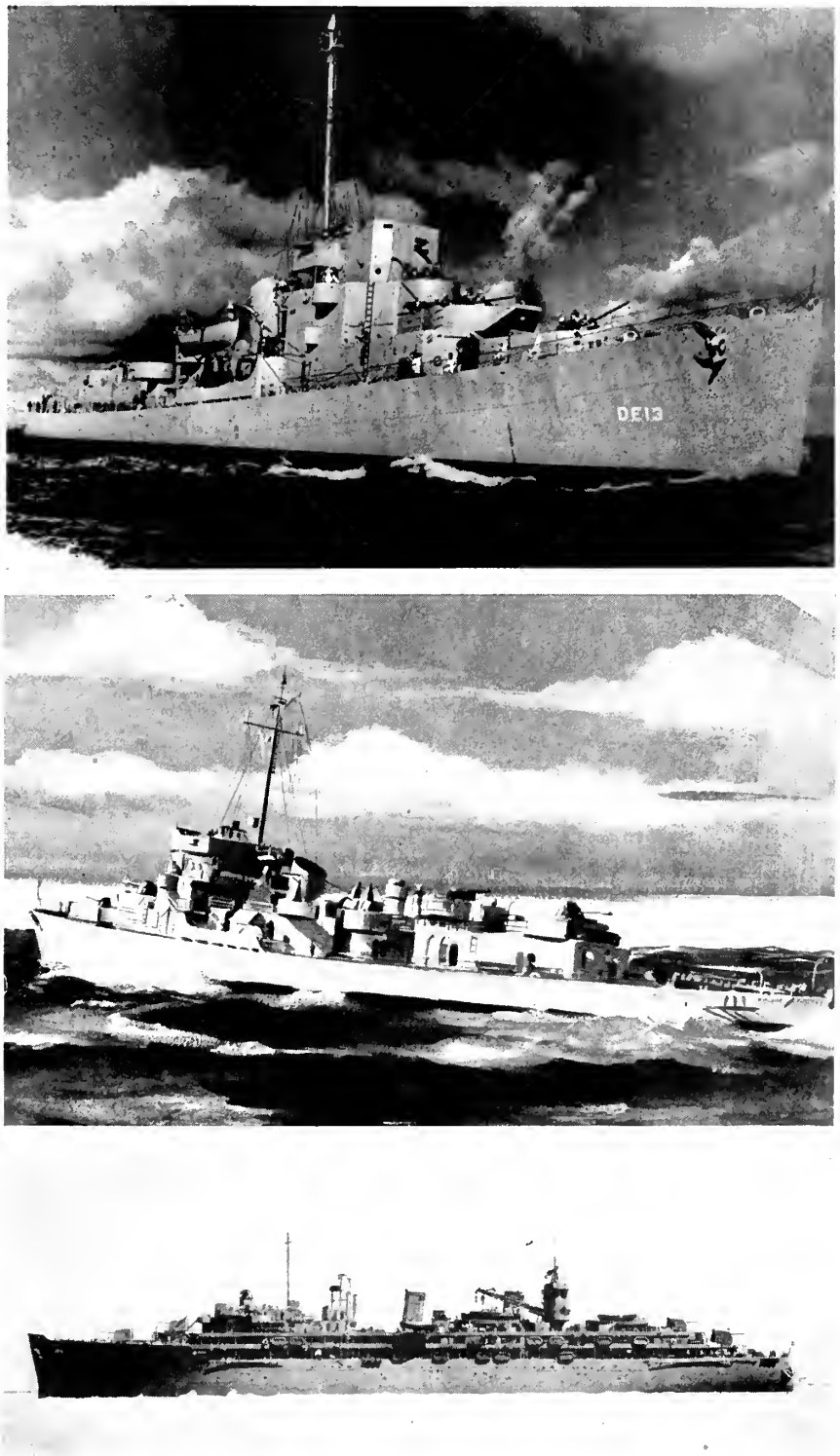
In quoting a communique from the Icarus' skipper concerning the ship's performance in combat, Admiral Waesche wired:

"Our engines worked perfectly throughout the action. They responded immediately to every demand. All our attacks were carried out at full speed, and our fourth pattern of charges blew the sub to the surface. We closed in with all guns firing. In four minutes she went down."

From another East Coast operating base, Admiral Waesche reported this comment:

"In spite of the fact that we ordinarily feel that an engine should be overhauled after 3000 hours' operation, our Winton diesels frequently have operated for over 4500 hours without the slightest trouble. To you who are producing these reliable engines, the Coast Guard extends commendations and thanks. We need more of them."

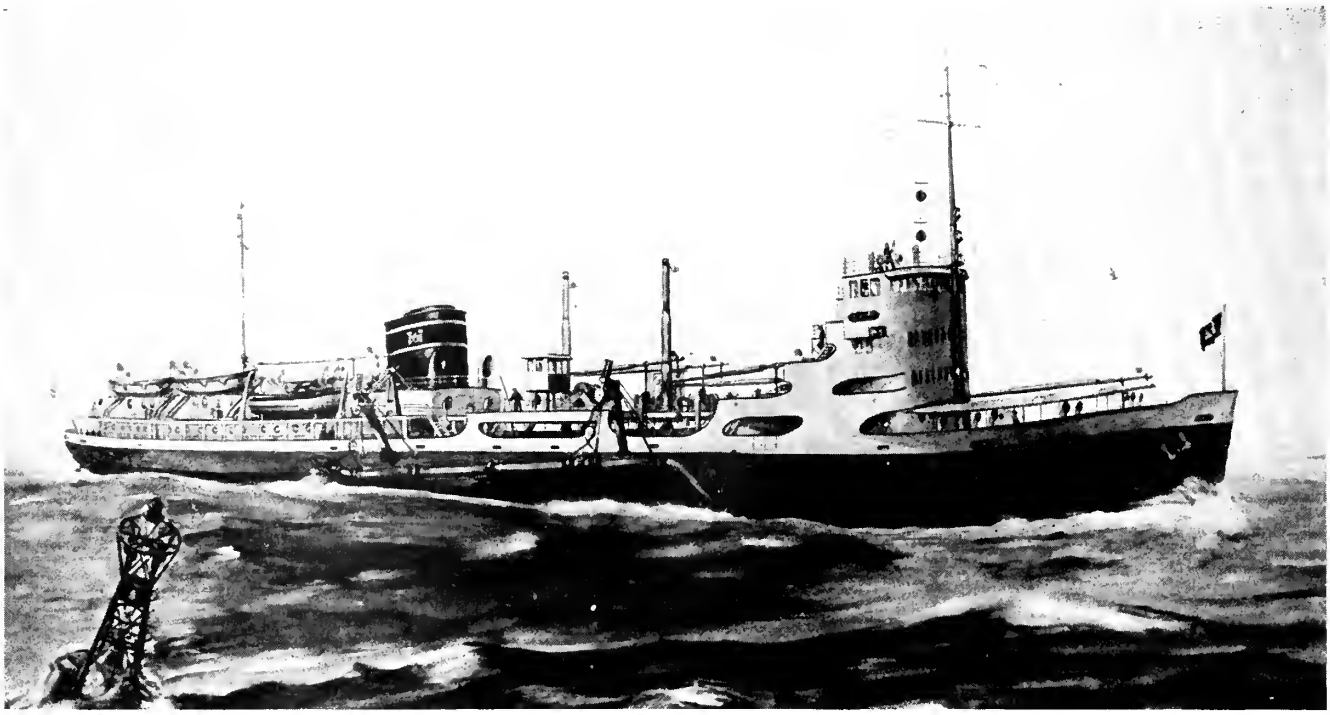
Matching the speed, the skill and ingenuity of manufacturing at the Cleveland Diesel and Detroit Diesel Divisions of General Motors were the extraordinary accomplishments of service representatives of the diesel industry. In Army and Navy camps, bases, arsenals, shipyards and installations in the U. S., and from the Aleutians to Australia in the Pacific, and Iceland to Africa and Europe in the Atlantic; on fighting fronts on land and sea the world around, these service men stayed on the job, assisting and teaching Army and Navy mechanics to "keep 'em running."



Top: One of Uncle Sam's Destroyer Escorts, powered by G-M diesels, knifes through the water in a trial run. (Official U. S. Navy Photograph). Center: A Destroyer Escort vessel powered by General Motors diesels. Bottom: Submarine Tender U.S.S. Sperry, powered by Cleveland diesel engine.

Today the fighting is over. Diesel did a job. GM diesels were selected by the armed forces for landing craft and other essential power operations because without any required changes they met the high standards of the military.

But diesel engineers are not relaxed. They still dream and figure and experiment on greater achievements to come. New adventures lie ahead. Today people everywhere are discovering that there occurred during World II an amazing revolution in the world of mechanical power.

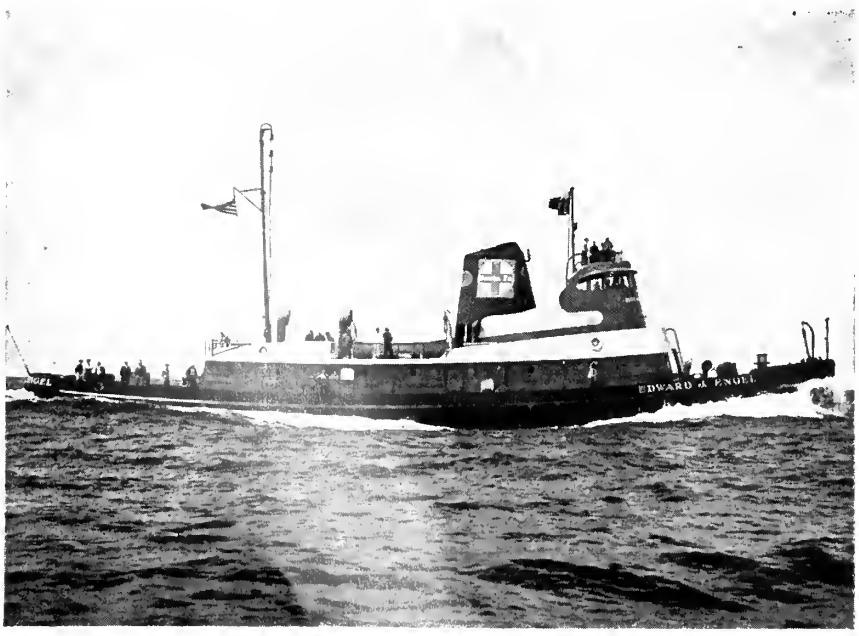


352-foot seagoing hopper dredge.

Coast Design Firm's Wartime Record

Joslyn & Ryan Planned Many Ships

142-foot tugboat for Santa Fe Railroad.



The emergency resulting from the prosecution of war by the United States against our enemies in the European and Pacific areas has come and gone, but the complete story of what happened during these years to bring about the tremendous production of arms, war plants, ships, products and equipment of every conceivable nature still remains to be told, to a great degree. It is true, the people of the nation were informed continually of the urgent necessity of mobilizing every resource of man power and materials, and were spurred on to greater activity by the release of censored information from time to time regarding the vast developments of shipyards and other industrial achievements.

Much interesting information could not be told for security reasons, and as each super activity superseded another a great deal of the story

concerning the stupendous effort exerted by industry and labor alike remained untold, in order that our goal be not endangered.

The Pacific Coast was called upon to furnish a large portion of the war materials required, particularly ships for the Pacific area. Firms of long standing were compelled to increase their facilities and output many fold. New firms came into being overnight and added their contribution to the total effort. Many of these have ceased to exist, now that the emergency is past.

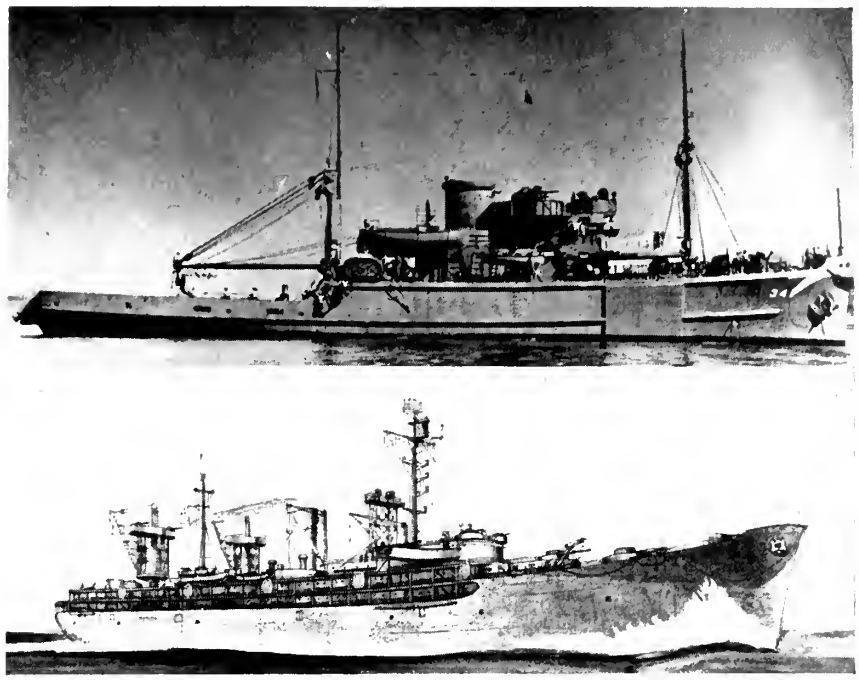
One of the concerns, established before the war, and of particular interest to shipping men up and down the Pacific Coast, and one that is destined to grow in importance, is the firm of Joslyn and Ryan, Marine Engineers and Naval Architects, 149 New Montgomery Street, San Francisco, who turned out thousands of plans for a great variety of ships built for our maritime and naval operations.

Ship designs were furnished by this firm for vessels built by shipyards from one end of the Pacific Coast to the other, as well as in Atlantic and Gulf ports. Joslyn & Ryan expanded its force of draftsmen and clerical personnel to a total of over 550 employees, which represented an increase of ten times their pre-war size. They are the largest organization of this nature on the Pacific Coast, as well as being one of the outstanding designing firms in the nation.

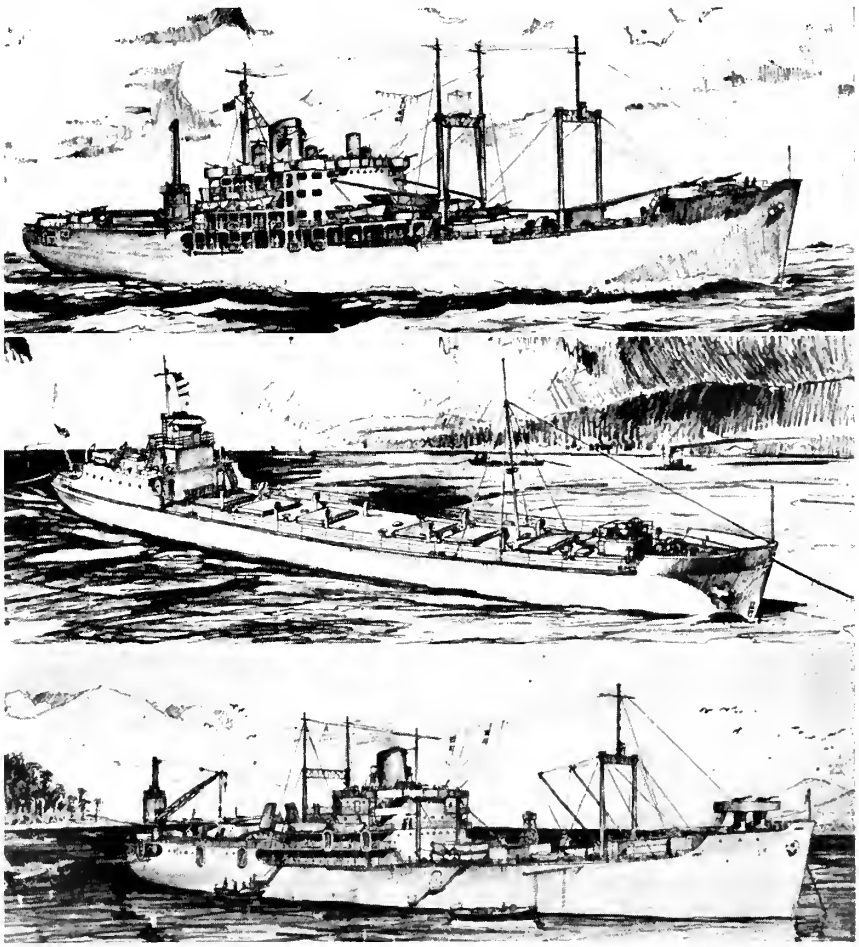
The firm is headed by Paul L. Joslyn and Michael J. Ryan, both of whom have been identified with shipping and shipbuilding interests in this area for many years.

Paul L. Joslyn is well known in the marine engineering field on the Pacific Coast, and for many years has been engaged in the design of ships and their power plants, both steam and diesel. He pioneered the first marine turbine installations on the Coast, both for cargo and tank vessels, in 1913-14, while serving as chief engineer at the Bethlehem Steel Company (Union Iron Works Plant) in San Francisco, and later at the Moore Dry Dock Company in Oakland.

Some time prior to the Pearl Harbor attack Joslyn founded the present firm when he accepted the contract from the Williamette Iron and Steel Corporation to handle the conversion of the former transatlantic liners City of Baltimore and the City of Norfolk into naval transports.



Top to bottom: Salvage vessel; AD-16 destroyer tender; AV 14-17 seaplane tender; concrete barge; AV 10 seaplane tender Chandeleur.



Michael J. Ryan majored in Naval Architecture and Marine Engineering at Massachusetts Institute of Technology. His early training was obtained at the Union Iron Works, and during the first world war he was assistant Naval Architect at the Moore Dry Dock Company in Oak-

Some of the important designs executed as Joslyn & Ryan's contribution to the war effort.

Number of Vessels	Type Designation	Name	Service Description	Contract	Length O. A.	Beam	Displacement Tons
N.C. 4	YO-		Fuel Oil Barge U. S. Navy	Basalt Rock Co. Napa, Calif.	235'- 0"	37'- 0"	2,650
N.C. 18	ARS-		Salvage Vessel U. S. Navy	Basalt Rock Co. Napa, Calif.	213'- 6"	39'- 0"	1,697
1	AV-10	Chandeleur	Seaplane Tender U. S. Navy	Western Pipe & Steel Co. So. San Francisco	492'- 0"	69'- 6"	11,850
1	AD-16	Cascade	Destroyer Tender U. S. Navy	Western Pipe & Steel Co. So. San Francisco	492'- 0"	69'- 6"	15,700
26	C3-		Cargo Vessel Conver. U. S. Maritime Comm.	Western Pipe & Steel Co. So. San Francisco	492'- 0"	69'- 6"	17,540
3	AVG-		Aircraft Carrier U. S. Navy	Western Pipe & Steel Co. So. San Francisco	492'- 0"	69'- 6"	12,260
O.D. 4	AV-14 to 17		Seaplane Tender U. S. Navy	Seattle-Tacoma Shipbuilding Corp. Tacoma, Wash.	492'- 0"	69'- 6"	14,650
O.D. 21	B7-D1		Concrete Barge U. S. Mar. Comm	Barrett & Hilp Belair, Calif.	366'- 4"	54'- 0"	10,975
O.D. 32	BD-1		Combat Loaded Trans. U. S. Navy	Consolidated Steel Co., Los Angeles, Calif.	426'- 0"	58'- 0"	6,775
O.D. 32	BE-1		Combat Loaded Cargo, U. S. Navy	Walsh-Kaiser Co. Providence, R. I.	426'- 0"	58'- 0"	6,775
O.D. 12	BT-1		Coastal Tanker 30,000 BBL. U. S. Navy	St. Johns River Shipbuilding Corp. Jacksonville, Fla.	325'- 2"	48'- 2"	5,975
O.D. 20	BT-2		Coastal Tanker 30,000 BBL. British War Min.	(14) Todd Co. Houston, Tex. (6) J. A. Jones Shipbuilding Co. Panama City, Fla.	325'- 2"	48'- 2"	5,975
O.D. 24	BK-1		Coastal Tanker 12,000 BBL. British War Min.	(12) New England Shipbuilding Corp. So. Portland, Me. (6) Avondale Marine Ways, Westwago, La. (6) United Concrete Pipe Corp. Long Beach, Calif.	239'- 9"	39'- 0"	2,560
(Contracts let and later cancelled)							
O.D. 1	JCT-	Edward J. Engel	Tug Boat Santa Fe R. R. Co.	Consolidated Steel Co., Los Angeles, Calif.	150'- 0"	28'-11"	730
N.C. 4	Hull Design 248		Seagoing Hopper Dredge—U. S. Engineers Dept.	The Ingalls Shipbuilding Corp. Birmingham, Ala.	351'- 8"	60'- 0"	8,970
1	AP-104	President Monroe	Transport Conversion—U. S. Navy		491'-10"	69'- 6"	16,200
1	AP-130	George Squier	Transport Conversion—U. S. Navy		522'-10"	71'- 0"	
1	EC2-S-C-1	Christopher Greenup	Transport Conversion—U. S. Army		441'- 6"	57'- 0"	14,300
1	AK-109	James Rowan	Cargo Vessel Conversion U. S. Navy		441'- 6"	57'- 0"	14,300
1	AK-128	Key Pitman	Cargo Vessel Conver. U. S. Navy		441'- 6"	57'- 0"	14,300
1	AK-94	Mintaka	Transport Conversion—U. S. Navy		441'- 6"	57'- 0"	14,300
1		John C. Ainsworth	Transport Conversion—U. S. Army		441'- 6"	57'- 0"	14,300
1	PC-Class	Atalanta	U. S. Coast Guard		165'- 0"	25'- 3"	337
1	PC-Class	Bonham	U. S. Coast Guard		125'- 0"	23'- 6"	220
1	PC-Class	Nemaha	U. S. Coast Guard		125'- 0"	23'- 6"	220
1		J. M. Davis	Repair Ship U. S. Army		357'-10"	48'- 0"	
1		W. J. Connors	Repair Ship U. S. Army		404'- 6"	50'- 0"	
1		Rapidan	Auxiliary Oiler U. S. Navy		477'-10"	60'- 0"	16,800
1		Salinas	Auxiliary Oiler U. S. Navy		477'-10"	60'- 0"	16,800
1		Klara Zepkin	Locomotive Carrier Russian Gov't.		347'- 9"	51'- 6"	8,790
1		Aleut	Locomotive Carrier Russian Gov't.		377'- 0"	52'- 0"	11,121

The last sixteen vessels were converted at the yard of Poole, Mc Gonigle & Jennings of Portland, Oregon
Vessels marked O. D. denotes original designs by Joslyn & Ryan
N. C. denotes new construction
All others are conversions

Paul L. Joslyn

land. Between 1930 and 1932 he was Technical Surveyor for the American Bureau of Shipping in the Plan Approval Section. He specialized in tonnage measurement requirements for the Panama and Suez Canals, and acted as consultant with regard to these requirements on vessels of many foreign and domestic shipping companies, including the United States Lines, Dollar Steamship Line, and Luckenbach Line.

Ryan became associated with Joslyn in the present undertaking on the contract for the design work on the U. S. Navy fuel oil tanks built by the Basalt Rock Company of Napa, California, and the Lake Superior Shipbuilding Company of Superior, Wisconsin.

The company's staff is composed of experienced marine engineers and shipbuilders, and other engineering personnel, all capably supervised by: E. Mitchell Breingan, chief naval architect; J. H. Laidman, assistant naval architect and estimator; J. C. Hare, in charge of hull materials; S. A. Lindsay, in charge of ventilation; James B. Bouick, Jr., chief marine engineer; and D. D. Howell, planning engineer.

Michael J. Ryan

First Luxury Liner—The Del Norte

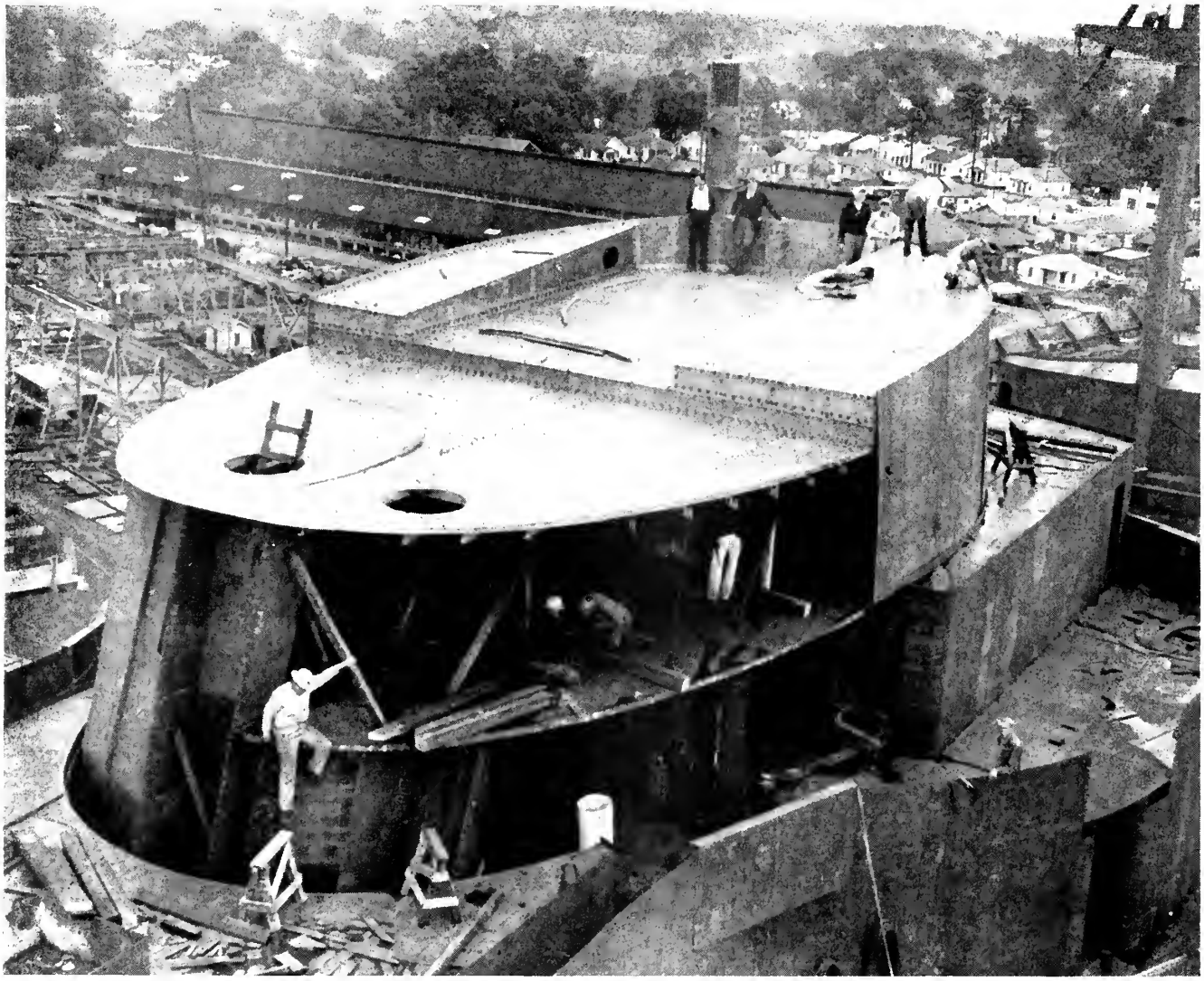
Aluminum Stackhouse, Lifeboats, Davits and Gear

THE NATION'S FIRST luxury liner to be built since the war was launched on January 11 at the Pascagoula, Miss., yard of the Ingalls Shipbuilding Corporation.

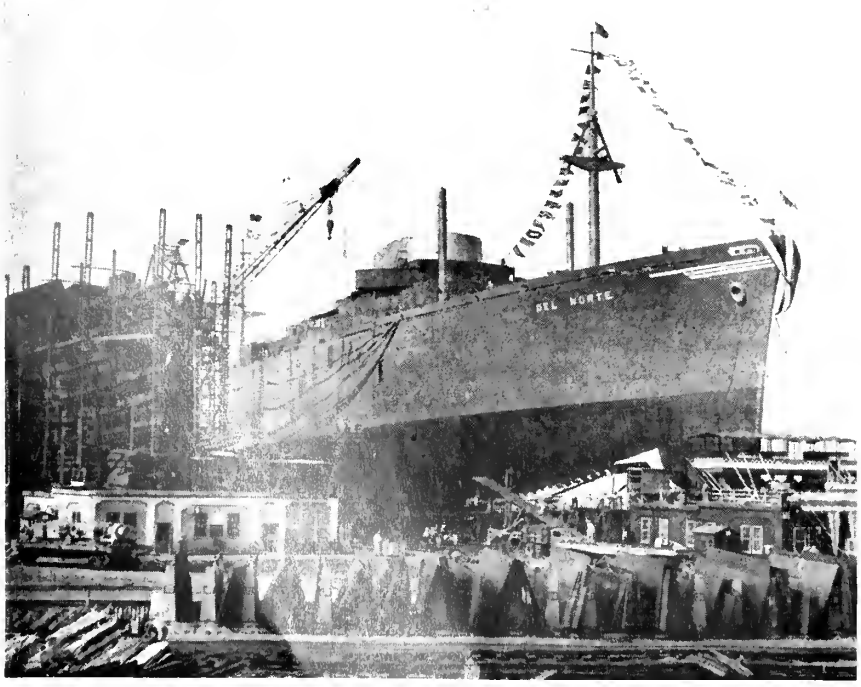
Featuring an aluminum stackhouse and the latest war-developed navigational aids, the 17,000-ton Del Norte is scheduled to make her maiden voyage on the South American run this spring for the Mississippi Shipping Company's Delta Line. She is one of three identical ships now being constructed at Ingalls for Delta.

In addition to aluminum plate and

The sprawling Ingalls shipyard at Pascagoula, Miss., was busy an ships in all stages of construction when this aerial view was taken recently. The yard, with $100,000,000 in peacetime ship orders, is looking for new employees.



Above: The Ingalls-built Del Norte's aluminum stockhouse is used as a deckhouse, inside of which are emergency generators, batteries for the same, chart room and wheel house. The upper level will be used for living rooms for radio operators and the radio office. Close to 75,000 pounds of aluminum alloy and cast aluminum are in the Delta Line ship, representing a saving of one pound in displacement for each pound of aluminum used.



With scaffolds removed and bunting flying, the 17,000-ton Del Norte stands poised on the ways for launching. Complete, she will represent an expenditure of about $6,000,000. Her gleaming aluminum superstructure may be plainly seen.

structural members in the stackhouse, aluminum is used in the vessel's lifeboats, davits and gear. In all, close to 75,000 pounds of aluminum alloy and castings go into the ship, representing a total saving of approximately the same weight in displacement.

The elliptical-shaped stackhouse is false, and is used instead to house emergency generators, batteries for the same, chart room and wheel house. On the upper level are living rooms for radio operators and the radio office. Exhaust gases from the boilers escape through separate smoke pipes aft of the stackhouse.

Aluminum alloys are also used extensively in extruded moldings for

grills, stair balusters, rails and other decorative applications.

Designed by George G. Sharp, naval architect of New York, the all-welded Del Norte is a modification of the C-3P in design. She is 489 feet in length, 69½ feet in breadth, with a depth of 45½ feet. She is the first and finest of her type.

The ships are designed to provide passenger accommodations exceeding those of pre-war luxury liners, and they are equipped with the most modern cargo-carrying facilities.

The three ships, which will be built at a total cost of more than $16,000,000, will be air-conditioned throughout, being the first passenger-cargo vessels to have this feature for all aboard, including the crew.

For the convenience of the 120 passengers, the Del Norte features a glass-enclosed promenade, outdoor swimming pool and sundeck, cafe and bar, grand salon and library, midship passenger elevator and a modern shopping center. A unique arrangement of bedrooms with strategically placed windows provides a clear view of the sea from every one. The bedrooms and apartments have fresh water showers, extra length beds with innerspring mattresses, ample wardrobe locker space and modern furnishings.

Lounges and clubrooms are separated by partitions of glass which provide satisfactory sound-proofing, yet create the visibility and air of spaciousness which is so all-important to travelers aboard ship.

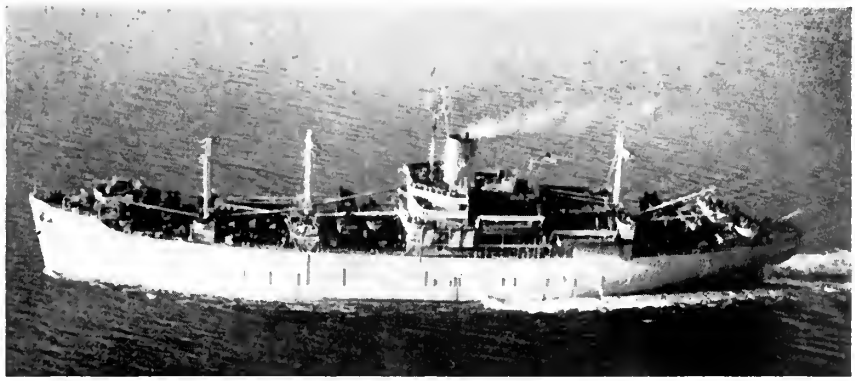
A new method of disposing of smoke and gases high above the deck also is featured on the new ship. The huge teardrop stack, built of aluminum, is false and provides two decks for officers' quarters, emergency generator and radio room, and the real "stack" is a hollow mast which discharges smoke and gases high above the deck, making it cleaner and more comfortable for passengers.

Murals and paintings depicting old New Orleans are combined with the greater use of glass and modern, soft-colored fabrics to give the vessel the pleasing tone of a well-appointed private club.

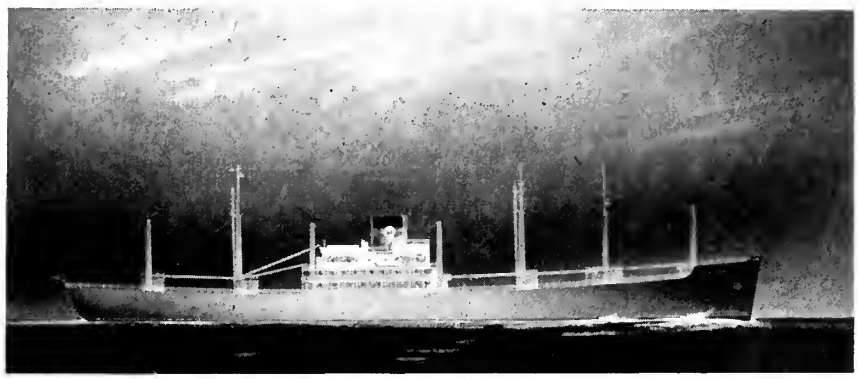
The Del Norte is just as up to date in arrangements for carrying cargo. The vessel has seven cargo holds, and approximately 70,000 cubic feet also is refrigerated and so arranged that it can be used for carrying additional cargo.

All holds except those provided with refrigeration are equipped with "Cargocaire"—a system to control humidity and prevent sweating and consequent damage to cargoes.

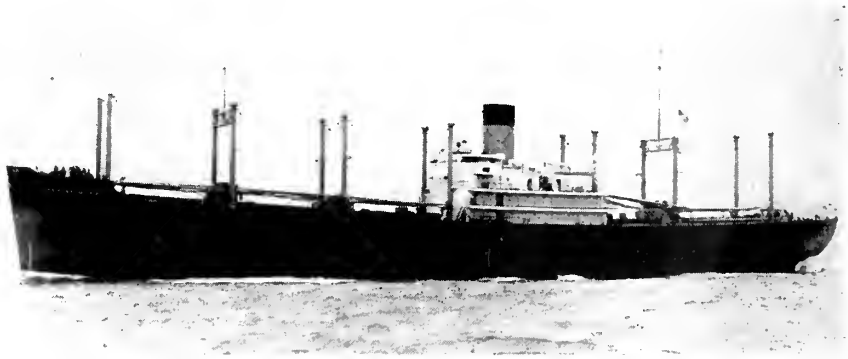
The three ships—the Del Norte, Del Sud and Del Mar, finest ever to make the South American run—will make the trip from New Orleans to Rio de Janeiro in 14 days and to Buenos Aires in 20 days, stopping en route at Santos and Montevideo. Delta Line plans to use the ships on a 47-day luxury cruise from New Orleans to Buenos Aires and return, allowing a week in the Argentine, three days in Rio and sight-seeing trips in Santos and Montevideo.



The USS Griggs, one of the attack transports which the Ingalls Shipbuilding Corporation sent to war from its Pascagoula, Miss., yard, is busy transporting troops from overseas for the Navy. These ships, armed to fight their way close to beachheads to land troops, will be employed as troop transports for five or six months, according to Navy officers, and their ultimate employment has not been decided.



The Ingalls Shipbuilding Corporation is building seven cargo-passenger vessels for the American Scantic Line of Moore-McCormack Lines, Inc., at its big Pascagoula, Miss., yard. This artist's conception shows how the 492-foot, 18,000-ton ships will look when they are completed. The third of these ships was launched recently.



The SS Sea Skimmer, all welded ship of the C3-SA-2 type, recently sailed for New Zealand and Australia under the Matson agency. One of the first peacetime vessels to go into service since the war, the ship, which was built at the Ingalls Shipbuilding Corporation yards in Pascagoula, Miss., was decked out in peacetime paint and featured the new corrugated superstructure which was developed by Ingalls. The Sea Skimmer will carry general cargo and some cargo which requires refrigeration. She also has staterooms for several passengers. She will be used between the West Coast and Down Under on a regular schedule.

ADMIRAL LAND

Vice Admiral Emory S. Land, Administrator, W.S.A.

One of the hardest jobs Admiral Jerry Land ever tackled was that of getting his resignation accepted. On January 4, with most of the major jobs practically "finished" or well in hand, his resignation from the Maritime Commission and the War Shipping Admistration was finally accepted by President Truman.

Typical of Admiral Land was his letter to the President stating that he had "done his bit." His bit was one of the biggest jobs in history. The answer he received was more than a mere formal acceptance and is in itself an eloquent tribute to a great man. It is quoted in full:

THE WHITE HOUSE
WASHINGTON

January 4, 1946

Dear Admiral:

The time has come when it is incumbent upon me to acquiesce with the utmost reluctance in the wish to retire which you have so often expressed during the past few months. It is nevertheless with sincere regret that I accept your resignation as a Commissioner, United States Maritime Commission; Chairman, United States Maritime Commission; and Administrator, War Shipping Administration, effective at the close of business on January 15, 1946, in accordance with the terms of your letter of January second.

I can appreciate that after thirty-nine years in the Navy and nearly nine years on the United States Maritime Commission, all but one as Chairman, you are "war-weary", to quote your own phrase. That the job you undertook was a "headache" none will deny. But your lasting satisfaction will be the realization of your superb accomplishments.

The job which you faced was colossal: the provision of shipping space adequate to support military operations all over the face of the earth. That involved the construction under your leadership of more than fifty million deadweight tons of merchant shipping—an achievement without a parallel in maritime history. There were also collateral problems involving administration, personnel, conversion and a hundred other things, all of which went into the job of creating and maintaining the

(Continued on page 114)

ADMIRAL VICKERY

Vice Admiral Howard L. Vickery.

When Howard L. Vickery left the Bethlehem Shipbuilding Company's Union Plant at San Francisco to become New Construction Superintendent at the Boston Navy Yard he was starting upward toward one of the outstanding accomplishments of history.

Graduating from Annapolis in 1915, Vickery served through World War I on the cruiser Charleston. He took a master's degree in naval architecture at Massachusetts Institute of Technology in 1921 and began the climb. He was loaned to the Haitian Government as Treaty Engineer from 1925 to 1928, and after a year in Washington in the Bureau of Construction and Repair he served for four years as Technical Advisor on Shipping to the Governor General of the Philippines. In 1933-34 he attended the Army Industrial College at Washington and served the next three years as head of the War Plan Section, Design Branch, Navy Department Bureau of Construction and Repair, and drafted the Senate Technical Committee's passenger regulations on Safety of Life at Sea.

As Assistant to the Chairman of the U. S. Maritime Commission from 1937 to 1940, Vickery had supervision over all shipbuilding, design and construction work in connection with the Commission's program to rehabilitate the Merchant Marine.

In September, 1940, appointed by the President as a Member of the United States Maritime Commission through special legislation, necessary because of his status as a commissioned officer on the active list of the United States Navy. As a Member of the Maritime Commission, he continued, in addition to others, the duties in connection with the construction program which he assumed in 1937. This building program, due to war needs, was expanded, and from the year 1939 through 1945, totaled 56,291,678 deadweight tons.

In February, 1942, named Vice Chairman of the United States Mari-

(Continued on page 114)

ADMIRAL LAND

(Continued from page 112)

largest merchant fleet ever built by one nation.

You have indeed done your bit and I am glad to accord to you the thanks of the nation which you have served with such fidelity and efficiency. You are entitled to a rest and after that I want to see you again active in a field which will give scope to your superb talents. With every good wish.

Very sincerely yours,

(Sgd.) HARRY TRUMAN

Vice Admiral Emory S. Land,
War Shipping Administration,
Washington, D. C.

Emory S. Land was appointed to the U. S. Naval Academy in September, 1898. He graduated with honor in 1902, going to the Asiatic Station on the U.S.S. Oregon for two years. At Annapolis he was presented with the Sword of General Excellence in Athletics and was Cadet Commander of the battalion in his graduating year, and received the Bachelor of Science degree.

Commissioned an Ensign, U. S. Navy, he completed a post-graduate course in Naval Architecture at the Massachusetts Institute of Technology, receiving an M. S. degree in 1907.

"Jerry" Land was appointed: Assistant Naval Constructor (1908) with the rank of Lieutenant (Junior Grade); Naval Constructor with the rank of Lieutenant (1912); Lieutenant Commander, Construction Corps, (1916); Commander (1921); Captain (1923); Rear Admiral (1932); and by special Act of Congress Vice Admiral on July 1, 1944.

On the staff of Admiral Sims in London in 1918, he was awarded the Navy Cross with the citation:

"For distinguished service in the line of his profession in connection with the design and construction of submarines and for work in the War Zone."

Admiral Land in October, 1932, was assigned to duty as Chief Constructor of the Navy and Chief of the Bureau of Construction and Repair, and permanent appointment to those positions was made on March 15, 1933. He was placed on the retired list of naval officers, with the rank of Rear Admiral, on his own application April 1, 1937, after 39 years of service. On April 16, 1937, he was appointed a member of the U. S. Maritime Commission for a six-year term, and was assigned immediately to supervise the Maritime Commission's construction program. Admiral Land was named Chairman of the Maritime Commission by the President on February 18, 1938.

Other appointments include: Director of Shipbuilding under the Advisory Commission to the Council of National Defense; Chairman of the Strategic Shipping Board; Administrator, War Shipping Administration; and American Member of the Combined Shipping Adjustment Board.

Decorations include: Spanish Campaign Badge; Victory Medal, World War (Submarines); Navy Cross; Honorary Commander, Military Order British Empire; The Army of Occupation of Germany Medal; Arthur Williams Memorial award; and Gold Medal of Bolivar-San Martin of the Pan American Society.

From 1940-1942 he served as President of the Society of Naval Architects and Marine Engineers.

Contrary to his statement, Admiral Land's job was not finished when he wrote to the President. Just as America will never be finished, so the splendid merchant marine that Admiral Land brought to fruition was not finished with war's end. Its task will be renewed from here on and it will take as wise a head and as strong a hand as his to guide it.

The industry is the better for Admiral Land's service to the country and to it, and is sorry to see him go.

ADMIRAL VICKERY

(Continued from page 113)

time Commission, in which capacity he served until his retirement on December 31, 1945.

In June, 1942, appointed Deputy Administrator, War Shipping Administration, which office he also held until his retirement.

During the war period, Vice Admiral Vickery was a Member of the Production Executive Committee, of the War Production Board; Member, War Manpower Commission; Member, Joint Canadian-United States Defense Board; Chairman, Post-War Planning Committee of the United States Maritime Commission.

He is a member of the Council of the Society of Naval Architects and Marine Engineers; Member, Naval Architecture Committee, as well as Classification Committee, of the American Bureau of Shipping; Member, American Legion; and Chairman of the Board of Trustees of the Cleveland Law School, Cleveland, Ohio.

Decorations: Distinguished Service Medal (Army); Distinguished Service Certificate, American Legion; Morehead Medal for 1945 awarded by the International Acetylene Association; Knight Commander, Military Division of the Order of the British Empire; Victory Medal, World War I; Officer, Grand Dragon of Anam, French Indo-China.

Admiral Vickery is married and has two children: Lt. Comdr. Hugh Blanchard Vickery, USN., and Miss Barbara Willis Vickery.

No man could have had better training for the big job he had to do, and no job could have been more in need of his splendid talents.

We will miss you, Admiral. And we say from the heart to your twelve million fellow Americans in the Armed Services, WELL DONE.

Irene Long

Serving as secretary to an Admiral could be a nice easy way for learning the ways and the lore of the Navy and the sea.

But being secretary to Admiral Howard L. Vickery through all the strenuous years of his Maritime Commission service is a task rather than an opportunity.

Irene Fontella Long, as Admiral Vickery's secretary, helped to keep the ship on its course, and, if such could be possible, made his task lighter and certainly brighter. In doing just that, Miss Long contributed at least her share to the success that Admiral Vickery achieved.

Coast COMMERCIAL CRAFT

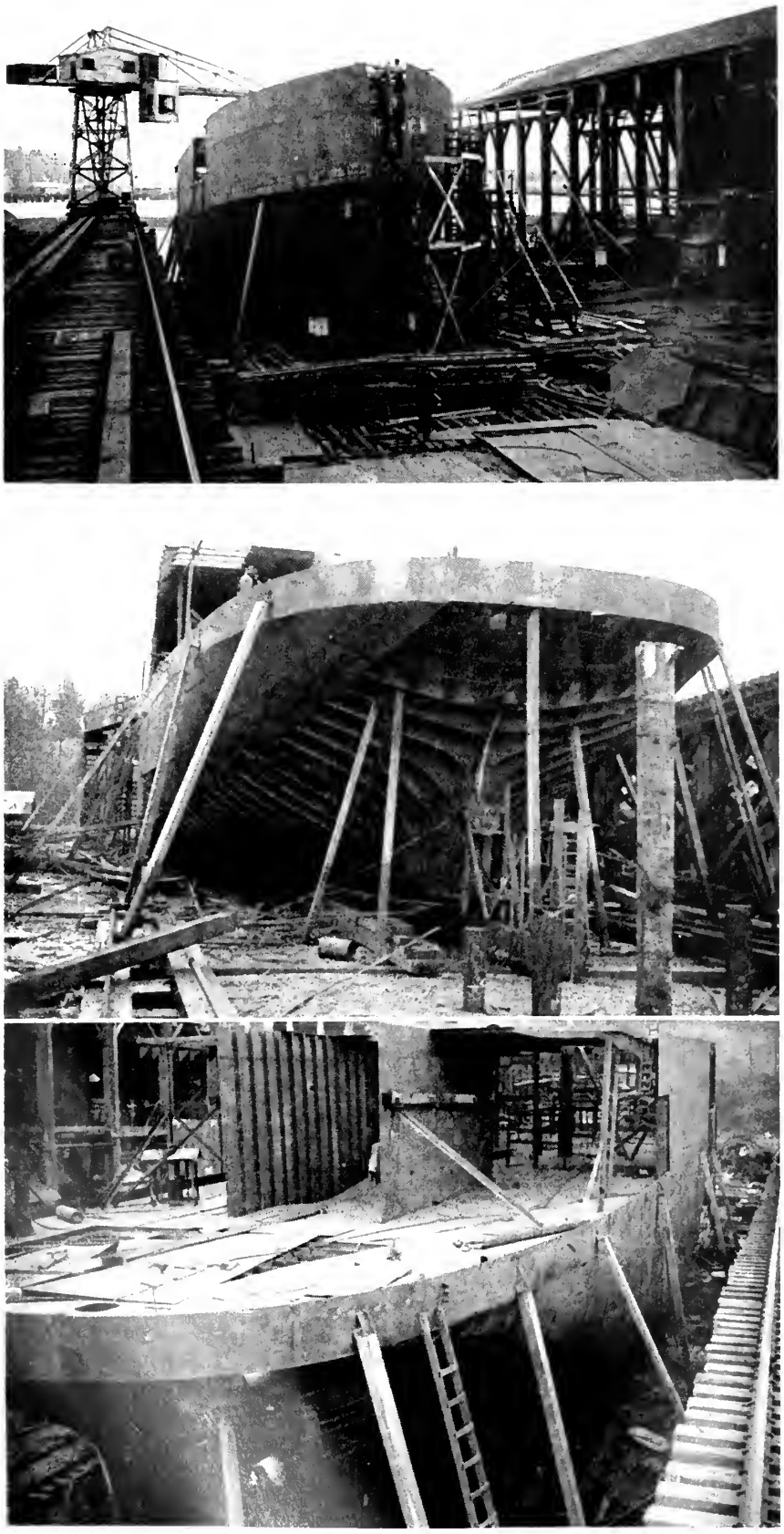
Diesel Freighter for Puget Sound Freight Lines

Construction of the 178-foot welded steel, diesel motor freighter for the Puget Sound Freight Lines is more than half completed at the Reliable Welding Works, Olympia, Washington, and delivery is expected sometime in April. The Puget Sound Freight Lines began preliminary work on the plans for this interesting vessel a year ago after a survey indicated that no vessels had been built during the war or previously that could be satisfactorily remodeled to suit their rapidly expanding trade on the inland waterways of Puget Sound and British Columbia. The modern design of this vessel, which is to be classed by the American Bureau of Shipping for limited coastwise service, has been capably worked out by Carl J. Nordstrom, Seattle Naval Architect.

The new craft has an over-all length of 178′ 4″. She has very pleasing lines, with a moderate beam of 36′ 0″ and a molded depth of 15′ 0″ displacing 1500 tons loaded. When fully laden, she is expected to make better than 11 knots.

The lower hold and main freight

Keel is laid for new Puget Sound diesel freighter. Foreground, left to right: Alfred Solibakke, marine superintendent; Clarence H. Carlander, president; Mrs. F. E. Lovejoy, secretary and treasurer, and widow of founder of the company; Mrs. Howard E. Lovejoy, wife of acting operating manager; George W. Foss, vice president; Carl J. Nordstrom, naval architect; A. W. Lewis, partner, Reliable Welding Works, Olympia, Washington; Don C. Harmon, Olympia district manager. With the exception of Mrs. Howard Lovejoy and Mr. Lewis, all are officers of the Puget Sound Freight Lines.



Three views of the vessel taken on the same date.

deck have over 10 feet of vertical clearance throughout for general cargo. The upper deck is exposed to the weather and may be utilized for deck loads. The carrying capacity is 800 tons of cargo loaded on conventional cargo boards or skips. Deck cargos of pipe, steel, or lumber will be loaded and unloaded by the vessel's own overhead gear. Gasoline-powered lift trucks will load and unload all other cargo. This method of handling and stowing cargo was pioneered by the Puget Sound Freight Lines 20 years ago on pulp movements and was quickly developed for other cargos. Such a revolutionary changeover from the old days of hand trucks has meant specialized equipment throughout and the vessel now being built is the culmination of 20 years of specialized development.

The revolutionizing feature of the design of all of the Puget Sound Freight Lines' vessels is the cargo elevator, which has been incorporated in the design of this new craft, providing access to the cargo decks and compensating for the varying heights of the tide.

The loading operation is accomplished with three-ton-capacity gasoline-powered lift trucks which pick up the loaded lift boards at a point of rest on a pier and carry them over a transfer plank onto the ship's elevator. The elevator is then adjusted to the deck level and the lift truck stows the loaded boards in place. Reversing the process unloads the vessel. The lift trucks easily lift the loads to a height of 8′ 8″, if necessary, so that loads can be set one on top of the other to utilize fully the headroom in the cargo spaces.

The ship is fitted with double bottom tanks forward of the machinery space, providing a large fuel capacity. The peak tanks and the deep ballast tank may be filled with salt water ballast to suit operating conditions.

The engine room is located well aft to provide a large hold for cargo and is confined between watertight bulkheads. Propulsion power will be provided by a 6-cylinder, 16 by 20, 300-rpm, 1200-hp Fairbanks-Morse direct reversible, 2-cycle diesel engine with oil cooled pistons. This engine weighs over 60 tons. It arrived at the shipyard dismantled in two carloads in the middle of January and assembly in the ship started on February 1.

Fairbanks, Morse and Company are providing the fire, bilge and bal-

last pumps, all of the service pumps as well as the two 110 volt DC generators. One generator of 10kw will drive from the main engine flywheel to provide power and lighting when the ship is under way. The other generator, of 25kw, will be driven by the auxiliary power plant, providing power for all of the ship's lights when handling cargo. An Exide storage battery set, consisting of 56 cells, MVA marine assembly, carries the lighting load when the generators are down.

The auxiliary power, furnished by a 4-cylinder, 9 by 10½, 514-rpm, 135-hp Atlas-Imperial diesel engine, will drive a 2-stage 408-cfm Sullivan air compressor having a fresh water cooled intercooler.

Separate fresh water cooling systems are provided for the main and auxiliary diesel engines. Low oil pressure and high temperature alarms are being provided to safeguard both engines.

The elevator winch will be a double reduction air operated unit built by the Washington Iron Works at Seattle. The owners have air operated elevators in five of their vessels, and have found them very successful. The anchor windlass, capstan, and two cargo winches on the upper deck will all be operated by air. The deck winches, in connection with two 8-ton booms stepped on kingposts located just ahead of the navigating bridge, are to be used for handling lumber, pipe, steel, and other cargo not suitable for handling on cargo boards or skips.

The Isaacson Iron Works of Seattle has forged the stern frame and tail shaft. The Nelson Iron Works forged the rudder stock, which is built in three sections. Doran Company of Seattle furnished the solid bronze propeller, which has a diameter of 94 inches and a pitch of 54 inches.

The steering gear, a Sperry No. 2 electric steering engine, is easily changed from power to manual steering in the pilot house. The steering engine will be located inside of the engine casing just under the upper deck.

A radio-telephone for ship-to-ship and ship-to-shore communication, and a radio direction finder, are included in the navigating equipment. The magnetic compass will be installed by the Northwest Instrument Company of Seattle.

The living quarters are to consist of a steel upper deck house, insulated and attractively finished inside with plywood, and a texas. The pilot house and texas will be built of wood. The doors and sash and all joiner work will be of wood. The crew's quarters are large, with two men to a room in the deck department, while the engine room and deck officers and cook each have quarters of their own. Basins and lockers are provided in all rooms. There are five showers and five heads. A day room is provided on the starboard side of the upper deck house for the crew's recreation. Heating will be by hot-water system with oil burner in the engine room and convector radiators in each heated space.

Setting shell around starboard bow above main deck.

The galley and messroom, located in the after end of the upper deck house, will be light and cheerful. Equipment in the galley includes a Lange oil-burning galley range, a large household type refrigerator and stainless steel sinks and drainboards. A large storeroom adjacent to the galley includes a walk-in refrigerator.

Cold drinking water may be had at any time at a drinking fountain that has coils inside the walk-in refrigerator.

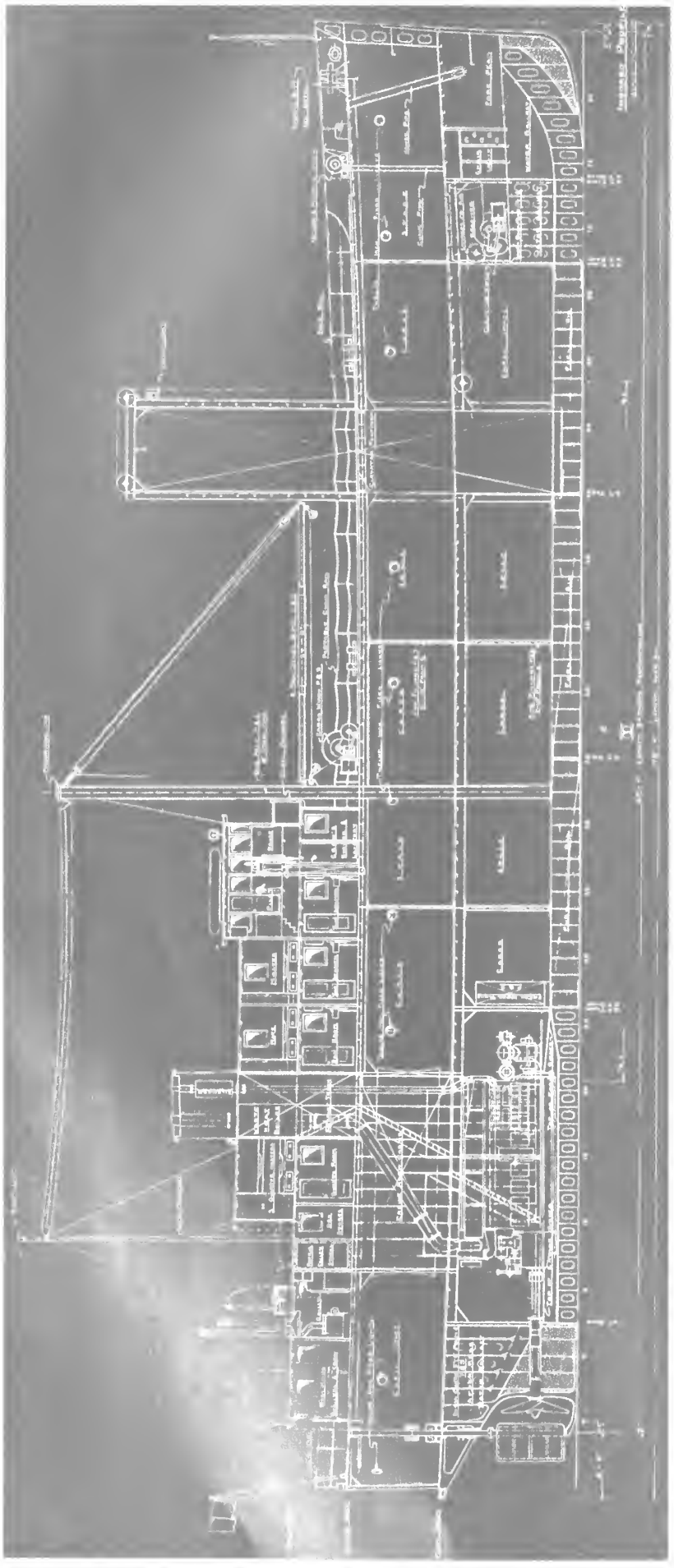
Carl J. Nordstrom designed this vessel upon returning to civilian life after more than four years as a Navy commander. He had charge of all design and construction in connection with the remodeling of many former well-known transpacific liners into military transports and later with the overhaul and repair of naval vessels in the Seattle area. He has opened offices in the 905 Second Avenue Building, Seattle.

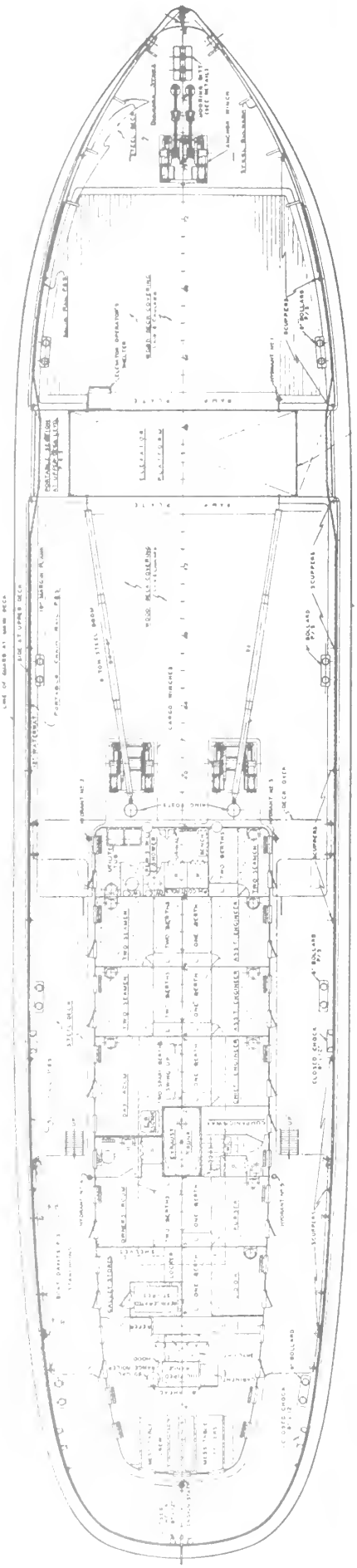
The Reliable Welding Works have been building commercial and Government vessels for the past ten years. During the war they built 22 tugs for the Army and a number of barges and commercial boats, including a 130-foot tuna hull. Their yard is specialized in the building of all welded steel vessels up to 200 feet in length. A. W. Lewis, owner, began his shipbuilding career as an apprentice shipbuilder in the Bremerton Navy Yard in 1915.

The Puget Sound Freight Lines was established in 1919 by Captain F. E. Lovejoy, and is today one of the largest operators in the inland water freight transportation business on the Coast, owning the following fleet of vessels: Warrior, 156 feet long, twin 200-hp Atlas diesels; Indian, 165 feet, 500-hp Atlas diesel; Seatac, 120 feet, 300-hp Fairbanks-Morse diesel; Skookum Chief, 125 feet, twin 180-hp Washington diesels; Belana, 105 feet, 240-hp Fairbanks-Morse diesel; F. H. Marvin, 125 feet, two 100-hp Fairbanks-Morse "CO" diesels.

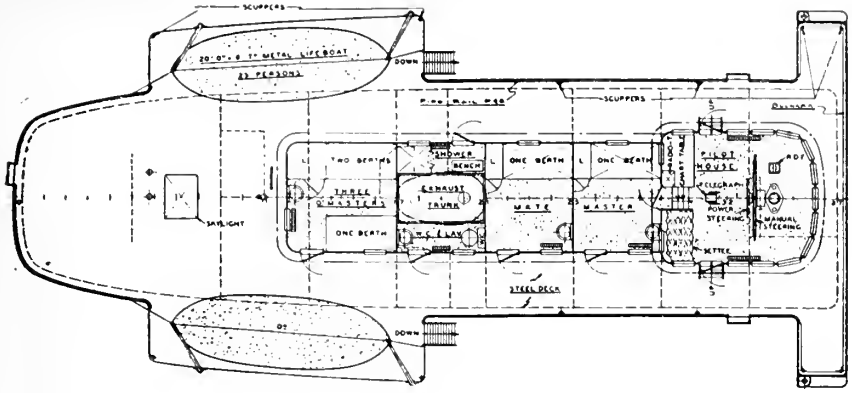
The company's business has steadily grown and expanded from the first, due to its methods of handling freight and to complete transportation service given its patrons in the Puget Sound, British Columbia and Grays Harbor area.

In addition to its fleet of vessels, the company owns its own docks in Bellingham and Olympia, nine 7-ton trucks, and five 16-ton tractors and semi-trailers, which are used in carrying freight between Aberdeen and Olympia as a feeder service to freight





Outboard profile and arrangement plan of Puget Sound freighter.



vessels plying between Olympia, Seattle and Tacoma, and other Sound ports, and for pick-up and delivery of freight in Bellingham, Olympia and Shelton. Terminal equipment includes 46 cargo power lift trucks, four automatic transporters, and considerable cargo handling equipment, including 4800 wooden cargo skips and 4000 cargo lift boards.

Present officers of the company are: Clarence H. Carlander, president; George W. Foss, vice president; and Edith R. Lovejoy, secretary and treasurer. Mr. Carlander, the present head of the company, has been associated with the organization ever since it was first founded, and became president of it when Captain Lovejoy died on October 4, 1940. Howard Lovejoy, the latter's son, is resident construction supervisor at Olympia while the new freighter is being built.

Other operating officials are as follows: David B. Fairley, assistant secretary-treasurer and auditor; Alfred Solibakke, marine superintendent; J. Knox Woodruff, operating manager; George B. Cooper, purchasing and claim agent; Alfred E. Bourke, Seattle agent and dock manager.

James Wright is general freight agent; Louis Coupez, chief, billing department; Albert W. Brazas, Bellingham district manager; Don C. Harmon, Olympia district manager; and Fred Erickson, Aberdeen district manager.

Hull Corrosion Licked

On drydocking the Case-American Construction Company electric dredge San Diego on July 27, 1945, a graphic picture was revealed of the protective properties of a plastic coating which it is said may revolutionize the conventional methods of protecting hulls against the corrosive action of sea water. It was found that a large test area on the bottom and side of the dredge which had been coated in June, 1941, with an American Pipe & Construction Co. product, Amercoat No. 23, appeared to be in practically the same condition as when first applied four years before, while the remainder of the hull, which had been coated twice in the four-year interval with conventional means, presented a completely etched, corroded surface, pitted in some areas to a depth of 1/16th of an inch.

Because of the extremely successful record of the Amercoated test section of the hull, the entire hull of the San Diego was Amercoated in July, 1945, before the dredge was placed back in service.

Applications to date of the Amercoat coating have not only proved its practicability in the marine field, but have excited the interest of engineers everywhere where corrision is a problem.

Applying plastic coating to electric dredge San Diego.

Grace Line Acquires Two Tugs from Maritime Commission

With the arrival of the Grace II and the Grace III in New York on January 10 from Jacksonville, Florida, Grace Line put into operation two tugs recently purchased from the U. S. Maritime Commission. Both tugs will be used in conjunction with the Grace I for lighterage work and ship docking at Grace Line's Hudson River terminals.

The Grace II was built by Ira S. Bushey & Son and the Grace III by Consolidated Shipbuilding Corp., both of Jacksonville, Florida.

Each tug has a length of 85 feet, a beam of 24 feet, and a draft of 9 feet 8 inches. Propulsion is by 700-horsepower General Motors diesel engines.

Atop the wheel house of S.S. Catalina, troop-carrying steamer of the San Francisco Port of Embarkation's Harbor Fleet, Major General Homer M. Groninger, Port Commander, inspects the ship's new radar installation. He is accompanied by Captain Howard J. King, master of the ship, and H. V. Cashdollar, radar engineer of the Port of Embarkation. Bruce Lawrence, ninth service command radar engineer now working at the Port, and Joseph F. Poplosky, radar expert from Raytheon Manufacturing Company, makers of the instruments, are shown colibrating the antenna at top of picture. The antenna is protected from rain and the winds which would retard its circular movement by the large plastic haad, the upper part af which lies on the deck (center). The transmitter-receiver box (under Capt. King's hand) automatically switches on and off 400 times a second. Radio impulses travel up the inside skin of the wave guide (the square vertical pipe) and bombard the antenna; travel thence until they hit a target and are reflected back to the antenna and back down the wave guide to the receiver. 60,000 watts af pawer are used. Instrument is Raytheon Manufacturing Company's SO-8 model. *(U. S. Army Signal Corps Photo.)*

Radar on Harbor Craft

Disclosure that the troop-loaded ferry Hayward, which ran aground in the tricky river channels of upper San Francisco Bay in a recent pea soup fog, was located by the Army's newest floating radar installation, lifted the lid on San Francisco Port of Embarkation's plans to battle the area tule fog.

The Hayward was picked up on the radar "scope" of the Army's steamer Catalina, first harbor vessel to get the special electronic equipment, as the latter ship neared Camp Stoneman with her just-returned veterans.

The run to Stoneman, first leg on the final homeward trip after Pacific warriors are debarked at San Francisco Port of Embarkation, is often more difficult than deep sea operation, due to narrow channels and frequent fogs. Without radar, these channels are run only by visual reference to buoys and markers which trace the winding paths.

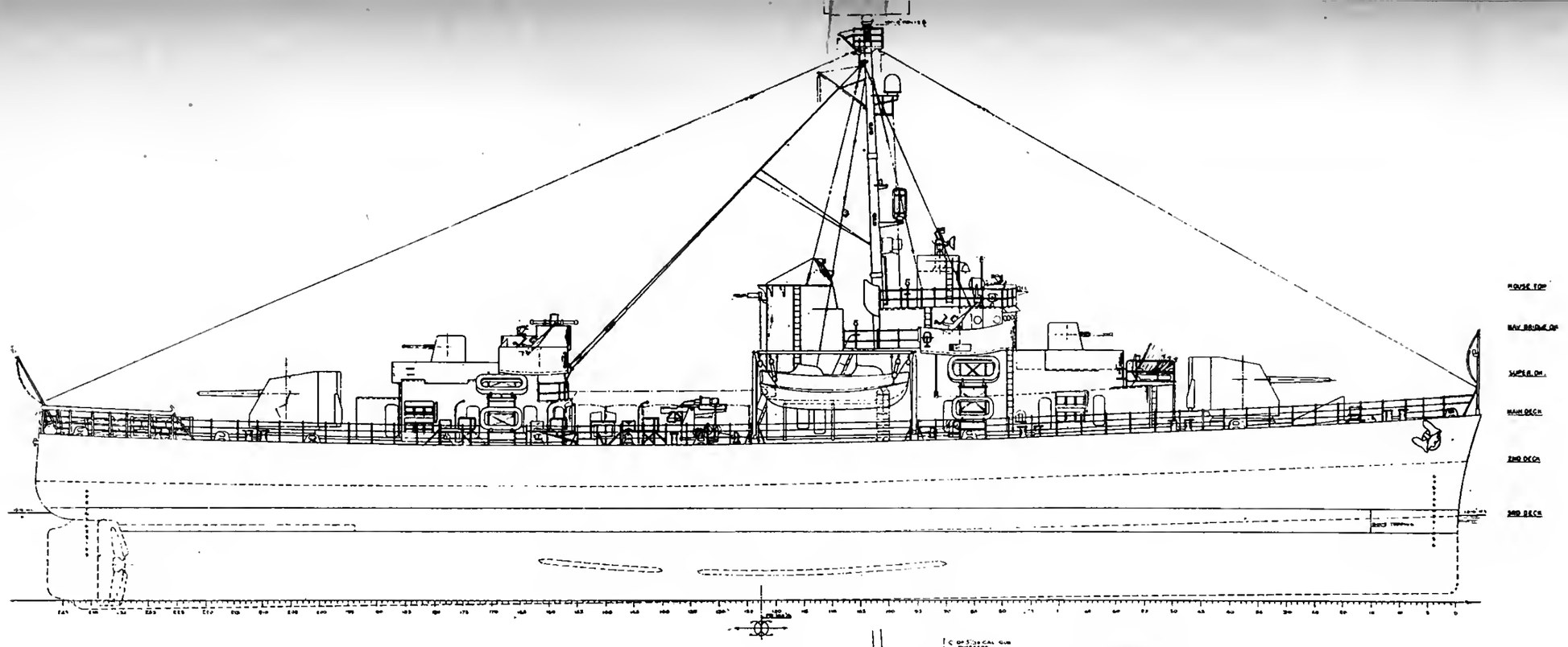
"The motive behind all Port operations is to speed the return home of the veterans coming in from the Pacific," Major General Homer M. Groninger said in setting the keynote of the radar operations. "With the special radar which we have installed on Army troop ships and which we are now placing on the harborcraft, the ships and ferries can make maximum speed in all weather and can enter the Golden Gate and narrower channels regardless of the degree of visability."

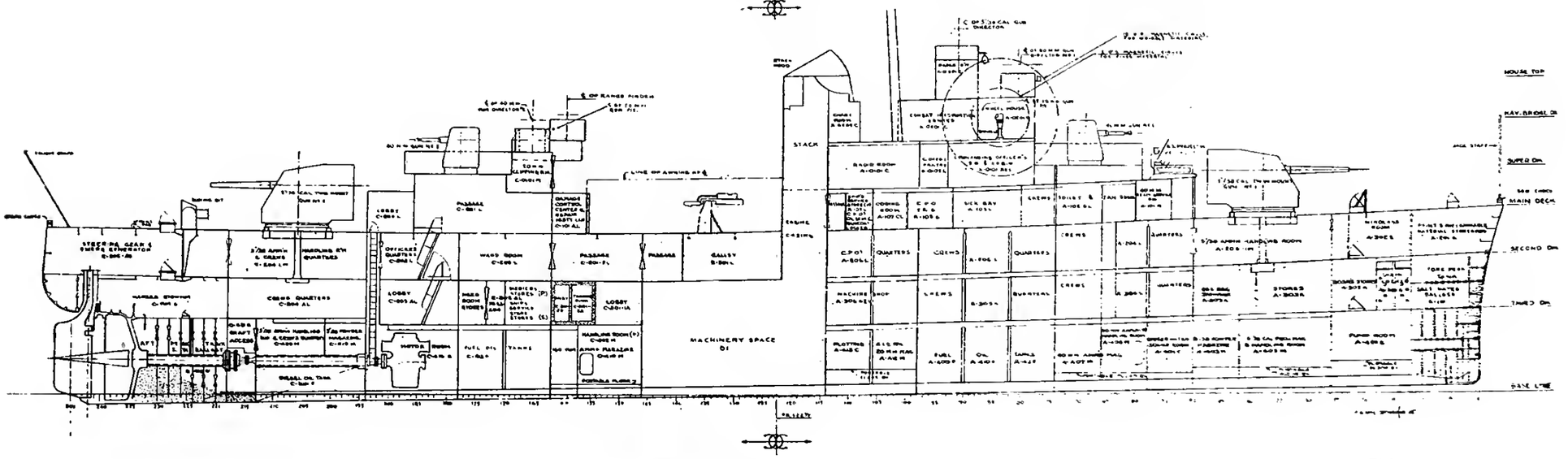
The trip on which the temporarily grounded Hayward was located was the first regular trip on which radar was used for river navigation. When the War Department initiated installation of radar equipment on Army deep sea ships some months ago, port signal officers secured an obsolete set for experimental river use on the Catalina, peacetime link between Los Angeles and Catalina Island off the Southern California coast. The main problem was to so adjust the instrument as to enable detection of close-in objects. Radio waves which strike targets within three hundred yards are reflected back to the ship too quickly to be pictured on the radar scope, and as the distance between many turn-locating channel markers is often but a scant hundred yards, any mechanism used had to have a super-fine adjustment.

When experiment with the obsolete equipment aboard the Catalina proved the feasability of using radar for channel work, a special type of the most modern equipment was installed. By fine adjustment of the instrument after each use, Port signal officers declared that results are far better than are normally expected. It is operated by a soldier technician, but Captain Howard J. King, master of the vessel, interprets the outlines and "pips" in the radar scope, when handling his vessel in the fog and at night. King has, as a result of his use of radar in San Francisco Bay, become an enthusiast who "wouldn't be without it."

While Captain King had his initial instruction aboard the vessel, Army operators who are put aboard transports as they are radar-equipped by San Francisco Port of Embarkation, are graduates of the Port's Special Electronics School. Set up under General Groninger's direction by Captain Frank L. Treadway, head of the Port's radar installation and one of the early graduates of the Army Radar School in 1942, the post-graduate electronics course features two complete radar systems of the type which soldier-operators will use and maintain aboard ship. The three weeks course, conducted at Fort Mason by Lt. Stanley Owens, draws its students from men who have previously completed basic radar instruction at the Fort Monmouth, N. J., Signal Corps School.

Installation of radar equipment takes eight to ten days on transports and four to five on harbor craft. The installations are supervised by H. V.



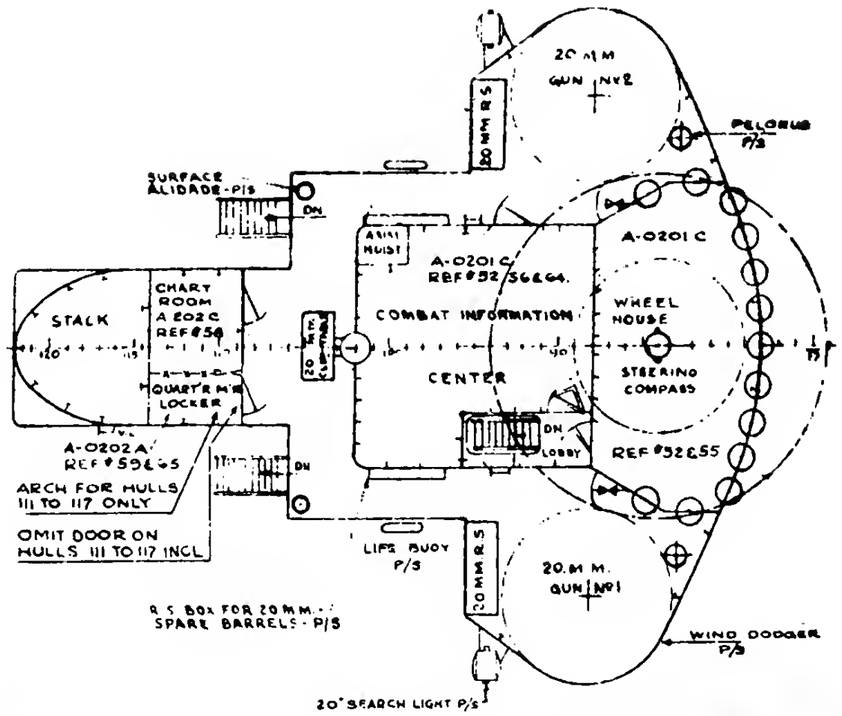


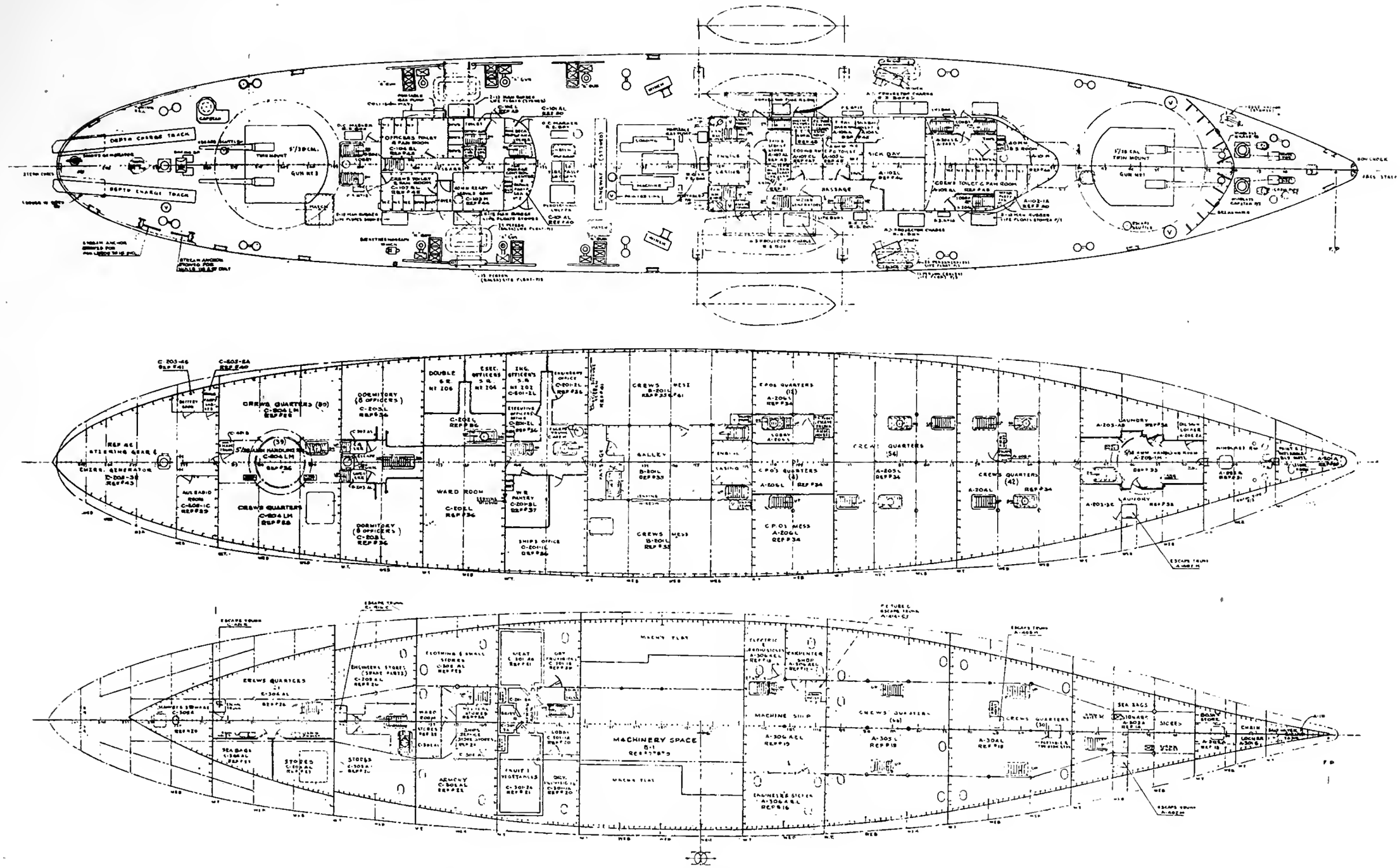
COAST GUARD CUTTERS

Last month we published an article entitled "Turbine-Electric Coast Guard Cutters," by J. A. Wasmund of Westinghouse, and announced that arrangement plans would follow. In the plans herewith and on opposite side of this insert the wartime arrangement is shown. However, the armament will be reduced considerably for the peacetime activities of the Coast Guard. There are 13 cutters of this class, the general characteristics of which are as follows:

Length Over All	254 feet
Beam (Molded)	43 feet
Draft (Design)	15 feet
Shaft Horsepower	4000

The cutters are propelled by a single screw. The power plant is turbo-electric, synchronous AC. Steam is obtained from two Foster Wheeler two-drum express oil-fired boilers, fitted with superheaters and economizers. The hull has special form and is strengthened for working in ice. Particular attention has been given to crew accommodations, for comfort and convenience, crew's quarters, as well as officers' quarters, being equipped with air-conditioning. For wartime purposes, armament and control were very complete. It is believed that these ships were the heaviest armed vessels for their length afloat. When stripped down for peacetime operation, the completeness of equipment and outfit will leave nothing to be desired.





Arrangement Plans of Turbine-Electric Coast Guard Cutters

(Continued from other side)

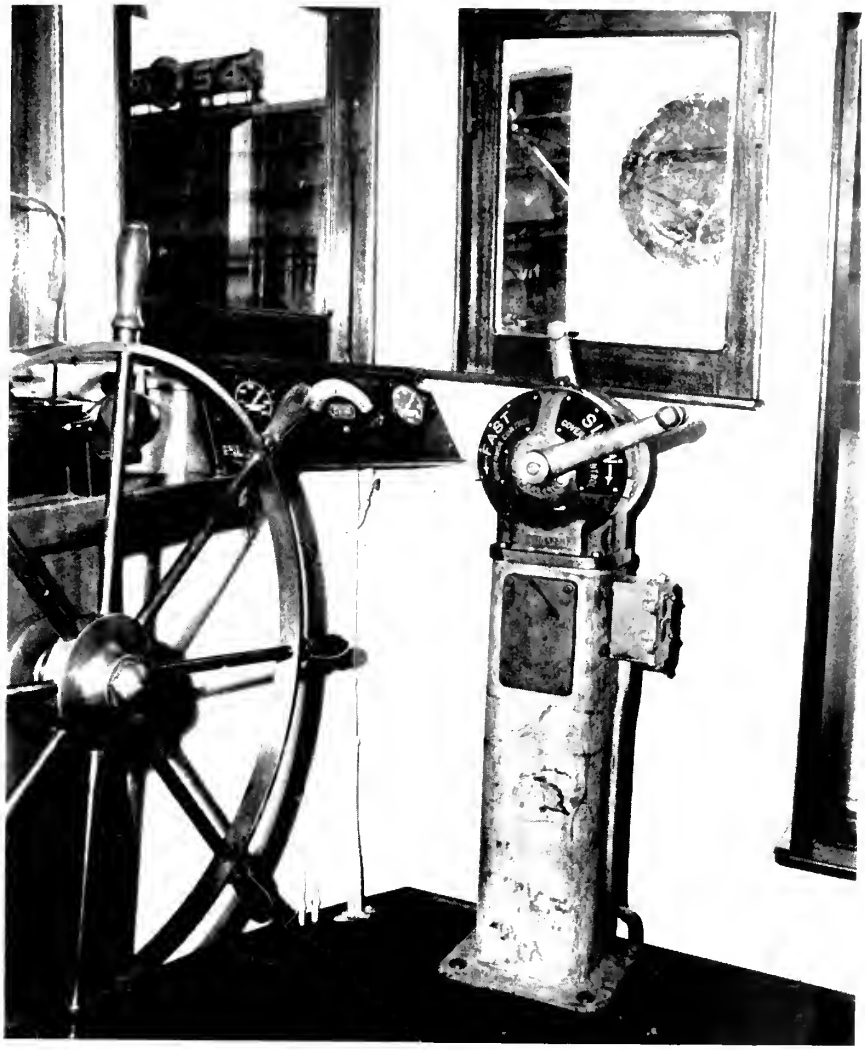
Cashdollar, war-time radar instructor for the Navy and request the services of no fewer than eight trained men. Much of the local installation for the larger troop ships is done under Army contract and supervision by bay area shipyards.

Shrimp Boat Built at Tacoma For Gulf Fishing

A very interesting shrimp fishing craft, built by the J. M. Martinac Shipbuilding Company in Tacoma, Washington, for Major J. H. Pullen of Houma, Louisiana, recently left the Pacific Coast and is now fishing in Gulf waters.

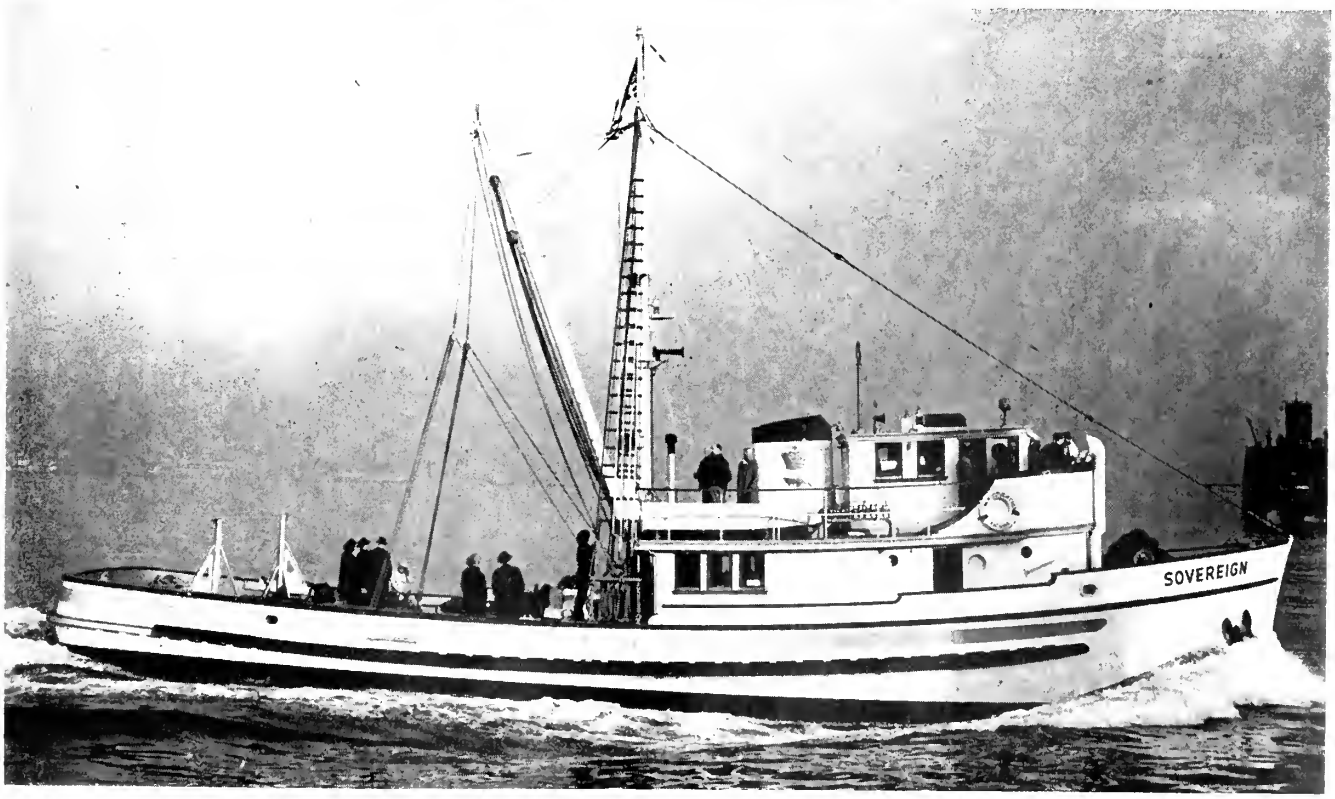
This vessel, named the Sovereign, is the first of a proposed shrimp fishing fleet which Major Pullen and his partner, Albert E. Fletcher, intend to build and operate in this important activity in the Gulf. It was designed by the shipbuilders to meet the particular requirements of the co-owners at a cost of approximately $130,000.

She is a smart looking craft of wood construction, with a raised foc'sle and a trim sheer line, a length of 82 feet and a beam of 26 feet. Her main propulsion unit is an Enterprise



Right: Corner of pilot house, showing steering wheel and Enterprise machinery controls and gage panel.

Below: New shrimp fishing boat for Gulf of Mexico waters on trial run.



Enterprise D.M.G.-6 400-hp main propulsion unit on the shrimp boat Sovereign.

D.M.G.—6 diesel engine of 400 hp at 400 rpm, which drives a main shaft with a Coolidge propeller of 66 inches diameter and 39 inches pitch. The cruising speed is 11 knots and the vessel is fitted with refrigerated holds of a capacity of 150,000 pounds of shrimps.

Accommodations for a crew of ten men and the two owners are provided in a deckhouse running from midships forward on the weather deck.

It seems noteworthy that the owners should come to Pacific Coast builders for a vessel which will operate in Gulf waters.

A Modern River Towboat

The new 112-foot towboat Codrington underwent final trials on January 10 at Nashville, Tenn. Named for George W. Codrington, vice president of General Motors, she was built by the Nashville Bridge Company at Nashville, and will be the largest towboat of a fleet of four boats operated by the Canal Barge Company of New Orleans on the Mississippi and Ohio Rivers hauling fuel oil.

Powered by a 16-cylinder 2 cycle General Motors diesel engine with a rating of 1235 bhp at 700 rpm, she is driven by direct connection Air-Flex clutch reverse reduction gear unit with the propeller shaft turning an 82" three-blade propeller at 304 rpm. The auxiliary equipment consists of two General Motors generator sets, each consisting of a 3 cylinder 2 cycle General Motors diesel engine and a 20-kw marine type generator.

The hull and superstructure are all welded steel construction. The towboat is equipped with pilot house control. This feature insures rapid maneuvering because all control of the engines is done by simply moving the speed controller lever—no vocal or manual order need go to the engine room. The rudders are operated by a pneumatic steering engine also controlled from the pilot house. In addition a special type Nabrico seminozzle has been installed to increase the thrust of the vessel.

R. R. Thorpe is captain and William Andrew is chief engineer.

"Plasticraft" Boats

"Always above water," a phrase used by Winner Mfg. Co., Inc., of Trenton, New Jersey, in referring to their products, is especially appropriate for their new unsinkable plastic boat.

The hull is a "sandwich" composed of two outer layers of lightweight duck, a low density core of sisal fiber matting and an inner layer of heavy duck. This combination is impregnated with a compound consisting of Bakelite resin with special chemicals and a neutralizing agent which helps the canvas to retain its original resiliency and tensile strength. With the "life" of the material unimpaired, there is no excessive rigidity and resultant brittleness. Instead, this type of construction makes the Plasticraft rebound rather than smash or dent when contacting a foreign object in the water.

The impregnated assembly is then laid up on a form to which a pressure of less than 50 lbs. per square inch is applied. After a short cure, a lightweight shell (only 73 lbs. for the 10 ft. dinghy) is stripped from the mold. Being seamless, it is watertight, and seasonal calking or pitching is eliminated at the outset.

The gunwhales, seat raisers, keel and keelson are bonded to the hull with phenolic-resorcinol cold-setting waterproof glue. With the addition of woodwork, seats and trim, the finished 10 ft. dinghy weighs but 142 lbs., making it possible for two persons to lift it with ease.

Being self-buoyant, the craft will not sink under any conditions. This same characteristic provides unusual freeboard with minimum draft . . . on slightly more than a heavy dew, as the Winner engineers so deftly put it.

The Winner line of Plasticraft includes dinghies for sailing, rowing, and outboards. Distribution will be made through dealers at a nominal figure in line with other boats of similar sizes.

Swedish Shipbuilding

By A. J. Dickie

DURING JANUARY the Johnson Line motorship Bio-Bio visited Pacific Coast ports on her maiden voyage. She had a fairly full load of Swedish paper products, Central American coffee and hardwoods, and refrigerated cargo. Since she is an excellent example of the post-war product of Swedish shipyards, and since Sweden is now the third shipbuilder in the world, we are compiling this article so that our readers may understand the competition that is facing American shipbuilders.

The Norwegian shipowners are probably the largest single block of customers for the Swedish yards. As of December 1, 1945, Norwegian orders in Swedish shipyards amounted to about 400 vessels, practically all of which are to be motorships. Not all of these vessels will be used in the Norwegian merchant marine. Many of them will be sold on delivery, and undoubtedly quite a number will be sold on the ways to the shipowners of other nations. Norse ship owners and ship brokers are always a little ahead in sizing up future trends in the ship business.

Every shipway in Sweden is occupied and has a nice backlog of orders. Most Swedish yards are prepared to build engines as well as hulls.

Bio-Bio was built by Kokums Malmo Sweden. Her steel hull is largely welded. All frames and deck beams are serrated so that the welding of these heavier members to the deck and shell plating is now continuous. This avoids locked-up strains and considerably lightens the framework of the ship without sacrificing stiffness. The welding was a very neat job. In all the trunked hatches the brackets for the strong backs were welded to the hatch combing and were further supported by a round steel bar with both ends spherical, which was welded at its upper end to the outer corner of the bracket and ran down and over to the bulkhead on an easy curve to a couple of spot weldings. This not only supported the bracket but acted as a guard to prevent the hook or a load catching on the bracket corner.

Bio-Bio is propelled by two Kokums M-A-N single acting diesel engines, each connected driectly to one of the twin screws and each delivering 3,750 shp. She carries also three auxiliary generating sets with Kockums M-A-N engines and Asea generators. Practically all of the auxiliary machinery is electrically driven by Asea Motors. An interesting feature of the engine room is the refrigeration corner where the refrigeration engineer can control the temperature of every refrigerating compartment on the ship. It is claimed that this control is so adjusted that any compartment can be maintained at a certain predetermined temperature, plus or minus one-half degree Fahrenheit, all the way from Stockholm to San Francisco, through the Panama Canal. Bio-Bio is equipped with a waste heat boiler that furnishes steam for heating and cooking and for warming coils in the fuel oil tanks. Lubricating oil and fuel oil is centrifuged in De Laval latest type oil purifiers.

She carries 24 passengers in beautiful rooms on the promenade and boat decks. Each of the eleven rooms has its private bath and is equipped with a bed and a Pullman berth that folds into a comfortable couch for day service. At the forward end of the promenade deck is the lounge, which is one of the most charming rooms we have seen on shipboard. The illustration and the deck plans herewith show the graceful shape of this apartment and some idea of the indirect lighting effects. In addition to line and proportion this room has hardwood paneling that is a masterpiece in ship joinery, and is furnished and carpeted in a very strikingly harmonious color scheme. It is separated from the vestibule by a fine etched glass bulkhead.

The dining room on the shelter deck level is another lovely room with normal seating for 24. On the starboard side is the chief steward's office and bedroom, on the port side, the office and bedroom of the ship's doctor.

The decor on this vessel impressed us as being harmoniously modern.

On the boat deck level, under the pilot house, are two luxurious suites, one for the owner and the other for the captain.

A notable feature of all new Johnson Line ships is that they carry stainless steel propellers, and on at least one vessel the propeller has an adjustable, or reversible pitch.

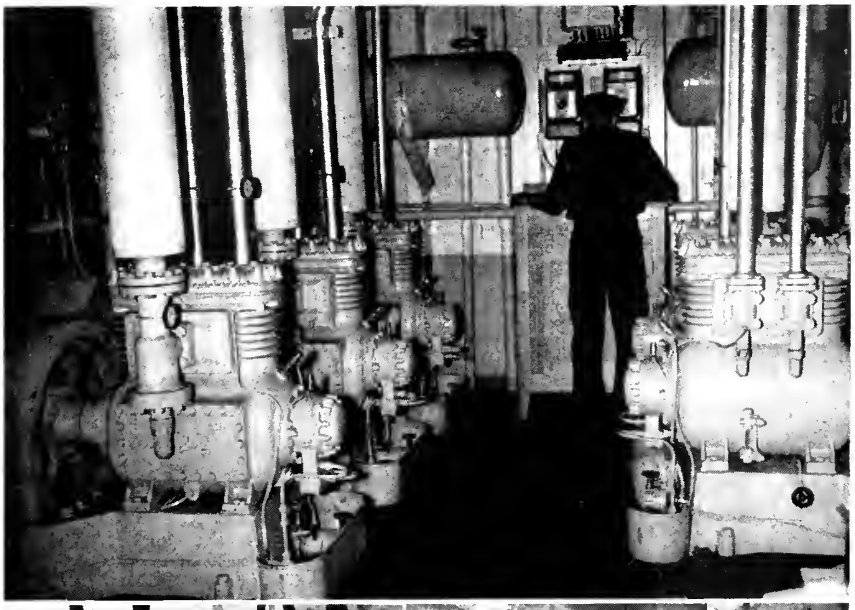
Bio-Bio is just one example of the modern cargo-passenger liner that Swedish yards are now building. Here are some more examples of that and other types.

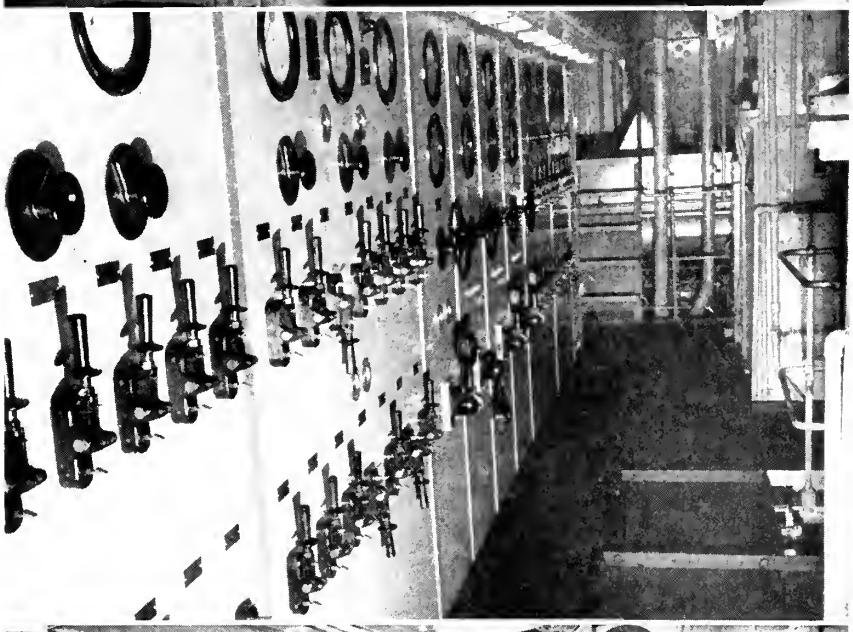
In the middle of December the Eriksberg shipyard of Gothenburg delivered a motor vessel of 9,160 tons d.w., the MS. Mongabarra, to the Transatlantic Shipping Company of Gothenburg.

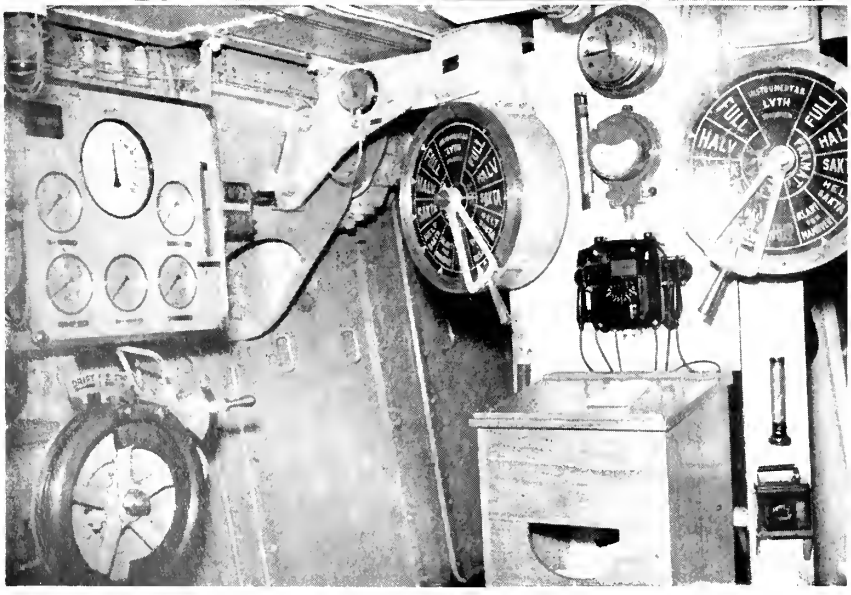
The vessel, which is of the modern shelter deck type, has been built to Lloyd's highest class. Her main dimensions are: length between p.p. 405′-0″, molded breadth 56′-6″, depth to main deck 28′-9″ and depth to shelter deck 38′-9″. She has four cargo holds and deep tanks for about 1,000 tons of oil. There are six passenger cabins, each with a bathroom. The officers are accommodated amidships, while the crew's quarters are situated aft. Officers as well as crew have special day rooms at their disposal. The propelling machinery consists of a two-stroke single-acting directly reversible solid injection diesel engine of Eriksberg's own make, developing 5,400 ihp and giving the ship a speed of 14 knots on full cargo.

At about the same time the Lindholmen shipyard of Gothenburg delivered the motor cargo vessel Yvonne, 5,800 tons d.w., to the Disa Shipping Company of Stockholm.

This vessel too is a shelter decker and built to the highest class of







Upper left: Five sets of refrigeration compressors.

Center left: Electrical switchboard in engine room.

Lower left: Port main diesels starting platform.

Lloyd's. The main dimensions are: over-all length 441'-1", molded breadth 53'-0" and molded depth to main deck 25'-0". Yvonne is provided with six cargo holds, one of them equipped with refrigerating system. Passengers as well as officers and crew have very comfortable accommodations at their disposal. A spacious dining room and a promenade deck and a veranda-cafe are among the passenger facilities, and every cabin has its own bathroom. The officers are accommodated in the deckhouse amidships, while the crew are quartered aft in single berth cabins. The vessel is propelled by two 9-cylinder two-stroke single-acting directly reversible solid injection B & W diesel engines of Eriksberg's make, each developing 3,150 hp. at 160 rpm, giving the ship a speed of 17 knots.

The same yard recently launched a motor cargo vessel of about 3,000 tons d.w. for the Diana Shipping Company of Stockholm. The propelling machinery, which is placed aft, will consist of an 8-cylinder two-stroke directly reversible Polar diesel engine, developing 1,310 at 250 rpm.

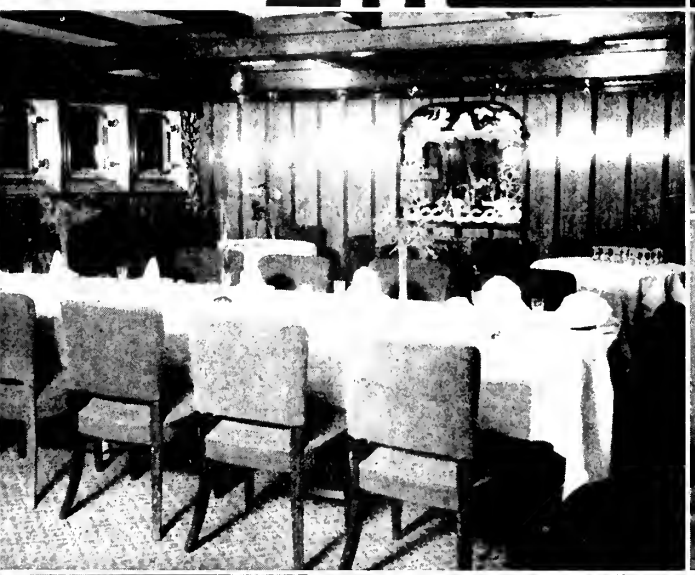
The Gotaverken shipyard of Gothenburg launched at the end of December a motor liner of 7,300 d.w., the Rydboholm, for the Swedish American Mexico Line (Brostrom Concern) of Gothenburg.

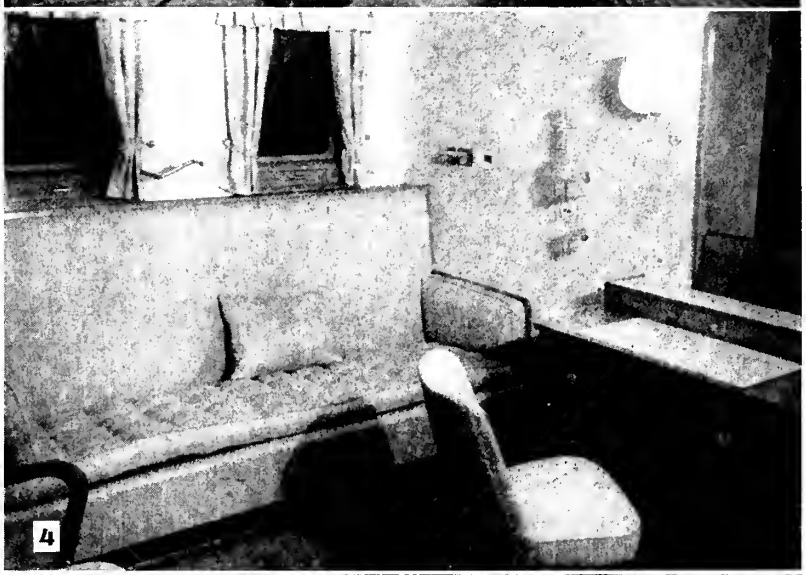
The new vessel, which is a sister ship of Stegeholm and Vretaholm, delivered by Gotaverken to the same owners in 1939 and 1943, respectively, is welded to a large extent and has welded corrugated bulkheads according to Gotaverken's system. She has accommodations for a small number of passengers, and will be propelled by a two-stroke single-acting

On the Facing Page:

(1) Ornamental glass screen between vestibule and lounge.
(2) Lounge.
(3) Dining room.
(4) Owner's stateroom.
(5) Indicating the careful matching of woodwork in the paneling.
(6) A well-lighted corner room.
(7) Indicating modern lighting.
(8) Owner's day room.


2

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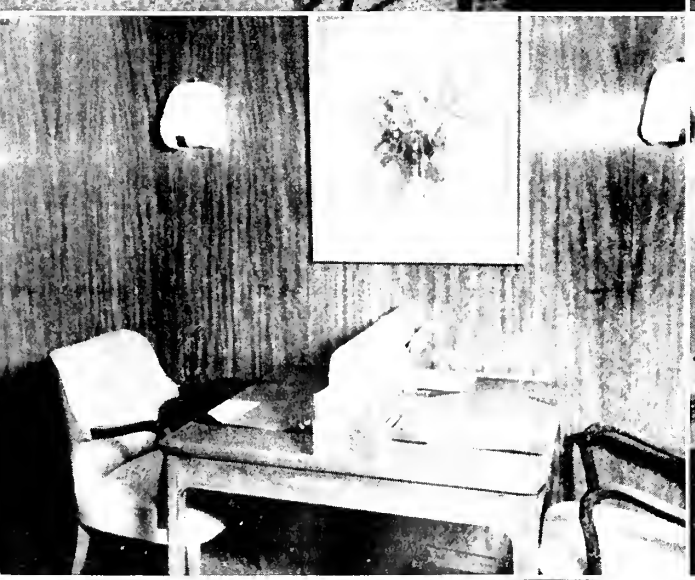


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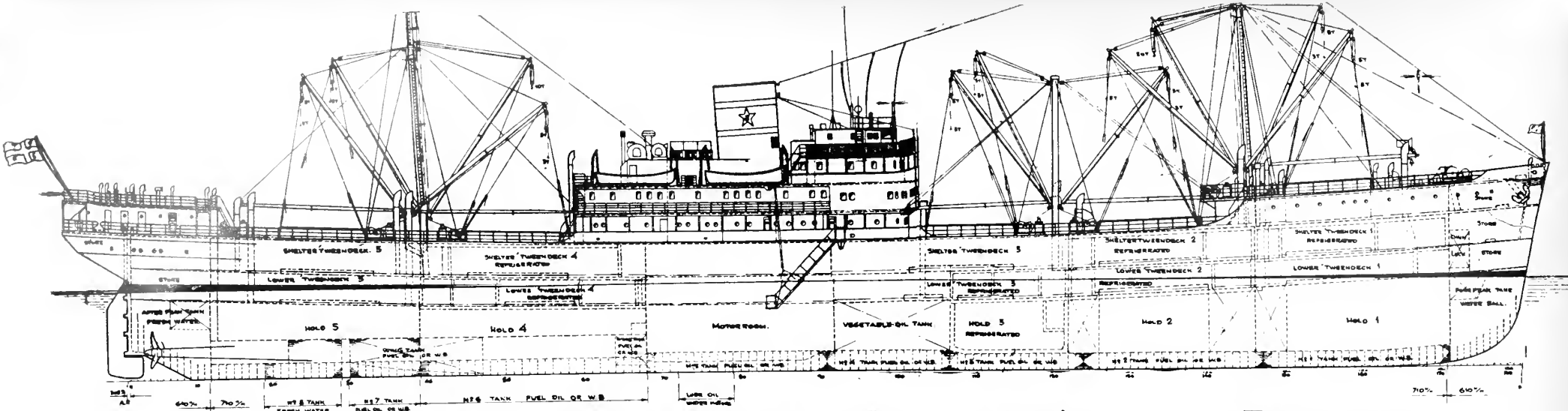
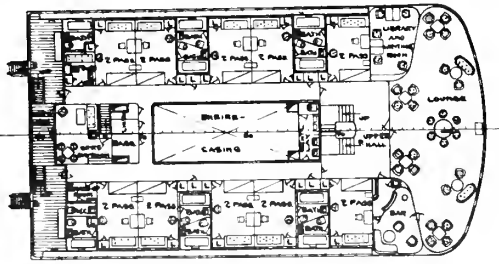
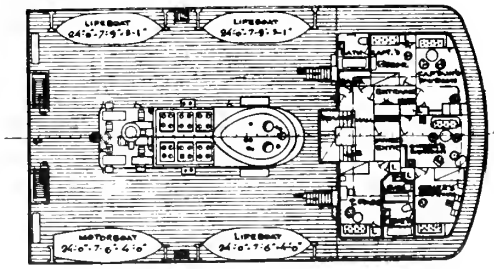
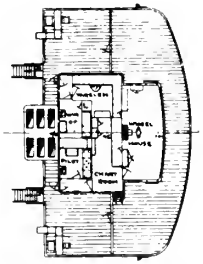




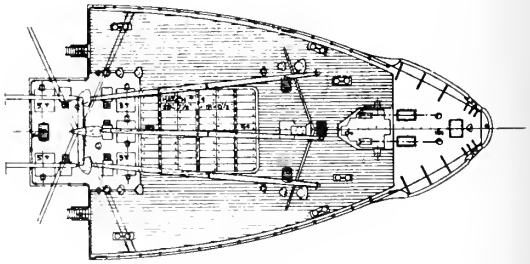
PROMENADE DECK



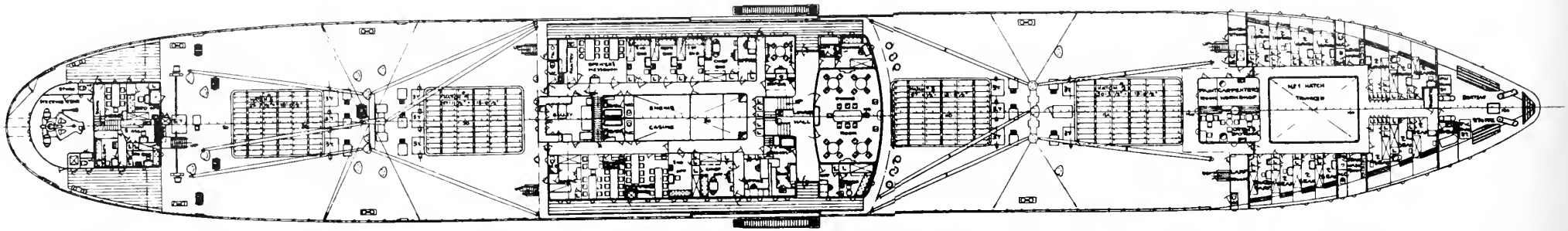
BOAT DECK.



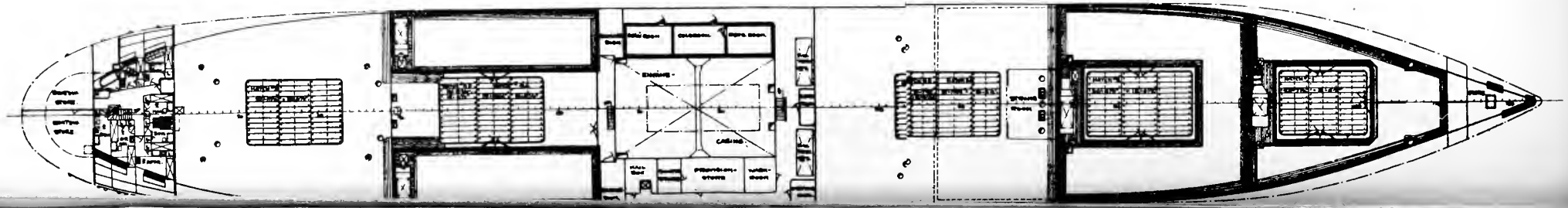
NAVIGATING BRIDGE



FORECASTLE DECK.



SHELTER DECK.



Bio-Bio loading cargo in San Francisco.

diesel engine of the yard's own make, developing 8,300 ihp at 112 rpm.

In the middle of December the Gotaverken yard launched a new ore carrier of 6000 tons d.w., the Karesuando, for the Grangesberg Company of Stockholm. This ship is the last one in a series of 12 vessels built by Gotaverken for these owners during the last three years.

The Eriksberg yard, also of Gothburg, launched a motor cargo vessel of 3650 tons d.w. for the Swedish Lloyd Shipping Company.

In the middle of November the Oresund shipyard of Landskrona launched a motor tanker of 15,500 tons d.w., the Avanti, for the Fraternitas Shipping Company of Gothenburg.

Early in December the Gotaverken yard delivered a motor tanker of 17,300 tons d.w., the Kim, to the Stenersen Shipping Company of Oslo. This company, however, has sold the vessel to the Argentine government-owned shipping company, Yacimientos Petrolificos Fiscales of Buenos Aires, which will name the ship San Antonio. The vessel, one of the biggest so far built by Gotaverken, is a sister ship of Julius, Constance and Buenos Aires.

Improved Post-War Danforth Anchor

A new Danforth anchor, the Mark IV, is now in production. This improved Danforth is planned in all sizes from 5 lbs. to and including sizes for the largest ships.

Judging from advance reports this improved post-war model is destined to create as great a revolution in the art of anchoring as the current Mark II, introduced some years ago.

The new Danforth is made of heat-treated high tensile alloy steel forgings and rolled steel sections with a tensile strength of over 150,000 lbs. as compared to 57,000 for ordinary steel.

Preliminary plans for the new anchor were developed several years ago but it was not possible to manufacture in quantity during the war, as the special steel required was not available for anchors. However, a number of experimental anchors were made and tested extensively by fishermen, pleasure boat owners and the manufacturer in actual service. For example, a 5-lb. Mark IV in service aboard a 40-ft. cruising sloop held this craft satisfactorily in all types of bottom, including soft mud six feet deep, in measured 25-mile winds. It is the opinion of the manufacturer that a 10-lb. Mark IV would furnish safe holding power for a boat of this size under almost any conditions.

The increased strength of the high tensile steel makes it possible to manufacture the new Danforths in the same dimensions but approximately half the present weight. Example: the 30-lb. Mark II "size" weighs only 17 lbs. in the new Mark IV.

All parts are thinner and stronger. This further streamlining decreases resistance to burial so that the new Danforth Mark IV digs in even faster and holding power per pound of anchor is substantially increased.

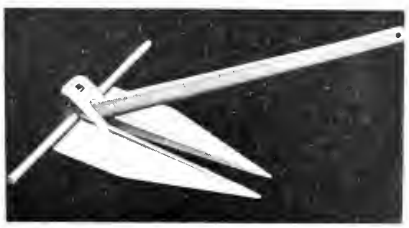
The cost of the material used is more expensive per pound, but it is so much stronger and lighter that less material is required to secure equivalent holding power. The net result is a reduction in the cost for Danforths in sizes necessary to do a given job. This means a better and more efficient product at lower prices to the consumer.

The following are a few comparisons of the tested holding power of

(Continued on page 168)

New 1000-lb. Danforth Mark IV.

New 17-lb. Danforth Mark IV. This improved post-war anchor made in sizes from 5 lbs. to and including sizes for largest ships.



Admiralty Decisions

By Harold S. Dobbs
of the San Francisco Bar

Misfeasance (1) Vs. Nonfeasance (2)

Sometimes the layman has difficulty in understanding why the general agent may be held for tort liability in one case and, under what appears to be the same set of circumstances, released in another. One of the answers to the question is graphically illustrated by the case of **Pipitone, Plaintiff, vs. Standard Fruit & Steamship Co., Defendant,** State of New York, Supreme Court, Trial Term, Kings County, May 17, 1945.

Plaintiff, an employee of an independent ship repair contractor, in the course of his duties was injured aboard the steamship Henry Groves Connor in the Port of New York. The vessel was owned and operated by the United States and assigned to defendant Standard Fruit & Steamship Company under the terms of a General Agency Agreement (G.A.A. 4/4/42). The action was brought in the New York Supreme Court, County of Kings, against the General Agent. Admittedly the port boom of No. 4 hatch fell, injuring the plaintiff, while it was being topped by riggers employed by the independent contractor. Upon conflicting evidence the jury found that the boom fell because of a worn and defective shackle by which the topping lift was made fast to a pad-eye in the deck. The negligence charged was that the defendant General Agent had failed to equip and maintain the vessel (G.A.A. Article 3A (c) and had failed to inspect and arrange for the repair of the vessel (G. A.A. Article 14) and negligently permitted the vessel to become unseaworthy. At the close of the plaintiff's case and of the whole case, defendant moved for a directed verdict and for the dismissal of the complaint. The Court reserved decision on the motions and submitted the question to the jury, who returned a verdict in plaintiff's favor in the sum of $25,000.

(1) Misfeasance: (a) A wrongful act; (b) The improper performance of some lawful act; (c) negligence.
(2) Nonfeasance: An offense of ommission.

The Court very aptly stated that there could be no question but that the relationship between the United States and this defendant was that of a principal and agent (**Pederson vs. Stockard,** 1945 A.M.C. 23, 51 N.Y.S. 2d. 675). That being so, the defendant was not liable to third parties for nonfeasance but only for misfeasance. It is not always easy to determine under which category the alleged negligence arose, but the determination of that question goes beyond consideration of the mere affirmative or negative allegation of the same charge, i.e., "The defendant failed to conduct himself as an ordinarily careful and prudent person, etc." or "the defendant conducted himself in a careless and negligent manner, etc." There must be an actual active intrusion upon the rights of a third party by the agent to make him liable. Thus, if this defendant had furnished a defective shackle, and by its act had created a dangerous condition, it would be liable, whereas, it is not liable for failure to remedy a condition which it did not create. Failure to inspect, repair or replace is nonfeasance, and herein lies the differentiation between this case and that of the Pederson case upon which plaintiff leans so heavily. In the Pederson case the Appellate Division of this Department said, "Here the agent's responsibility required it to **furnish** appliances suitable for the work they were designed to perform and free from defects." Of course, the furnishing of an inadequate or defective appliance would be a misfeasance, because it would be an act which created the dangerous condition precipitating the accident. Defendant's motion is granted. The verdict of the jury is set aside and the complaint dismissed.

Wholly-Owned Government Subsidiary Cannot Recover Against Another Wholly-Owned Government Subsidiary

A most important decision from the standpoint of the underwriter has been followed again in **Defense Supplies Corporation, Libellant, vs. American-Hawaiian Steamship Company, Respondent, and United States of America, Respondent-Impleaded,** U. S. Dist. Ct., Southern Dist. of New York (1945 A.M.C. 1300). In that case the libellant, a wholly-owned subsidiary of Reconstruction Finance Corporation, shipped a cargo in the steamship Minnesotan and insured it against usual marine cargo risks. The Minnesotan was under Time Charter, Form 101, to War Shipping Administration. The cargo was damaged and the cargo underwriters caused a cargo damage suit to be filed against American-Hawaiian S. S. Co., as owner of the Minnesotan, in the name of the assured, Defense Supplies Corporation. The American-Hawaiian Co. impleaded the United States as a party respondent, alleging certain provisions of the charter party and also certain indemnity clauses in the Time-Charter-Agency Agreement under which the steamship company

acted as Agent for W.S.A. Thereafter the proctors for Defense Supplies Corporation made a motion to intervene on behalf of 12 cargo underwriters participating in the loss.

The Court follows the sound authority of **Defense Supplies Corporation vs. United States Lines Co., et al.,** (1945 A.M.C. 423, 148 F. (2d) 311) (Cert. denied, U. S. Supreme Court), (1945 A.M.C. 1387), wherein the Court made a finding that if one subsidiary of the Government were allowed to recover against another subsidiary, the Government would be in effect taking its money out of one pocekt and putting it in another. In the instant case, 12 insurance companies ask leave to intervene as subrogees of the libellant, Defense Supplies Corporation. The respondent, American - Hawaiian Steamship Company, is the owner of the steamship Minnesotan, which was under time charter from the owner to War Shipping Administration at the time the libellant's goods were damaged. The respondent has impleaded the United States of America.

The libellant is a corporation, completely owned by the Reconstruction Finance Corporation, a Government agency. Hence, this admiralty suit **in personam** is in effect a suit by the United States against the United States, and under the authority of **Defense Supplies Corporation vs. United States Lines Co.,** cannot be maintained. The insurance companies which seek to intervene would have no better rights as litigants herein than their subrogor, the libellant. Hence, to grant this petition for intervention would be futile.

The motion for leave to intervene is accordingly denied.

The principle of this case as well as the first Defense Supplies case certainly works to the ultimate advantage of the underwriters in that they are completely relieved of liability, provided each of the parties to the claim is a wholly-owned Government subsidiary. Of course, under ordinary circumstances a different result would follow.

Steamship Owner's Rights Under Special Appearance

In the case of **William F. Lenz, Libellant, vs. Sudden & Christenson, Inc., Respondent** (U. S. Dist. Ct., Eastern Division of Pennsylvania, in Admiralty, 1945 A.M.C. 938), the sole question involved is whether a respondent who is challenging the jurisdiction of the Court may be required to answer interrogatories pertaining to the challenged jurisdiction. In this case the libellant is seeking wages, penalty, maintenance and cure through the medium of an "in personam" action in admiralty. In this case, service of the Citation and Libel in personam was made by leaving a copy at the office of the Waterman Steamship Corporation as agent of the respondent. The respondent then appeared specially and moved to vacate the service upon the following grounds: (1) that it is a California corporation and its principal office and place of business is San Francisco, California; (2) that it is not registered to carry on business in the Commonwealth of Pennsylvania and has not engaged in business in said Commonwealth; and (3) that it does not maintain an office or place of business within the Commonwealth of Pennsylvania.

The libellant filed an Answer to the Motion to Vacate Service, admitting that the respondent is a California corporation, but averring that it has been, and is presently, engaged in doing business within his district and further that the respondent by its duly authorized agent (Waterman Steamship Corporation) has maintained a place of business within his district. Subsequently, the libellant propounded a series of interrogatories which it contends is designed to throw light on the question of whether the respondent is carrying on business within this district by a duly authorized agent. The respondent in turn filed Exceptions to these interrogatories, contending that it is not an adverse party within Rule 33 of the Federal Rules of Civil Procedure.

The Court leans heavily on the authority of **Tradesmens National Bank and Trust Company, Executor, Etc., Plaintiff, vs. Charlton Steam Shipping Company, Ltd., et al, Defendants** (1944 A.M.C. 475) (April, 1944), which holds that a libellant is without right to propound interrogatories to a respondent who had appeared specially to deny jurisdiction. The Court in the Tradesmens case said:

"Where a corporation named as a defendant in an action has challenged the jurisdiction of the court to entertain the action against it on the ground that it has no property or agents in the jurisdiction and is not doing business therein, it is difficult to see how it may be considered as an 'adverse party' within Rule 33 so as to be required to answer under oath interrogatories served upon its alleged agent or, in the alternative, be subject to the penalties prescribed by the rules for refusing to answer."

For the reasons stated, the respondent's Exceptions to Interrogatories must be sustained, and it is so ordered.

The libellant, however, is free to utilize the remedy afforded by Rule 26 (a) of the Federal Rules of Civil Procedure, which provides for the taking of depositions in a situation such as exists here. In **Jiffy Lubricator Company vs. Alemite Company et al** (23 Fed. Supp. 385), the Court specifically stated that where the question of jurisdiction had been raised (page 386) "* * * it would seem that it is within the spirit and intent of the new rules, under these circumstances, to permit the Court to authorize the taking of depositions which are limited to the question of jurisdiction raised by defendants' motion * * *."

The William F. Fitch, Army Repair Ship

By George H. Harlan

(All photos Official U. S. Signal Corps Photographs)

THE PACIFIC WAR required repair facilities for troopships and troop supply vessels at points much closer to the fighting areas than those which already had repair facilities. The latter were already overloaded with work as well as being remote from the scenes of combat. The Army's answer to this problem was the outfitting of five repair ships and three repair barges, eight units in all, and all equipped to make major repairs to all types of vessels wherever they may be. Realizing that the military operations would change from locality to locality in the island warfare, the Army chose to build these mobile repair yards rather than build up permanent shore installations in places that might become removed from the battle-fronts before a repair yard could be completed.

The five repair ships consisted of shops and stores which were operated by repair gangs carried by the ships themselves. The three repair barges were mere floating repair shops, carrying no stores or crew, but were operated by short based crews and stores sent as required from central operating depots.

To describe the ships more adequately, the William F. Fitch will be taken as an example. She was typical of the five and was outfitted by the Marine Repair Shops of the San Francisco Port of Embarkation. Built in 1902 by the Detroit Shipbuilding Company, the Fitch was, like her sister repair ships, a Great Lakes ore carrier. Transferred to the Gulf, the Boland Machine Works of New Orleans, La., transformed her into an ocean-going cargo vessel, and she went into service as such for the Army until she was commandeered for repair ship duty.

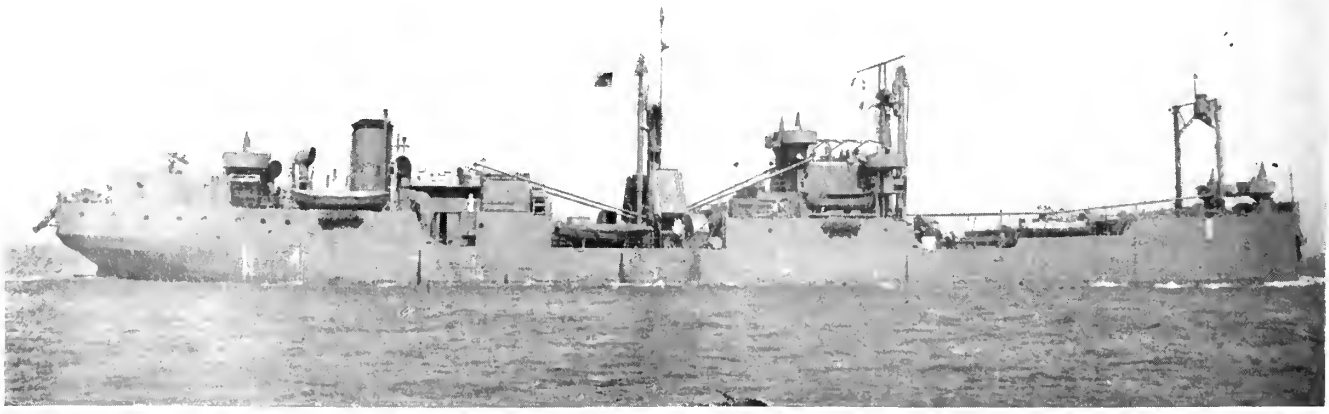
The Fitch is a steel deck freighter of four hatches. Her wheel house is on an island house between hatches Nos. 2 and 3, and her machinery is aft. She has a small triple expansion engine and two small Scotch marine boilers of the single end type, and is capable of doing about eight knots. This is adequate speed to propel her from frontier base to base.

Principal Characteristics of the U. S. A. R. S. William F. Fitch

L. O. A.	353′ 8″
L. B. P.	346′ 0″
Breadth	48′ 0″
Depth (Molded)	28′ 1″
Gross Tonnage	3982
Net Tonnage	2859
Main Engine	Triple Expansion
Size	22″ x 35″ x 58″ / 42″
I. H. P.	1550

The three decks which were extensively altered were the Main Deck, 2nd Deck and Holds. At the forward end of the Main Deck and adjoining the Fo'c'sle Deck was built housing for oxygen and acetylene bottles for the welding apparatus. Although electric welding was used by the repair ship's welders, the older style was also employed where repair parties were unable to work close to the ship's electrical supply. Hatches Nos. 1 and 2 were cut down in size and a large working platform 35′ 0″ x 48′ 0″ was provided be-

Girded for war work by the San Francisco Port of Embarkation, D & C's William F. Fitch bears little resemblance to the grain and ore carrier that sailed the Great Lakes for over 30 years.



tween the two. This platform was of sufficient area to enable large projects to be worked on by many men of all crafts at one time. When the ship is under way, the platform provides stowage for the ship's barge, duck (seagoing Army automobile), and jeep. The barge was of steel construction and sectional. Its two sections could be locked together, and as both were 9′ 0″ x 40′ 0″, when assembled they made a barge 18′ 0″ x 40′ 0″. This barge could be used as a place from which to work on ships' sides or where a floating scaffold had to be employed.

Aft of No. 2 Hatch and forward of the island house was the mast for the 50-ton boom. The mast was stepped on the tank top and stood 45′ 0″ above the Main Deck. The 50-ton boom was stepped on deck at the base of the mast and had a reach, at a good working angle of 45°, to the center of the working platform. The boom was used to handle the ship's barge and to lift aboard any small boat to be repaired which might weigh 50 tons or less. This lifting gear had an 11 part topping lift and 10 part hoist, both composed of 1 1/8″ 6 x 19 wire rope. Blocks were shackled onto links with square cross sections to prevent twisting of the multipart purchases. Steam winches for this boom developed a line pull of 13,500 lbs.

All hatches were provided with 5-ton booms. As a freighter the Fitch had a 30-ton boom at No. 4 Hatch. This was left to handle any heavy loads to the machine shop below, and to handle the 26′ 0″ towing mine yawls which were kept abreast of No. 4 Hatch. These small diesel driven craft were used to tow the ship's barge, and were used as the ship's launches to make physical contact with ships to be repaired. On the stern of the ship a large steam driven winch was placed, and 1000 feet of 1 1/8″ wire cable was stowed on the drum thereof. This winch served a threefold purpose. It could handle mooring lines about the stern of the ship, its cable could be attached to the stream anchor when such was necessary, or it could be used as a towing engine for towing small craft. There being no place on deck to stow the stream anchor, this article was stowed on a pipe rack on the stern of the ship.

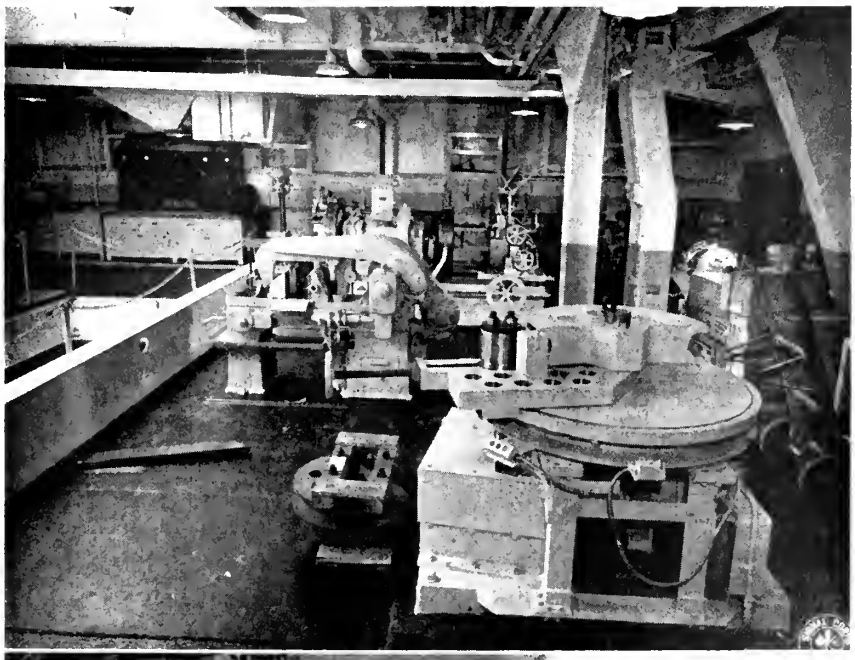
The repair shops were located for the most part on the 2nd deck. Up forward in No. 1 compartment was the Carpenter Shop. Woodworking

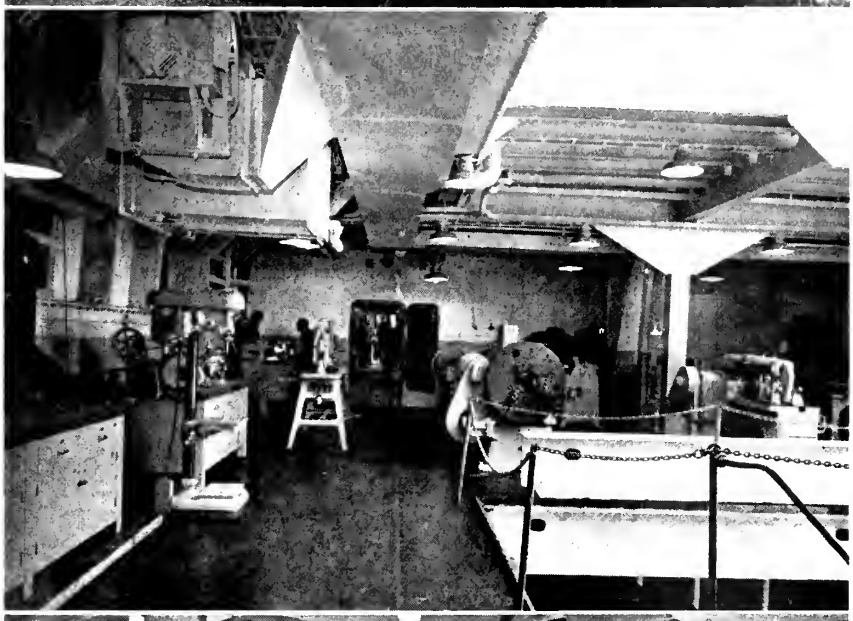
Army marine ship repairman operating 14-ton machine lathe aboard a Transportation Corps vessel operated by the San Fancisco Port of Embarkation.

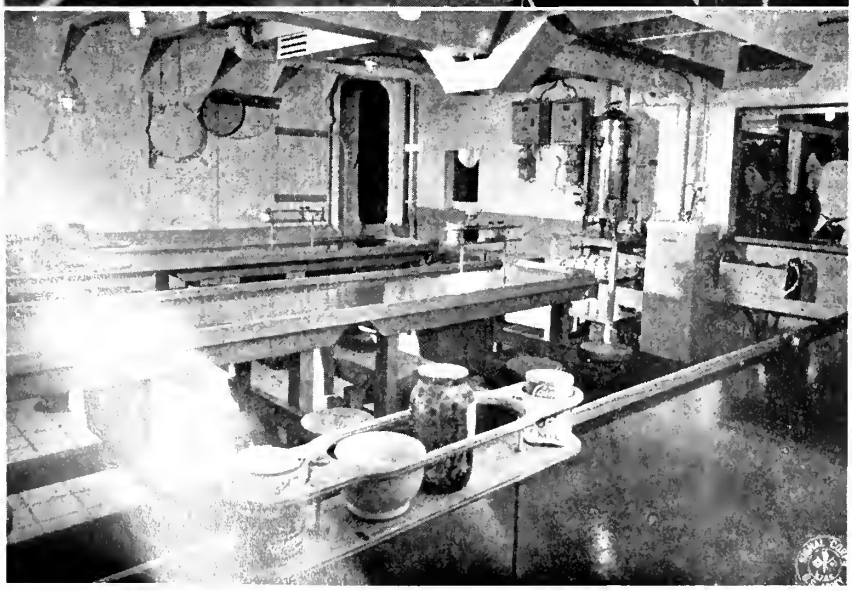
equipment, both hand and machine, were provided in as complete an array as could be found in any first class joiner shop. On the port side was the DeWalt circular saw with roller conveyors extending from the forward to after bulkheads of the compartment. At the forward end of the compartment was a pitch heater. Aft of the hatch were benches and tool cabinets, a large band saw, an arbor saw, a tilting arbor saw, a hollow chisel mortiser, a bench grinder and a saw blade cabinet. On the starboard side was a planer, a woodworking lathe, a joiner and a drill press. Up on the main deck, under the working platform, were three steam boxes to prepare wood for shaping. The steam boxes were made out of former torpedo tubes from World War I.

In No. 2 compartment were the Shipfitters, Blacksmith and Sheet

Sheet Metal Shop.



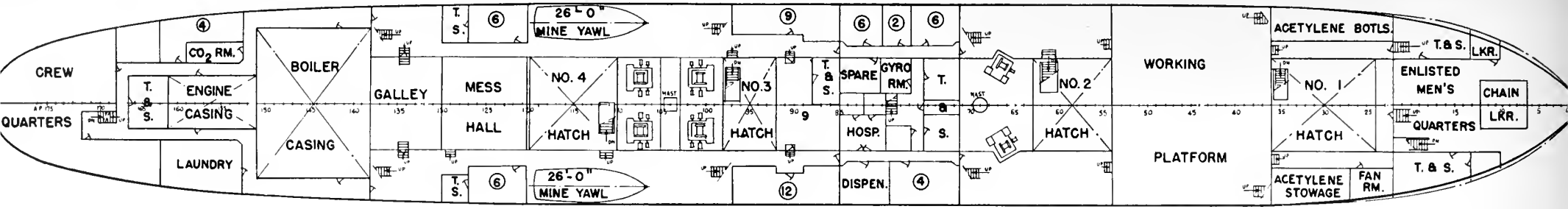




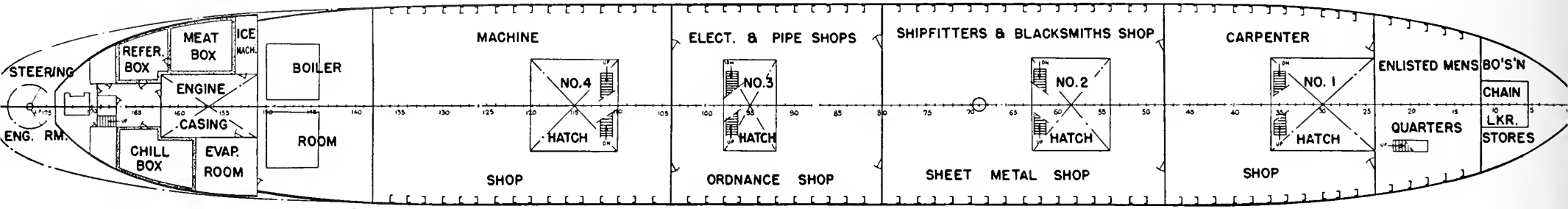
Metal Shops. The Shipfitters' Shop was located on the starboard side aft. Most of the space was taken up by a large bending slab, 10′ 0″ x 15′ 0″. Next to it was a plate roller which could accommodate any plate size up to ¾″ There were also a slip roll hand forming machine, welding sets, and two portable electric welding machines. Overhead was a monorail system to simplify the handling of large steel stock. On the portside of the compartment at the after end was the Blacksmith Shop. This contained a forge (6″ sq. open.) with quenching tank, an iron worker, anvils, a large grinding machine, a power hammer and cutting machine. All equipment necessary to do any kind of blacksmith work was present. One of the disadvantages of the ships, however, was that none of them possessed foundry equipment, and this proved to be a hindrance at times. In the forward end of No. 2 compartment was the Sheet Metal Shop, which contained a combination roller, bending, and box brake; a power shear and squaring shears, rotary shears, an angle iron combination machine and a soldering iron furnace.

The Electric Shop, Pipe Shop, and Ordnance and Signal Corps Repair Shops were in No. 3 compartment, 2nd Deck. The Pipe Shop occupied the space forward of the hatch. It contained a cutting saw capable of handling anything up to 10″ pipe. There were also two pipe threading and cutting machines, one for the smaller sizes up to 2″ and a larger one to handle the intermediate sizes up to 6″. Tool racks, benches, and a Pedrick pipe bending machine of 4″ pipe size capacity rounded out the power tools in the pipe shop The electric shop was on the port side and contained a test panel, wire reel rack, a coil former, a buffer, an armature winder and an armature press. Various tool cabinets and benches constituted the remainder of the equipment of the electric shop, as well as a battery charger and a bake oven. An overhead monorail facilitated the handling of large generators and motors. On the starboard side the Ordnance and Signal Corps had shops capable of repairing guns, radio equipment and radar. Most of the tools in this shop were small precision machines. The larger power

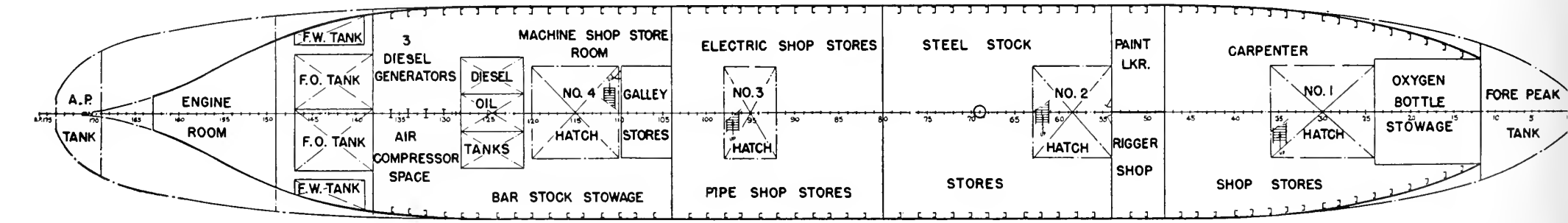
The top and center pictures show the Pipe Shop; the bottom shows the crew mess.



MAIN DECK



2ND DECK



HOLDS

Drawings showing arrangement of repair facilities on the William F. Fitch

tools consisted of a 9" lathe and two drill presses. Any larger work could be handled by machine shop equipment in the next compartment.

The Machine Shop in compartment No. 4 was the largest installation on the William F. Fitch. Its quantity and size of power tools would be the envy of many a shore installation. All four of her sister repair ships and the three repair barges were equipped with shops of equal magnitude. A heavy duty engine lathe, 26' 0" long, was the largest tool in the shop, although a giant shaper and a 4' 0" radial drill were not far behind in size. There was an 80-ton Manly hydraulic press, a toolmaker's lathe, a 13½" lathe and a 16" lathe. In addition to this battery of lathes there was a precision lathe. There was an adjustable stand for overhauling engines, this stand not only capable of being adjusted to fit the engine under repair, but also tilting in any direction to facilitate work on any isolated part of the engine. There was a small precision shaper, a Do-All saw and a universal milling machine. There were a Norton cutter and grinder, a tool grinder, and an internal grinder. There were a babbit furnace, a 3-ton arbor press and a 100-ton wheel press. Major Norman R. Gindrat of the Marine Repair Shops at Oakland Army Base takes great pride in the construction of the latter machine. He made his first hydraulic press for the Oakland Shops out of scrap iron and junk. It was so successful that he stood ready to make all the presses needed for the repair ships and barges, and he was permitted to fill the order. He improved upon his original machine, and the result was a class "A" wheel press which saw plenty of service on every vessel on which it was placed. Tool cabinets and benches line the machine shop, and all heavy machines were served by an overhead monorail system. This floating repair shop proved to be an eyeopener for many a mariner with a ship which was a casualty up at the front lines. Machining, electrical and pipe work, joiner work, gear repair, and radio repair, no job was too big for the Fitch to handle. Some tools, of course, saw more service than others, some were worked day and night, others hardly at all. But each had its advantages and limitations, and each helped to make the Fitch into one of the most versatile repair ships afloat.

In No. 1 Hold, at the forward end, were stowed additional oxygen bottles. The remainder of the hold was devoted to the storing of lumber, all kinds, heavy timbers, light boards, plywood, etc., and all varieties from pine to oak. There was also storage bins in No. 1 Hold for nails, hardware, screws, bolts, and all other odds and ends of stores necessary to keep a floating carpenter shop running. All stores, wherever possible, were located directly below the shops which used them. The ship's cargo gear could lift them to the decks where used as needed.

In the forward end of No. 2 Hold was the Paint Locker on the port side and the Rigger's shop on the starboard side. The paint locker accommodated all paints for ship's service and repair work. The Rigging Shop was a storage place only, for all rigging work was done out on the working platform or in the machine and blacksmith's shops. The rest of No. 2 Hold was devoted to sheet metal, steel shapes and plate stowage. Because of the concentrated weight of these stores, the hold was not completely filled with stock, a load limit per square foot of floor space being imposed.

In No. 3 Hold, which was directly under the Pipe Shop, were stored all the pipe lengths. In bins on each side of the hold were kept the pipe fittings, other pipe shop supplies and electrical supplies. In No. 4 Hold forward was kept the bar stock for the machine shop, spring wire, tool steel, piston stock, etc. Just forward of No. 4 Hatch was the galley dry store space. Aft of the hatch were three deep tanks, not extending full thwartship, these tanks being storage space for diesel oil. Aft of the tanks was the motor room for the repair shops. It contained two air compressors and three diesel driven generators. The air compressors were Ingersoll-Rand two stage compressors which delivered 156 cfm each at 100 lbs. pressure. The three generators were 50-kw capacity, producing alternating current. At the time that the repair ships and barges were designed it was almost impossible to get large machine tools with direct current motors; hence it was deemed advisable to make the entire ship alternating current with the exception of the few direct current motors which were already aboard and which constituted only a small portion of the load. Two new small turbo generators in the engine room took care of the entire D. C. load, for one could handle it alone with the other as a stand-by.

The operation of the ship itself was handled by a Coast Guard crew. The Repair Company aboard the Fitch was the 801st Army Marine Ship Repair Company. It was composed of officers and enlisted men who operated its extensive shops. The enlisted men were top craftsmen and made special application to the Army for the jobs. Taken from civilian life, these men were given basic training and then sent out to sea on a repair ship. Ratings were given not on their military proficiency but on their skill in their respective crafts. Many of these men would ordinarily have been drafted into the artillery or infantry, but in repair companies were able to serve in their own special line in places where they were most needed. The repair companies were composed of 114 men, and the ship carried 80 additional persons as crew members. As enough water could not be carried to serve this group, a 12-ton low pressure evaporator was installed to take care of their needs.

Whereas the repair ships could operate as a unit, and were a complete shop with men and material for operation, the repair barges were just floating shops. The barges worked out very well when used in conjunction with a floating drydock and a supply barge, anchored offshore at some frontier base. Both the repair ships and barges had over $1,000,000 worth of machinery and equipment aboard. They were able to serve the frontier of remote islands as it could never have been otherwise served. They repaired disabled ships which would have either had to be towed hundreds or thousands of miles for repair or be left at the front. They repaired ships which were damaged but not disabled which might have been disabled had they had to make the return journey in their damaged condition. Army, Navy, Coast Guard or merchant ships, they all looked alike to the repair companies. They were all attended to as needed by the Pacific Command.

Peak Diesel Performance Demands Quality Engine Accessories

By Walter C. Bauer

To maintain a diesel engine at its peak performance there are a number of operational characteristics that must be kept normal. The major of these items are:

(1) Controlled cooling
(2) "Tight" engine
(3) Free piston rings
(4) Adequate clean lubrication
(5) Perfectly operating injectors
(6) Proper injection timing
(7) Clean, high-quality fuel
(8) Intake air cleanliness
(9) Engineered exhaust system
(10) Efficient and reliable instrumentation.

Controlled Cooling

The proper control of diesel engine cooling demands more than a thermometer on the cooling water outlet. The diesel engine is defined as a "compression ignition engine". The air that is compressed in the cylinder reaches a sufficiently high temperature to ignite the fuel as it leaves the injection nozzle. Obviously the hotter this compressed air, the less time lag for the fuel to start to burn and the smoother becomes the combustion. To maintain peak performance, this compression temperature should be constant under all conditions of load. In fact, it should be hotter under light engine loads—when very minute quantities of fuel are injected — than under full loads, when large quantities—and more easily ignitable quantities — of fuel are admitted. The head of the piston usually comprises about 40% of the surface of the combustion chamber. In modern diesels the piston is almost universally oil cooled. The piston coolant temperature then should be maintained constant.

There is a temperature gradient from the combustion chamber to the cylinder water jacket that is quite high. To maintain a constant or cooler compression temperature under heavy loads than exists under light loads requires a considerable variation in jacket coolant temperatures. Coolant circuit diagram (1) illustrates how this can be done reasonably well automatically with a somewhat different arrangement of heat exchangers in a closed cooling system.

This system requires much larger heat exchangers than those normally supplied with the engine, but results obtained over rather long periods of time have well justified the expense where this system has been installed.

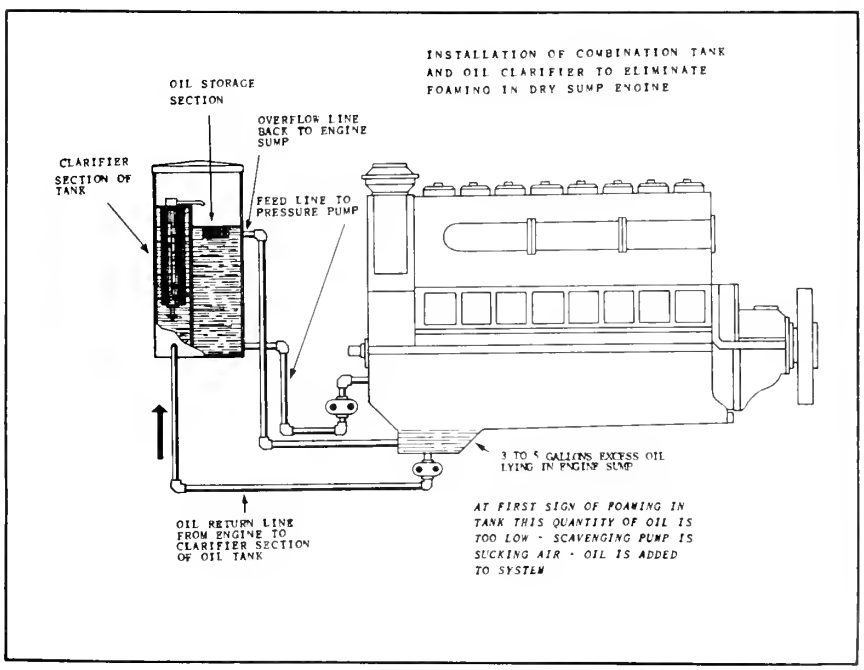
"Closed" cooling systems—systems where treated clean water is used to cool the engine—and raw water only enters the heat exchangers—is almost a must for efficient diesel engine operation. By this system a large quantity of water can be circulated through the cylinder jackets, hot or cold spots eliminated, water jackets remain free of mud or lime deposits and engine cooling maintained at its peak indefinitely.

Tight Engine

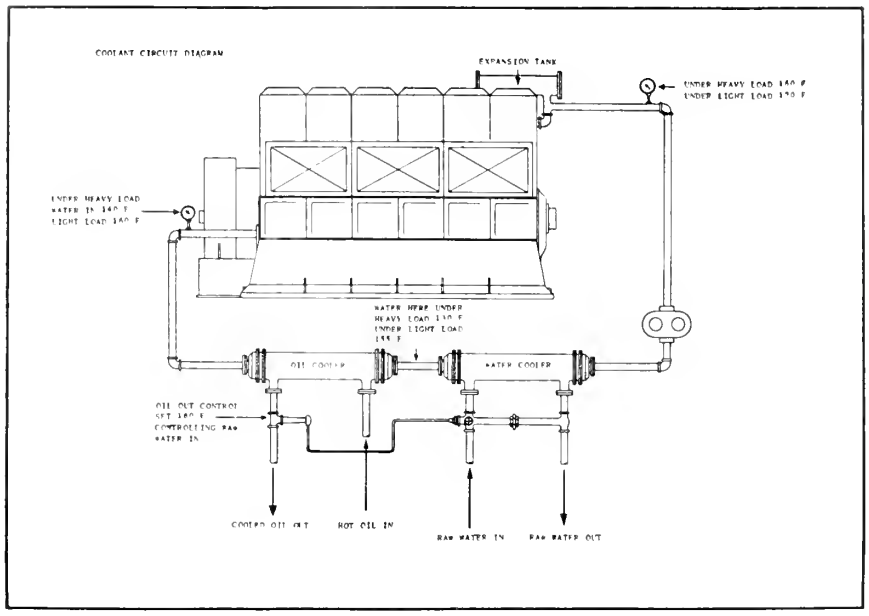
Webster defines "tight" as "not loose," "compactly built," "not leaky", "taut," "snug." That about describes a "tight" engine. A tight engine would have no loose or sloppy bearings, no piston slaps, no loose or clattering valves or valve gear, no loosely fitted gears in the accessory drives, no leaking fuel or lubricating oil lines, no leaking crankcase doors, no unbalanced parts to cause vibration or uneven running at peak loads and speeds. A "tight" engine is a must, if rated power and speed is to be maintained for any period of time.

Free Piston Rings

The maintenance of good piston ring condition in a diesel engine is imperative for economical power delivery. These rings are subjected to much greater punishment than is given those of a spark ignition engine. In a spark ignition engine, the fuel and air are metered to make nearly an ideal combustion mixture. There is little or no excess oxygen present and hence little or no tendency to burn the lubricant from the cylinder walls; also the compression pressures vary with the load and under light or partial loads there is reduced pressure, reduced temperature, and no burning off of the lubricant from the



(The author is Chief Consulting Engineer, The Briggs Filtration Co.)



cylinder walls. In the compression ignition engine the compression pressures are the same under all conditions of load, and only under full or nearly full load is enough fuel injected to use all of the oxygen present. Since piston ring efficiency is so closely correlated to over-all engine efficiency, the selection of piston replacement rings is one where quality alone should govern the choice.

Adequate Clean Lubrication

There is no piece of machinery where useful life is so enhanced by the use of perfectly clean oil or where the problem of maintaining the oil in that condition is as severe as in a diesel engine. The oil that cools the pistons is subjected to metallic contacts when the temperatures are well above the cracking or flash temperatures of the oil itself.

The drain down from the cylinder walls has been subjected to oxidation at extremely high temperatures. The combustion blow-by is always combustion soot-laden due to the arrest of combustion by the comparatively cool piston and cylinder walls. Should the oil not be maintained clean, these oil contaminants deposit themselves at vital spots throughout the lubrication system, restrict oil flow, seriously impair heat transfer, stick piston rings, ultimately make peak engine output impossible, and costly repairs and overhaul necessary.

It has been only during the last ten years that equipment was developed that made continuous lube oil maintenance possible. It was done by balancing absorption filtration for the removal of all visible contamination, even to soot particles, with adsorption filtration for the removal of the soluble contaminants such as the gums, resins and asphaltenes to insure really clean oil return to the system.

Constant development work and field testing has also led to the establishment of the size and volume of filtration material necessary for a reasonable operational period for the different engines and services involved. This oil maintenance equipment is again a quality "must" for peak engine performance.

Perfectly Operating Injectors

This factor is so obvious that almost no discussion of it is necessary. For each cylinder of the engine to carry its share of the load, for the full deliverance of the power in the fuel to the crankshaft, for clean engine operation, the fuel must be properly atomized. There can be no pre-leakage or after dribbling from nozzle. The pressure must be right, the opening sharp, and the cut-off clean.

Proper Injection Timing

Injection timing in a multi-cylinder diesel engine is more than just having the proper camshaft setting for injector operation. It is constantly checking the injector actuating linkage to maintain uniform clearances, to keep all control rods tight, to keep all delivery lines tight to eliminate all leakages in the fuel system, or in other words to keep the whole fuel system "snug."

Clean High Quality Fuel

A diesel engine will run on practically any liquid fuel that can be ignited by the compression temperature and that is fluid enough for the fuel system to handle. Fuel of the wrong quality can, however, cause many operational troubles and can prove terribly expensive in the long run. Ring sticking can occur from lacquering and soot formed from fuels having portions difficult to ignite and burn. High wear rates in rings and cylinder liners and bearing damage can come from similar fuels and from fuels containing excessive sulphur. Corrosion of metal fuel filters and injector parts can be the result of using fuel that has not received sufficient refining or from improper diesel fuel additives. Loss of power can come from the use of fuel having so low a viscosity that the pump seal and lubrication of injection plungers cannot be obtained.

Diesel fuel may leave the refinery a perfect product, but, due to transit contamination, arrive at the consumer's tanks in rather poor condition. This puts the burden for final cleanliness on the engine accessory fuel filters. Water, suspended rust particles, abrasive dust, zinc particles from galvanized drums, are some of the more common contaminants found in fuel oil. Water can cause rough engine operation due to faulty fuel metering, cause injector corrosion, plug fuel filters. The solid material can abrade pump plungers, plug injection nozzles, seriously impair proper atomization and cause injector dribbling.

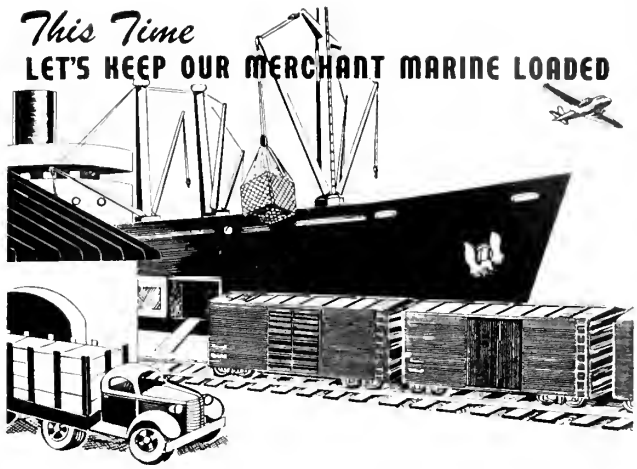
There is also strong evidence that adsorption filtering of the fuel in use can go far to remedy injector plunger sticking, particularly in the high speed high output diesels using the lighter grades of fuel. This adsorption filtering will remove the preformed gum in the fuel which is believed to be the basic cause of this plunger sticking. Quality fuel filters, usually, a primary and secondary in series, or one large enough to combine both functions, are very necessary for continued peak engine performance.

Intake Air Cleanliness

No engineer that has ever seen

(Continued on page 168)

Pacific WORLD TRADE
Reg. U. S. Pat. Off.



By T. Douglas MacMullen

World Trade Institute

Nearly 400 foreign traders attended a three-day session in San Francisco last month as 50 leaders in world trade, shipping, finance and allied activities, headed by Brayton Wilbur, president Wilbur-Ellis Company, addressed sessions of the Institute of World Trade, January 24 to 26.

The series of meetings, sponsored by the San Francisco Bay Area World Trade Promotion Committee in cooperation with the Extension Division of the University of California and the Graduate School of Stanford Unversity, were designed to make available to northern California manufacturers up-to-the-minute information on entering foreign markets and conducting world trade under changing world conditions.

Panel discussions followed each address to give manufacturers the opportunity to discuss special and technical problems and assist them in establishing their foreign trade policy at this time.

At the opening session Brayton Wilbur urged manufacturers to establish their foreign policy immediately and set aside in their reconversion plans a portion of their products for foreign markets.

Dr. J. B. Condlife, Professor of Economics at the University of California, described in an opening address to Institute members the importance of world trade in our national economy.

General subjects covered were:
Direct Exporting
Indirect Types of Export Outlets
Creating Export Sales
Export Sales Promotion and Advertising.
Importing Raw Materials
Importing Consumer Goods
Transportation and Documentation
Financing Overseas Business
Marine Insurance
Controls and Restrictions
Foreign Credit, Collection, and Exchange

Copies of the "proceedings" may be ordered at $2.00 per copy from University Extension, University of California, 2441 Bancroft Way, Berkeley 4, California.

Top: Opening session of Institute of World Trade in San Francisco. Speaking is Chamber of Commerce President Brayton Wilbur.

Bottom: The panel on direct exporting. Speaking is Walter G. Perker, export manager, Marchant Calculating Machine Co. Seated, left to right: George Somerville, Atkins Kroll & Co.; Philip E. Gross, assistant export manager, California Packing Corp.; Frank Prevost, export manager, Laher Spring & Tire Corp.; H. A. Sawin, export manager, Yuba Manufacturing Co.; Gregory Lance, export manager, Erwin Paint Co.; Richard H. Steuben, export manager, Cutter Laboratories.

Creating Export Sales

By Joseph F. Marias

President

Associated Commercial Company

Export selling must never be confused with domestic selling. An exporter rarely gets the opportunity to sell his own "personality," provided he has one to sell. But, as we all know, many domestic sales are consummated because of this very thing.

An exporter then has only merchandise and service and both have to be just what the consignee wants, otherwise no business. However, it is not just as easy as that because the exporter salesmen also has foreign competition that rarely bothers a domestic salesman and so this exporter salesman must know the methods and the quality and the service of several foreign competitors and that is quite a job and it takes quite a different type of salesman.

In my own foreign experience I saw too many failures to please my American blood. Unfortunately too many manufacturers have sent successful domestic salesmen to build up their foreign accounts in the field. I do not recall many successes from these types of men. Therefore one item in the program of creating export sales is to get the right type of exporter or the right kind of foreign field representative, give him the goods and permit him to meet the requirements of the buyer by special services, if necessary, and you are off to a good start.

There are nine basic types of export selling outlets or organizations, any one of which may fit your particular needs more than any other. Briefly they are:

(1) A Full-Fledged Export Department
(2) A Built-in Export Department
(3) Combination Export Manager
(4) Export Commission House
(5) Manufacturers' Export Agent
(6) Export Merchant
(7) Buyers for Export
    (a) Resident buying offices
    (b) Foreign government purchasing missions
(8) Export and Import Brokers
(9) Cooperative Export Selling

Assuming the above has been accomplished, our American goods should meet the language, measurement and labeling requirements of the country in which they are to be sold. I hope the day is not too far away when we shall adopt the metric systems of weights and measurement. This would help exporters no end. Our foreign competitors are born with it and we suffer because we do not conform. Of course some manufacturers do, which only goes to prove my point that others should follow suit and be encouraged by our own Government to do so.

In analyzing the foreign market we need to follow rules of common sense. It matters not what the color or the language of a person is, because being a human being he has human desires just the same as any of the rest of us. Perhaps we have one very great advantage over most of our competitors in that our magazines carrying national advertising in such superior ways get to the most remote parts of the world and being graphic they create these reactions that I choose to call human desires. We must always keep in mind that basically our first sales are made as luxuries, most of them later becoming necessities. In this, foreign selling is no different from domestic selling. If anyone doubts this let him think of the automobile, to name just one item. Surely it was a luxury when we first bought it, but most certainly it is now a necessity, and so on ad infinitum.

In further analyzing the foreign markets, we must try to estimate purchasing power of the local currency. It is discouraging to try to sell American goods in a country that has a currency greatly depreciated by comparison to our own. To give you an idea of that, we are reading every day what the GI dollar is buying in the many lands where our troops are now occupying enemy territory or sojourning on allied territory.

It is silly to try to sell fur caps to the Filipinos, although I saw it done, but only once. It hurts all American business if one manufacturer sells something lower than the so-called American standard of living.

In the matter of labels we must meet the requirements of the buyers. Recently I saw a label being designed for a food item to be sold in China. Very great care was used **not** to print

J. F. Marias

the **wrong** colors. This delayed the printing until the proper colors could be approved, but it will pay dividends. I once saw an order of several thousand cans of fish refused because the picture of the fish gave the appearance that the fish was dead. That may sound silly until you learn that in that particular country, a tropical one, no one dared eat a dead fish. It has to be seen swimming in the sink, otherwise no eat. I once saw a large shipment of American cigarettes refused because of a very slight printing change. The manufacturer had decided to use the words "Made in the United States" as a substitute for

the former "Made in the USA." The natives noticed the change and concluded the new shipment was made in Japan. To those who could read no language, including their own, any change made them suspicious, and since they hated Japs, they refused to smoke this particular brand any more, although they were identical in every respect to their old favorites.

An export sale, generally speaking, is a surplus article. One would not sell anything as far as that goes if he needed it himself. Many, many good American firms will not get interested in export because they can sell all they can produce in the domestic market. You have heard that many times. But some more progressive producers see that by increasing their output and selling much of it abroad they are able to reduce the cost of manufacturing and therefore give to the domestic market a good item cheaper than if they manufactured only for the domestic trade. Nevertheless an export sale is a surplus sale, at least for the benefit of my picture as I want to give it to you here. All production, and especially farm production, is variable. All producers want to produce at least enough for their domestic market. Everything else becomes surplus in my present meaning. It seems to me that if a foreign market is developed to take this surplus off the hands of the producer the producer has a very great and important guarantee against heavy losses, and to that degree the price that he has to sell for in the foreign market, even though it be greatly lower than the domestic price, is not very important. The fact that he can sell it and keep it from becoming a surplus in his domestic market to break down his domestic price is something not to neglect.

I think that this is a good place to review the success of the Japanese in selling in foreign fields as our competitors. I make the bold statement that had it not been for our methods of production, selling and distributing, the Japs would not have been as high up the economic ladder as they otherwise would have been. Who ever heard of a Jap invention? What did the Japs ever initiate? Did you ever see anything in Japan that was not either an imitation of something that we or the Europeans first made or something very crude and quaint? But you certainly have seen many, many items like American flags and plastic Santa Clauses with the words "Made in Japan." Well, that's what I mean. Certainly the American flag is not of Japanese origin, nor is Santa Claus, but why was it that we bought so many of them? The answer is the same as the answer you will get in every part of the world. We Americans, more than any European people, made Japan what it was before the war, and incidentally we made it what it is today. That is also a demonstration of American initiative. I for one hope that we shall have the good sense to keep the Japs from imitating our items any more, any place. Remember that we first design, or invent, the item. Then we find a way to make it good and serviceable. Then we find a way to make it in large quantities. And then a way to get it into the hands of the people at a price they can afford to pay. And, finally, we find a way to get it into the hands of the foreign friends and thereby create business for us.

Pacific WORLD TRADE

Often we have the satisfaction of adding to the pleasure of living among the peoples of far away lands. All this is good, and the Jap recognized it, and so when he got things going, he found a way to make it cheaper and sell it to his benefit and we to a great degree lost considerable of our "follow up" market. It was not uncommon to have natives say, "Yes, that is a very fine article, but we must wait until the Japanese sell it to us cheaper." Nice people. But now the Jap is out of the way and so it appears that if we can get the economic balance back to something approaching a pre-war level, we should dig in for a long period of excellent foreign trade.

For those of you contemplating an entry into export trade at this time there is probably one big question, "How do I get export customers?" How you should get them and who they should be depends largely on what you have to sell. To determine the answers to these questions and several others which will have a direct bearing on your ultimate success as an exporter it is desirable to make an analysis of your market. The same rules of merchandising with minor variations apply to export selling as to domestic.

If a trip can't be made to study the market first-hand, there is a wealth of statistical data available here in this country for your perusal.

(1) Your local Chamber of Commerce has continuous inquiries from buyers abroad seeking certain U. S. goods.

(2) The Department of Commerce, Bureau of Foreign and Domestic Commerce, here in San Francisco under the able leadership of John Judge has a great amount of down-to-earth information which has been gathered and compiled by well qualified field representatives.

(3) The foreign department of your bank can give you information pertaining to credits, collections, rates of exchange, etc.

(4) Certain air lines and steamship companies have established bureaus to assist businessmen with their entry into the export field. They supply information on needs, customs, buying habits, freight rates, etc.

(5) A letter to the Commercial Attache at any of our embassies in the form of a definite inquiry will shed additional light on the problems at hand.

(6) Dun and Bradstreet's Foreign Division through their world-wide organization can supply complete credit information on any customer.

(7) One dollar will buy a complete report on any prospect from the World Trade Intelligence Division of the Department of Commerce in Washington.

(8) Many trade journals have foreign editions. If there is one of these in your field they will gladly supply you with information they have accumulated from experience with products and market conditions in their field.

(9) There are many reliable export houses who have years of experience in foreign marketing who have on their staffs individuals who are specialists in a particular field. No market survey should ignore the possibility of using the services of an export house as a possible distribution outlet.

Now you have the types of export outlets and information services on

(Continued on page 147)

New Policy Statement by Export-Import Bank

FOREWORD

The recent expansion of the lending authority of the Export-Import Bank under the terms of the Export-Import Bank Act of 1945 has accentuated the need for a comprehensive statement of its general policies. The following statement was prepared in the light of both the established practices of the Bank and the new problems of foreign-trade financing growing out of the transition from war to peace. The purpose of the statement is to provide the public with information on the facilities of the Bank and on the policies which guide its operations.

WAYNE C. TAYLOR,
President.

The Export-Import Bank was established in 1934 as a banking corporation organized under the laws of the District of Columbia. The Bank was continued as an agency of the United States by acts of Congress in 1935, 1937, 1939, and 1940 and was made a permanent independent agency of Government by the Export-Import Bank Act of 1945.

The purpose of the Export-Import Bank of Washington, as laid down by Congress, is to aid in "the financing and facilitating of exports and imports and the exchange of commodities between the United States or any of its Territories or insular possessions and any foreign country or the agencies or nationals thereof." All of the operations of the Bank are and must be related to this fundamental purpose.

Powers

The Export-Import Bank has been given broad powers to do a general banking business and to make practically any type of loan, without limitation as to the amount of loans to any one borrower, insofar as the exercise of these powers is necessary to carry out its fundamental purpose of assisting in the financing of United States foreign trade. (See later paragraphs for a statement of transactions expressly forbidden to the Bank or excluded by reason of its general policies.)

Sources of Funds

In addition to its capital stock of $1,000,000,000 subscribed by the United States, the Bank is authorized to borrow from the Secretary of the Treasury on the evidence of its

own debentures or other acceptable obligations an amount not in excess at any one time of two and one-half times its authorized capital stock. The earnings of the Bank provide an additional source of funds.

Limitations Imposed

The Bank shall not have outstanding at any one time loans and guaranties in an aggregate amount in excess of three and one-half times its authorized capital stock, or $3,500,000,000. However, over a period of time the Bank can obviously handle a total volume of business larger than this amount because of participations by private banks with the Export-Import Bank without its guaranty, because of sales by the Bank to private persons of paper from its portfolio without its endorsement or guaranty, and because of the release of funds through repayments.

Organization

The Export-Import Bank Act of 1945 places the management of the Bank in a Board of Directors consisting of the Foreign Economic Administrator as chairman (so long as the Foreign Economic Administration shall exist), the Secretary of State, and three full-time directors appointed by the President of the United States by and with the advice and consent of the Senate. Not more than three of the five members of the Board shall be members of any one political party. Participation by other Government agencies in shaping the policies of the Bank is provided through an Advisory Board consisting of the chairman (at present the Foreign Economic Administrator), the Secretaries of State, Treasury, and Commerce, and the Chairman of the Board of Governors of the Federal Reserve System.

The National Advisory Council created by the Bretton Woods Agreements Act has the same membership as the Advisory Board of the Export-Import Bank, except that its Chairman is the Secretary of the Treasury. It is responsible for coordinating the policies of the Export-Import Bank with those of the United States representatives on the Bretton Woods organizations and with all other agencies of the Government to the extent that they make foreign loans or engage in foreign financial transactions.

The close working relationships between the Bank and the Departments of State, Treasury, Commerce, Agriculture, and the Board of Governors of the Federal Reserve System, as the permanent agencies of Government primarily concerned with foreign economic operations, serve to keep them fully informed regarding individual loan projects under consideration by the Bank and give them full opportunity to call attention to any possible conflict between the day-to-day activities of the Bank and their activities in carrying out the international economic program of the United States. They have also facilitated access by the Bank to the information and technical services of these Departments and the Federal Reserve Board and in

OFF FOR CHINA!

One of ten N-3 coasters recently purchased by the Chinese Government and outfitted at Consolidated Steel and Kaiser Shipyards. They were due to carry cargoes of railroad ties, nails, hardware and a wide assortment of UNRRA materials. The vessels are to be used in coastal and river operations in China. Purchase was negotiated for China by Robert H. Chiang.

this way enabled the Bank to limit the size of its own technical staff.

The operations of the Bank are administered by its officers and staff under the general supervision of the Board of Directors.

Basic Principles

Since its organization in 1934, the Export-Import Bank has been guided in its lending operations by the following basic principles:

(a) In accordance with the statutes governing its activities, **the Bank makes only loans and guaranties which serve to promote the export and import trade of the United States.** The Bank promotes foreign trade directly by financing exports and imports as specific transactions and by financing exports in connection with development projects and programs in foreign countries. Loans of the latter type have a further indirect effect upon United States foreign trade; for they assist in building up the economies and raising the levels of income of foreign countries, which thereby become better markets for American products and better suppliers of imports to this country. Thus, the Export-Import Bank is guided in its lending policies by the demonstrated fact that the best trading partners of the United States are countries which have reached the highest state of economic development.

(b) In accordance with its established practice and as explicitly provided in the Export-Import Bank Act of 1945, **the Bank makes loans generally only for specific purposes.** A corollary of this principle is that disbursements under a commitment by the Bank are made only upon receipt of evidence satisfactory to the Bank that the purposes of the loan have been carried out by the borrower. Conversely, the Bank does not make lump-sum advances for use as the borrower sees fit.

(c) As a matter of prudent management and as required by law, **the Bank makes only loans which offer reasonable assurance of repayment.** The restriction of loans to specific purposes is an important means to this end, as is also the spread of maturities over the productive life of a project in order to facilitate repayment. Furthermore, all loan applications are carefully analyzed by the Bank's staff from the legal, engineering, and economic points of view and must be approved by its Board of Directors.

(d) As a general rule, **the Bank**

extends credit only to finance purchases of materials and equipment produced or manufactured in the United States and the technical services of American firms and individuals as distinguished from outlays for materials and labor in the borrowing country or purchases in third countries. The reasons for doing so are principally two: (1) The limited resources of the Bank should be used with rare exceptions solely for the purpose of directly financing and facilitating United States foreign trade; (2) foreign countries should not ordinarily assume external indebtedness to finance expenditures in local currency.

(c) In accordance with its own rule and the express instruction of Congress, **the Bank does not compete with private capital but rather supplements and encourages it.** The activities of the Bank are confined, therefore, to dealing with certain types of risks which private banks are not in a position to assume without Government assistance and with other risks which they are not prepared to assume at all.

The principle of non-competition with private lending institutions is further carried out by the readiness of the Export-Import Bank to sell paper which it has acquired and by arrangements under which the Export-Import Bank undertakes in advance to purchase from commercial banks notes arising out of specified transactions financed in the first instance by the commercial banks.

What the Bank Finances

The Export-Import Bank is prepared to assist, under proper conditions, in financing exports from the United States and imports into the United States of products of all kinds. It is also prepared to aid in the purchase of engineering and other technical services in the United States. As a matter of practice, however, its assistance is required primarily in facilitating exports of tangible commodities the sale of which involves extended terms of credit. Exports of commodities may be financed on the basis of values f. o. b. the inland point of shipment, f. o. b. the land port or seaport of exit from the United States, or c. i. f. a foreign port.

The Bank's financing of exports is of two general types. The first type consists of credits for the benefit of individual United States exporters to facilitate the sale abroad of specific materials or equipment. The second type consists of a line of credit in favor of a foreign government, a foreign bank, or a foreign firm, to be available during a stipulated period of time, for the purpose of facilitating the purchase in the United States of specific materials, equipment, and services. Although different in form, the two types of credits obviously serve a single purpose. It is often a matter of choice or convenience whether a given transaction or set of transactions is financed by extending credit to American exporters or by making a loan to a foreign country or purchaser. Thus, it is clearly preferable from the point of view of ease of administration to make an arrangement with a foreign government or purchaser rather than separate arrangements with each of several hundred United States suppliers who may be providing equipment for a given project. The difference between the two types of operations is made even smaller by the

fact that the guaranty of a foreign bank or government is usually required as a condition of credits extended on the application of individual United States exporters without recourse to them (i. e., credits involving no liability on the part of the exporter in the event of default by the foreign debtor).

What the Bank Does Not Do

There are a number of things which the Export-Import Bank is expressly prohibited from doing under existing law or which are excluded by its general policies. Thus,

(a) The Bank does not compete with private banks and does not, therefore, extend credits when private credit is available in adequate amounts and on reasonable terms.

(b) The Bank is prohibited by its charter from purchasing stock in any corporation. In other words, the Bank is not permitted to engage in equity financing.

(c) The Bank does not make lump-sum advances for use as the borrower sees fit.

(d) The Bank is not authorized by the language of the Export-Import Bank Act of 1945 to finance trade between the United States and its Territories or insular possessions. This means that the Bank may not assist in financing trade between continental United States and Puerto Rico, the Virgin Islands, Alaska, Hawaii, the Philippines, or other possessions in the Pacific or between any two of these Territories or possessions. However, the Bank may finance export or import transactions between United States Territories or possessions and foreign countries.

(e) The Bank does not ordinarily finance local currency expenditures.

(f) The Bank does not assume any obligation or responsibility for the issuance by any agency of the United States Government of any priority, allocation, permit, or license which may be required by law or regulation for the procurement and export of any commodity which it may finance. Nor does the Bank attempt to give advice to borrowers on possible suppliers of exports which it finances.

(g) The Bank does not undertake to select engineering or other technical firms or individuals whose services may be sought by foreign borrowers in connection with projects financed by the Bank, although it does require competent engineering and other technical direction of such projects and will finance long-term contracts providing for payments for engineering or other technical services.

Who May Apply for Credit

The facilities of the Export-Import Bank are open to United States exporters either of goods or of engineering and other technical services, to United States importers, and to foreign governments, the agencies of foreign governments, and foreign firms and individuals. In brief, the Bank's facilities are accessible to any one requiring assistance and to whom the granting of assistance will aid in the financing of United States foreign trade.

The Export-Import Bank Act of 1945 released the Export-Import Bank from the pre-existing prohibition against loans by the Bank to foreign governments in default on their obligations to the United States Government. The Act also permits any individual, partnership, corpora-

tion, or association to participate with the Export-Import Bank in any of its authorized transactions and thus sets aside, with respect to participations with the Bank, the provisions of the so-called Johnson Act prohibiting loans by private persons to such governments.

How to Apply

United States exporters, both of goods and of engineering and other technical services, or United States importers who wish to apply to the Bank for credit may do so by writing directly to the Export-Import Bank of Washington, Washington 25, D. C., or, preferably, by seeking assistance from the Bank through their own commercial banks. It is recommended that the applicant consult his bank in any case, since in most cases it will be familiar with the facilities of the Export-Import Bank and will be able to judge whether or not the assistance of the Export-Import Bank is necessary and appropriate. Banks may obtain further information with respect to Export-Import Bank policies and procedures from their local Federal Reserve Banks.

The following information is essential for the consideration by the Bank of applications from domestic exporters (and, with appropriate modifications, also for the consideration of applications from domestic importers):

(a) Description of commodity to be financed.

(b) Name of foreign country to which the exports to be financed are destined and the name of the foreign purchaser.

(c) Justification for seeking the assistance of the Export-Import Bank, including a statement of the credit terms to be extended to the purchaser and suitable evidence that neither the seller nor his bank is in a position to finance the transaction.

(d) Amount of credit desired and proposed terms of repayment.

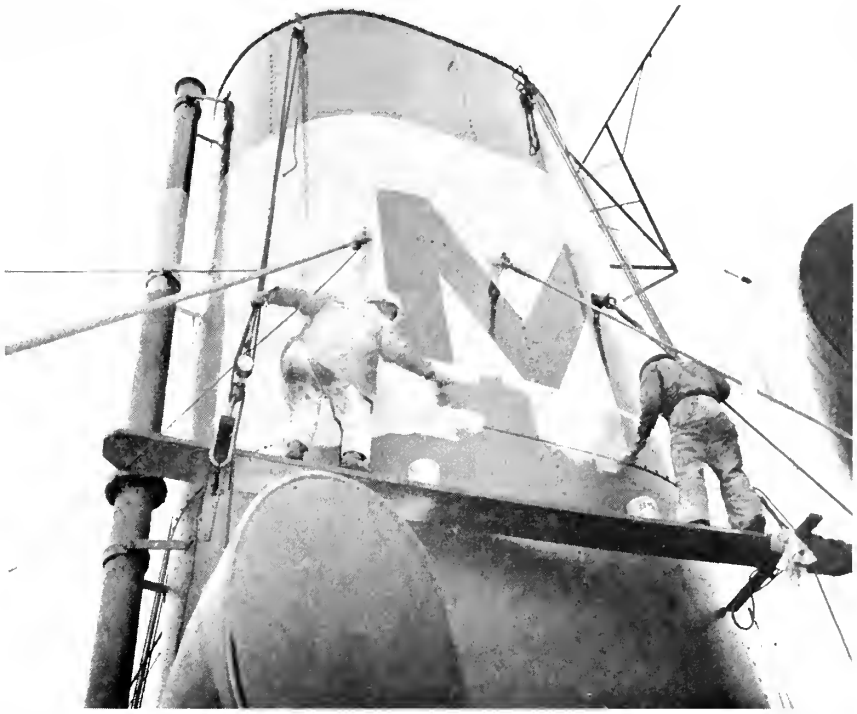
(e) Commercial bank and trade references.

(f) Comparative balance sheets and profit-and-loss figures for the preceding 3 years.

(g) In certain cases, cost sheets or other evidence of cost.

(h) Brief statement of history and experience.

GOOD NEWS!



Painting the Matson M on one of the Matson Navigation Company's liners. It is expected that 17 pre-war vessels will be restored to Matson control by mid-February.

(i) Credit information regarding the purchaser.

(j) Names of possible guarantors, together with an indication as to whether the guaranty of a foreign bank or government has been promised.

(k) Any other information which would be useful to the Bank in appraising the credit risk involved.

Authorized representatives of foreign governments may apply directly to the Export-Import Bank for credits or may initiate discussions through United States embassies and legations in their respective countries. In the consideration of applications from foreign governments or their agencies, the following information is necessary:

(a) Purposes for which the credit is to be used, including lists of materials, equipment, and services to be purchased in the United States and their suppliers (if known) and, when specific projects are involved, engineering and economic surveys.

(b) Justification for seeking the assistance of the Export-Import Bank, including satisfactory evidence that private credit is not available.

(c) Amount of credit desired and proposed terms of repayment.

(d) Statement of external assets of the country in the form of gold and foreign exchange, showing official holdings separately from private holdings and holdings of dollars separately from holdings of other currencies.

(e) Current and prospective rate of gold production.

(f) Statement of the international investment position of the country at long-term and short-term, including major commitments pending or contemplated, and an estimate of the amounts of interest and amortization due annually over the life of the loan on external fixed-service obligations.

(g) Summary of the record of the country as regards the payment of external debt and statement of the default status of outstanding external obligations.

(h) Analysis of the capacity of the country to repay on the basis of its current and prospective balance-of-payments position.

(i) Satisfactory assurances that dollars will be made available by the monetary authorities of the country to meet payments of interest and principal to the Export-Import Bank as they fall due.

Foreign applicants other than governments or their agencies may apply directly to the Bank, but the support of their governments will ordinarily be required before a credit can be negotiated. The information required of such applicants consists of items (a), (b), and (c) in the itemization applicable to foreign governments and items (e), (f), (h), (j), and

(k) in the itemization applicable to domestic firms or individuals.

Advance Commitments

United States exporters who desire to bid on foreign business may apply to the Export-Import Bank for credit with a view to securing commitments in principle in advance of the submission of bids. When more than one United States exporter is interested in obtaining a given order, the Bank will indicate identical or similar terms to all qualified bidders in order that the successful bidder, if a United States exporter, will be determined solely on the basis of price, quality, and proposed delivery schedule, rather than upon any advantage in credit terms created by the Bank.

The Bank does not look with favor upon requests for assistance from exporters who have not consulted it prior to making credit engagements to foreign buyers.

Nonrecourse Financing

The percentage of the credit risk involved in any export or import transaction which the Export-Import Bank will assume without recourse on the exporter or importer depends upon the circumstances in each case. Under present conditions, nonrecourse financing of exports by the Bank almost invariably requires the endorsement or unconditional guaranty of a foreign bank or foreign government.

Maturities

The maturities of credits granted by the Export-Import Bank are arranged in accordance with the circumstances in each case. Generally speaking, the financing of trade in consumption goods is limited to relatively short-term credits. On the other hand, the financing of trade in durable productive equipment may be on terms extending over a period of years. Where extended terms are involved, principal amounts are ordinarily made payable in equal installments beginning with the first or some subsequent interest date.

Interest Rates

The rate of interest charged by the Export-Import Bank depends upon the type of credit involved in each case, is computed on the outstanding balance, and is usually payable semiannually. The Bank is obliged to charge interest sufficient to cover the cost of its own funds, defray its administrative expenses, and accumulate a reasonable reserve against losses in order that the Bank may be self-sustaining. The Bank is also bound to consider market rates of interest in order to avoid what might be construed as competition on a rate basis with private sources of credit. Interest rates are uniform to all borrowers for any given type of credit.

Security

Loans to domestic exporters, importers, and manufacturers are usually made on the basis of the credit standing of the borrower, supplemented by the guaranty of a foreign bank or government in the case of loans made without recourse to the applicant. Credits to foreign governments and their agencies are made on the basis of the general credit of the country or agency, supplemented where desirable and appropriate by a pledge of specific revenues or specific receipts of dollar exchange. The Export-Import Bank attempts to arrange the terms and conditions of its loans in accordance with the circumstances in each case and with a view to creating the type of obligation which is most suitable from the point of view of both the borrower and the Bank.

Aid to Small Business

As a special aid to small and medium-sized firms engaged in exporting, the Export-Import Bank extends credit lines to individual firms which are experienced and of good repute, but which are hampered by lack of capital in obtaining adequate accommodations from private sources. These credits are revolving and are available for limited periods, generally from year to year, upon presentation for discount by the Bank through its agent bank of drafts on approved foreign purchasers. These credits are designed especially to help small firms increase their export commitments without the necessity of raising additional capital. Comparable facilities are available to small and medium-sized firms engaged in importing.

Vis-a-Vis Commercial Banks

It is a cardinal principle of the Bank's operations that it does not compete with private banks. This principle is carried into effect in a number of ways. As indicated above, the Export-Import Bank prefers to receive applications for loans from private firms and individuals through commercial banks to insure that private credit is not available. The Bank attempts to secure the maximum participation by private banks in credit arrangements to which it is a party. The Export-Import Bank commonly uses the facilities of commercial banks for making funds available to borrowers under lines of credit, receiving payments of interest and principal, and for handling other matters in connection with the extension and collection of credits. The Export-Import Bank enters into agreements with commercial banks under which it undertakes in advance to purchase from them notes arising out of specified transactions financed in the first instances by the commercial banks. It stands ready in turn to sell to commercial banks or other private investors paper from its own portfolio.

By using the services of commercial banks, and other private organizations to the fullest extent possible, the Export-Import Bank is able to keep its own operating personnel at a minimum.

Relation to International Bank

The Export-Import Bank will not compete in any sense with the proposed International Bank for Reconstruction and Development. This will obviously be true during the period before the International Bank comes into being. It is also true with respect to short-term and medium-term credits to United States exporters and importers, because this is a field in which the International Bank will not operate. With respect to long-term loans to foreign governments, the activities of the Export-Import Bank and the policies of the United States representatives on the International Bank will be coordinated by the National Advisory Council on International Monetary and Financial Problems, as provided in the Bretton Woods Agreements Act. The making of long-term loans to private foreign companies by the Export-Import Bank and the International Bank will be coordinated in the same way.

Marine Transportation

Public Resolution No. 17, Seventy-third Congress, requires that exports of agricultural or other products fostered by loans made by any instrumentality of the United States Government shall be carried exclusively in vessels of United States registry unless it is determined by proper authority after investigation that such vessels are not available in sufficient numbers, or in sufficient tonnage capacity, or on necessary sailing schedule, or at reasonable rates.

First 1946 session of San Francisco's Foreign Trade Association at the Fairmont Hotel. Left to right: T. Douglas MacMullen, Executive Editor, Pacific Marine Review; Charles Romanowitz, Yuba Manufacturing Co.; Hon. A. Sporon-Fiedler, Consul General of Denmark and dean of San Francisco Consular Corps; William L. Montgomery, president of the Association and managing director, China-America Council of Commerce and Industry; Baron James Baeyens, Consul General of France; Hon. Henry Beaujard, Commercial Counselor to the Consulate General of France; William F. Minehan, assistant vice president, Bank of America, and Chairman, Foreign Credit Chapter, Credit Managers' Association. Gazing south in the lower right-hand corner is George Davis of the Argentine Trade Promotion Corp.

"World Trade Preview"

at the Foreign Trade Association of San Francisco

In a meeting planned as a brief symposium to hear the thoughts of a few leaders as to what can be expected during the coming year in world trade developments, the Foreign Trade Association's new president, William L. Montgomery, inaugurated his official term with one of the most enthusiastic meetings since pre-war days. It was held January 7 at the Fairmont Hotel, San Francisco.

Mr. Montgomery, who is managing director of the China-America Council of Commerce and Industry, Inc., and long-time manager of the World Trade Department of the San Francisco Chamber of Commerce, enlarged upon opportunities and recent developments.

President Montgomery introducing Consul General Sporon-Fiedler.

Charles Romanowitz of the Yuba Manufacturing Co., chairman of the Bay Area Promotion Committee, outlined the plans for the Institute of World Trade, since held in the University of California Extension Division.

William F. Minehan, assistant vice president of the Bank of America and chairman of the Foreign Credit Chapter, Credit Managers Assn. of northern California, with traditional banker's conservatism quoted credit conditions in various foreign countries.

T. Douglas MacMullen, executive editor of Pacific Marine Review, reviewed conditions both favorable and unfavorable with which the industry in general is concerned. They ranged through port conditions, tariffs, markets, ships, planes and freight rates. His conclusion was that the markets are waiting and obstacles can be made stepping-stones by those who just dig in and **trade.**

William F. Minehan and Alvin E. Eichholz. Eichholz is manager, World Trade Department, S. F. Chamber of Commerce, and secretary of the Foreign Trade Association. If there is anything he didn't know about foreign credits, he will have learned it from Banker Minehan.

John A. Sowers

PROMOTED?

John A. Sowers, manager, World Trade Department, Oakland Chamber of Commerce, has announced his resignation effective February 1. Mr. Sowers, who is well known in trade circles on the Pacific Coast, has directed the Chamber's world trade activities since 1935 except for service during the war years with the War Production Board.

He will join the Los Angeles Chamber of Commerce as assistant manager of the World Trade Department and will be in charge of the Far Eastern Division. He has been identified with world trade activities in the Bay Area since 1931. In 1935 he joined the Oakland Chamber of Commerce as head of its World Trade Department, and in 1936 made a comprehensive tour of China, Japan, Korea, Manchuria and the Philippines, followed by a three-months' trip around South America in 1937. He has served the Oakland Foreign Trade and Harbor Club as president, vice president, secretary and director. He is a member of the Delta Phi Epsilon, national foreign service fraternity; Pan American Association; Bay Area Maritime Committee, and is secretary of the Bay Area World Trade Promotion Committee.

Mr. Sowers has been identified with international affairs since his graduation from George Washington University in 1926. For two years he attended the School of Foreign Service, Georgetown University, where he majored in international relations, marketing, money and banking, foreign exchange, international law, and export merchandising and procedures. Following his graduation he became associated as assistant export manager of a large hardware manufacturing concern.

In announcing his appointment, General Manager Harold W. Wright of the Los Angeles Chamber stated, "As one of the best-known organization executives in the international commerce field on the Pacific Coast, Sowers will have an opportunity for carrying out in Los Angeles on an expanded scale the successful trade promotion activities he has handled while with the Oakland Chamber of Commerce."

Pacific WORLD TRADE

Employment of Veterans In Foreign Trade

Listing the sources of information on what is needed to obtain employment in foreign trade and where and how employment may possibly be obtained, the National Chamber's Foreign Commerce Department has issued a three-page mimeographed circular entitled "Employment in Foreign Trade." Copies are available upon request. The circular points out:

A well-known foreign trade authority has stated that firms pick their employees on two bases: (a) because of their knowledge of the product and the industry; or (b) their knowledge of the foreign field.

Some companies think it is easier for a man to learn foreign trade practices than it is to learn the company's products and methods of doing business. In addition, a good personality suitable to foreign trade and ability to be quick to learn are needed to succeed in foreign trade.

Some companies will employ complete outsiders to the company who have a knowledge of exporting and other qualifications, while other firms will take a pretty careful look over their existing personnel. The domestic departments of companies are quite often a stepping stone to foreign trade.

New Chile-Argentine Tunnel Studied

By agreement of the governments of Argentina and Chile, a commission of engineers of both countries has been appointed to study plans for the construction of a 3-kilometer tunnel through the Andes, between Juncal, on the Chilean side, and "Las Vacas" on the Argentine side, according to the foreign press.

The tunnel is intended to form part of the Pan American Highway and will also be used by the Transandine Railway, it is said.

R. E. Waterlow Elected

At its recent annual election, the Export Managers' Association of San Francisco elected R. E. Waterlow as its new president for the year 1946. Mr. Waterlow recently joined the staff of Frazar & Hansen, international merchants, and is well known in foreign trade circles.

Other officers elected for the coming year are: L. A. Elsener, Chicago Bridge & Iron Co., vice president; Luis Yribarren, Crown Willamette Paper Co., secretary; David Mari, Fibreboard Products, Inc., treasurer.

This Association has played an important part in San Francisco's foreign trade life for many years and looks forward to 1946 as one of the most active and important years in foreign trade history.

R. E. Waterlow

Quotes from the International Bulletin of the World Trade Department, San Francisco Chamber of Commerce

Information on Far East

Local firms can obtain information on commercial conditions in the Far East more speedily by addressing inquiries to the San Francisco field office of the Department of Commerce or to the Bureau of Foreign and Domestic Commerce in Washington rather than to consulates in the Far East, according to the Department of Commerce.

Consulates in the Far East, reopened since the end of the war and still under-staffed, are not yet able to handle a large volume of commercial inquiries. In general, information desired by American firms is available in the United States in readily usable form, the Department pointed out.

Import License Requirements Lifted For China

China has been removed from Procedural Group A by the Office of International Trade, and remains, however, in Country Group K with all attendant general license privileges.

The effect of this new order is that when submitting export license applications covering shipments to China, exporters are not required to specify the Import Permit Number of the Chinese Importer. However, during the first quarter of 1946 the Department of Commerce will endeavor to give preferential consideration insofar as possible to those applications supported by import permits issued prior to the announcement.

Discontinuance of Philippine Registry Numbers

Discontinuance of the registry-number system established for controlling imports into the Philippine Islands was announced effective January 1, according to the Department of Commerce.

It has been explained that the conditions which made necessary the setting up of the system have sufficiently improved so that the procedure is no longer required.

Trade with Japan

Import and export trade between the United States and Japan will be handled by Government agencies for at least another six months. Exports to Japan will be procured through the War Department, Quartermaster General. Imports will be handled through the U. S. Commercial Company of RFC somewhat as it handles imports from Italy. It is understood that exports to Japan will consist chiefly of foodstuffs and products

needed for the maintenance of a minimum subsistence level for the country.

Bretton Woods Agreements

The International Monetary Fund, and the Bank for Reconstruction and Development were brought into being in Washington on December 27, 1945, when representatives of 28 nations signed documents indicating that their Governments had ratified the Bretton Woods Agreements and had deposited the initial payments towards the expenses of the organization. The Fund will have $8,800,000,000 in gold and currencies at the start, and the Bank initial subscriptions of $9,100,000,000.

CREATING EXPORT SALES

(Continued from page 139)

this end which should be considered in your survey.

Just as important a consideration as your outlet here is the proper channeling of your business in the country of sale.

Here are the types of organizations or outlets abroad which you must of necessity consider.

(1) Distributor
  (a) Exclusive
  (b) Non-exclusive
(2) Wholesaler or jobber
(3) Commission Agent
(4) Retailer
(5) Direct user or purchaser
(6) Broker
(7) Resident salesman
(8) Branch Office
(9) Foreign offices or agents of export merchant

Most of the factors to be taken into consideration in a foreign market survey are the same as would be considered in a domestic one. As we said before, pay particular attention to what may seem like minor details, such as labels, size and style of packaging. Instead of having competition from U. S. firms as we do here, remember that competition in a foreign country comes from three directions: (1) the national manufacturer, (2) firms from other countries and (3) last, but by no means least, many of the same old competitors you do battle with daily in Milwaukee or San Diego.

When you decide to enter the market after you have the results of your survey—go ahead with the same enthusiasm and ingenuity you would use on a domestic campaign.

Don't expect big returns immediately because you are now selling to the biggest mass market in the world without even going into the export business.

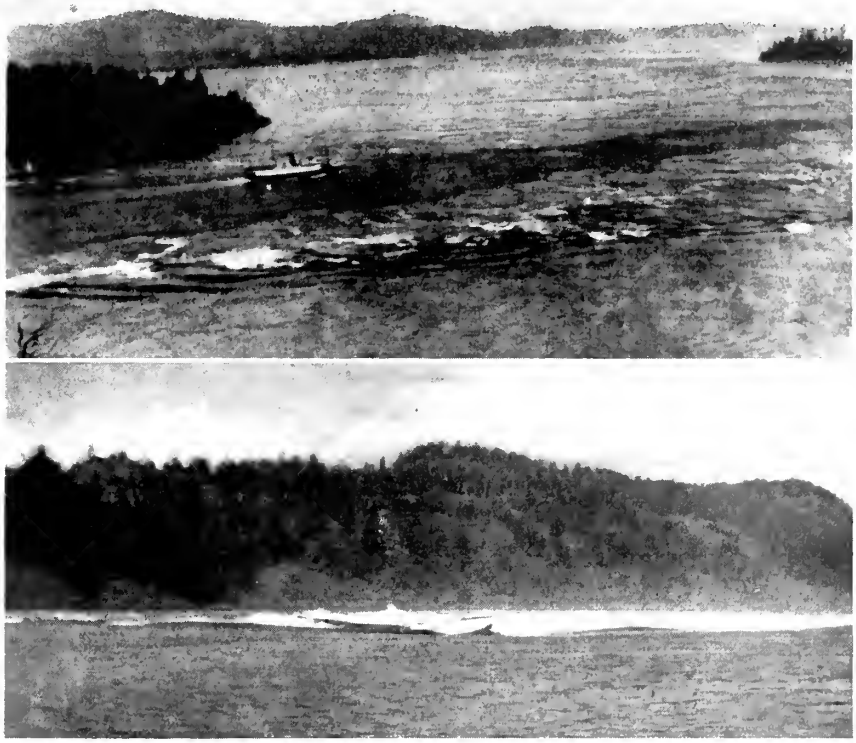
Don't think you know all the answers. Listen to the advice of your selling agents.

Always remember to play the game fair and square. A blow below the belt won't benefit you or anyone else in this country engaged in export business.

If you follow the rules of the game there is every reason to believe that you will get your share in a direct proportion to what you put into it.

Mariners' Dread, Ripple Rock, to be Blasted Out

By Francis Dickie



Top of page: S. S. Cardena, passenger ship of Union Steamship, Ltd., at engine speed of 12½ knots with tidal current near Ripple Rock is making 26 knots. Even the most powerful steamers cannot buck high flood tides, which in times of storm build up a current reaching speed of 18 knots. In the past 30 years, time lost by ships waiting for short periods of "slack" (quiet water) to run this dangerous tide race amounts to millions of hours. *(Photo courtesy Capt. J. Muir)*

Center: Flood tide begins in Seymour narrows near Ripple Rock. A seething, roaring, dreadful turmoil of white water, gigantic whirlpools, overfalls, eddies in a racing current with speed at times of 18 knots, defies passage of even a battleship. Ships go through on short periods of calm water, depending on time and state of tide.

Below: Flood tide in Seymour Narrows. *(Photos by Ronald Miller)*

SHIPS' CAPTAINS plying the North Pacific to and from Alaska, and all masters of coastwise shipping, will be jubilant and relieved to know that the Canadian Government's determination to destroy the nightmare of the North Pacific sea-lane, known as Ripple Rock, is undeterred.

Though the first attempt to drill the Rock from a barge held over it in the swift current, lasting nine months, from March to November, 1943, was a disastrous failure, costing half a million dollars, the Government's contractors, B. C. Bridge & Dredging Co., have now returned to the attack, aided by an additional grant of $125,000.

Ripple Rock is the worst menace on the "Inside Passage," which stretches along the coast of British Columbia, protected from the sweep of the open Pacific by islands, for nearly a thousand miles.

Of large passenger and freight steamers approximately 2000 per year pass the rock, shipping worth approximately $25,000,000, carrying 175,000 passengers, 2,000,000 tons of freight, cargo valued at $107,000,000.

The nautical description from the B. C. Pilot Vol. 1 reads, "Ripple Rock (Lat. 50° 08′ North. Long. 125° 21′ W). A dangerous shoal with two heads lying north and south of each other, nearly a cable apart, the northern head 1½ fathoms least water, being the shoalest, lies in the centre of the Narrows." How exceedingly treacherous is this passage is emphasized by Commander B. L. Johnson, R.N.R., in his sailing directions published in the Vancouver Pilotage Service. This officer has navigated ships for 30 years in these waters.

He writes: "Except to those with intimate local knowledge, it is recommended to enter the Narrows only at or near slack water . . . during the strength of either stream, the eddies are very heavy and extra men should be at the helm . . . on big tides, a

speed of sixteen knots and a vessel particularly quick to answer her helm is necessary for a safe passage during the second and third hours of the ebb. . . . Strangers are advised to navigate only at slack tide. . . . The passage should be used with caution at night, even by those having local intimate knowledge."

The loss of ships and cargo caused by Ripple Rock and adjacent water has run into many millions of dollars. Among vessels lost are:

1875—American Warship Saranac, total loss.

1875—American steamer Wachusett, total loss.

1884—H.M.S. Satellite (40 feet of false bottom torn off by R.R.)

On dates uncertain, presumed total loss, S.S. Amur, Spokane and Queen.

Of ships of American, British and Canadian registry which suffered damage varying from $1000 to $500,000 in more recent years were:

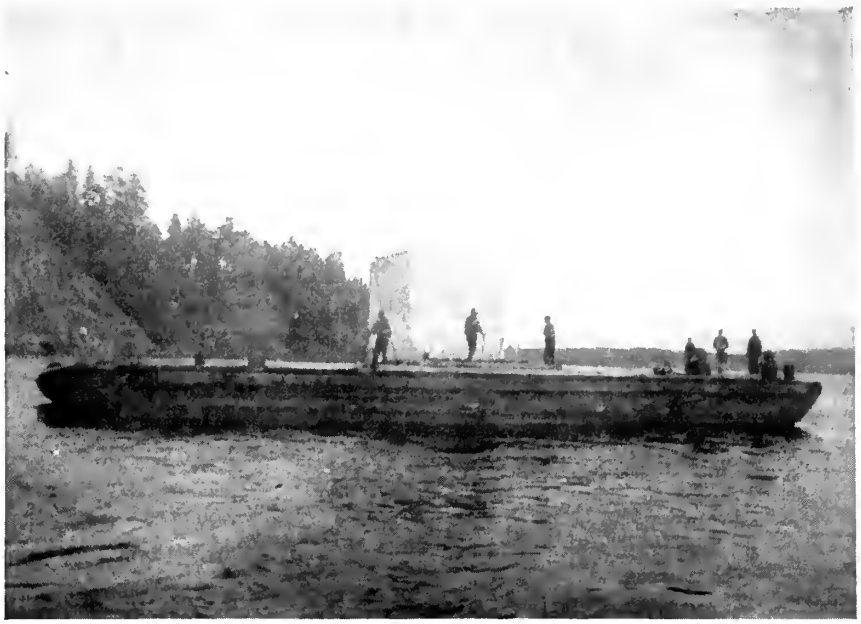
1902—S.S. Bonita.
1904—Danube.
1906—Themis.
1916—Princess Maquinna.
1919—Princess Ena.
1920—Prince George.

1929—Greylock; Aleutian (large passenger list, ship and passengers narrowly escaped complete wreck); Princess Mary.

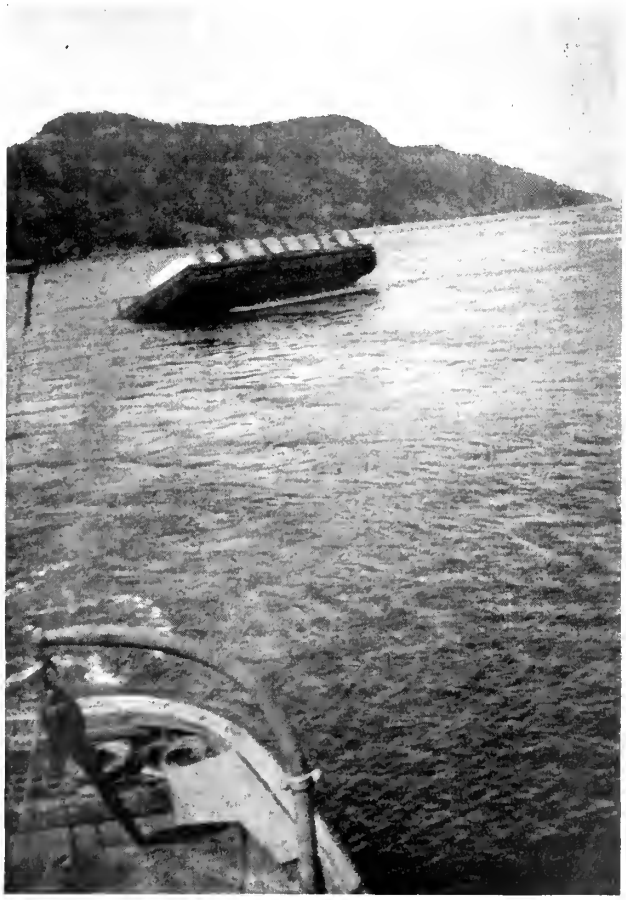
1944—William J. Stewart; Lakima (the latter with large passenger list saved from Rock only by heroic efforts of a small power boat keeping her in eddy to pass the Rock).

In addition, large numbers of barges, oil tankers, tugs, fishing boats and pleasure launches of which no records are available. The toll of lives taken in rowboats is also considerable.

But Ripple Rock's supreme triumph came on June 11, 1944. The Canadian Government's own Hydrographic Survey Ship, William J. Stewart, dedicated to pointing out to others dangerous places, a vessel equipped with hundreds of thousands of dollars worth of delicate nautical instruments, a vessel officered by men highly experienced in avoiding danger, this ship struck on Ripple Rock. Complete wreck was barely averted by beaching the Stewart. The over-all damage to ship and instruments was estimated at half a million dollars. It should, however, be most particularly noted that the officers were blameless. No man is master of the incalculable currents around Ripple Rock. The vessel going north in the Seymour Narrows met a southbound Union steamer, necessitating both vessels to deflect from course. This was just enough, in the Stewart's case, to throw her into one



Setting anchor (first stage). The 25-ton cement anchors for holding drilling scow in tide-race were built in quiet water on scows with special water compartments. Picture shows scow on level keel ready to drop anchor in required position at bottom of dangerous Seymour Narrows tide-race. *(Photo by Ronald Müller)*



Setting anchor (second stage). Compartment on scow opens, letting in water to tilt the scow till 75-ton anchor slides into sea.
(Photo by Ronald Miller)

Huge drilling scow, a little city in itself, shown with tugs in moment of quiet water in one of the world's swiftest tide races. A new anchor is being dropped, weighing 75 tons. Six anchors, totaling 550 tons, held it only temporarily as 11 steel cables kept breaking through "fatigue" caused by movement of scow in shifting water.

of the resistless currents driving the craft straight upon the Rock.

For 75 years this menace has been protected for the most fantastic of reasons: **as an "absolutely required pier-foot" for a bridge, one bridge in a proposed island-hopping scheme to connect Vancouver Island with the North American mainland.** At first, 75 years ago and for some time after, the Rock was to be a pier-foot for the bridge of a transcontinental railway, linking Montreal and Victoria. When three transcontinental railways were built and each ignored this bridge the protectors group changed their plea to a vehicular bridge. In 1943 this opposition gave way before the louder clamor of mariners and shipping companies for the Rock's removal.

In 1930 the Canadian Merchant Service Guild Inc., representing 90 per cent of the masters and mates engaged in coastwise shipping—The Vancouver Merchants Exchange; Vancouver Board of Trade; Victoria Chamber of Commerce; the B. C. Coast Steamships; the C.P.R.; Canadian National and Union Steamship Companies; the Shipping Federation; the National Association of Marine Engineers; the United Fishermen; the United States Navy; and shipping interests in Puget Sound, Columbia River, and California ports—brought their combined pressure to bear on the Canadian Federal Government.

The Government appointed a commission, which, on February 20, 1931, reported the removal of the Rock was desirable. It estimated the cost at $200,000. But nothing happened.

Not until 1942 did the Government's Department of Public Works at last yield to pressure. It first considered the possibility of bombing out the Rock from a plane. On the advice of Professor Webster, British expert on bombing, this idea was deemed not feasible.

Many mariners and mining engineers agree that the only practical manner to remove Ripple Rock is by regular mining methods of putting down a shaft on the shoreline of Vancouver Island and tunneling under the Rock, then crosscut it and blast the entire Rock at once. They point out that a similar tunnel was driven under the First Narrows at Vancouver to bring the city its water supply.

The West Coast Salvage and Contracting Company, in the beginning of 1943, submitted to the Government a plan to place a steel caisson over the Rock. Fill the caisson with concrete as a working base. When this was set, drill through concrete and Rock to the desired depth and blow the caisson and the Rock. The Government rejected this plan.

The feasibility of drilling the Rock from a barge anchored over it in this terribly swift stream was made the object of an experiment begun in June, 1942. This took the form of building a model Rock, tide-race and barge at the University of Washington, with a stream pumped from the nearby lake to simulate the tide-race. The experiment cost $5000 and **proved highly satisfactory.**

On May 26, 1942, W. G. McKenzie, president of the B. C. Bridge and Dredging Company, to which the Government had given the contract on a cost-plus fee basis, optimistically stated: "the entire top of the Rock, which has 19 pinnacles, will be blasted by 354 seven and a half inch holes. The estimated cost will be $375,000 and the work will be done in ten months."

After much preliminary examination and delay, the method of attacking the Rock was decided upon as a drilling from a barge over the Rock. In the spring of 1943 a specially constructed drilling barge, costing $160,000, was towed to quiet water in the vicinity of the Rock. It was a veritable small floating town. On it was mounted an 80-foot drill tower. It carried two 12 x 14 Washington donkey engines to handle the enormous anchoring cables of steel line. At the same time six concrete anchors were built on specially equipped scows.

The four concrete anchors to hold the corners of the raft to lie at right angles to the swift stream were 10 x 10 x 10 feet, each weighing 75 tons. The other two anchors to hold either end of the barge north and south, the lines of which were parallel with the flow of the stream, were 10 x 10 x 26 feet, each weighing 125 tons. To the four lighter anchors were affixed 1¼ inch steel cable; to the other two, cables of 1½ inch steel. The scows with the anchors were towed to the required position about the Rock. The water compartments on the scows were then opened. The water filling them tipped the scow until the concrete anchor slid into the water. The other end of the cables was attached to large buoys. When all anchors were set, the drilling barge was towed into position and the donkey engines took the lines from the buoys and drew these fast onto the drilling barge.

Then down the narrow channel shot the stream of the Narrows with all the force of the outer Pacific. The water came roaring, churning, twisting with incredible speed and varying currents. Under its ceaseless pressure the mighty steel cables were so whipped and vibrated by the leaping, swaying, enormous drilling barge that in the first 24 hours one of the starboard cables, at right angles to the stream, snapped like a thread in the hands of an impatient housewife.

Only by a swift maneuver of the attending tugs was the great barge saved from disaster.

Within two weeks another cable went. New anchors were made. The attempt at drilling was continued upon this great barge, while most of the time the mighty frame quivered, vibrated, as it leaped and swayed and clumped down upon the stormy water, held like an eternally agitated

chip in the grip of the tide-race. Amazing as it seems that men could stand such strain, the majority of the crew, working in this fantastic watery dance with death, stuck it out.

Indeed, before work ever began on this method of drilling from the water, the Chief Engineer of the Department of Public Works said of this attempt, unique in engineering efforts: "Drilling the Rock from a barge held in the stream is probably the most hazardous ever contemplated in the world."

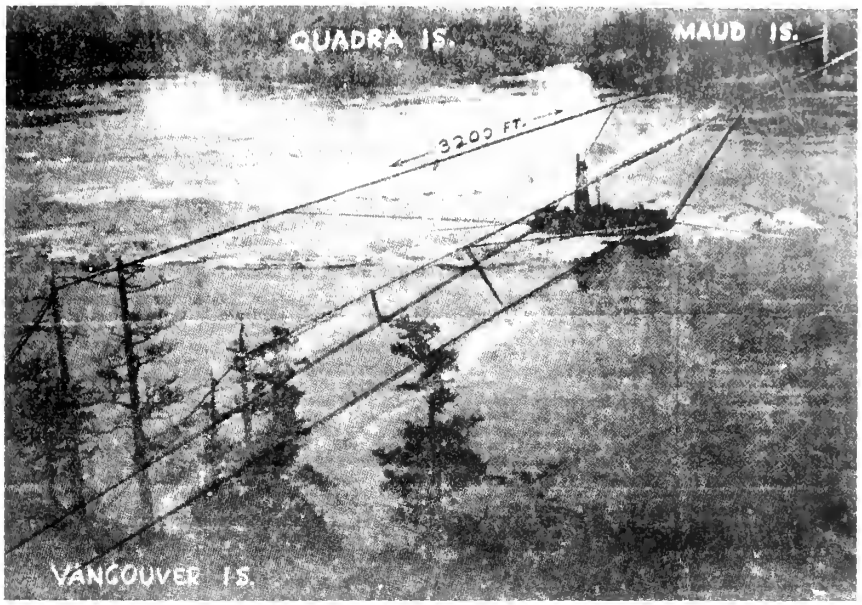
Little did he dream when he made that statement how right he was. By the time the autumnal storms were nearing the attempt was given up as futile. Eleven anchors had been lost in five months, and many fathoms of steel cable. Of the 354 holes the president had so proudly announced would be drilled in ten months, only eleven had been blasted. And of the half million dollars allotted by the Government to do the work not a cent was left.

From November, 1943, until the spring of 1945 work ceased on the project. Then, with an additional grant from the Canadian Government of $125,000, the attack was recommenced.

Despite the failure of the first drilling from the water method, and the criticism of its continuance by many mariners and all mining men, the second method now in progress very similarly parallels the basic idea of the earlier method, though this so signally failed.

The second method persists in drilling from a barge held over the Rock in this terrifically powerful and swift stream. The only difference is in the method of anchoring the drilling barge. Instead of anchors being sent to the bottom of the channel the barge is now held from two overhead cables.

High on the rocky cliff of Vancouver Island, "spartrees," such as used in "sky-line" logging methods, were raised. On Maud Islet, near the opposite (eastern) shore, similar "spar-trees" were placed. Extending from these across the channel, cables of 1¾ inch steel span a distance of 3200 feet. From these two lines of cross-channel cables extend downward "quarter-lines" to the drilling barge, a line to each of the four corners of the barge, and a line to either end. An additional help, two more lines



Constructed picture shows operation of new method to drill Ripple Rock. Scow is held over sunken rock by two overhead cables 325 feet above water to give clear steamer lane. Steel cables are 1¾ inches thick, 3200 feet long, secured to spar trees on either side of channel. From Vancouver Island side to scow, on closed channel side, are two additional cables at water level to scow. From overhead cables to scow, and to two lines at water level, descend "quarter-lines." In actual operation there is sag in overhead cables, but owing to number of lines shown in sketch, all are drawn straight for greater clarity.

extend from the "closed-channel" Vancouver Island side to the barge at water level.

With the completion of the raising of the "spar-trees" on either side of Seymour Narrows, at the end of June, 1945, the great steel ropes were brought into place to hold the barge in the second method of drilling Ripple Rock, a method unique in engineering annals, attempted here for the first time anywhere in the world.

On July 18 and 20, the Narrows were closed to navigation for several hours. During this time the two enormous steel cables, each weighing 11 tons, with a breaking test strength of 145 tons, were floated across the channel on 30 two-drum floats, with the cooperation of the Canadian Army Signal Corps and five tugs. These monsters of steel rope, specially constructed for the work by Wright's Canadian Ropes Limited, are the longest ever used in an operation carrying so tremendous a pulling load.

And so, with this unique method holding the drilling barge in the fast tide-race, drilling recommended in August, 1945, and continued until the end of September. But very little progress in the ultimate destruction of the Rock was achieved when work shut down again with the coming of the winter storm season in October.

(Continued on Adv. page 68)

Courageous drilling crew for 7 months rode on floating earthquake of drilling scow leaping about in one of world's fiercest tide-races.

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

A Letter From A Victory Electrician

AMERICAN RED CROSS

Yokohama, Japan, December 1st, 1945.

Mr. John M. Dodds,
Field Engineer,
Pac. Dist. Eng. Div.,
General Electric Co.,
Russ Building,
San Francisco, Calif.

Dear Mr. Dodds:-

Inasmuch as we have already met I don't think it necessary to introduce myself. Right after I left your office last September I went down and signed up on this ship, the SS Plattsburg Victory, operated by the Coastwise Pacific Far East Lines, as electrician. This ship, incidentally, was one of the last, if not the last, of the Victory ships out of Yard 2, Richmond. In fact it was outfitted and commissioned so fast they sent her out minus electrical gear for the lifeboats for one of many omissions. This does not alleviate things during the lifeboat drills as those units have a way to turn laboriously. Another omission is the providing of an instruction book for the winches, anchor windlass, capstan, and generators. The winch gear is all GE, but the generators are Wesinghouse; one a 258E and the other a 240E which are running in parallel.

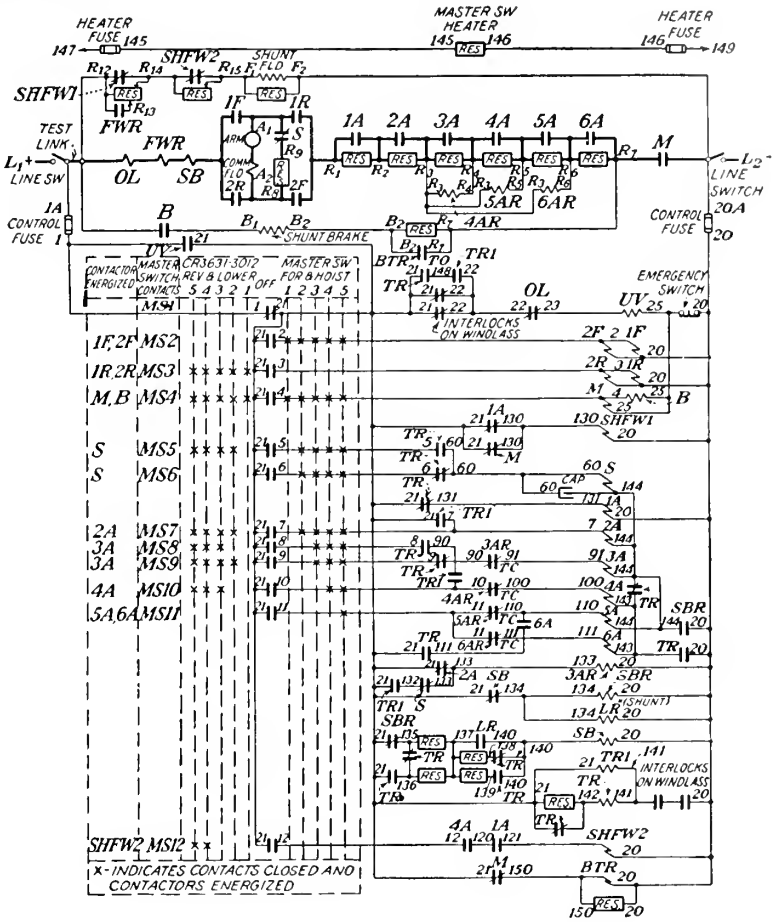
We sailed out of San Francisco on October 10, passing Halsey's fleet bound for the States the second night out. After being out about a week bound for Nagasaki, Japan, with a cargo of priority freight we ran head-on into a violent storm. The hatch cover over our forecastle deck was bashed in by the sea, as well as gear on the deck. Water poured into the forecastle compartments until it flowed over the hatch collars. Stored in one of the compartments was almost a thousand gallons of paint, several hundred gallons of fish oil, barrels of soap, coils of calking material, and black oil. As the ship was rolling to describe up to 42 deg. angles all of this freight was bobbed around in the seawater that had inundated the chain-locker, and resistor room, wherein is located the control panel for the anchor-windless, and its complement of 19 boxes of coil resistors.

All of the resistance was telescoped by being rammed against the skin of the ship and this content of course mixed together with each other using seawater to thin it down to a consistency of, let us say, a gallon of glyptal thinner to ½ gallon of glyptal. Just right for a spray-gun

were we looking for something to spray the resistors to give them an ohm reading to ground which they read after we tested them later. This all of course put a homogeneous sheet and ground across all elements of the board and the resistors. The overhead lighting cables, of course, were ripped from their studs and formed up like spaghetti in this great bowl of gray soup (the paint was 1000 gallons of gray color). Nothing was done about pumping for a couple of days as we all were busy serving the rest of the ship. We were forced to turn back to put the typhoon winds at our stern, and that stern bobbed up and down like the valve rod in an old coil-less engine.

Our bow was taking the sea to the mizzen mast awash. But we finally ran out of the storm and rigged up pumps, and in a few days we had all pumped out to a depth of 3 ft. of the settlings. These were siphoned out and bucketed out until all was dry except about 1½" of goo clinging to the bulkheads and to the entire anchor windlass. First we got busy on the degaussing cable as we were running into dangerous waters. We cleaned it off as best we could, took a megger reading, and shot a few amps. in her.

Coming into Japanese water we took the only set we had and socked 75 amps. to her expecting anything. But it held. We took later megger readings and found it was drying out nicely. While this was going on we skimmed the goo from the anchor windlass panel and resistors and found some of the resistors broken from floating cans ramming them and the wiring on the board pulled out in many places. The whole set-up looked like 2 mounds of soft clay, and would have been an effigy of the Bunker Hill monument to us if we didn't know electrons were flowing beneath those mounds of churned up paint, fish oil, etc., with a liberal garnish of ground up calking and packing protruding from them everywhere. But did we give up? No, sir, we went back and read Kipling's "If" from the Sailor's Manual of Inspiration, then retraced our steps over the catwalk and first skimmed the goo with our hands, then with a paint brush and kerosene, throwing everything in a basket if it felt like it came from GE before it was cemented and baptized in this strange country and manner, somewhere west of the International Date Line.



This is one of the connection diagrams used by Garrett.

Yes, Mr. Dodds, we took turns as the air was cold and incidentally the coffee in the galley was—Chase & Sanborn's. As in all things there is an ending; came the day we had things so we could see the outline of the 21 coils and the 14 resistors on the board. From there in it was tough. When the sailors cleaned the bulkheads they rubbed most of the diagrams of connections off that were pasted on them. We disassembled the whole board from top to bottom so that nothing but the slate remained. We disassembled all of the relays, the resistors, the master and limit switches, and gave them over to the wipers to clean. The relay coils we turned in to the War Shipping Administration for drying out, etc. This, of course, after we landed here in Yokohama.

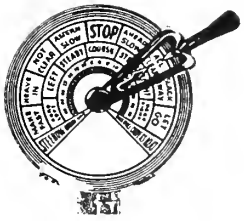
Then I went around to a dozen ships before I had enough material to start rewiring. I bummed an instruction book from the last ship and I copied Drg. P-8299190, and the data on the relays, etc. It took me 3 days on that job alone, as I had to get that book back before they sailed. We took out the whole 19 box resistors and had one heck of a time getting the goo out of the spirals. Then we commenced on the main cables and meggered each out and retagged a lot of them. Then we reassembled the master switch and the limit switches and got in the motor, the gaskets of which over the commutator as those in the limit switches had allowed some water to come in. We literally cleaned that motor in carbon tetrachloride, but we succeeded in getting .5 meg-ohms and cleaned the salt-crystals off the segments to get a clear commutator.

By this time the coils came back from the War Shipping Administration and we compared them with one of each we had which were new. All were O.K. as far as ohms across were concerned, but the tubing to the pole pieces meggered low, so we dipped them all in Glyptal and let that dry while in the pole piece. The insulation on the reverse and forward blowouts was all shot so we wound scotch

(Continued on page 155)

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE SEXTANT

CHAPTER I (Continued)

(Note: In reading this installment on the sextant it will be well to refer to Figs. 1 and 2 in the preceding installment).

(5) **The Index Arm** is really a movable arm being free to rotate on a central axis under the index mirror, around a point on the frame which is the center of a circle of which the arc is a section. It is mounted on a round baseplate beneath the index mirror, which is firmly fixed to it at the top of the arm; while the bottom of the index arm (with the vernier attached) slides along the arc on the limb when pushed by hand.

(6) **The Index Mirror** is a reflector or mirror set in a brass frame perpendicular to the plane of the instrument. It is rigidly fixed to the index arm at its pivoting point in such a manner that its plane is over the center of motion of the index. The index mirror, being fixed to the index arm, moves with it and changes its direction as the direction of the index arm is changed. The glass is silvered all over, and is designed to reflect the image of the sun (or any other object) upon the horizon glass, from where it is reflected to the eye of the observer. It is fitted with a small, capped adjusting screw at its back.

(7) **Index Shades** of colored glass (usually four) of different densities are fitted to be turned down as required between the index and the horizon glass in order to moderate the brightness of the reflected image of the object—as the sun or moon.

(8) **The Index** is the arrow or zero on the index arm, which in the case of the vernier sextant is actually situated at 0′ on the vernier. In micrometer sextants, however, it is situated in the center of the blank space hitherto occupied by the vernier.

(9) **The Clamp or Clamping Screw.** When the index of the Sextant has been moved approximately to the correct angle, it must be brought into firm contact with the arc by being fastened at the back of the arc by a clamp or clamping screw. In the case of the endless tangent and micrometer sextants this clamping is automatic.

(10) **The Tangent Screw.** Attached at right angles to the index arm is the tangent screw, which comes into operation only when the index arm has first been clamped. It is really a "slow motion" screw, and by turning it the index arm is carried backwards or forwards along the arc. This enables the observer to make the images of the object come precisely in contact because, by its use, the index may be moved with far greater regularity than could be done by hand.

(11) **The Vernier.** The lower end of the index arm has a dividing scale cut on it (and therefore moving with it), which slides along close to the arc—called the vernier. This simply divides the arc cuts into 10 major divisions, each representing one minute of arc, and enables the reading of the index on the arc to be made with accuracy. In the ordinary sextant the vernier simply subdivides the 10′ intervals on the arc into 10″ intervals by each minute of arc being subdivided into six divisions of 10″ each.

(12) **The Microscope.** This is simply a magnifier fitted to all vernier sextants so that the divisions of the arc and the vernier may be more easily read. It is fitted on a movable arm on the index arm, and may be swung to cover the whole length of the vernier.

(13) **The Telescope.** By enlarging the object observed the telescope makes accurate observations easier. Also by the place of the image in field of the telescope it is easy to see whether the sextant is held in the proper plane for observation. Various telescopes are a part of the equipment of every sextant.

(14) **The Telescope Collar.** The telescope collar is provided so that the telescope may be screwed into it and thus kept rigidly in the correct position. It is really a double brass ring fitted inside the collar and is so constructed as to furnish means of adjusting the line of sight of the telescope parallel to the plane of the instrument. It is fixed to a stem in a direction perpendicular to the plane of the instrument, which in some sextants is just pushed into a socket and kept in position by a thumb screw, and in others it is screwed into the rising piece but is removable at will. It is "shipped" (i.e. screwed) into the collar by a continuous thread, or, as in most modern sextants, by an interrupted thread for rapidity of use.

(15) **The Rising Piece.** This is a device by which the telescope in its collar may be raised or lowered so as to give more or less light to the direct image, thus equalizing the illumination of the reflected and direct objects. It is usually operated by a milled head screw underneath the frame; however in some sextants it simply slides in a socket and is secured by a small thumb screw. The normal position of the telescope is where equal parts of the plain and silvered parts of the horizon glass are visible, but by raising or lowering the rising piece the telescope in its collar can be directed to either the silvered

Fig. 3: A "diamond frame" micrometer sextant stowed in its case. Note the position of the index bar (about halfway along the arc) and the erect telescope shipped in position.

or plain glass portions of the horizon glass, and the brilliance of the reflected image be regulated. As the telescope is raised less of the silvered part of the horizon glass appears in the field of view and the reflected image will not be so bright. If the telescope is lowered the brilliance of the reflected image will be greatest.

Figure 3 illustrates the manner in which a modern sextant is stowed in its case.

(To be continued)

Your Problems Answered

(Continued from page 153)

tape and some thin paper on the short bars that the coils covered and treated them with glyptal also. The same with the overload relay.

The air circuit breaker, as well as the XY and brake resistors we had to renew as the salt water, etc., had eaten through, and shorted the turns. The 19 resistor bank we reassembled. We treated the jumpers from the board to this bank with glyptal. Then we assembled the board itself. Actually we wore out the copy of the print which I had made before we were finished so guessed a little bit in the end. Then we pulled out #12, shot in the juice and after a few changes got a few clicks. After long arduous experiment we got the sequence in order. Then we switched the windlass to warping and started it up. Oh! what fun! The goo left on the 19 bank resistor began to fry and for a half hour we let it. Then there was enough smoke to use for a Pomona orange orchard smudge. But no go on the motor. So once again. Finally we found the trouble. We had shunted out the motor by connecting the jumpers wrong. Then we got the motor started. All O.K. both directions. Then we tried the hook. All O.K. there also.

So now we are ready to go. In a couple of days we will be loaded so we didn't lose any time at that. From here we go to Manila, P. I., and to Singapore, then Calcutta, India.

Besides this trouble several of the winches had faulty gaskets, but we saved them all without having to take out the armature. Let it be known here, Mr. Dodds, I gathered quite a bit of information for this job from your Vol. 3—Marine Electrician's Library called, "Power Uses in Marine Service," and will tackle a tedious synchronizing job in the engine room next.

As anything is liable to happen in such a room as this being without an instruction book on the generator is distinctly a disadvantage, I wonder if you couldn't arrange to have one sent to me. We receive mail regularly so will receive it if you will drop it in any mail box. The book I need is GEI-18208. I certainly would appreciate it. Much blood would have been saved on this job if I had had it to go by throughout the job, for you know how it is when you copy anything. My address is:

B. R. GARRETT,
c/o Postmaster,
San Francisco, Calif.
Coastwise Pacific Far East Lines,
SS PLATTSBURG VICTORY

Wishing you a Merry Christmas and a Happy New Year from this land of yen (now 15 for $1),

I remain, yours truly,
B. R. GARRETT.

THE CHIEF TO BRUCE

Dear Bruce:

Of course you will get the instruction book. It is being put in the mail at once.

It is just such a valiant struggle against odds as illustrated by your job that makes the American Merchant Marine crew the outstanding of the world. It also illustrates why the American worker is able to out-produce the world in goods. More power to B. R. Garrett and all the other ships' electricians.

Deck-Edge Elevators

In the closing months of the fight with Japan the Navy did many things "not in the book." Big carrier fleets were brought closer to Japanese-held land bases than had been considered possible—and got away with it. One thing that contributed mightily to this is the ability of a big carrier of the Essex class to get its planes up into the air quickly. In this the elevator system for shuttling planes between hangar and flight deck is a key factor. The dispatch and landing of planes from an aircraft carrier must be performed with almost split-second timing of crews, pilots, and the ship itself. A few wasted seconds may cost the lives of pilots, the loss of planes, even possible damage to the carrier or jeopardy to the mission.

On the older type carriers, each time the midship elevator carrying airplanes left the flight deck for the hangars below, a large hole appeared in the middle of the flight deck. During this time planes can neither take-off nor land, which clearly could be a serious matter. Furthermore, there was always the possibility that the elevator may be so badly damaged while in the downward position that it could not return to the flight deck, making the runway unusable. An elevator near the middle of the ship is absolutely essential to facilitate hangar operation as well as for strategic reasons. The Navy was posed with the problem of transporting airplanes between hangar and flight deck without creating a gaping hole in the landing and take-off area.

The solution devised by Westinghouse was to hang the elevator over the side of the ship—in short, a deck-edge elevator. Several factors greatly complicated this problem. A platform 60 feet long by 34 feet wide, an area on which a thousand people could stand and capable of lifting an 18,000-pound load, must be overhung from the side of the ship with no chance for counterweighting, and operated by a driving mechanism within the ship. Furthermore, the platform and supporting structure must be collapsible against the side of the ship when not in service and to enable the ship to pass through the Panama Canal. In heavy seas the ship may roll to such an extent that the platform and supports are submerged. When this happens, with the carrier knifing through the water at high speed, the structure is smacked

(Continued on Adv. page 68)

Jutting from the carrier's midsection is the deck-edge elevator by which planes can be shuttled between hangar and flight deck with dispatch.
(Official U. S. Navy Photo)

Keep Posted

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Instruments Tested on Sperry's "Floating Laboratory"

Radar devices still on the secret list, as well as new developments in other marine instruments designed to increase safety in navigation, are now being tested by the Sperry Gyroscope Company in a well-equipped "floating laboratory." The precision instrument concern, makers of the famous gyro compass used aboard ships on seas around the world, has procured, under charter, use of the seagoing diesel-driven yacht Wanderer, so that new marine devices developed by Sperry research engineers can be rigidly tested under actual sea conditions.

Before the war it was comparatively easy to find a ship operator who welcomed the opportunity to have new navigating devices installed on his ship for service testing. The Wanderer, when under the private ownership of R. W. Allen, served to test a variety of Sperry equipment, and was fully equipped with such instruments as the gyro pilot, gyro compass, steering gear, and searchlight.

However, service testing on privately-owned vessels or yachts has become extremely difficult under conditions today because ships are not yet being operated over established routes. What may have been intended at sailing as a three- or four-day run today is likely to end in many months of wandering before returning to the home port. With the facilities of a marine laboratory, a practical necessity for Sperry, opportunity to procure use of the Wanderer offered the solution. A sturdy and seaworthy craft, she is 100 feet long, with a 26-foot beam, and draws 12 feet. She is powered with two diesels of 350 hp each, and with an auxiliary generator capacity of 120 kw for laboratory use. The cruising radius of 6000 miles provides adequate facilities for service testing under sea conditions. Her features, including an unusually large wheelhouse-chart room, complete cruising accommodations, machine shop, and ample space for equipment installation, make her well adapted for laboratory and experimental purposes.

Besides radar and Loran instruments, other equipment now undergoing tests on the Wanderer include Sperry's new gyro-magnetic compass, and latest developments in automatic pilots and steering apparatus.

Motor yacht Wanderer, in Coast Guard service during the war, is now Sperry's marine laboratory, serving as a proving ground for a host of new marine instruments, including radar and Loran.

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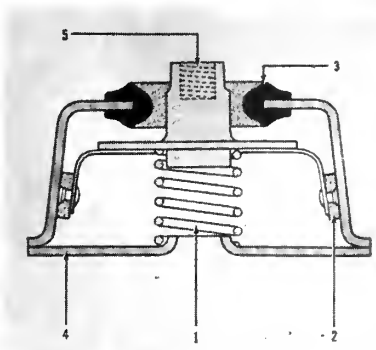
Array of new navigation instruments seen in this photo are undergoing service tests on the "Floating Laboratory." These instruments include automatic steering apparatus, radar devices, and other equipment navigators dream about.



New Robinson Vibrashock Unit Mount

The unretouched photo (top) of an actual vibration test demonstrates the extremely high efficiency of the new Robinson Vibrashock unit mount in eliminating all vertical and lateral vibrations. Note that the model on the left is mounted on a conventional shear-type unit mount, that on the right on the newly developed Robinson Vibrashock unit mount. The conventionally-mounted model shows marked lateral and vertical vibration, while the Vibrashock unit mounts provide the other with virtually 100 per cent absorption of vibration in all directions. Similar tests carried out over a wide range of vibration frequencies showed the same Robinson superiority at all frequency ranges. Lower left: The Vibrashock unit mount is offered in three standardized sizes, ready to install for load requirements varying from 1/2 lb. to 45 lbs. Lower right: Cutaway view of typical Vibrashock unit mount shows: (1) Principal load-bearing stainless steel spring with three-way freedom of motion; (2) Built-in damping mechanism to kill low frequency oscillation and minimize resonance at critical frequencies; (3) Built-in three-way limiting snubbers furnishing a resilient stop to limit heavy load shocks; (4) Sturdy, light-weight metal housing, provided with standard attachment holes in its base; (5) A rugged load-carrying central stud tapped for standard machine screws.

New 633-hp, 7-Cylinder, Supercharged Diesel Engine

A new seven-cylinder, supercharged diesel engine is in production by the Buckeye Machine Company, Lima, Ohio, according to Robert L. Neiswander, sales manager of the company.

Buckeye has already shipped the first engine of a total of 26 which are scheduled for delivery to the United Nations Relief and Rehabilitation Administration to provide power plants for public utilities in war-devastated areas throughout the world.

The engine develops 633 hp at 600 rpm and produces 400 kwh of electrical power. Cylinder bore is 10½ inches, stroke 12 inches. The engine is 28 feet long, seven feet wide and nine feet high. It is complete with supercharger, generator, switchboard, starting tank and alarm system, which protects the engine from damage due to failure of cooling water of lubricating oil.

Navy Baffles Barnacles, Increases Range of Ships

A synthetic rubber hose reinforced with Fiberglas inner braid, through which hot plastic paint can be run at temperatures of 300° F., has been developed by the DeVilbiss Company engineers. This hose is now being supplied to the U. S. Navy and has the possibility of wide civilian application.

The Navy uses the hose to deliver the hot paint in a spraying operation on ships' hulls. The plastic paint forms a "skin" to minimize barnacle growth, a wartime development that increased the effective range of vessels in tropical waters. Composition of the plastic paint has not been revealed by the Navy.

This reinforcing for the hose was selected after tests of some two months because of its high tensile strength and heat-resisting qualities needed to withstand the operating pressures and temperatures encountered.

Hot plastic paint application on hulls doubles the time a ship can stay out of drydock before barnacle removal and still operate efficiently. It is now standard Navy practice to spray the hulls of vessels before they leave for missions in warm water areas. With spray painting equipment involving the use of this new hose, a crew of 140 men can apply the hot paint to an entire battleship hull in 16 hours.

The barnacle bugaboo has been a worry of shipping interests since the early days of sailing vessels. Marine investigation has shown that a 12-month accumulation of a 10,000-ton vessel may weigh as much as 30 tons, which fact is the basis of the maritime regulation that requires all ships to drydock once a year for hull cleaning and barnacle removal.

The new paint spraying hose, reinforced with two inner braids of neoprene-coated Fiberglas yarn, manufactured by Owens-Corning Fiberglas Corporation, has a minimum bursting pressure of 2,000 lbs. psi. Since the hot plastic paint is forced by compressed air through the hose at a pressure of 100 lbs., adequate margin of safety to the operator is allowed and deterioration of the rubber is minimized. The hose, one-half-inch inside diameter, will withstand maximum temperatures up to 400 degrees.

This 16-foot storage cylinder will house a height finder.

"Canning" Precision Instruments

There's going to be no more war—this has been demonstrated conclusively by editorial and feature writers, newspapers and magazines, and the radio commentators too—but just the same, Uncle Sam isn't going to toss his weapons away right now. Delicate and expensive war equipment will not be scrapped, but instead will be scientifically sealed in specially built containers and treated by a recently developed process that will preclude the possibility of corrosion, decay or other deterioration which under normal conditions would attack such equipment in time.

It has always been a difficult and expensive job to store away the materials of war. According to former methods, machinery had to be greased and stored in warehouses which were frequently constructed especially for the purpose and which required some type of maintenance and temperature control. Degreasing prior to eventual use is also a costly, time-consuming process.

At Dravo Corporation's Neville Island Plant near Pittsburgh, generating units, height finders, and directors are being stored in all-steel hermetically-sealed containers. The size and shape of the container is determined by its purpose. As soon as the container is filled, the vessel is completely welded and the air pumped out. Then nitrogen gas is forced in. Nitrogen, an almost inert gas, won't react with the metal or anything else in the apparatus.

Silica gel—a chemical dehydrator—is put into the container. Silica gel absorbs any trace of moisture which might still be clinging to the inside of the containers and is capable of absorbing many times its own volume of moisture.

Temperature changes varying from 20° F. below to 140° F. above zero won't harm the contents of these containers. They can be stored in the open in any place that has the necessary area. This type of packaging has another advantage in that it eliminates the use of warehouses, which have always been choice targets for bombers or saboteurs. Containers in this case can be widely dispersed and separated. They can be easily concealed.

Not all military equipment need be stored, because some of it is sure to be obsolete in a year or two. Precious optical instruments, some special weapons, fire control apparatus, and a number of other items lend themselves to storage and will be as effective when removed from the containers some years hence as they are today. The containers being built by Dravo Corporation are for the Army Service Forces, Ordnance Department, Frankford Arsenal, Philadelphia. All engineering services in connection with their design and fabrication were performed by Dravo.

This all-steel hermetically-sealed storage container for a generating unit is getting final check.

The new CCA Filter-Lube, compact pneumatic filtering unit combined with a precision lubricator.

CCA Filter-Lube Announced For Pneumatic Equipment

CCA Filter-Lube, a compact pneumatic filtering unit combined with a precision lubricator, is announced by CCA Products Engineering, Glendale, California. Its primary use is for installation as close as possible to the equipment it is intended to service, including air cylinders, vises, chucks or any reciprocating or rotary air tools.

Designed to prolong the life of all types of pneumatic equipment, prevent freezing of air-operated devices, and deter the inroads of corrosion, the CCA attachment is the latest development in a long line of industrial equipment by this manufacturer.

Available in 1/4", 3/8" and 1/2" standard pipe line sizes, it is simple to install on air supply lines. It features a full-view, lightweight, transparent plastic lubricator oil reservoir, enabling the operator to see at a glance the quantity of oil in the element.

A needle valve oil regulator, easily adjustable to meet all varying lubrication requirements, permits the correct amount of oil to mix with filtered operating air.

The lower element is composed of a sludge basin of ample size and an all wool felt filter medium. Fully automatic in operation, the device first filters incoming working air, and next provides a finely adjusted lube-mist, perfectly regulated according to equipment requirements. Through use of the device, no flood of oil is permitted to enter working equipment, and no oil starvation is possible, thereby eliminating loss of equipment and man-hours in adjustments and repairs.

The felt filter medium, interchangeable and reconditionable, guarantees protection against free moisture, oil sludge, dust clogging, corrosion or pitting. Filter-Lube functions only when equipment is in operation.

Lightweight Generator

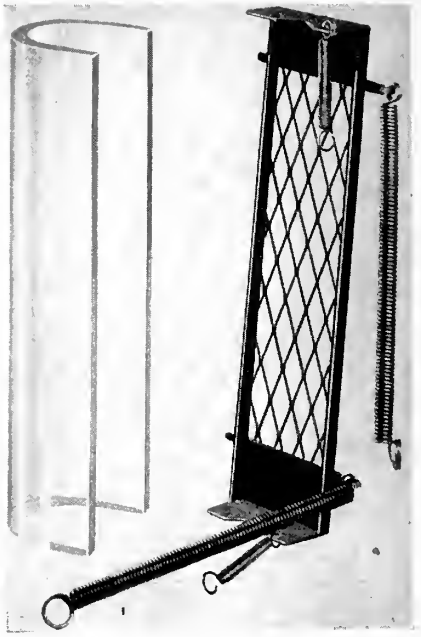
A generator weighing but half as much as formerly available equipment but capable of supplying up to 1200 watts in continuous duty is announced by Electrical Engineering and Manufacturing Corporation, Los Angeles, California.

Originally developed as an airborne unit for remote radar stations, this especially designed EEMCO unit has a maximum weight of 20 to 25 pounds, depending upon rating. Available in 500, 600, and 1200-watt capacities, at 32 and 120 volts, 50° temperature rise, this generator is the totally enclosed, glass-insulated type, and is equipped with lifetime-lubricated ball bearings.

It can be supplied as a two-bearing unit, or with a single bearing for direct-drive applications. An integral panel with meters and voltage regulator is also available.

Small in size, light in weight, and built for continuous-duty operation, this new unit has many uses for auxiliary power generation, as well as for primary power in a variety of marine, rural and commercial applications.

Lightweight generator.



Transparent gage glass protector.

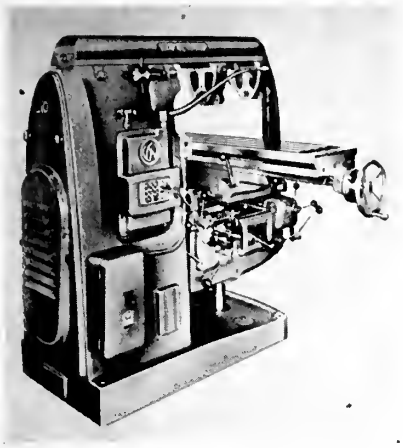
Transparent Gage Glass Protector

The Wright-Austin Company, Detroit, Michigan, has recently developed a new type of gage glass protector, trade-named "Kleervu." This protector consists of two simple parts — the metal frame, with four holding springs, and a quarter-inch thick transparent "Nuglas" cover. C. B. Walter, general manager, tells us that installation is very simple, taking but a couple of minutes.

When installed, the "Kleervu" encloses the gage glass within a protective transparent cover, so that should the gage glass burst or explode, all flying broken glass is safely confined within this shatter-proof enclosure, eliminating danger of injury to persons.

In the back is a screened frame which holds the cover and provides an open vent area for escaping steam in case of gage glass breakage, thus avoiding any pressure build-up within the protector.

"Kleervu" gage glass protectors are now available in any desired length for tubular gage glasses on boilers, process tanks, chemical tanks, oil tanks, cooker and other installations. Descriptive literature sent on request to the manufacturer.



No. 3 standard horizontal milling machine.

New Standard Horizontal Milling Machine

The Van Norman Company, Springfield, Massachusetts, announces a new No. 3 horizontal milling machine especially designed for a wide range of general purpose and production milling. A large heavy duty miller, it has a 64-inch by 14-inch table, permitting the user to handle heavy work. This machine is unusually compact, with exceptional rigidity and dependability assuring smooth operation on the heaviest cuts. It combines rugged strength with utmost accuracy and extreme sensitivity of operation and control.

An important feature of the new transmission includes a heavy large diameter flywheel mounted on the spindle inside of the column, assuring smooth, uniform application of power to the cutter.

A few operating specifications are: table 64″ x 14″, drive motor 7½ hp, table travel longitudinal 34″, saddle cross feed 12″, knee vertical feed 17″. Eighteen speeds are available from 25 to 1250 rpm; 18 feeds from ⅜″ to 32″. The miller is available with plain or universal saddle. The universal saddle permits the table to be swiveled 45° to the right and 45° to the left.

Zircoat-M

Zircoat-M is a zirconium silicate base refractory developed by Basic Refractories, Incorporated, which upon application with a spray gun sets up rapidly to form a hard, dense working surface that will withstand high furnace operating temperatures and unusual furnace conditions. It is a fine-grained material shipped dry in 100-lb. bags. It is mixed with water for spraying and has been extensively used as a protective coating on silicon carbide, fireclay, sillimanite, mullite, silica and other acid type refractories.

It has been widely used with success in the industrial boiler field in protecting brickwork that is exposed to severe flame impingement and corrosive action of clinker or fly ash.

Applications of from ⅛″ to ¼″ on the inside brickwork of marine boilers have increased the continuous operation of such units between repair lay-ups from two months to six and eight months.

Safety Floor Covering

Economy, ease of application and maintenance, plus a high degree of anti-slip efficiency, are features of Ferrox, a lightweight non-slip composition made by American Abrasive Metals Company of Irvington, New Jersey. This product is a synthetic resin containing an abrasive. It will adhere to metal, concrete, or wood surfaces, and may be applied by trowel or spray gun. Where principally foot traffic is encountered, it provides a highly serviceable, low-cost safety surface.

Ferrox was originally developed to meet the requirements of the U. S. Navy for a lightweight, slip-proof deck covering. It was the first of its type to be used by the Navy. Hundreds of thousands of square feet have been used since 1941 on all types of vessels, from the small PT boats to battleships. Ferrox has served as well for uses by the U. S. Army Engineers and by several leading aircraft manufacturers.

New Grease for Ball Bearings

For dependable lubrication from 13° F. to 176° F. for all speeds up to 3600 rpm and for horizontal or vertical operation, an improved grease for ball and roller bearing motors is announced by the Westinghouse Electric Corporation.

Available in a new eight-ounce nasal type tube, the grease is stable, highly resistant to oxidation, and will remain in a bearing for an indefinite period without drying out, caking or separating. The new tube is designed for easy and economical use. It has a large opening in the long nasal spout which fits into a one-eighth-inch pipe coupling, and a key with which to wind and exert pressure from the bottom of the tube.

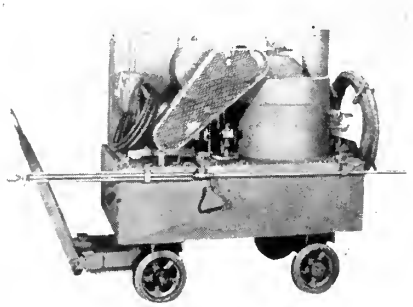
Oakite-Vapor Cleaning Unit

Oakits Products, Inc., has developed a new, multiple-duty steam cleaning unit known as the Oakite-vapor cleaning unit.

This unique unit is a self-contained, down-draft flame, oil-fired, enclosed coil-type steam generator that delivers hot vaporized cleaning solutions under selective pressures up to 200 lbs for the speedier, easier removal of grease, grit, grime, paint and other deposits from surfaces. A wide range of fuel oils such as No. 1, No. 2 or No. 3 fuel oil, kerosene or gasoline, may be used to operate the unit. Due to its flexibility of steam pressures, the unit may be used on many different types of light and heavy-duty cleaning.

Extremely rugged in construction, only the highest quality materials are used in the manufacture of the Oakite-Vapor cleaning unit. Built for long, continuous, trouble-free service, the unit has tremendous reserve power and operates without vibration. Many new, exclusive features are incorporated that provide for simplicity and ease of operation and maintenance, rapid steam generation, unusual solution tank capacity, effective operation of two steam guns simultaneously, wide flexibility in its application to various cleaning operations, safety against fire (A.S.M.E. safety code standards are fully met) and other advantages.

Oakite-vapor cleaning unit.



Post-War Line of Marine Gages

A complete new and improved post-war line of marine gages to provide modern boat owners with accurate, dependable indication of fuel and water level, rudder angle and reverse gear position, is now in production at the Liquidometer Corporation, New York.

This company has completed its program of reconversion and is now in a position to supply boat builders, dealers, ship chandlers and pleasure boat owners with various types of Liquidometer gages in price ranges to fit every class of vessel.

Liquidometer's line of instruments is designed to take the modern boat owner out of the "horse and buggy" stage, and features: an economical direct-reading liquid-level indicator for mounting on the top, side or end of a tank; the type "L" levelometer, distance-reading hydrostatic indicator; a distance reading, float-actuated electric fuel level gage that eliminates danger of old electric gaging systems by use of metal bellows seals at tank fittings to prevent escape of vapor or fuel; a distance-reading hydraulic gage employing a fully temperature-compensated, balanced hydraulic transmission system that does not depend on any outside source of power. An electric rudder angle position indicator is also available. The same hydraulic transmission system used in the fuel gage can be furnished for transmitting any kind of motion, such as rudder angle position or the position of the reverse gear.

New Plastic Fabric Finds Varied Application on Watercraft

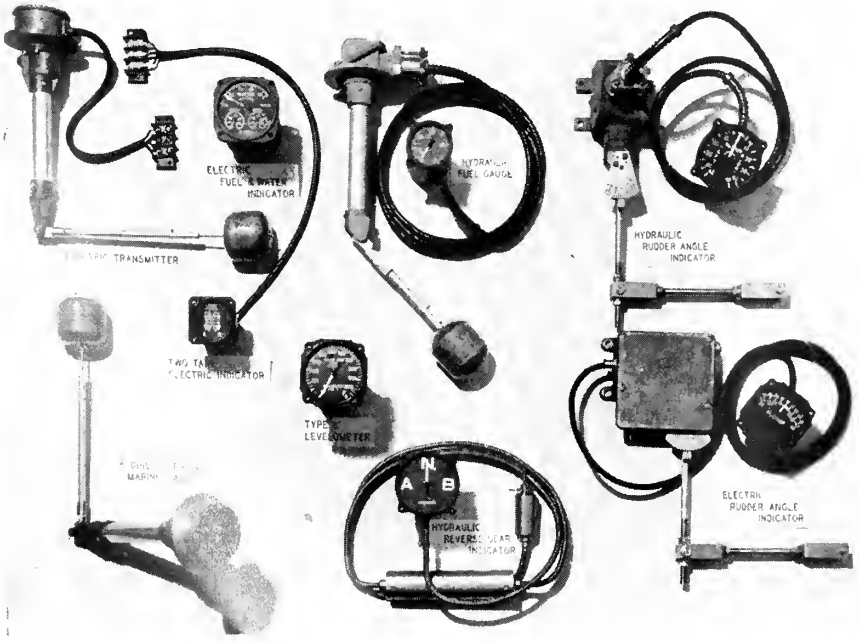
Textasote G., a new plastic coated duck fabric, manufactured by The Pantasote Company, Passaic, N. J., is finding wide application on ships, boats and watercraft.

The new fabric is flame resistant, mildew resistant, easily washed, and has excellent aging characteristics. It is waterproof as well as highly resistant to wind, sun, and weather.

On privately-owned new or reconverted craft and commercial vessels, Textasote G is being used as awning and upholstery material above and below deck. The colors do not fade or wash out due to spray, salt water or rugged boating usage.

Samples will be furnished upon request.

New instruments now in production by the Liquidometer Corp. for use on pleasure boats and small commercial craft include: left to right, top: float-actuated electric transmitter for fuel and water tanks; electric fuel and water level indicator for three tanks; float-actuated hydraulic fuel gage; hydraulic rudder angle indicator; left to right, lower: float-actuated direct-reading gage with three-inch-diameter dial for mounting on top, side or end of tank; electric fuel and water indicator for two tanks; type "L" Levelometer hydrostatic fuel and water level gage; hydraulic reverse gear indicator or engine room telegaph; and electric rudder angle indicator.



New Construction Principle In Flexible Tubing

A new type of flexible tubing, non-collapsible under plus or minus pressures and retractable to about one-eighth its extended length, is announced by the Warner Brothers Company, Spiratube Division, Bridgeport, Conn., for portable or semi-permanent ventilation or any handling of air, gases or light solids. Its spring steel helix core causes it to spring out, like a jack-in-the-box, to its fully extended length, and it will stay in this position regardless of whether it is working on pressure or suction.

A feature of the tube construction is the method of spiral-stitching the spring core within the fabric. The inside surface is free of wire ridges, providing far less resistance to air flow and no obstruction to the passage of solids. Sharp bends can be made with only slight reduction of air flow and without the use of elbows or special fittings.

This new tube is considerably lighter than metal duct or molded tubing, and takes up less space when retracted. The standard spiratube is made of long-fiber duck, having a bursting strength of 170 psi; the fabric is processed fire-resistant and covered with tough, durable thermoplastic. It can also be made to specification in a variety of other fabrics for special applications. Spiral stitching is done with a double seam of rot-proofed thread. There is no exposed metal inside or out (even the couplings are covered), eliminating the possibility of sparking where explosive or inflammable materials are present.

Spiratube has had two and one-half years of service in the U. S. Navy, being used in shipyards, vessels, and advance bases, and has already been given a thorough trial in industry.

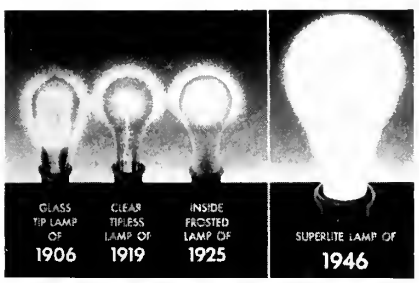
Section of Spirotube flexible tubing. Such sharp turns are made with only slight reduction in free air area.

New Light Conditioning Bulbs Available

After five years of continuous production on U. S. light bulb and photolamp war contracts, Wabash Appliance Corporation, Brooklyn N. Y., announces new improvements in light bulbs now available for civilian allocation.

Heading the list is the white light conditioning bulb, which Wabash compares with the tungsten lamp of 1906 and the clear lamp of 1919, as the most important development since the frosted lamp of 1925. A new process, the company says, treats the glass on the inside of the bulb to diffuse the central glare point caused by the concentrated filament, with the result that the direct raw light rays are broken up into millions of softer "counter diffusing" light rays that glow evenly over the entire bulb surface, without sacrifice of visible illumination.

Wabash states that over forty million light conditioning bulbs of this type have been tested in use over the past five war years, and that substantial shipments are already being diverted to civilian outlets now that Government purchasing has been curtailed. Ten sizes from 10 to 200 watts will be made in 115, 120 and 125 volts, with four sizes from 25 to 150 watts in 220, 230, 240 and 250 volts. Other bulbs being announced include new types of photoflash bulbs and other photographic lighting units, ultra-violet and infra-red heat lamps.



New light conditioning bulbs.

H. F. Gelhaus Returns

Henry F. Gelhaus has returned to San Francisco after approximately five years with the Todd Shipyards Corporation as assistant general manager of their Brooklyn yard.

He is now Pacific Coast sales manager for the company with headquarters at 486 California Street, San Francisco.

He is well known on the Pacific Coast and for many years was marine superintendent for the Swayne & Hoyt Company.

Small Portable Searchlight

Kenyon Instrument Co. Inc., Huntington, L. I., manufacturers of marine and aviation precision equipment, announce development of a small portable searchlight capable of throwing an 80,000-candlepower beam a distance of two miles.

Small, well-balanced, and designed to operate either by hand or on a ball-and-socket mount attached to a ship's rail, this searchlight is directable through any arc. A lightning-fast micro-switch, mounted in a trigger grip, makes the new light a perfect signaling device. Another feature is a built-in plastic beam-sight which provides a pilot light and a glowing aiming bar.

The searchlight will be produced in two models, one designed for six-volt and the other for 12-volt operation. Both models are of 80,000 candlepower.

Small portable searchlight.

Tide Tables for 1946

The Shell Oil Company is distributing a well-prepared 48-page booklet giving tide tables for over 90 points on the California and Mexico Coasts. The tidal variations are based on the figures for Los Angeles and San Francisco harbors, and are indicated for every day of the year.

The booklet also contains towing signals, weather signals, and various useful information for mariners.

Marinship's Record Filmed

Dramatic story of one of the Pacific Coast's finest wartime shipyards has been recorded in an hour-long colored sound movie which is now available for showing by Marinship Corporation of Sausalito, California.

Narration by John B. Hughes accompanies the film, which includes historic views of the first keel laying on June 27, 1942, first launching on September 26, 1942, and many other important events during the succeeding three years. At Sausalito Marinship employees built a $17,000,000 shipyard and 93 EC-2 Liberty ships and T-2 tankers. The tankers were 10,000-horsepower Mission class merchant tankers and oilers and 8250-horsepower Hills class merchant tankers.

After three years of preparation, the motion picture was completed only recently. It is now available to interested groups for showing, according to R. W. Adams, employee relations manager, Marinship Corporation, Sausalito, California.

Therm-O-Sol Kills Corrosion on Metals

In Therm-O-Sol, Harry W. Parsons, Inc., has developed an answer to the problem of corrosion following the pickling and descaling of metals. On steel the corrosion rate is less than that of most city drinking water, .0035 per year; while on copper and copper alloys an actual build-up or permanent plate forms on the surface of the metal pushing the scale off.

Their recommendations are:

Therm-O-Sol A for evaporators and other vessels containing hard scales formed at over 200° F. and containing a combination of steel and copper alloys.

Therm-O-Sol B for pickling operations.

Therm-O-Sol C for evaporators, condensers, or other heat exchangers containing steel and copper alloys and operating under vacuum.

After the wear and tear of hard wartime usage with unskilled help, rising costs of new equipment can be combated by making pressure vessels last out their life expenctancy by descaling the Therm-O-Sol way.

Equipment can be returned to service in from 20 to 72 hours.

On the Ways — SHIPS IN THE MAKING

S. S. Arizona Pine, which was recently launched at Albina Engine & Machine Works. This ship is one of a series of lumber ships being constructed by Albina, featured in August 1945 Pacific Marine Review.

Arizona Pine Launched At Albina

The last of 765 Maritime Commission ships built in Portland since the start of World War II was launched at Albina Engine and Machine Works on January 5, as Mrs. Stanley G. Jewett cracked the bottle of champagne on the bow of the Arizona Pine, fourth of the lumber ships designed by Albina's president, L. R. Hussa.

Santa Rosa Nabs Pennant in Pacific Redeployment Race

Vieing to beat her own record performance as America's fastest troop transport in service between New York and the China-Burma-India theater, the Grace Liner SS Santa Rosa, which recently completed the 16,000 mile turn-around voyage in forty days and fifteen hours has just sailed from New York under the command of the veteran Master, Captain Duncan Cook, of Rowayton, Connecticut, with 120 passengers bound for Port Said, Egypt, and Karachi, India.

Completion of the current record-breaking voyage with a complement of 2446 GI's and one repatriated merchant seaman aboard brings the total number of troops carried during the war by the Santa Rosa up to the 100,000 mark. The vessel came to the coast on her maiden voyage, December, 1931, and continued to sail between Pacific Coast ports, Havana and New York in the Grace Line service until January, 1938. Then she was transferred to the New York, Atlantic and the Orient services.

Included among the passengers embarked on the Santa Rosa are a party of missionaries bound for Nairobi, Kenya; Indian merchants and traders returning home to implement commercial and export program; and 23 civilian employees of a United States oil refinery in the Middle East.

Among those sailing are:

Robert Morrisey, United States Vice-Consul to Egypt.

Philip Cottell, United States Vice-Consul to Palestine.

Donald Bergus, United States Vice-Consul to Greece.

George Arnold, United States Commercial Attache to the American Legation in the Lebanon.

Hans Raj, American representative of Zamindar Sports, Ltd., Sialkot City, India.

Consolidated Steel Launches Fifth of a New Series

The SS Mountain Wave, the fifth of a fleet of ten huge C-2 cargo vessels, was launched from Consolidated Steel's Wilmington shipyard. Mrs. Morris, wife of Samuel B. Morris, general manager and Chief Engineer of the Los Angeles Department of Water & Power, was the sponsor.

The SS Mountain Wave, together with her nine sister ships, are the largest vessels to be built at Consolidated's Wilmington yard.

These C-2's are 460 feet long, have a beam of 63 feet, and a molded depth of 40′ 6″. They are of 14,000 tons displacement, and their design includes comfortable accommodations for eight passengers, besides the space for cargo.

AMERICAN BUREAU'S RECORD OF PACIFIC COAST SHIPBUILDING

Western Pipe & Steel Co., S. F.	4	C-3's Totaling	48,000 dwt.
Reliable Welding	1	Cargo Vessel,	1,000 dwt.
Kaiser, Richmond, California	2	C-4 Vessels,	29,000 dwt.
Kaiser, Vancouver, Washington	8	C-4 Vessels,	160,000 dwt.
Consolidated Steel Co.	3	C-1 Vessels,	15,000 dwt.
Consolidated Steel Co.	10	C-2,	90,000 dwt.
Albina, Portland, Oregon	3	Cargo Lumber,	10,271 dwt.

Making a total of 31 cargo vessels at 354,171 dwt.

Miscellaneous

Consolidated, Newport Beach	2	Tuna Clippers,	680 gross tons
Hickinbotham Bros., Stockton	2	Tuna Clippers,	1080 gross tons
Judson Pacific	1	Steel Barge,	40 gross tons
United Concrete Pipe Co.	5	Tuna Clippers,	2040 gross tons

(The above construction record was compiled for the month of December, 1945)

Bids for Passenger Vessels For South American Trade

The United States Maritime Commission has invited bids for the construction of two 28 knot 670 foot, twin-screw, turbine-driven passenger vessels for the South American trade and for four 560 foot, single-screw, turbine-driven cargo vessels.

The 670-foot South American liners, fastest merchant vessels ever built in the United States, will carry 543 passengers and 8550 dw. tons of cargo. They will be powered by steam turbines developing a total of 55,000 hp and driving twin-screws. Contractors may bid on one or both vessels.

Bids on the four dry cargo ships are asked on behalf of the Ore Steamship Corporation of 25 Broadway, New York. The 560-foot, C5-S-AX1 type vessels have a dwt of 24,000 and are powered with an 11,000 hp steam turbine driving a single screw to give the ships a speed of 16 knots. Contractors may bid on 1, 2, 3 or 4 vessels.

Bidding is limited to American citizens and all labor and materials must be done within the continental limits of the United States.

Bids for the passenger ships will be opened at 12 noon EST March 28, 1946, and those for the dry cargo vessels at the same hour February 11, in Room 4821, Department of Commerce Building, Washington. Bids and information on the Invitations to Bid are handled by the Secretary of the Maritime Commission, Room 4852.

YEAR-END STATEMENT OF THE SHIPUILDING INDUSTRY

By H. GERRISH SMITH

President Shipbuilders Council of America

During 1945, despite cancellations, there were constructed approximately 10,500,000 dwt of commercial vessels of 2000 dwt or more. The ship repair yards cared for 23,800 vessels of over 1000 gross tons, slightly in excess of the number of ships handled in 1944.

There has been a natural and inevitable liquidation of labor in the shipbuilding industry which has been paralleled in the allied marine industries that supply materials and equipment needed in shipbuilding. Liquidation of labor in the ship repairing industry is much less than in the shipbuilding industry. The demands on ship repair will continue to be heavy for an indefinite time.

Department of Labor statistics clearly indicate that the average hourly earnings in the shipbuilding and ship repairing industry continue to be the highest in the durable goods groups. The total payroll for 1945 for the construction and repair of both commercial and naval vessels in private yards and navy yards was approximately $3,400,000,000.

The industry may emerge from its greatest productive era with employment and orders sufficient to maintain the highly skilled personnel so essential in the designing and construction of the best merchant and navy ships in the world. This personnel represents a reserve of technicians that cannot quickly be trained in a national emergency, such as this nation faced twice in a quarter of a century. Men in this category played a major role in the tremendous tonnage totals produced by American shipyards in the most critical period of world history.

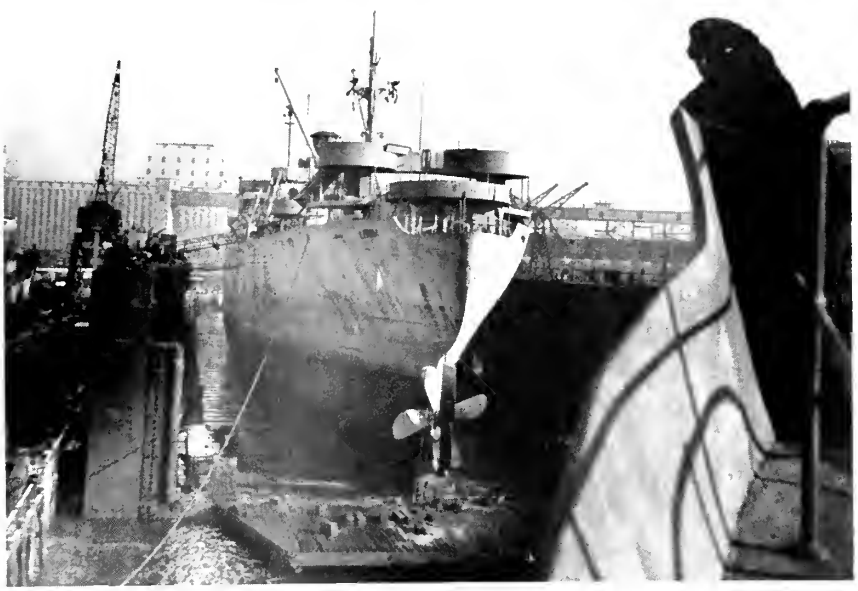
Interocean General Agents for Knutsen Line

For the purpose of placing in the hands of one general agency all the Pacific Coast liner activities of his large fleet of modern motorships, Knut Knutsen, O.A.S., shipowner of Haugesund, Norway, has appointed Interocean Steamship Corporation to handle operations of the following two Knutsen Line services:

(1) Between Pacific Coast ports and United Kingdom via the Panama Canal, and

DAMAGED TROOP SHIP IN SAFE BERTH

Sea water gushes from crack in double bottom of the Liberty ship SS Joseph Hooker, which safely made port with 526 G. I.'s despite leaks and storms. At right, Chief Engineer Louis Fraser of Todd Shipyards Corporation, Brooklyn Division, examines fracture that caused the master of the Liberty to radio for help. Below: the S S Joseph Hooker safely in dry dock after making port under escort of light cruiser Honolulu. She suffered a double-bottom fracture that let eleven feet of water into No. 3 hold.



(2) Between Pacific Coast ports and West Coast of South America.

Sailings to the United Kingdom were resumed from the Pacific Coast in December 1945, and two vessels, the MS Ida Bakke and MS Knut Bakke have already been dispatched. Six fast combination passenger, refrigerator and general cargo motorships of the most modern type are scheduled to be employed in this service.

West Coast South America sailings will be resumed as soon as ships, not under control of the United Maritime Authority, have been released. Vessels which operated prewar include the motorships Marie Bakke, John Bakke, Samuel Bakke, Vinland, Geisha, Nyhorn, Nyhaug, and other units of the Knutsen fleet.

USS Oregon leaving drydock at Puget Sound Navy Yard.
This nostalgic picture belongs with the feature in this issue on Bremerton.

Victories Sailing To the Orient

The American Mail Line has started its post-war program of shipments from Portland to the Orient with a cargo of flour for the Philippines on the Victory ship Gonzaga Victory. The Liberty ship, Anthony Ravalli, is sailing with a load of lumber, building supplies, and general freight for Shanghai. Already on its way to Italy with 8500 tons of wheat for the destitute peoples of Europe, via UNRRA, is the Liberty ship Joel Palmer.

Shortly commercial relations with Hong Kong will be re-established when the China Mail, a C-2 liner, will start loading at Portland and Seattle for the first post-war trip to Hong Kong. The vessel will also touch at Shanghai and Manila as will the Gonzaga Victory and the Waco Victory due to leave Portland in the near future. The Whitman Victory of the same line is due to load in Portland early in February.

NEW LINE-UP OF WORLD'S MERCHANT SHIPPING

In spite of heavy losses inflicted by the enemy the United States emerged from the global war with almost four times as many merchant ships as there were in its pre-war fleet, statistics compiled by the Economics and Statistics Division of the U. S. Maritime Commission disclosed. The gross tonnage of these vessels was almost five times that of the 1939 total.

Thanks to unprecedented shipbuilding during the war years the end of hostilities found the United States possessing 5529 sea-going merchant ships 1600 gross tons and over, against 1401 sailing in 1939.

In that year, less than one-fourth, or 3,000,000 deadweight, were employed in foreign trade. The second largest fleet is the merchant navy of the British Empire, which shows an aggregate loss of only 545 vessels from the 1939 total of 2892 in spite of the concentrated undersea, air and surface attacks by the Axis.

Latest compilations which do not include fleets of the former axis powers, show that during the war the United States lost 604 merchant vessels of 1,000 gross tons and over through direct enemy action. In addition 139 such ships were sunk as the result of marine hazards due largely to war conditions.

The comparative standing of 27 nations having merchant fleets at the close of the conflict is shown in the following table listing vessels except those operating on the Great Lakes and inland waters and special types such as ice-breakers, cable ships and the like:

There are not included in this tabulation vessels acquired by any nation during the war through capture, seizure or transfer and operated under that country's temporary control. Such ships are included in the total of the country from which they were thus acquired.

Included in the United States total are not only vessels which may or may not have undergone some degree of conversion when acquired by the Army or Navy but also military types originally designed as merchant ships and constructed under the Maritime Commission building program. Vessels of a strictly military type and built by the Commission, such as LST's, frigates, aircraft carriers, etc. are excluded from the total.

MERCHANT FLEETS OF THE WORLD

	1939			1945		
Country	No. of Vessels	Gross Tons	Deadweight Tons	No. of Vessels	Gross Tons	Deadweight Tons
United States*	1,401	8,479,953	12,100,200	5,529	40,080,002	56,797,700
British Empire	2,892	17,240,943	23,325,300	2,347	14,842,805	19,589,000
Norway	803	4,140,829	6,384,800	465	2,602,870	3,957,100
Netherlands	461	2,573,749	3,296,200	272	1,579,142	2,019,900
France	497	2,612,587	2,903,200	213	1,232,004	1,323,000
Greece	381	1,626,966	2,698,400	130	577,104	936,900
Sweden	255	1,010,669	1,567,100	252	1,116,178	1,714,400
U. S. S. R.	302	1,065,693	1,500,700	251	882,614	1,199,300
Denmark	237	851,436	1,292,000	164	619,226	924,900
Panama	116	701,099	1,082,300	118	678,885	1,034,600
Yugoslavia	86	361,318	582,600	32	132,044	221,900
Brazil	109	402,781	528,700	103	380,199	509,500
Belgium	63	345,672	476,000	29	158,815	219,300
Argentina	42	193,409	263,200	42	209,533	274,000
China	65	158,543	213,900	49	122,354	157,600
Turkey	49	160,924	207,500	43	153,517	184,600
Chile	47	155,461	183,300	35	107,906	137,000
Egypt	19	91,873	121,200	5	23,798	29,800
Honduras	26	80,959	88,900	25	90,503	89,600
Venezuela	24	65,216	87,200	24	66,889	91,600
Poland	23	102,968	87,100	23	103,696	116,000
Peru	7	25,834	31,100	8	32,682	39,200
Mexico	6	18,675	26,000	10	43,614	62,900
Uruguay	4	12,726	12,900	4	18,588	29,600
Cuba	4	7,904	9,900	2	4,236	4,100
Nicaragua	1	1,768	2,500	—	———	———
Dominion Republic	1	1,973	2,200	—	———	———
TOTAL	7,921	42,491,958	59,074,400	10,175	65,859,204	91,663,500

*—Includes merchant-type vessels owned by U. S. Army and Navy.

SPONSORS MEDITERRANEAN. INDIA FAST FREIGHTER

Mrs. Marjorie M. Hiltbrunner of Birmingham, Ala., daughter of H. M. Gillespie (left) v. p. and sec-treas., American Expart Lines, christened that company's SS Exbrook, a 9900-dwt. fast freighter intended for the Mediterranean and India trade routes. John F. Gehan, v. p., of same line and Frank Hodge (extreme right) mgr. Bethlehem - Sparrows Point Shipyard, builder of the ship, are shown with the sponsor.

Barge Line Orders Kort Nozzles for Towboats

In a move that ranks as one of the most extensive programs of renovation for improving towboat performance in recent years, Mississippi Valley Barge Line recently contracted with Dravo Corporation for the furnishing and installation of Kort nozzles on the towboats Tennessee, Louisiana, and Indiana. These installations will also include the complete redesign of the stern hull section on each of the three vessels to provide more efficient lines.

The decision to equip these towboats with Kort nozzles came after nearly four years of study of the performance record of the towboat Ohio, a sister ship of the Indiana. The Ohio was Kort nozzle equipped at Dravo's Marine Ways in February 1942 and after conversion was found to have an increased pushing capacity which permitted her owners to increase her fleet tonnage substantially. Similar results are to be expected in the conversion of the other three vessels which are very similar in design.

December Merchant Ship Deliveries

U. S. merchant shipyards closed 1945 with delivery of 19 vessels totalling 150,534 dwt, the lowest monthly deliveries since January 1942 when 16 vessels were put into service, the U. S. Maritime Commission announced. December of 1943 marked the peak of the shipbuilding program when 219 ships were delivered.

Deliveries for the year were lower than 1943 or 1944 and totalled 1,097 vessels for the twelve-month period with a total of 10,598,154 dwt.

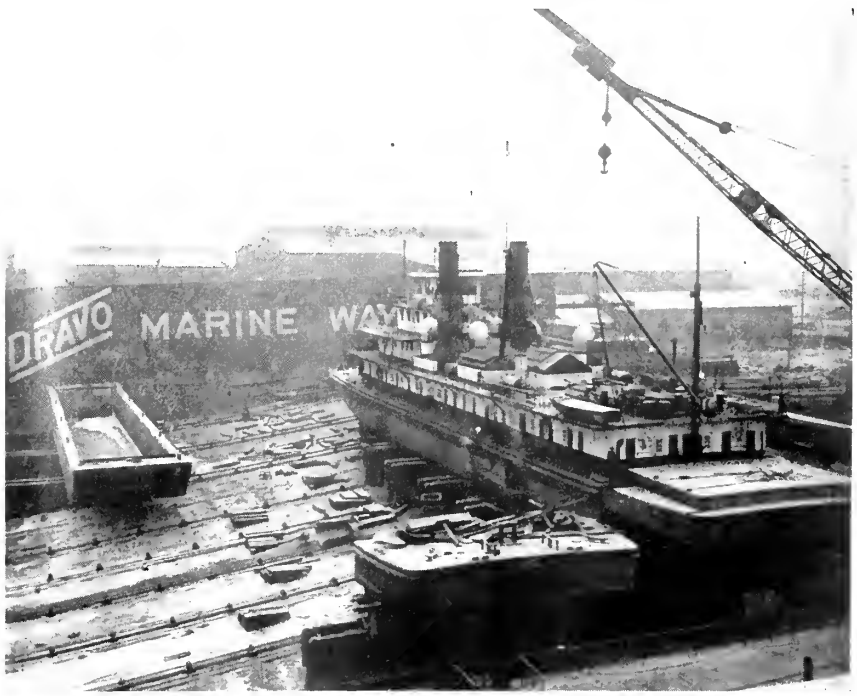
December deliveries included six C-type cargo vessels, five coastal cargo ships, three coastal tankers, two Navy tankers, two private motor coasters, and one refrigerated cargo ship.

East Coast yards delivered 53.4 per cent of the total, including six vessels of 80,339 dwt. Gulf Coast shipyards delivered eight vessels aggregating 54,165 dwt. which netted 36.0 per cent of the month's deliveries and the West Coast yards delivered five vessels of 16,030 dwt., 10.6 per cent of the total.

Deliveries by yards follow:

Shipyard	No. of Vessels	Type of Vessel
Albina Engine & Machine Works	2	Pvt. Motor Coaster
Bethlehem-Sparrows Point Shipyards	1	C-3-S-A3 C-Type Cargo
	1	
Consolidated Steel Corp.	3	T3-S2-A1 Tanker (Navy AO)
Federal Shipbuilding D. D. Co.	1	C-1-M-AV1 Coastal Cargo
Gulf Shipbuilding Corp.	1	C-3-S-BH1 C-Type Cargo
Ingalls Shipbuilding Corp.	2	R2-St-AU Refrigerated Cargo
J. A. Jones Construction Co., Inc. Wainwright Yard		C3-S-A2 C-Type Cargo
	1	T1-M-BT2 Coastal Tanker
North Carolina Shipbuilding Co.	2	C-2-S-AJ5 C-Type Cargo
Pennsylvania Shipyards, Inc.	2	C1-M-AV1 Coastal Cargo
Sun Shipbuilding & Dr·· Dock Co.	1	T3-S2-A3 Tanker (Navy AO)
Todd-Houston Shipbuilding Corp.	2	T1-M-BT2 Coastal Tankers

The adding of a new stern section and Kort nozzles to the Indiana, Tennessee and Louisiana, will be handled in much the same manner as scene below. This picture, taken in 1942, shows the old section set aside and new prefabricated stern section being set into place on the towboat Ohio. Kort nozzles were added later.



IMPROVED ANCHOR

(Continued from page 127)

conventional type anchors and the Danforth Mark II and Mark IV:

	Holding Power in:		
	Very soft mud	Med. soft mud	Hard sand
100-lb. kedge (varying with design)	200-500 lbs.	200-700 lbs.	200-700 lbs.
Mark II			
30 lbs.	750 lbs.	1780 lbs.	6000 lbs.
Mark IV			
10 lbs.	800 lbs.	1600 lbs.	7000 lbs.
25 lbs.	1400 lbs.	2800 lbs.	9000 lbs.

The above figures and the results of many hundreds of tests indicate that it would be conservative to use a Mark IV half the weight of a Mark II in order to secure equivalent holding power.

The new anchor has the same features as the current model, but to a more marked degree; it is non-fouling, easy-to-handle and has the greatest holding power of any anchor ever designed.

Hundreds of thousands of Danfort Mark II anchors in sizes from 17 lbs. to 10,000 lbs. were manufactured in the United States, Great Britain and Canada during the war and were extensively used by Allied armed forces throughout the world. Danforths were used for regular anchoring tasks and astern on all types of craft to haul these vessels back off the beaches. Port repair ships used 3000-lb. Danforths to haul wrecked docks and ships and clear harbors destroyed by the enemy—a spectacular test of Danforth holding power.

PEAK DIESEL PERFORMANCE

(Continued from page 136)

the effects of dirty intake air on cylinder liner, ring and piston condition questions the need of a quality product in this service. Very few engineers, however, realize that where diesels are not operating under dirty conditions, and air intake filters are not deemed necessary, greater engine room comfort in regard to noise and vibration can be secured when properly designed and engineered air intake systems are applied to the engine.

Engineered Exhaust Systems

The too-complete elimination of exhaust back pressure can be nearly as detrimental to peak diesel engine performance as having the back pressure too great. In the first case, the slug of exhaust gas from the cylinder creates a partial vacuum in the cylinder which is immediatedly filled by a resurgence of exhaust gases from its line preventing fuel scavenging. In the second, the back pressure is sufficient to prevent complete elimination of the burned gases with the same result. Considerable operating benefit, cleaner exhaust and better scavenging can be received from having the exhaust system "tuned" to the engine. This can only mean an engineered exhaust system.

Efficient and Reliable Instrumentation

Faulty instrumentation on diesel engines can give almost as much operating trouble as no instrumentation whatsoever. Many a diesel operating engineer has endeavored to correct a rough engine by bringing the exhaust temperatures for the individual cylinders more nearly into line, only to find the engine still rougher after balancing the temperatures nearly perfectly according to the instruments available, and then, by switching his thermometers or thermocouples, find recorded temperatures away out of line. Faulty instrumentation had him giving more fuel to a cylinder that was already getting too much.

Instrumentation that will allow periodic check of both compression and firing pressures and used in conjunction with exhaust temperatures will give smooth peak operation and indicate correctional procedure for difficulties before they become serious. Instruments to check injection operation periodically for pressure, spray pattern, and fuel quantity are big aids in preventing trouble. Accurate gages to indicate oil pressure, oil temperature, cylinder cooling water temperatures in and out, raw water in and out temperatures, fuel pressure, scavenging air pressure, crankcase pressure, rotational speed, exhaust temperature from each cylinder, give the operator running indications on engine conditions, and, intelligently used, pay big dividends in maintaining performance.

Summary

Detailed consideration of the various factors governing peak diesel engine operation lead to but one conclusion; i. e. the choice of accessory equipment to meet the specific conditions under which the engine must operate is as important as the proper selection of the engine itself.

Running LIGHTS

Edited by B. H. Boynton

"WELL DONE . . . WELCOME HOME." The Red Cross volunteer is at the pier to greet every returning transport. Throughout the war Red Cross has served at the docks and will continue to work there until the last troops are home.

Red Cross Still Hard at War Work

The Red Cross, a friend through the war years to the wounded, the man overseas, the returned veteran and his family, still feels its job is only partly finished. Overseas there are several thousand ARC field workers remaining on duty until the last American soldier is brought home. In the hospitals, their service is tremendous with recreation and welfare programs, and its Gray Ladies.

Some idea of the task confronting the Red Cross may be seen any day at the docks where thousands of returning servicemen stream across the piers and are met, day and night, by the ARC volunteers. The canteen workers have seen off every transport, giving a parting wave and some small comfort to the men going out to fight. Today, Red Cross remains at the docks, serving as many as 30,000 a day, of those same returning men. This Christmas was an example, when shiploads of high point veterans were stranded at Pacific Coast piers. The Red Cross set up emergency canteens and worked the clock around, also finding time to give each veteran a Christmas gift.

With all this and other services too, the Red Cross must assume community obligations formerly curtailed by war. The nation is asked to quickly raise the 1946 Red Cross fund.

USMS OFFICERS' SCHOOL OF ALAMEDA

GRADUATING CLASS OF JANUARY, 1946

ENGINEER OFFICERS

ABOVE—**SECTION 6011-E: First row, left to right: Robert Brons, Patrick Reese, Vincent Donato, Lieut. Joseph Lewis (Section Officer), Richard Knowles, Lorenz Fowler, Leonard Fontaine. Second row: Karl Shearer, Frederick Butler, Francis Moore, Ira Fitts, Sam Kravitz, Daniel Bowman, Henry O'Connor. Third row: William Briody, Patrick Maloney, Lloyd Mood, Richard Southland, Sidney Rudin, Philip Kurin, William Redline.**

ENGINEER OFFICERS

ABOVE—**SECTION 6012-E: First row, left to right: Maximillian Johnson, Henry Vanderbeck, Harold Wheeler, Ensign Charles Abraham (Section Officer), Jack Walton, Charles Duff, Ernest Trimpey. Second row: Elmer Aldington, Waldemar Miller, Lester Holmberg, John Maillet, Robert Smith, Robert Kelly, Warner Hansen. Third row: John Haverfield, Gerald Hearn, Christopher Quigley, Donald Hand, Robert Berning, Hugh Roe, Donald Orr. (Samuel Rigby, absent.)**

DECK OFFICERS

AT LEFT—**SECTION 6011-D: First row, left to right: Ned Williams, Leroy Harris, James Valentine, Ensign Warren Thorkelson (Section Officer), Lambert Geertsema, Raymond O'Connor, Robert Ferguson. Second row: William Mallonee, Deral Adamson, Alfred Ferdinandsen, Robert Hunt, Harold Ach, Lee Drayton, Raymond Ames. Third row: Alexander Bolton, Joseph DuQuesnay, Jesse Pirtle, John Olds, David Forchemer, Eugene Kellums, Wesley Moore.**

DECK OFFICERS (Continued)

AT RIGHT—**SECTION 6012-D: First row, left to right: Floyd Johnson, Kenneth Van Knapp, Claude Perasso, Gean Cannon, Lt. (jg.) William Milgate (Section Officer), Francis Nixon, Lewis Kennon, Raymond Taylor, Eddie Coleman. Second row: Edward Masel. Willis Taylor, Edmund Lohr, Richard Hartford, Francis Hart, Raymond Mokwa, Walter Froslie, Forrest Herr, Charles Bendel, Jay Abrams. Third row: John Royal, Harold Peterson, John Strachan. Davitt Kasdan, Carlton Newman, George Hanson, Robert Eldridge, Wiley Staggers, Robert Hards.**

Seated: PMR's scribe, Mrs. Claude B. Mayo, and Mrs. Frank Short. Rear Admiral Giles C. Stedman gave an informal interview at the January meeting. He assumed the rank of Rear Admiral in the Naval Reserve at an impressive ceremony at Kings Point. President Truman made his nomination on October 6 and the Senate confirmed the appointment later that month. Admiral Stedman, a modest hero, a keen and able administrator, is a native of Quincy, Mass. He has been associated with the Maritime Academy since the summer of 1942.

Maritime Academy Day at Women's Meeting

The Women's Organization for the American Merchant Marine was honored by a visit from two leading maritime figures, guests at the January meeting. They were Rear Admiral Giles C. Stedman, USNR, superintendent of Kings Point Academy in New York, and Captain Claude B. Mayo, USN (retired), superintendent of the California Maritime Academy. Guest of Captain Mayo was his aide, Lieutenant A. M. Barlow, former aide to Admiral Stedman at Kings Point and former graduate of the Academy.

Admiral Stedman was in San Francisco for a few days around the first of the year and paid the WOAMM's an informal visit during the luncheon honoring Captain Mayo. Stedman has been on tour of the various Maritime Academies, after spending several months in Washington, D. C., on a special assignment.

During each of their talks, both officers emphasized the need of intensified training of the youth to the sea, in order to maintain and operate a strong merchant marine. This need of highly skilled officers to handle our great merchant fleet is growing with the expansion of peacetime trade. Therefore, it is important that the various State Maritime Academies supply the skill in men, through a rigid three year course, comparable to the training of our skilled professional men.

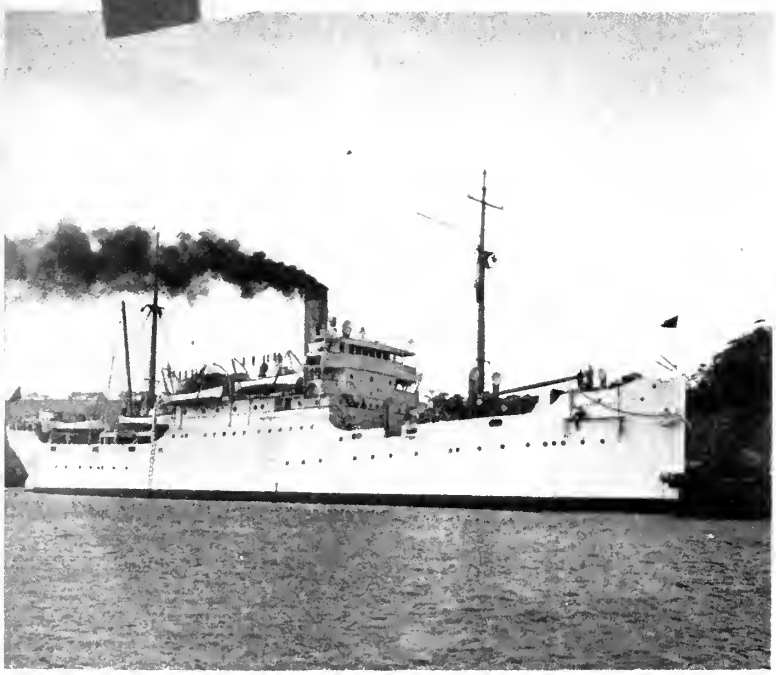
Stedman gave a brief account of the National Maritime Academy at Kings Point, and Captain Mayo explained the functions of the California Academy, a State operated school. He also lauded the young men graduates that have performed so well during this war.

There are five State Merchant Marine schools. One is in Maine, started in 1941; one is in New York State at Sheepshead Bay, started in 1876; another in Massachusetts and one in Pennsylvania, each started sometime in the '80's; and one is in California, started in 1929.

Captain Claude B. Mayo, USN (retired), addressing the Women's Group. Seated to the left is Mrs. Frank Short, president of group, and across from her is Mrs. Harry W. Parsons and Lt. A. M. Barlow, aide to Captain Mayo.

S.S. Golden State

At top: Cadet Midshipmen applying the finishing touches to the school ship.



Center: Training ship, S. S. Golden State, steams up prior to sailing out of Morrow Cove, out of the Golden Gate, and out—for her first peacetime cruise to South America.

Below, left: Midshipmen coming aboard for a stay of two and one-half months. During this cruise they combine theory with actual experience. While on the cruise the cadets form the crew of the vessel. They will visit Acapulco, Balboa, Callao, Peru, and Valparaiso, Chile. At right: Recreation is provided on board and the student crew supplies the talent.

The California Maritime Academy school ship got back in its stride when on January 10, midshipmen from the Academy carried their duffle bags aboard the training ship, S.S. Golden State, and settled in for a two-and-one-half months cruise to South America, taking in such ports of call as Acapulco, Balboa, Callao, Peru, and Valparaiso, Chile. The best part of the training program, to the students way of thinking, is this period of training when they pull up anchor and sail out the Golden Gate. For the duration of the war, these cruises were limited to San Francisco Bay but before the war, the school ship sailed on very ambitious cruises, including circumnavigation of the world; round South America; Hawaii, New Zealand and Australia; and intercoastal to the Atlantic ports of the United States.

This ship is an integral part of the Academy. During intervals between cruises she is berthed at the Academy dock. Here the midshipmen stand watch and do repair and maintenance work. Steam is kept up and the vessel is continually in use for demonstration and even classroom purposes. Now, while on cruise, the midshipmen are the crew of the vessel and do all the work, as the ship carries no sailors or firemen.

Twelve Navy officers sail with the midshipmen as instructors. Most of the officers on the staff and instructors at the Academy are graduates, either of this State Academy or some other Merchant Marine Officers' School, with the exception of Captain Mayo.

Sails for South America

The California State Academy building grounds cover some 70 acres. At present, it has a capacity for 150 men. At the last opening for students, the school received some 2600 applications. Out of that number 650 men took the examination and the Examining Board accepted 40 California men. During the three year course of training, the cadet midshipmen makes three cruises of from two and one-half to four months each, then spends 21 months in academic classroom training, and receives a 30-day leave each year.

Captain Mayo USN, (retired), superintendent of the Academy at Morrow Cove, Vallejo, California, when recently lauding the graduates of the school, said that since the school has been in operation they have graduated over 600 officers. Around 100 of these men hold masters licenses; over 100 of them are chiefs and others certificates. Two graduates have held the coveted position of chief engineer for over 18 months on navy ships during the war, one on the USS Pennsylvania and the other on the USS Nevada. During the war, the training time was two years and graduates were awarded licenses as Third Mates or Third Assistant Engineers, a commission as Ensign in the United States Maritime Service, and a commission as Ensign in the United States Naval Reserve. This new class has gone back to peacetime requirements of three years, and graduates will be awarded a Bachelor of Science Degree and will probably receive a license as Second Mate or Second Assistant Engineer, in addition to their commissions in the United States Naval Reserve and United States Maritime Service.

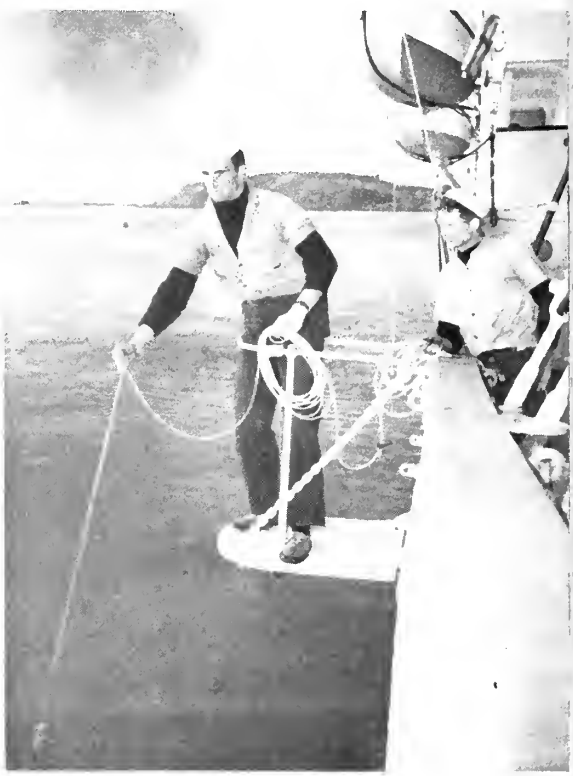
The future of the shipping industry and maritime commerce depends on well educated and experienced officers.

Now the training ship, S.S. Golden State is plowing her way south of the border. But at other schools a new quota of 15 men a week will be accepted by the U. S. Maritime Service Recruiting offices in San Francisco as resumption of training for peacetime careers in the merchant marine. Sixteen men have been accepted as candidates between the ages of 26 and 35, these men, as well as qualified veterans, will be sent to the U. S. Maritime Service training station, Sheepshead Bay, New York, for deck, engine or steward department instruction.

Transportation to the East Coast, plus uniform, quarters, subsistence and $50 per month cash allowances are provided by the Government.

Interested applicants should contact the U. S. Maritime Service Enrolling office, 1000 Geary Street, San Francisco.

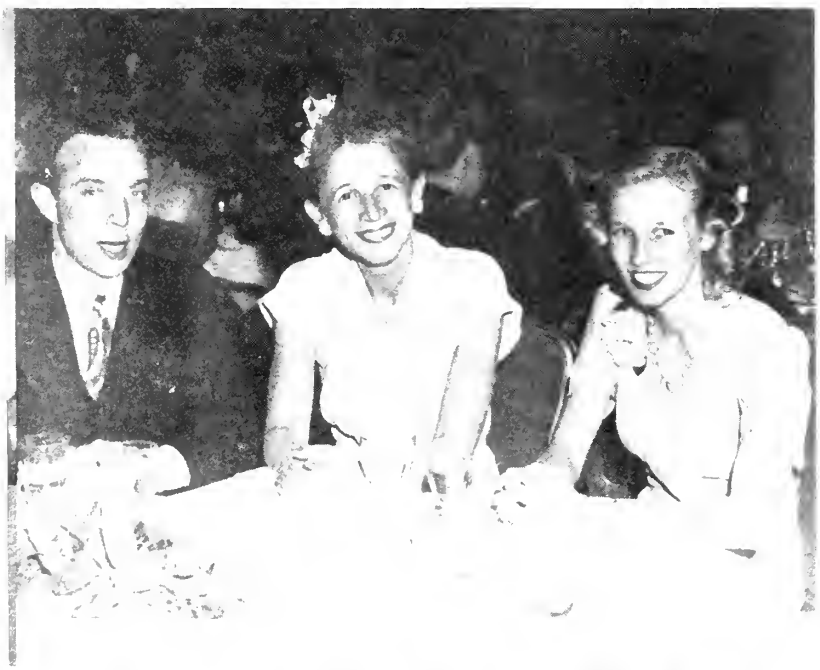
Captain Mayo, USN (retired), is handing over final instruction and bidding goodbye to Captoin Lester Martin, USNR, skipper of the S.S. Golden State, former skipper of an LSD during the war, and wearer of the Bronze Star.



Cadets receiving instruction on sextant reading by Lt. Comdr. C. H. Tubbs. Left to right: Curtis Harrison, Melvin Pollins, Raymond Wilson, John C. Welch, Jr., and Joseph Karasky.

S.F. Propeller Club 5th Annual Dinner Dance

HELD DECEMBER 15 AT THE ST. FRANCIS



Head table, left to right: Ed Harms, James E. Keller, guest from the Los Angeles Bilge Club, ond affiliated with the Pacific Coast Cement Institute of Los Angeles; W. R. Chamberlain, J. J. Geary, president of the San Francisco Propeller Port, J. A. Moore, Jr., retiring president; E. Russell Lutz, George E. Swett, Captoin Paul Cronk and Gene Hoffman.

CHANGE OF HELMSMAN

San Francico Propeller Port

The new administration of Joseph J. Geary, 1946 president of The Propeller Club, Port of San Francisco, got under way impressibly at the January 16th luncheon meeting when retiring President Joseph A. Moore, Jr. offered his valedictory remarks to an appreciative audience, turning the gavel over to the new helmsman, and his duly elected governing board.

Presentation of a beautiful gift in behalf of the membership was made to Mr. Moore. The selection, we understand, was a magnificent ultra-modern radio job (which was not unveiled because of the "fitness of things").

To hear the swan song of our retiring leader, a dignified rooting section came aboard . . . comprised by Joseph A. Moore, Sr., Austin Sperry, Charles Bulotti, Roy Folger, Nat Levy, and other friends of the Moore Dry Dock Company, where "young Joe" is the able president. Roy Folger seized the opportunity of making some dignified remarks, and gave The Propellers and their guests a rollicking

Rudy De Gorog, catering superintendent of Matson, receives a token of appreciafrom club members through Gene Hoffman.

ten or twelve minutes. Secretary Gene Hoffman, still the Club's official story-teller was next on the bill, and with a neat genuflection to Folger, managed quite well to "follow the acrobats."

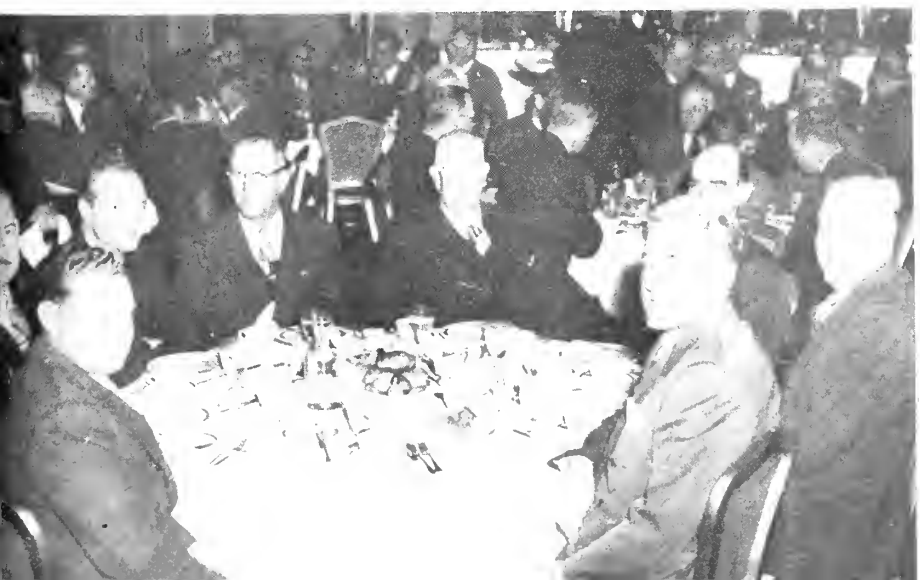
The man responsible for the excellent service which the Club has enjoyed during 1945 received the dining spotlight of appreciation! Rudy De Gorog, catering superintendent of Matson, deft member of the House Committee, was the receipient!

Among the guests in attendance was L. Godfrey Waters, proposed chairman of the board of General Engineering and Dry Dock Company. Mr. Waters attended with the President, George A. Armes.

The new members introduced during the meeting were: M. J. Burress, manager, Crane Company; Peter Howard, superintendent, Howard Terminal; Lt. Ed. L. H. Johannessen, USMS, Training Organization, WSA; Clinton L. Mosher, Schwabacher-Frey; and C. R. Redlich, vice president, Marine Terminals Corp. Thomas C. Ryan has recently transferred to the Club from the Port of Huntington, West Virginia.

L. Godfrey Waters and George A. Armes.

Gathered at the round table are, left to right: H. J. Wrigley, port engineer, Weyerhaeuser SS Co.; W. B. Littlefield, Harry W. Parsons Co.; J. W. Wallace, v.p. & gen. mgr., Hastings Co.; Mr. Lawrence, representing an Insurance Firm; Chas. Noland, Pat Mulvany and R. L. Strough, all of U. S. Maritime Commission construction office, Oakland; and Art Rosette, Bay Cities Asbestos Co.



Shoreside Personalities

Captain Arthur O. Brady, USNR, Commanding Officer of the U. S. Merchant Marine Cadet School, San Mateo.

Brady Promoted to Captain

The promotion of Commander Arthur O. Brady, USNR, commanding officer of the U. S. Merchant Marine Cadet School, San Mateo, California, to the rank of captain in the United States Naval Reserve was announced.

Captain Brady, a native of Methuen, Massachusetts, began his career in the merchant marine when he was 17 years of age aboard the U. S. Coast and Geodetic Survey vessel Pioneer. He graduated from the Massachusetts Nautical Academy in 1922 and served with the American Hawaiian Lines, United States Lines and Panama-Pacific Lines during his 20 odd years of sea experience as merchant marine officer, master and pilot.

Soon after World War II he was given an assignment as District Cadet-Midshipmen supervisor with the U. S. Merchant Marine Cadet Corps in San Francisco. Later he assumed the duties of assistant to the supervisor, U. S. Merchant Marine Cadet Corps, in Washington, D. C. He served in that capacity until December 4, 1944, when he took command of the Cadet Corps installations at San Mateo.

Election to Sterling Engine Board of Directors

Addison F. Vars, president of the Sterling Engine Company, announced that at the annual meeting held in the company's Buffalo offices December 27, Robert E. Dillon was elected to the board of directors.

With a broad experience in industrial and financial circles Mr. Dillon will be in a position to contribute much toward the continued success of Sterling Engine Company's postwar plans.

In addition to his directorship in the Sterling Engine Company, Mr. Dillon is also president and general manager of the Lake Erie Engineering Corporation, director of the Marine Trust Company, Air Investors, Inc. of New York City, and several other financial and manufacturing companies.

Mr. Dillon is most energetic in civic and philanthropic activities having served as vice president and director of Buffalo Chamber of Commerce and Chairman Erie County Emergency Relief Board.

Robert E. Dillon, elected to the Boord of Directors of Sterling Engine.

Officers and other directors of the Sterling Engine Company are: Spencer H. Logan, chairman of the board; Charles A. Criqui, vice chairman of the board and director; Addison F. Vars, president, general manager, treasurer and director; Hans Bohuslav, vice president-in-charge-of engineering and director; Frank G. Raichle, secretary and director.

OTHER DIRECTORS

William J. Conners, Jr., publisher of the Buffalo Courier Express, Buffalo, N. Y.; Lewis G. Harriman, president, Manufacturers & Traders Trust Company, Buffalo, N. Y.; Carroll E. Gray, Jr., chairman of the board, United Aircraft Products, Inc., Dayton, Ohio; Fred C. Rummel, president, Burr & Company, New York, N. Y.

New Appointments Made by Matson

W. J. Williams has been appointed as superintendent engineer of Matson Navigation Company, according to a recent announcement by Hugh Gallagher, vice president in charge of operations.

Mr. Williams, well known to the Pacific Coast shipping industry, has been associated with Matson since 1928. He has served in various capacities in the engine department on Matson's freight and passenger vessels and has occupied positions both in San Francisco and Honolulu in connection with ship maintenance and repair operations. During the war, Mr. Williams was general superintendent of the Maintenance Division of Matson's Construction & Repair Department.

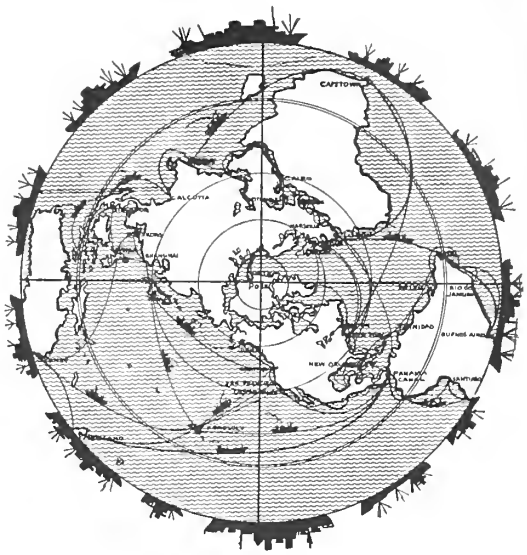
While in Los Angeles, the importance of postwar plans of the Matson Lines was further stressed with the announcement of H. E. Pippin as assistant passenger traffic manager in charge of the Southern California area.

Pippin's career with Matson began in 1926, and during the intervening years he has assisted in the development of passenger traffic in Matson offices in New York, Chicago, San Francisco and Australia. Since 1942 he has been stationed in Los Angeles.

Matson is increasing its Los Angeles staff with a view to resumption of normal commercial shipping during 1946.

W. J. Williams, superintendent engineer Matson Navigation Co.

Pacific STEAMSHIP DIRECTORY



Ship Owners, Ship Operators and Their Agents with Offices on the Pacific Coast — Listed by Cities

SAN DIEGO

ALASKA S. S. CO
See, W. P. ELLIOT, Agents

AMERICAN PRESIDENT LINES
See, W. P. ELLIOT, Agents

ELLIOT, W. P. — **AGENT**
336 C Street — **FRanklin 6581**
Agents For:
ALASKA S. S. CO.
AMERICAN PRESIDENT LINES

GRACE LINES
1030 W. Broadway — **FRanklin 0453**

OCEANIC S. S. CO.
213 Broadway — **FRanklin 4722**

LOS ANGELES

AGWILINES, INC.
See, INTEROCEAN S. S. CORP., Agents

ALASKA PACKERS ASSOCIATION
See, W. R. GRACE & CO., Agents

ALASKA TRANSPORTATION CO.
See, CONSOLIDATED S. S. COMPANY, Agents

ALCOA STEAMSHIP CO
See, POPE & TALBOT, INC., Agents

AMERICAN-HAWAIIAN S. S. CO.
530 West 6th St. — **TUcker 8181**

F. A. Hooper, Dist. Mgr.
S. S. Harlow, Dist. Mgr.
Berth 175, Wilmington — Wilmington 4-4541
R. A. Stewart, Pier Supt.
J. F. Walsh, Chief Clerk

AMERICAN MAIL LINES, LTD.
See, HAMMOND SHIPPING CO., Agents

AMERICAN PIONEER LINE
715 W. 7th — **TRinity 8261**

AMERICAN PRESIDENT LINES
510 W. 6th — **MUtual 4321**

Edgar M. Wilson, General Agent
R. M. DeLong, Gen. Pass. Agt.
R. G. Dinwoodie, Dist. Pass. Agt.
S. J. Hindle, Asst. to General Agent
R. O. Vernon, District Freight Agent
J. J. Berryman, Chief Clerk
G. W. Schreader, Chief Accountant
Agents For:
JAMES GRIFFITHS & SONS

AMERICAN REPUBLICS LINE
530 W. 6th St. — **TRinity 7171**

AMERICAN SOUTH AFRICAN LINE, INC.
210 W. 7th — **TRinity 3044**

ARROW LINE
111 W. 7th — **TRinity 8844**

BALFOUR GUTHRIE & CO., LTD. AGENTS
530 W. 6th — **TRinity 9051**

G. S. Tyler, Manager
J. A. Sullivan, Mgr. S. S. Dept.
Lines:
DONALDSON LINE
KNUTSEN LINE (S. A. SERVICE)
SPENCER KELLOGG & SONS, INC
INDO-CHINA STEAM NAV. CO., LTD.
ATHEL LINE
Service to U. K. and West Coast of S. A.

BARBER S. S. LINES, INC.
610 S. Main — **MIchigan 7896**

B. Gibney, Pacific Coast Mgr.
C. C. Miller, Asst. Mgr.
J. W. Zundel, Traffic Mgr.
S. T. Lashbrook, Purchasing Agent

BLUE FUNNEL LINE
See, DODWELL & CO., LTD., Agents

BLUE STAR LINE, INC.
See, MARINE AGENCIES, LTD., Agents

BURNS STEAMSHIP COMPANY
727 W. 7th — **TRinity 1061**
Also: 809 N. Avalon Blvd., Wilmington, Calif.

L. G. Burns, President
Val Larsen, Vice President
H. Neergaard, Marine Supt.
Agents For:
W. R. CHAMBERLIN & CO.
Service To:
All California, Oregon and Washington (Puget Sound including Canadian) ports. Present operation covers all world ports under W.S.A.

CANADIAN AUSTRALASIAN LINE
513 W. 6th (Passenger Dept.) MIchigan 8337

A. D. MacDonald, General Agent
T. A. Dickson, District Freight Agent
828 Van Nuys Bldg.
Service To (Normally):
Vancouver to Honolulu, New Zealand, Australia.

CANADIAN PACIFIC STEAMSHIP LINES
513 W. 6th (Passenger Dept.) MIchigan 8337

A. D. MacDonald, General Agent
Service To (Normally):
Vancouver to Hawaii and Oriental Ports.

CANADIAN NATIONAL STEAMSHIPS
Passenger Dept.:
607 S. Grand — **TRinity 5751**
H. R. Bullen, General Agent
Freight Dept.:
Room 1102, 510 W. 6th. — **VAndike 9179**
G. W. Amey, General Agent
Service To:
From Vancouver, B. C., to Powell River, B. C., Ocean Falls, B. C., Prince Rupert, B. C., and Ketchikan, Alaska

CHAMBERLIN, W. R., & CO. **AGENTS**
809 N. Avalon **TErminal 4-4556**
Wilmington, California

COASTWISE LINE
715 W. 7th **TRinity 8261**
T. G. Maddox, District Manager

CONSOLIDATED S. S. COMPANY
Pier 1, Municipal Docks **Phone 64996**
J. H. Fay
Agents For:
ALASKA TRANSPORTATION CO.

CUNARD-WHITE STAR, LTD.
606 S. Hill **TUcker 5208**

DECONHIL SHIPPING CO.
See, HILLCONE STEAMSHIP CO., Agents

DE LA RAMA STEAMSHIP CO., INC., THE
530 W. 6th **TUcker 5103**
Hugh Middleton, Asst. Pacific Coast Mgr.
Ralph M. Hylton, Port Supt.
Sherman W. Elliott, Asst. Purch. Agt.
Lines:
PACIFIC-ATLANTIC S. S. CO.
QUAKER LINE
STATES MARINE CORP.
SWEDISH EAST ASIATIC CO.
Service To:
Quaker Line—Intercoastal
De La Rama Line—Philippines & China

DODWELL & CO., LTD. **AGENTS**
Berth 53, Outer Harbor Dock **Harbor 4090**
George H. Baldwin, Manager
Agents For:
BLUE FUNNEL LINE
FRUIT EXPRESS LINE

DONALDSON LINE
See, BALFOUR, GUTHRIE & CO., LTD., Agents

FRED OLSEN LINE
704 S. Spring **TRinity 4186**

FRENCH LINE
541 S. Spring **MIchigan 7412**

FRUIT EXPRESS LINE
See, DODWELL & CO., LTD., Agents

FURNESS (PACIFIC) LIMITED **AGENTS**
108 W. 6th **TRinity 8111**
R. V. Ross, Manager
Agent For:
PRINCE LINE, LIMITED

GENERAL PETROLEUM CORPORATION OF CALIF. **MUtual 0171**
Higgins Bldg., 108 W. 2nd St.
S. J. Dickey, President
W. Cunningham, Treasurer
W. Beck, Purchasing Agent
A. O. Woll, Manager Marine Dept.
Box A, Terminal Island TErminal 2-2950
Service To:
COASTWISE
WORLDWIDE

GENERAL STEAMSHIP CORP., LTD.
541 South Spring **AGENTS**
Capt. H. H. Birkholm, Vice-Pres. in Charge Southern District
W. B. Bryant, Dist. Mgr.
W. W. Wynn, Chief Accountant
H. P. Wynn, Dist. Passenger Agent
Operating Dept. (San Pedro):
365 W. 7th St. TErminal 3-0151
R. H. Hannah, Local Manager

Agents For:
FRENCH LINE
PACIFIC ISLANDS TRANSPORT LINE
TRANSATLANTIC S. S. CO., LTD.
WESTFAL-LARSEN CO. LINE
SILVER LINE
SILVER-JAVA PACIFIC LINE

GRACE, W. R., & CO.
523 W. 6th **MIchigan 7811**
Wm. A. St. Amant, Manager
Agents For:
GRACE LINE
JOHNSON LINE
ALASKA PACKERS ASSOCIATION
J. H. WINCHESTER & CO., INC.
ALASKA STEAMSHIP CO.
Service To:
Mexico, Central America, Panama, Colombia, Ecuador, Peru, Bolivia, Chile

GRACE LINE
See, W. R. GRACE & CO., Agents

GRIFFITHS, JAMES, & SONS
See AMERICAN PRESIDENT LINES, Agents

HAMMOND SHIPPING CO.
110 W. Ocean Blvd.
Long Beach, Calif.
L. C. Hammond, President
R. C. Robinson, Vice Pres. & Gen. Mgr.
G. B. McLeod, Vice President
S. L. Rea, Secretary
H. E. Bailey, Treasurer
C. I. Jackson, Port Engineer, L. B
H. D. McLeod, Port Captain, L. B.
Agents For:
AMERICAN MAIL LINE at S. California Ports
ServiceTo:
COASTWISE (Lumber)

HILLCONE STEAMSHIP CO.
305 N. Avalon Blvd. **Wilmington 2160**
Wilmington, California
Agents For:
DECONHIL SHIPPING CO.
INDIES TERMINAL CO.
Berth 230B Terminal 2-6464
Terminal Island, Calif.
R. R. Bennett, Mgr.

INTERNATIONAL TERMINALS, INC.
215 W. 6th St. **AGENTS**
Max G. Linder, President & Gen. Manager
Roland C. Stevens, Vice President
A. Malone, Superintendent

INTEROCEAN LINE
See, INTEROCEAN S. S. CORP., Agents

INTEROCEAN S. S. CORP. **AGENTS**
111 W. 7th **TUcker 3111**
W. F. Wilkinson, District Manager
W. J. Sweeney, Traffic Mgr. & Purch. Agent
C. F. Staples, Operating Manager
Lines:
INTEROCEAN LINE
KNUTSEN LINE
PACIFIC COAST DIRECT LINE
WEYERHAEUSER LINE
AGWILINES INC.
SALEN LINE
AMERICAN LIBERTY S.S. CORP.

ISTHMIAN LINE
510 W. 6th **TRinity 7921**
W. C. Fulton, Manager
J. Eitze, Pier Agent

JAVA PACIFIC LINE
Berth 230-B **HArbor 6466**
Terminal Island, California
See, TRANSPACIFIC TRANS. CO., Agents

JOHNSON LINE
See, W. R. GRACE & CO., Agents

KERR STEAMSHIP CO.
541 S. Spring **MIchigan 7412**
Los Angeles 13, California

KEYSTONE SHIPPING COMPANY
See, W. H. WICKERSHAM & CO., Agents

KINGSLEY CO. OF CALIFORNIA
Agents For:
McCORMICK S. S. CO.

KNUTSEN LINE
Agents:
BALFOUR, GUTHRIE & CO., LTD.
530 W. 6th TRinity 9051
Los Angeles, California
INTEROCEAN S. S. CORP.
111 W. 7th TUcker 3111
Los Angeles, California

LA LINIA DE VAPORES
See, RED ANCHOR DOCK & S. S. CO., Agents

LAURITZEN LINE (P. F. Soto Shipping Co.)
704 S. Spring **TRinity 4186**

LAWRENCE PHILLIPS STEAMSHIP CO.
714 W. Olympic Boulevard

LOS ANGELES TANKER OPERATORS, INC.
541 South Spring **MIchigan 7411**

LOS ANGELES TANKER OPERATORS, INC.
369 W. 7th **HArbor 3460**
San Pedro, California

LUCKENBACH GULF STEAMSHIP CO., INC.
LUCKENBACH STEAMSHIP CO., INC.
621 S. Hope **TRinity 7881**
E. A. MacMahon, District Manager
G. H. Dickard, District Claim Agent

MacDONALD, A. D. **GENERAL AGENT**
513 W. 6th (Passenger Dept.) **MIchigan 8337**
Lines:
CANADIAN AUSTRALASIAN LINE
CANADIAN PACIFIC S. S. LINES

MARINE AGENCIES, LTD.
815 Preble Ave., Box 365 **TErminal 4-7227**
Wilmington, California
E. W. Horsman, Owner
O. W. Pearson, Manager
W. R. Dial, Asst. Manager
Agents For:
BLUE STAR LINE
Service To:
Pacific Coast—U. K.
Passengers—Refrigerator and General Cargo

MATSON NAVIGATION CO.
Pacific Mutual Bldg. **VAndike 2421**

McCORMICK S. S. CO.
See POPE & TALBOT, INC.

MOORE-McCORMACK LINES, INC.
530 W. 6th **TRinity 7171**
L. E. Archer, Manager
W. J. Marsh, Operating Dept.
G. L. Duff, Purchasing Agent

NORTON LILLY & CO.
210 W. 7th **TRinity 3044**

OCEANIC S. S. CO.
6th and Grand **VAndike 2421**

OLIVER J. OLSON & CO.
106 East "F" St.
Wilmington, California

PACIFIC ATLANTIC S. S. CO.
See, DE LA RAMA S. S. CO., INC., THE, Agents

PACIFIC COAST DIRECT LINE
See, INTEROCEAN S. S. CORP., Agents

PACIFIC ISLANDS TRANSPORT LINE
541 S. Spring **MIchigan 7412**
Service To:
South Seas and New Caledonia
See, GENERAL STEAMSHIP CORP., LTD., Agents

PANAMA PACIFIC LINE
See: UNITED STATES LINES CO., Agents

PHILIPPINE-DE LA RAMA
530 W. 6th **TUcker 5103**

POPE & TALBOT, INC.
McCormick Steamship Division
714 W. Olympic Blvd. **PRospect 8231**
W. Kenneth Pope, Vice President
Geo. H. Bushnell, District Manager
Berth 146, Wilmington **TErminal 4-2531**
Capt. C. E. Larson, Dist. Op. Manager
J. R. Waters, Dock Superintendent
Agents For:
ALCOA STEAMSHIP CO.
KINGSLEY CO. OF CALIFORNIA
INTERNATIONAL FREIGHTING CORP.
PRUDENTIAL STEAMSHIP CO.
POLARUS STEAMSHIP CO.
SMITH & JOHNSON
SPRAGUE STEAMSHIP CO.
STOCKARD STEAMSHIP CORP.
U. S. NAVIGATION CO.
BERNUTH LEMBCKE CO.
WESSEL DUVAL & CO.
Service To:
World Ports, Intercoastal, and Puerto Rico

PRINCE LINE, LTD.
See, FURNESS LINE, Agents
108 W. 6th TRinity 8111
Los Angeles, California

QUAKER LINE
See, DE LA RAMA S. S. CO., INC., Agents

RED ANCHOR DOCK & S. S. CO.
P. O. Box 345 **Long Beach 639-00**
Long Beach, California
D. A. Linthicum, President
C. J. Chodzko, secretary
Agents For:
STOCKTON-LONG BEACH S. S. CO.
RED ANCHOR S. S. LINES
LA LINIA DE VAPORES
Handle all lumber lines discharging at Red Anchor Docks.

RED ANCHOR S. S. LINES
See, RED ANCHOR DOCK & S. S. CO., Agents

RICHFIELD OIL CORPORATION
555 S. Flower **TRinity 2231**
P. C. Lamb, Manager Marine Department

ROYAL MAIL LINES, LTD. (FREIGHT)
108 W. 6th **TRinity 8111**

SALEN LINE
See, INTEROCEAN S. S. CORP., Agents

SILVER-JAVA PACIFIC LINE
See, GENERAL S. S. CORP., LTD., and TRANSPACIFIC TRANS. CO., Agents

SILVER LINE
See, GENERAL STEAMSHIP CORP., LTD., Agents

STOCKTON-LONG BEACH S. S. COMPANY
See, RED ANCHOR DOCK & S. S. CO., Agents

SUDDEN & CHRISTENSON, INC.
111 W. 7th **TRinity 8844**

TEXAS COMPANY, THE
929 South Broadway
Also: Berth 172, Wilmington, California

TIDEWATER ASSOCIATED OIL CO.
Wilmington Road
San Pedro, California

TRANSATLANTIC S. S. CO., LTD.
See, GENERAL STEAMSHIP CORP., Agents

TRANSMARINE NAVIGATION CORPORATION **AGENTS**
215 W. 6th St. **TRinity 5534**
Max G. Linder, Pres. & Gen. Mgr.
Roland C. Stevens, Vice Pres.
A. Malone, Superintendent
Agents For:
LAMBERT BROTHERS, LTD.
WALLEN & CO.
AGENT ASSOCIATIONS THROUGHOUT THE WORLD.
Terminals:
Pier A Long Beach 66261
Long Beach 2, California
Berth 228-D TErminal 3-2741
Terminal Island, California
Terminal Operators, Ship Operators, Ship Agents, Freight Forwarders, Bunkering Agents, Chartering Brokers.

TRANSPACIFIC TRANSPORTATION CO.
530 W. 6th **AGENTS**
TUcker 2511
C. F. Yenney, District Manager
Lines:
SILVER-JAVA PACIFIC LINE
JAVA PACIFIC LINE
INDIES TERMINAL COMPANY
Service To:
Freight and Passenger—Philippine Islands, Netherlands Indies, Straits Settlements, British India, Persian Gulf, South and East African Ports

UNION OIL CO. OF CALIFORNIA
617 W. 7th **TUcker 7211**
W. L. Stewart, Jr., Exec. Vice President
A. C. Rubel, Vice President
A. C. Stewart, Vice President
Sam Grinsfelder, Vice President
Basil Hopper, Vice President
Ole Berg, Jr., Vice President
W. A. Newhoff, Vice President
M. G. Kerr, Comptroller
H. W. Sanders, Secretary-Treasurer
L. A. Gibbons, General Counsel
Service To:
Coastwise and Hawaiian Trading

UNITED FRUIT COMPANY
Pier 147 **TErminal 4-2631**
P. O. Box 218
Wilmington, California

UNITED STATES LINES CO.
(Panama Pacific Line)
715 W. 7th St. **TRinity 8261**
T. G. Maddox, District Manager

WEST COAST STEAMSHIP CO.
714 W. Olympic Blvd. **PRospect 1108**
A. C. Penberthy, President
M. W. Crook, Secretary-Treasurer
Service To:
Pacific Coastwise

WESTFAL-LARSEN CO. LINE
See, GENERAL S. S. CORP., LTD., Agents

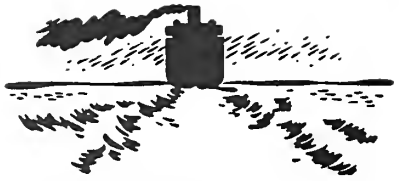
WEYERHAEUSER LINE
See, INTEROCEAN S. S. CORP., Agents

WHITE STAR LINE
606 S. Hill **TUcker 5208**

WICKERSHAM & CO., W. H.
111 W. 7th **AGENTS**
San Pedro California **HArbor 2498-99-79**
H. E. Pickering, Managing Partner
Lt. Comdr. H. H. Wickersham, Partner
Roy Blydenburgh, Manager Agency Dept.
W. F. Arnold, Manager Brokerage Dept.
W. H. Wickersham & Co., Inc.
Agents For:
KEYSTONE SHIPPING COMPANY (Philadelphia)
CITIES SERVICE OIL COMPANY (NYC)
PAN AMERICAN PETROLEUM & TRANSPORT CO. (NYC)
THE ATLANTIC REFINING COMPANY (Philadelphia)
B. L. SHIPPING COMPANY, INC. (NYC)
AMERICAN TRADING & PRODUCTION CORP. (NYC)
CHILE STEAMSHIP CO., INC. (NYC)
CONTINENTAL STEAMSHIP CO. (Baltimore, Md.)
SABINE TRANSPORTATION CO. (Port Arthur, Texas)
NORWEGIAN SHIPPING AND TRADE MISSION (NYC)
BRITISH TANKERS CO., LTD. (London, England)
TANKERS, LTD. (London, England)
W. R. CARPENTER CO., LTD. (S. F. and Vancouver)
SHEPARD STEAMSHIP CO. (S. F.)
CUNARD WHITE STAR LTD. (S. F.)

WILLIAMS, DIMOND & CO.
530 W. 6th **TUcker 8181**
L. C. Munson, District Manager
W. C. Ricks, Asst. District Manager
C. A. Jones, Asst. Oper. Mgr., So. Calif. (Berth 228-E, Terminal Island, Calif. Dock—Berth 228-E,)
Agents For:
AMERICAN REPUBLICS CORP.
A. H. BULL & CO., INC.
BLACK DIAMOND STEAMSHIP CORP.
BOLAND & CORNELIUS
COMMERCIAL MOLASSES CORP.
EASTERN STEAMSHIP LINES, INC.
MARINE TRANSPORT LINES, INC.
MORAN TOWING & TRANSPORTATION CO., INC.
SEAS SHIPPING CO., INC.
SOUTH ATLANTIC STEAMSHIP LINE
TANKERS COMPANY, INC.
UNION STEAMSHIP CO. OF NEW ZEALAND, LTD.
WILMORE STEAMSHIP CO., INC.

WILMINGTON TRANSPORTATION CO.
Catalina Terminal **TErminal 4-5241**
Wilmington, California
D. P. Fleming, Chairman of the Board
Philip K. Wrigley, President
C. F. Fennema, Vice Pres. & Gen. Mgr.
W. J. Scott, Controller & Treasurer
D. P. Fleming, Secretary
L. H. Connor, Operating Mgr., Wilmington
W. L. Scott, Port Eng., Wilmington
C. E. Brownlee, Purch. Agent, Wilmington,
W. H. Leisk, Manager, Tugboat Dept.,



SAN FRANCISCO

Berth 82, San Pedro
Service To:
Steamer service to Santa Catalina Island; Tugboat service to Los Angeles and Long Beach Harbors

AGWILINES, INC.
See, INTEROCEAN STEAMSHIP CORP., Agents

ALASKA PACKERS ASSOCIATION
111 California **GArfield 7360**
A. K. Tichenor, President
C. A. Iversen, Vice President
A. C. Mott, Secretary-Treasurer
R. A. Stack, Asst. Secretary
R. E. Astrup, Marine Superintendent
M. E. Wall, Asst. Marine Superintendent
H. B. Adams, Oper. Manager
J. M. Metzner, Port Engineer
Oscar Sundby, Port Steward
B. P. Thornton, Purchasing Agent

ALASKA TRANSPORTATION CO.
See, OLYMPIC STEAMSHIP CO., INC., Agents

ALCOA STEAMSHIP CO., INC.
461 Market Street **DOuglas 2561**
Captain P. E. Odeen, Port Captain
F. H. Brewster, Port Engineer
H. C. Hart, Port Steward
See, POPE & TALBOT, INC., Agents

AMERICAN EXPORT LINES, INC.
233 Post St. **GArfield 7556**
Frank E. Short, District Representative

AMERICAN-HAWAIIAN STEAMSHIP CO.
215 Market Street **SUtter 5841**
Edw. P. Farley, Chairman of the Board
J. E. Cushing, President
T. G. Plant, Vice President
W. Dearborn Clark, V. P. & Traffic Mgr.
C. M. Fedderman, Treasurer
A. E. Stow, Oper. Manager
G. V. Cooley, District Mgr.
E. M. Slevin, Claim Agent
Capt. N. J. Kane, Marine Supt.
F. P. Ritchie, Superintending Engineer
J. M. Pruner, Purchasing Agent
E. E. Voellings, Port Steward
Weekly sailings from Boston, Philadelphia, New York; to Los Angeles, San Francisco, Oakland, Alameda, Portland, Seattle and Tacoma, and from Tacoma, Seattle, Portland, Stockton, Oakland, Alameda; San Francisco and Los Angeles to New York, Philadelphia and Boston
Service from Baltimore, Norfolk, Charleston and Savannah to San Diego, Los Angeles, San Francisco, Oakland, Alameda, Portland, Seattle and Tacoma, and from Tacoma, Seattle, Portland, Stockton, Oakland, Alameda, San Francisco and Los Angeles to Jacksonville, Savannah, Charleston, Wilmington (N. C.), Norfolk and Baltimore; eastbound service to Puerto Rico.

AMERICAN MAIL LINE
369 Pine Street **EXbrook 1468**
B. E. Watson, Manager (Miss Barbara)

AMERICAN MANCHURIAN LINE
See, NORTON, LILLY & CO., Agents

AMERICAN PRESIDENT LINES
311 California Street **DOuglas 6000**
Henry F. Grady, President
E. Russell Lutz, Executive Vice President
A. B. Poole, Vice Pres. & Treasurer
M. J. Buckley, Vice Pres (Freight Traffic)
Hugh Mackenzie, Vice Pres. (Passenger Traffic)
Oscar G. Steen, Vice Pres. for Orient
W. J. Bush, Vice Pres., Operating Mgr.
T. E. Cuffe, Vice Pres. Eastern U.S.A.
D. T. Buckley, Secretary & Asst. Treas.
Gene Holfman, Director Public Relations
E. D. Flaherty, General Office Manager
Capt. W. G. Pearch, Marine Supt.
J. J. Robinson, Port Steward
J. Jacobsen, Superintending Engineer
Reg. S. Laughlin, General Counsel
F. L. Morgan, General Purch. Agent
Ed Kester, Mgr. Insurance Dept.

AMERICAN REPUBLICS CORP.
215 Market Street **SUtter 0525**

AMERICAN SOUTH AFRICAN LINE
(Norton, Lilly & Co.)
230 California Street **SUtter 3600**

AMERICAN TRADING CO.
311 California Street **YUkon 0344**
John N. Raymond, President
J. J. Geary, Vice President
Ian Armstrong, Secretary-Treasurer
Service To:
California ports to Central America and Panama
Proposed resumption of service to:
South Seas and Australia

ARROW LINE
See, SUDDEN & CHRISTENSON, Agents

AUSTRALIAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

BALFOUR, GUTHRIE & CO., LTD. AGENTS
351 California Street **SUtter 6423**
L. P. Bailey, Mgr. S. S. Dept.
David Lindquist
Lines:
DONALDSON LINE and
KNUTSEN LINE (So. American Service)
Service To:
Donaldson Line—Pacific Coast Ports to London, Liverpool, Glasgow.
Knutsen Line—Pacific Coast Ports to Colombia, Ecuador, Peru, Chile.

BALTIMORE MAIL LINE
See: PANAMA-PACIFIC LINE

BANK LINE TRANSPORT & TRADING CO.
260 California Street **DOuglas 0442**
Captain Walter Gay, President
P. F. Brown, Manager

BARBER ASPHALT CO.
See, DECONHIL SHIPPING COMPANY, Agents

BARBER S. S. LINES, INC.
See, DODWELL & CO., LTD., Agents

BAY CITIES TRANSPORTATION CO.
Pier 5 **GArfield 6986**
1 Webster St., Oakland **GLencort 3277**
W. G. Westman, General Manager
R. W. Dyer, Operating Manager
C. R. Escher, Traffic Manager
Service To:
San Francisco - Oakland - Alameda - Emeryville - Berkeley - Richmond - and other River Points.

BLUE FUNNEL LINE
See, DODWELL & CO., Agents

BLUE STAR LINE, INC.
465 California Street **EXbrook 1580**
J. Van Meurs, Calif. District Mgr.
Agents For:
BLUE STAR LINE, LTD.
London, England
Service To:
Liverpool, Glasgow, London, Newcastle, Hull, Dublin, Havre, Rotterdam.

BOARD OF STATE HARBOR COMMISSIONERS, PORT OF SAN FRANCISCO
Ferry Building **GArfield 8800**
J. W. Mailliard, Jr., President
Thomas Coakley, Commissioner
William G. Welt, Commissioner
M. H. Gates, Secretary
Neil S. Laidlow, Manager
Carl M. Smith, Asst. Secretary
Frank G. White, Chief Engineer
W. A. Geary, Chief Wharfinger
R. K. Hunter, Port Traffic Manager
Thos. E. Twohig, Rental Manager

BROCKLEBANK, T & J., LTD.
See, CUNARD WHITE STAR LIMITED, Agents

BURNS STEAMSHIP COMPANY
615 Hearst Bldg. **YUkon 1001**

CALIFORNIA EASTERN LINE
(States S. S. Co.—Portland, Oregon)
See, DE LA RAMA STEAMSHIP CO., INC., THE, Agents

CALMAR LINE
See, SWAYNE & HOYT, LTD., Agents

CANADIAN AUSTRALASIAN LINE
152 Geary Street **SUtter 1585**
S. E. Corbin, General Agt. Passenger Dept.
A. E. Walker, District Freight Agent
681 Market Street GArfield 5185
San Francisco, California

CANADIAN NATIONAL STEAMSHIPS
648 Market Street (Pass. Dept.), SUtter 1321
(Freight Dept.), SUtter 5091
Service To:
Vancouver, B. C., Powell River, Ocean Falls, Prince Rupert, B. C.; Ketchikan, Alaska

CANADIAN PACIFIC STEAMSHIPS, LTD.
152 Geary Street **SUtter 1585**

CANADIAN TRANSPORT
See, FURNESS LINE, Agents

CIA. MARITIMA DEL NERVION, BILBAO
See, KERR STEAMSHIP COMPANY, INC., Agents

CHAMBERLIN, W. R., & CO.
465 California Street **YUkon 0543**
W. R. Chamberlin, Managing Owner
W. R. Chamberlin, Jr., Assistant Manager
Mina S. Keswick, Purchasing Agent
T. L. Tomlinson, Marine Superintendent
A. S. Coskey, Port Engineer
F. M. Graham, Port Captain
L. H. Beckendorf, Port Steward

COASTAL STEAMSHIP CO.
See, OLYMPIC STEAMSHIP CO., INC., Agents

COASTWISE LINE
See, UNITED STATES LINES CO., Agents

CONSOLIDATED-OLYMPIC LINE
64 Pine Street **DOuglas 1463**
Service To:
Regular Pacific Coastwise Service

CONSOLIDATED S. S. CO.
64 Pine Street **DOuglas 1463**
J. C. Strittmatter, General Manager
David Gregory, Mgr. of Operations & Traffic
Pier 16 DOuglas 7207
Terminal Operators and Contracting Stevedoring

CROWLEY LAUNCH & TUGBOAT CO.
Pier 14 **EXbrook 1743**

CUNARD WHITE STAR LIMITED
250 Post Street **EXbrook 1486**
H. G. DeGolia, San Francisco Manager
Agents For:
T. & J. BROCKLEBANK, LTD.
PORT LINE LIMITED
PENINSULAR & ORIENTAL LINE
DONALDSON ATLANTIC LINE

DECONHIL SHIPPING COMPANY
311 California Street **EXbrook 2365**
J. J. Coney, President
C. A. Ames, Vice President
Stanley Hiller, Vice President
E. B. DeGolia, Vice President
L. R. Kerdell, Secretary-Treasurer
Capt. P. K. Countryman, Port Captain
Fred H. Cordes, Marine Superintendent
H. H. Whitesel, Mgr. Regional Office
Lloyd Richardson, Superintending Engineer
M. C. Wright, Port Engineer
S. Gordon, Port Engineer
C. Becker, Port Steward
F. P. Richmond, Port Electrician
Agents For:
BARBER ASPHALT CO.
SHIP OWNERS' AGENCY

DE LA RAMA STEAMSHIP CO., INC., THE
230 California Street **EXbrook 8560**
H. H. Pierson, Pacific Coast Mgr.
J. O. McManus, Asst. Oper. Mgr.
James A. Riemers, Port Engineer
James E. Black, Port Superintendent
P. F. Baker, Port Steward
W. D. Hampshire, Purch. Agent
Agents For:
CALIFORNIA EASTERN LINE, INC.
R. A. NICOL & CO., INC.
PACIFIC-ATLANTIC STEAMSHIP CO.
QUAKER LINE
STATES STEAMSHIP CO.

DODWELL & CO., LTD. **AGENTS**
465 California Street **GArfield 8047**
Norman Hardie, Manager
Lines:
BLUE FUNNEL LINE
BARBER LINE
FRUIT EXPRESS LINE

DONALDSON ATLANTIC LINE
See, CUNARD-WHITE STAR, LTD., Agents

DONALDSON LINE, LTD.
(Donaldson Bros. Ltd.—Glasgow, Scotland)
L. P. Bailey, Manager
David Lindstedt, Operating Manager
J. L. Brainerd, Traffic Manager
See, BALFOUR GUTHRIE & CO., LTD., Agents

EAST ASIATIC CO., INC.
433 California Street **EXbrook 7324**
(Ostasiatiske Kompagni Aktieselskabet Det. Copenhagen, Denmark)
Christian Jensen, President
Mogens Bildsoe, Vice Pres.
K. G. Rasmussen, Sec.-Treas.
J. H. Ollerdessen, Traffic Mgr.

ELLERMAN & BUCKNALL S. S. CO., LTD.
See, NORTON, LILLY & CO., Agents

FLOOD LINES, INC.
465 California Street **EXbrook 6269**

S. S. FREEMAN & CO.
Fife Building **DOuglas 4341**
S. Dayre Freeman, Managing Owner
Service To:
Pacific Coast - Coastwise U.S.A.

FRENCH LINE
465 California Street **EXbrook 4100**
See, GENERAL S. S. CORP., Agents

FRISCO LINES
681 Market Street **DOuglas 1128**

FRUIT EXPRESS LINE
(Sigurd Herlofson & Co.—Als, Oslo, Norway)
See, DODWELL & CO., LTD., Agents

FURNESS (PACIFIC) LIMITED **AGENTS**
Mills Tower **GArfield 7030**
J. J. Walsh, Pacific Coast Manager
J. West, Asst. Pacific Coast Manager
G. Alst, Financial Manager
G. R. Nowlin, Freight Traffic Manager
J. F. Hanavan, Asst. Traffic Manager
Lines:
PRINCE LINE
SILVER LINE
FURNESS LINE

FURNESS LINE
See, FURNESS (Pacific), LTD.
J. J. Walsh, President
AGENT FOR CANADIAN TRANSPORT

GENERAL PETROLEUM CORP. OF CALIF.
417 Montgomery Street **EXbrook 6411**
V. A. Bellman, Resident Manager
E. L. Koster, Asst. Resident Manager
C. D. Griffith, Marine District Sales Mgr.
Service To:
Coastwise, Worldwide

GENERAL STEAMSHIP CORP., LTD.
465 California Street **AGENTS**
EXbrook 4100
(Steamship Agents - Operators - Brokers and Charterers)
Harry S. Scott, President
Drew Chidester, Exec. Vice Pres.
F. A. Reeves, Secretary and Treasurer
D. M. White, Controller
Operations and Charters:
Allan K. Hulme, Vice Pres.
Capt. A. T. Hunter, Operating Mgr.
Lawrence M. Ammon, Purchasing Agt.
J. M. Michaelsen, Insurance Claims & Reports
Wilford Thomas, Port Steward
C. T. Soloman, Port Engineer
W. Plunket, Port Purser
Traffic:
R. V. Windquist, Vice President
C. A. Reali, Mgr. Australian Inbound Freight, South American & South Seas Depts.
Morse Frazier, Mgr., Australian Dept., Outbound Freight
J. R. Page, Manager, European Dept.
L. I. McKim, General Freight Agent
R. W. King, Mgr., Passenger Dept.
G. E. Hay, Manager, Documentation & Trade Prom. Depts.

Terminal Operations:
George B. Schirmer, Vice President
W. E. Bunker, Mgr., Term. Operations

Agents For:
PACIFIC ISLANDS TRANSPORT LINE
PACIFIC AUSTRALIA DIRECT LINE
WESTFAL-LARSEN COMPANY LINE
FRENCH LINE
LOS ANGELES TANKER OPERATORS, INC.

GRACE LINE (W. R. Grace & Co.)
2 Pine Street **SUtter 3800**

F. L. Doelker, Vice President
D. N. Lillevand, Oper. Manager
Harry Thompson, Traffic Manager
R. E. Pyke, Asst. Traffic Mgr. & Frt. Claim Agent
F. L. Hardy, Asst. Traffic Manager
G. T. Littlejohn, Steamship Acct.
Capt. P. H. Gallagher, Port Captain
E. J. Graff, Port Engineer
G. F. Williams, Asst. Oper. Manager
A. C. Brownlie, Asst. Claim Agent
C. A. Nelson, Auditor
R. C. Rose, Purch. Agent
E. T. Senter, Marine Supt.
A. Cobbett, Port Steward
A. C. Holsten, Stevedore Superintendent

Agents For:
JOHNSON LINE
Pacific Coast-European
Scandinavian Service

Service To:
Mexico, Central America, Panama, C. Z., Colombia, Ecuador, Peru, Bolivia, Chile

GRACE, W. R., & CO.
2 Pine Street **SUtter 3700**

H. S. Parsons, Vice President
W. V. Lynch, Asst. Mgr.
W. E. Rodgers, Asst. Mgr.
G. H. Mahoney Asst. Mgr.
V. J. Pollock, Asst. Manager

GULF OIL CORPORATION

See, HILLCONE S. S. CO., LTD., Agents

GULF PACIFIC LINE

See, SWAYNE & HOYT, LTD., Agents

HAMMOND SHIPPING CO., LTD.
417 Montgomery Street **AGENTS**
DOuglas 3388

L. G. Hammond, President
R. G. Robinson, Vice Pres. & Gen. Mgr.
G. B. McLeod, Vice Pres.
P. B. Babcock, Port Stewart & Purch, Agent
Wm. Meriwether, Port Capt.
A. T. Jones, Port Engineer

Agents For:
P. L. TRANSPORTATION CO.

HAMBURG-AMERICAN LINE

See, SUDDEN & CHRISTENSON, Agents

HILLCONE S. S. CO., LTD.
311 California Street **EXbrook 2365**

Stanley Hiller, President
Joseph J. Coney, Vice Pres. & Gen. Mgr.
E. B. DeGolia, Vice President
C. A. Ames, Vice Pres & Operating Mgr.
L. R. Kerdell, Secretary & Treasurer

Agents For:
GULF OIL CORP.

HIND, ROLPH & CO. **AGENT**
230 California Street **DOuglas 3100**

Line:
LAURITZEN LINE

HOLLAND-AMERICA LINE
149 California Street **DOuglas 7510**

E. F. R. de Lancy, Pacific Coast Manager
W. Klaasen, Asst. Pacific Coast Manager
D. de Vries, Asst. Traffic Manager
T. P. Guerin, Pacific Coast Pass. Agent
H. Th. Page, Accountant
J. H. Diederik, Dock Superintendent

Agents For:
ROYAL MAIL LINES, LTD.

Service To:
U. K. & Continent

HOLWAY STEAMSHIP CO.
465 California Street **EXbrook 7534**

P. M. Holway, President

Pacific Coast Agents For:
MOSVOLD LINE

INTERNATIONAL FREIGHTING CORP.

See, POPE & TALBOT, INC., Agents

INTEROCEAN STEAMSHIP CORP.
311 California Street **AGENTS**
DOuglas 7729

Harry Brown, President
Erik Krag, Exec. Vice Pres.
A. H. Mortensen, Vice Pres.
R. W. Cobell, Vice Pres.
R. G. Thomas, Treas. & Comptroller
E. Berlund, Secretary
H. G. Beadle, Asst. Operating Mgr.
D. M. Nunan, Port Captain
J. F. Gisler, Marine Supt.
R. I. Jacobs, Purch. Agent
Chas. J. Keller, Port Steward
R. H. Ratto, Mgr. Insurance & Claims

Lines:
INTEROCEAN LINE
KNUTSEN LINE
WEYERHAEUSER LINE
PACIFIC COAST DIRECT LINE
SALEN LINE
AGWILINES, INC.
AMERICAN LIBERTY STEAMSHIP CORP.

INTEROCEAN LINE
(Westfal-Larsen & Co. A/S—Bergen, Norway)

See, INTEROCEAN STEAMSHIP CORP., Agents

ISTHMIAN S. S. CO.
215 Market Street **YUkon 0562**

A. E. Blake, Mgr., Pacific Division
R. G. Sullivan, Oper. Mgr., Pacific Div.
J. J. Jacobs, Traffic Mgr., Pacific Div.
Capt. Lucas, Asst. Marine Supt.
M. S. Toon, Asst. Supt. Eng.
J. Priele, Port Steward

Service To:
Intercoastal, Philippines, China, Netherlands East Indies, French Indo-China, Straits Settlements (Malaya), Hawaiian Islands, India, Ceylon, Burma, Persian Gulf, Egypt, Palestine, Syria, Red Sea.

JOHNSON LINE
(Rederiaktiebolaget Nordstjernan—Stockholm, Sweden)

See, GRACE LINE, Agents

KERR STEAMSHIP COMPANY, INC.
324 Sansome Street **YUkon 0943**

E. Wright, Vice President
A. L. Wise, Traffic Manager

Agents For:
SILVER LINE, LTD., LONDON
SILVER-JAVA PACIFIC LINE
PRINCE-SILVER ROUND WORLD SERVICE
LEIF HOEGH, OSLO
CIA, MARITIMA DE NERVION, BILBAO
NAVIERA AZNAR, S. A., BILBAO

Service To:
Philippine Islands, China, Netherlands East Indies, Straits Settlements, Burma, India, Ceylon, Iraq, Iran (Persian Gulf), South and East Africa Red Sea, Mediterranean and Spanish Ports.

KEYSTONE SHIPPING COMPANY

See, THORLEY & PITT, Agents

KINGSLEY CO. OF CALIF.
(Kingsley Navigation Co.)
260 California Street **SUtter 8156**

R. J. Deremer, Manager

Service To:
CALIFORNIA-BRITISH COLUMBIA

KLAVENESS LINE

See, SUDDEN & CHRISTENSON, Agents
Christian Blom, Pacific Coast Representative To: PACIFIC COAST-ASIATIC SERVICE

KNUTSEN LINE
(Knut Knutsen, O.A.S.—Haugesund, Norway)

See, INTEROCEAN S. S. CORP. and BALFOUR GUTHRIE & CO., LTD., Agents

Service:
Colombia, Ecuador, Peru, Chile, Scotland, Ireland, England.

LATIN-AMERICA LINE

See, J. J. MOORE & CO., INC., Agents

LAURITZEN LINE
(J. Lauritzen—Copenhagen, Denmark)

See, HIND, ROLPH & CO., Agents

LEIF HOEGH, OSLO

See, KERR STEAMSHIP COMPANY, INC., Agents

LOS ANGELES TANKER OPERATORS, INC.

See, GENERAL STEAMSHIP CORP., LTD., Agents

LUCKENBACH GULF STEAMSHIP CO., INC.
100 Bush Street **SUtter 8711**

LUCKENBACH STEAMSHIP CO., INC.
100 Bush Street **SUtter 8711**

V. P. McMurdo, Acting Pacific Coast Mgr.
W. G. Perow, Pacific Coast Marine Supt.
Ira Head Asst. Pacific Coast Marine Supt.
H. F. Clifford, Pacific Coast Auditor
J. T. Bolts, Pacific Coast Purchasing Agent
D. R. O'Neill, Pacific Coast Port Steward
W. H. Conradi, Pier Superintendent
J. H. Weller, Stevedoring Superintendent
F. P. Kenneally, Asst. Stevedoring Supt.

SAN FRANCISCO —

Service To:
North Atlantic Service from Seattle, Portland, Stockton, Oakland - Alameda, San Francisco, Los Angeles Harbor to New York, Philadelphia and Boston.
Gulf Service between Seattle, Portland, Stockton (Eastbound), San Francisco and Los Angeles Harbor—New Orleans, Houston, Mobile and Tampa via Panama Canal

MADRIGAL LINES, INC.
See, C. U. MARTIN, Agents

MARTIN, C. U. **AGENT**
465 California Street **EXbrook 7140**
Line:
THE MADRIGAL LINE

MATSON NAVIGATION CO.
215 Market Street **DOuglas 5233**
Wm. P. Roth, President
F. A. Bailey, Exec. Vice President
S. G. Walton, Vice Pres. & Secretary
Hugh Gallagher, Vice Pres. in Charge of Operations
G. K. Nichols, Vice Pres. in charge of Const. and Repair
R. P. Hasenauer, Treasurer
Kenneth M. Miller, Industrial Relations Mgr.
M. F. Cropley, Freight Traffic Mgr.
Capt. A. G. Townsend, Marine Mgr.
Henry J. Wolters, Port Engineer
A. J. Haring, Service Mgr.
A. M. McKellison, Act. General Purch. Agt.
R. DeGorog, Catering Superintendent
Agents For:
OCEANIC S. S. CO.
Service:
Matson to: Pacific Coast Ports & Hawaiian Islands
Oceanic to: Hawaii, Samoa, Fiji, New Zealand, Australia

McCORMICK STEAMSHIP CO.
See, POPE & TALBOT, INC.

MOORE-McCORMACK LINES, INC.
140 California Street **GArfield 7121**
K. C. Tripp, Pacific Coast Manager
A. P. Smith, Manager, S. F. Office
H. Martin, Port Engineer
R. E. Moon, Port Captain
G. R. Vaio, Purchasing Agent
H. Lindquist, Port Steward
R. M. Despommier, Auditor
H. K. Grady, Western Freight Traffic Mgr.
H. R. Cawsey, Passenger Agent

MOORE, J. J., & CO. **AGENTS**
451 Montgomery Street **GArfield 7480**
H. B. Adams, Vice Pres. and Oper. Mgr.
J. C. Morrison, Exec. Vice President
A. O. Snaider, Freight Traffic Mgr.
Agents For:
LATIN-AMERICAN LINE
(West Coast of South America)
SOUTH AFRICAN DISPATCH LINE
(South Africa)
AUSTRALIAN DISPATCH LINE
(Australia)
ALASKA PACKERS ASSOCIATION

MOSVOLD LINE
See, HOLWAY S. S. CO., Agents

NAVIERA AZNAR, S.A., BILBAO
See, KERR STEAMSHIP COMPANY, INC., Agents

NICOL, R. A., & CO., INC.
See, DE LA RAMA STEAMSHIP CO., INC., THE, Agents

NORTON, LILLY & CO. **AGENTS**
230 California Street **SUtter 3600**
Lines:
AMERICAN MANCHURIAN LINE
ELLERMAN & BUCKNALL S.S. CO., LTD.
AMERICAN SOUTH AFRICAN LINE
UNION SULPHR CO., LTD.
FOSS LAUNCH & TUG CO.

NORWEGIAN AMERICA LINE AGCY., INC.
323 Geary Street

OCEANIC STEAMSHIP CO.
215 Market Street **DOuglas 5233**
See, MATSON NAVIGATION CO., Agents
To:
Hawaii, Samoa, Fiji, New Zealand, Australia.

OLSEN, FRED, LINE AGENCY, LTD.
405 Montgomery Street **EXbrook 2261**
Harald Muller, President
Jens Feragen, Vice Pres.-General Mgr.
M. S. Bannatyne, Secretary-Traffic Mgr.

OLSON, OLIVER J., & CO., INC.
260 California Street **DOuglas 0915**
E. Whitney Olson, President
George L. Olson, Exec. Vice President
Oliver J. Olson, Jr., Secretary
L. E. Phillips, Vice President

OLYMPIC STEAMSHIP CO., INC.
112 Market Street **DOuglas 1468**
J. C. Strittmatter, Exec. Vice Pres.
D. M. Gregory, Director for Traffic
E. H. Johannsen, General Freight Agent
John Berg, Dist. Operating Mgr.
M. A. Johnston, Port Engineer
D. R. McGath, Purchasing Agent
Wm. Gleason, Port Purser
Geo. Stephens, Port Steward

Agents For:
ALASKA TRANSPORTATION CO.
COASTAL STEAMSHIP CO.
Service To:
Complete Pacific Coastwise Service

PACIFIC AMERICAN SHIPOWNERS ASSOCIATION EXbrook 3913
405 Montgomery Street
J. B. Bryan, President
A. Boyd, Secretary-Treasurer

PACIFIC-AUSTRALIA DIRECT LINE
(Transatlantic Rederi A/B—Gothenburg Sweden)
See, GENERAL STEAMSHIP CORP., Agents
Service:
Sydney, Melbourne, Adelaide

PACIFIC ISLANDS TRANSPORT LINE
(Aktieselskabet Thor Dahl, Sandefjord, Norway)
See, GENERAL STEAMSHIP CORP., Agents
Service:
South Seas and New Caledonia

PACIFIC COAST DIRECT LINE
(Weyerhaeuser S. S. Co.—Newark, N.J.)
See, INTEROCEAN STEAMSHIP CORP., Agents

PACIFIC MAIL STEAMSHIP COMPANY
311 California Street EXbrook 8454
R. H. Andersen, President
J. Harold Dollar, Jr., Vice President
J. M. Fisher, Secretary-Treasurer
E. E. Daniels, Marine Supt.
W. Dodge, Jr., Purch. Agent

PACIFIC REPUBLICS LINE
140 California Street GArfield 7121

PACIFIC TANKERS, INC.
433 California Street DOuglas 8616
K. D. Dawson, President
W. T. Sexton, Vice President
Andrew Neilson, General Manager
Arthur A. Layne, Secretary-Treasurer
H. E. Hedrick, Asst. Sec.-Treas.
Allen Cameron, General Supt.
Bert Hale, Superintending Engineer
Capt. Frank J. Morrison, Port Captain
Edward Marks, Purch. Agent
J. Malcolm Baird, Personnel Manager
C. M. Cox, Traffic Manager

PARRY NAVIGATION CO., INC.
112 Pine Street
Chas. A. Perkes, Pacific Coast Manager
Carleton F. Lester, Assistant Manager
Captain R. A. Wood, Marine Superintendent
R. A. Coleman, Superintendent Engineer
Howard H. Greathouse, Purchasing Agent
Thomas J. Taylor, Port Steward
Robert D. Glynn, Port Purser
Corday Hyman, Personnel Mgr. (Ships)
A. L. Weicher, Insurance and Claims
Agents For:
TRANSMARINE NAVIGATION CORP.
AMERICAN EXPORT LINES, INC.
DICHMANN, WRIGHT AND PUGH, INC.

PENINSULAR & ORIENTAL LINE
See, CUNARD WHITE STAR LIMITED, Agents

PIONEER LINE
Pier 5 SUtter 3934
W. G. Westman, Operating Manager
C. R. Escher, Traffic Manager
Service:
San Francisco, Oakland, Alameda, Mare Island Navy Yard, So. Vallejo, Oleum, Selby, Crockett, and other Bay and River Points.

P. L. TRANSPORTATION CO.
100 Bush Street GArfield 1181
See, HAMMOND SHIPPING CO., Agents

POLARIS STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

POPE & TALBOT, INC.
McCORMICK STEAMSHIP DIVISION
461 Market Street DOuglas 2561
Geo. A. Pope, Jr., President
Chas. L. Wheeler, Exec. Vice Pres.
F. C. Talbot, Vice President
Joseph A. Lunny, Vice Pres. & Director of Operations
Jos. L. Paiva, Controller
R. F. Burley, Freight Traffic Mgr.
James S. Brown, Asst. Secretary
M. C. Darr, Auditor
E. C. Elwood, Purch. Agent (Pier 40)
W. S. Lewis, Claims & Insurance
Harry Strittmatter, Terminal Agent (Pier 40)
John Clerico, Port Engineer (Pier 40)
Capt. B. H. Tietjen, Port Captain (Pier 40)
E. H. Harms, Oper. Manager
Agents For:
ALCOA STEAMSHIP CO.
INTERNATIONAL FREIGHTING CORP.
POLARIS STEAMSHIP CO.
PRUDENTIAL STEAMSHIP CO.
SMITH & JOHNSON
J. T. STEVENSON & CO., INC.
STOCKARD STEAMSHIP CO.
UNITED STATES NAVIGATION CO.
WESSAL DUVAL CO.
Presently operating intercoastal service for WSA, with sailings approximately every 18 days. Westbound sailings from Chester and Philadelphia, Baltimore, Norfolk. Eastbound service to Baltimore and Norfolk for general merchandise; also Newark, N. J., and Brooklyn for lumber.
Presently operating monthly sailings from Pacific Coast to Puerto Rico for WSA.
Expect to resume coastwise service for WSA with weekly sailings.

PORT LINE LIMITED
See, CUNARD WHITE STAR LIMITED, Agents

PRINCE LINE
See, FURNESS (PAC.) LTD., Agents

PRINCE-SILVER ROUND WORLD SERVICE
See, KERR STEAMSHIP COMPANY, INC., Agents

PRUDENTIAL STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

QUAKER LINE
See, DE LA RAMA STEAMSHIP CO., INC., THE, Agents

RIVER LINES, THE
Pier 3 SUtter 3880
N. A. Fay, Vice Pres. & Gen. Mgr.
J. H. Anderson, Traffic Mgr.
R. M. Clare, General Agent

RICHFIELD OIL CORPORATION
333 Montgomery Street DOuglas 2815
Lee B. Johnstone, Mgr. Marine Sales

SALEN LINE
See, INTEROCEAN STEAMSHIP CORP., Agents

SAN FRANCISCO BAR PILOTS
Pier 7 DOuglas 5436

SCHAFER BROS. S. S. LINES
1 Drumm Street SUtter 1772
F. W. Elliot, Manager

SHARP, C. F., & CO., INC. AGENTS
230 California Street YUkon 1654
Chester F. Sharp, President
A. V. Rocha, Vice President
A. S. Lonnberg, Manager
Agents For:
IVARIAN LINES
WATERMAN STEAMSHIP CORP.
Service To:
Manila, Hongkong, Shanghai, Singapore, Penang

SHEPARD STEAMSHIP CO.
369 Pine Street EXbrook 6974
F. C. Ninnis, District Manager (Calif.)
Earl Sanders, Calif. Operating Manager
R. V. Howie, Asst. Oper. Manager
J. W. Dopp, Port Captain
C. Branford, Port Engineer
B. A. Bailey, Purchasing Agent
C. Martin, Port Steward
H. Bostwick, Port Accountant

SILVER-JAVA PACIFIC LINE
(Stanley & John Thompson, Ltd.—London & N.Y.; Stoomvaart Maat-chappy — Nederland, Rotterdam)
See, KERR STEAMSHIP CO., INC., and TRANSPACIFIC TRANSPORTATION CO., Agents

SILVER LINE, LTD.
See, KERR STEAMSHIP CO., INC., and FURNESS (Pacific), LTD., Agents

SMITH & JOHNSON
See, POPE & TALBOT, INC., Agents

STANDARD OIL COMPANY OF CALIF.
225 Bush Street SUtter 7700
J. L. Hanna, Vice Pres. in Chg. Mar. Affairs
J. H. McEachern, Mgr. Marine Dept.
A. E. Kihn, Asst. Mgr. Marine Dept.
B. A. Young, Superintending Engineer
M. H. Jaehne, Naval Architect
Capt. J. A. Rumsey, Mar. Supt., Richmond
Capt. A. C. Nelson, Mar. Supt, Estero Bay
Capt. T. W. Peters, Mar. Supt., San Pedro
L. Simonson, Marine Supt., Richmond Beach, Washington
Service:
Pacific Coastwise, Alaska, Hawaiian Islands and Offshore (Private Carriers)

STATES STEAMSHIP CO.
See, DE LA RAMA STEAMSHIP CO., INC., Agents

STEVENSON, J. T., & CO., INC.
See, POPE & TALBOT, INC., Agents

STOCKARD STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

SOUTH AFRICAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

SWAYNE & HOYT, LTD. **AGENT**
215 Market Street
Lines:
CALMAR LINE
GULF PACIFIC LINE

SWEDISH AMERICAN LINE
760 Market Street **GArfield 2811**
Herbert Seebohm, District Manager
Agents For:
GOTA CANAL STEAMSHIP CO.
Service To:
New York—Gothenburg
Canal Passage—Gothenburg—Stockholm

SUDDEN & CHRISTENSEN **AGENTS**
310 Sansome Street **GArfield 2846**
Lines:
ARROW LINE
KLAVENESS LINE
HAMBURG-AMERICAN LINE
Capt. R. O. Demarest, Oper. Manager
Louis Depmann, Port Engineer
C. Olson, Port Captain

TEXAS COMPANY, THE
Hearst Building **GArfield 0728**

THORNLEY & PITT
520 Battery Street **GArfield 3536**
C. J. Madsen
N. C. Unfug
Geo. H. Pitt
Agents For:
KEYSTONE SHIPPING CO.

TIDE WATER ASSOCIATED OIL CO.
79 New Montgomery Street **EXbrook 4800**
William F. Humphrey, Chairman & Pres.
H. B. Haney, Manager of Transportation
H. J. Wilson, Manager, Marine Department
O. Lundin, Asst. Mgr., Marine Department
H. C. Ruf, Chief Engineer
D. L. Rigden, Port Engineer
S. H. Harrison, Asst. Port Engineer
W. E. Kammerer, Vessel Dispatcher
H. Shapiro, Asst. Vessel Dispatcher
F. R. Starrs, Port Steward

TRANSATLANTIC STEAMSHIP CO.
See, GENERAL STEAMSHIP CORP., Agents

TRANSPACIFIC TRANSPORTATION CO.
149 California Street **AGENTS**
YUkon 0786
Cornelius Winkler, President
E. L. Bargones, Vice Pres. & Gen. Mgr.
Harold Taft, Traffic Manager
Lines:
SILVER-JAVA PACIFIC LINE

UNION OIL CO. OF CALIFORNIA
425 First Street **SUtter 1400**

UNION STEAM SHIP CO. OF NEW ZEALAND, LTD.
230 California Street **YUkon 1866**
S. B. Pilcher, Manager
Service To:
New Zealand, Australia & South Seas

UNITED FRUIT CO. **AGENT**
1001 Fourth Street **GArfield 4040**
C. D. Daswell, Pacific Coast Manager
H. P. Champlain, Marine Superintendent
J. T. O'Neill, Purch. Agent
Frank Cook, Freight Agent

UNITED STATES LINES CO.
222 Sansome Street **DOuglas 8680**
K. D. Dawson, Vice President
W. T. Sexton, Pacific Coast Manager
Agent For:
COASTWISE LINE
Service:
Intercoastal and European

UNITED STATES NAVIGATION CO.
See, POPE & TALBOT, INC., Agents

VIKING STEAMSHIP CO.
311 California Street **DOuglas 7729**
Erik Krag, President
H. G. Beadle, Vice President

WATERMAN STEAMSHIP CORP.
See, C. F. SHARP & CO., INC., Agents

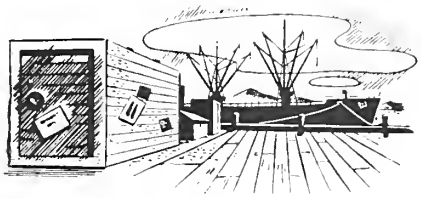
WESSAL DUVAL CO.
See, POPE & TALBOT, INC., Agents

WEST COAST STEAMSHIP LINE
683 Market Street **SUtter 1680**

WESTFAL-LARSEN CO. LINE
See, GENERAL STEAMSHIP CORP., Agents
Service:
Between Pacific Coast and East Coast of South America.

WEYERHAEUSER LINE
(Pacific Coast Direct Line, Inc.; Weyerhaeuser S. S. Co.—Newark, N. J.)
See, INTEROCEAN STEAMSHIP CORP., Agents

WILLIAMS, DIMOND & CO.
215 Market Street **SUtter 0525**



PORTLAND

AGWILINES, INC.
See, INTEROCEAN S. S. CORP., Agents

ALASKA STEAMSHIP CO.
See, LIDDELL & CLARKE, Agents

ALASKA TRANSPORTATION CO.
See, AMERICAN MAIL LINE, LTD., Agents

ALCOA STEAMSHIP CO.
See, McCORMICK S. S. CO., Agents

ALEXANDER & BALDWIN, LTD. **AGENTS**
327 S. W. Pine **ATwater 4386**
R. L. Kingsbury, Manager
Lines:
MATSON NAVIGATION CO.
OCEANIC S. S. CO.
(New Zealand & Australian Service)
INTER-ISLAND STEAM NAVIGATION CO.

AMERICAN EXPORT LINES, INC.
327 S. W. Pine Street
See, AMERICAN MAIL LINE, LTD., Agents

AMERICAN-HAWAIIAN S. S. CO.
Railway Exchange Building **ATwater 8536**
F. N. Mills, District Manager
H. L. Hamilton, Shipping Master
E. L. Graham, Asst. to Dist. Mgr.
W. D. Anderson, Asst. to Dist. Mgr.

AMERICAN MAIL LINE, LTD.
522 Pacific Building **BRoadway 5447**
W. L. Williams, Manager
D. G. Page, Asst. Operating Manager
H. C. Ashton, Asst. Traffic Manager
Miss Irene Neubauer, Asst. Purch. Agent
C. R. Toole, Port Engineer
Agents For:
LYKES BROS. S. S. CO.
HAMMOND SHIPPING CO.
ALASKA TRANSPORTATION CO.
NORTHLAND TRANSPORTATION CO.
OLYMPIC STEAMSHIP CO.
PARRY NAVIGATION CO.
AMERICAN EXPORT LINE
DICHMANN, WRIGHT & PUGH
Service To:
Philippine Islands and China

AMERICAN PRESIDENT LINES, LTD.
1788 Front Avenue

ARROW LINE
Henry Building **ATwater 3316**

BALFOUR, GUTHRIE & CO. LTD.
733 S. W. Oak **AGENTS**
ATwater 9441
D. W. L. MacGregor, President
A. M. Chrystall, Vice Pres.
R. F. Shepherd, Imports
D. S. Cameron, S. S. Dept.
James A. Dick, Marine Insurance
Lines:
DONALDSON LINE
KNUTSEN LINE (S. A. Service)

BARBER STEAMSHIP LINES, INC.
See, COASTWISE (PAC. FAR EAST) LINE, Agents

BLACK DIAMOND STEAMSHIP CORPORATION
See, WILLIAMS, DIMOND & CO., Agents

BULL, A. H., & CO.
See, WILLIAMS, DIMOND & CO., Agents

BURCHARD & FISKEN **AGENTS**
Board of Trade Building **ATwater 9501**
W. D. Hazen, Portland Manager
Lines:
FURNESS LINE
(Furness (Pacific) Limited)
EAST ASIATIC CO.
JAVA PACIFIC LINE
PRINCE LINE

CALIFORNIA-EASTERN LINE, INC.
1010 Washington ATwater 1361
Vancouver, Washington

CANADIAN AUSTRALASIAN LINE
626 S. W. Broadway MAin 0637
E. J. Dahlberg, City Passenger Agent
C. W. Laird, District Freight Agent
626 S. W. Broadway

CANADIAN PACIFIC S. S. CO.
626 S. W. Broadway BRoadway 0637
E. J. Dahlberg, City Pass. Agent
C. W. Laird, D. F. A.

CARPENTER LINE
See, INTEROCEAN S. S. CORP., Agents

CHAMBERLIN, W. R., & CO.
Board of Trade Building BRoadway 0406

COASTWISE (PACIFIC FAR EAST) LINE
1788 N. W. Front Avenue BRoadway 7301
Agents For:
BARBER STEAMSHIP LINES INC.

DECONHIL SHIPPING CO.
Board of Trade Building

DICHMANN, WRIGHT & PUGH
See, AMERICAN MAIL LINE, Agents

DONALDSON LINE
See, BALFOUR, GUTHRIE & CO., LTD., Agents

EAST ASIATIC CO.
See, BURCHARD & FISKEN, INC., Agents

EASTERN STEAMSHIP LINES, INC.
See, WILLIAMS, DIMOND & CO., Agents

FRENCH LINE
Lewis Building ATwater 7214

FRUIT EXPRESS LINE
See, PAGE BROTHERS, INC., Agents

FURNESS (PACIFIC) LIMITED
See, BURCHARD & FISKEN, INC., Agents

GENERAL PETROLEUM CORP.
General Petroleum Bldg. BEacon 7101
11th and Alder Streets
E. C. Nelson, Dist. Mgr., Marine Sales
B. F. Ball, Resident Manager

GENERAL STEAMSHIP CORP., LTD.
Lewis Building AGENTS
ATwater 7214
V. A. Driscoll, District Manager
J. D. Lyman, Traffic Dept.
E. E. Anderson, District Passenger Agent
D. B. Carson, Purch. Agent
Walter Smith, Traffic Rep.
Cox Birkholm, Traffic Rep.

GRACE LINE
See, LIDDELL & CLARK, Agents

GRIFFITH TRANSPORT COMPANY
614 Porter Building ATwater 7329
E. J. Griffith, President
R. D. Magill, Vice President
W. A. Allen, Secty.
R. E. Tetherow, Treas.

HAMMOND SHIPPING CO.
See, AMERICAN MAIL LINE, LTD., Agents

HILLCONE STEAMSHIP CO.
Board of Trade Building

INTER-ISLAND STEAM NAVIGATION CO.
See, ALEXANDER & BALDWIN, LTD., Agents

INTEROCEAN LINE
See, INTEROCEAN S. S. CORP., Agents

INTEROCEAN STEAMSHIP CORP.
Board of Trade Building AGENTS
BEacon 4174
A. C. Nielsen, District Manager
Lines:
INTEROCEAN LINE
KNUTSEN LINE
PACIFIC COAST DIRECT LINE
WEYERHAEUSER LINE
CARPENTER LINE
AGWILINES, INC.

ISTHMIAN S. S. CO.
1908 N. W. Front Street BEacon 3126
E. G. Shields, Manager
Service to (From Pacific Coast):
Intercoastal (Atlantic and U. S. Gulf Ports), Philippines, China, Netherlands East Indies.
From Atlantic and U. S. Gulf:
Philippines, China, French Indo China, Netherlands East Indies, Straits Settlements (Malaya), Hawaiian Islands, India, Ceylon, Burma, Persian Gulf, Egypt, Palestine, Syria, Red Sea.

JAVA PACIFIC LINE
See, BURCHARD & FISKEN, INC., Agents

JOHNSON LINE
See: LIDELL & CLARK, Agents

KEYSTONE SHIPPING COMPANY
Board of Trade Building

KLAVENESS LINE
Henry Building ATwater 3316

KNUTSEN LINE (S. A. SERVICE)
See, BALFOUR, GUTHRIE & CO., LTD., and INTEROCEAN S. S. CORP., Agents

LIDELL & CLARK AGENTS
Board of Trade Building ATwater 8508
Geo. G. Clarke, President
Roy Albers, Traffic Manager
Lines:
JOHNSON LINE
ALASKA STEAMSHIP CO.
GRACE LINE

LOS ANGELES TANKER OPERATORS, INC.
Lewis Building ATwater 7214

LUCKENBACH STEAMSHIP CO., INC.
1201 Public Service Building ATwater 8371
Also: Luckenbach Gulf Steamship Co., Inc.
R. E. Piper, District Manager
A. M. Hendrickson, Dist. Claim Agent
H. C. Chadbourne, Cashier
R. R. Steele, Marine Supt.
Service To:
North Atlantic — New York, Boston, Philadelphia, Providence
Gulf—New Orleans, Mobile, Houston, Tampa

LYKES BROS. S. S. CO.
See, AMERICAN MAIL LINE, LTD., Agents

McCORMICK S. S. CO.
618 N. W. Front ATwater 9161
H. Lueddemann, Vice Pres. & No'west Mgr.
Cyrus T. Walker, Asst. to Vice Pres.
Kit C. Conyers, Dist. Manager
W. E. Whitcomb, Dist. Accountant
C. E. Collins, N.W. Oper. Manager
Agents For:
ALCOA STEAMSHIP CO.
UNITED FRUIT COMPANY

MARINE TRANSPORT LINES, INC.
See, WILLIAMS, DIMOND & CO., Agents

MATSON NAVIGATION CO.
See, ALEXANDER & BALDWIN, LTD., Agents

MOORE, J. J., & CO. AGENTS
918 Board of Trade Bldg. ATwater 8201
H. C. Neilson, Manager
Hazel Zuck, Traffic
Agents For:
AUSTRALIAN DISPATCH LINE
SOUTH AFRICAN DISPATCH LINE
LATIN-AMERICA LINE
CANADIAN TRADING COMPANY, LTD.
Service To:
South Africa, Australia, West Coast South America

MOORE McCORMACK LINES, INC.
Behnke-Walker Building ATwater 7241
E. F. Sweeney, Manager
R. Orndulf, Jr., Operating Manager
A. J. Gartland, Purchasing Agent

MORAN TOWING & TRANSPORTATION CO.
See, WILLIAMS, DIMOND & CO., Agents

NORPAC SHIPPING CO., INC.
Lewis Building AGENTS
BEacon 6207
James McDonald, President
A. H. Gattie, Vice President
Agents For:
ROYAL MAIL LINES, LTD.
HOLLAND AMERICA LINE
Service To:
United Kingdom and Continent

NORTHLAND TRANSPORTATION CO.
See, AMERICAN MAIL LINE, LTD., Agents

NORTON LILLY & CO.
Board of Trade Bldg. BRoadway 0683

OCEANIC S. S. Co.
(New Zealand and Australia Service)
See, ALEXANDER & BALDWIN, LTD., Agents

OLSON, OLIVER J., & CO.
1020 N. W. Front

OLYMPIC STEAMSHIP CO.
See, AMERICAN MAIL LINE, LTD., Agents

PACIFIC COAST DIRECT LINE
See, INTEROCEAN S. S. CORP., Agents

PAGE BROTHERS, INC. AGENTS
224-226 Board of Trade Bldg. BEacon 4811
Harald Carl, Owner
Agents For:
FRUIT EXPRESS LINE

PORTLAND —

PARRY NAVIGATION COMPANY
See, AMERICAN MAIL LINE, LTD., Agents

PRINCE LINE, LTD.
See, BURCHARD & FISKEN, INC., Agents

RICHFIELD OIL CORPORATION
Linnton

ROBIN LINE (Seas Shipping Co.)
See, WILLIAMS, DIMOND & CO., Agents

ROUNTREE, W. J., CO., INC.
See, WILLIAMS, DIMOND & CO., Agents

ROYAL MAIL LINES, LTD.
See, NORPAC SHIPPING CO., INC., Agents

SEAS SHIPPING CO. (Robin Line)
See, WILLIAMS, DIMOND & CO., Agents

SHEPARD STEAMSHIP CO.
Builders Exchange Bldg. ATwater 9378
J. T. Cornell, N. W. Operating Manager

SOUTH ATLANTIC STEAMSHIP LINE
See, WILLIAMS, DIMOND & CO., Agents

STEEB, J. T., & CO., INC. AGENTS
Board of Trade Building

SUDDEN & CHRISTENSON, INC.
Henry Building ATwater 3316

TEXAS COMPANY, THE
3640 N. W. St. Helens
Service To:
Portland, Ore.; Vancouver, Wash.

TIDE WATER ASSOCIATED OIL CO.
Pittock Block

TRANSATLANTIC S. S. CO., LTD.
Lewis Building ATwater 7214

UNION OIL CO. OF CALIFORNIA
Yeon Building

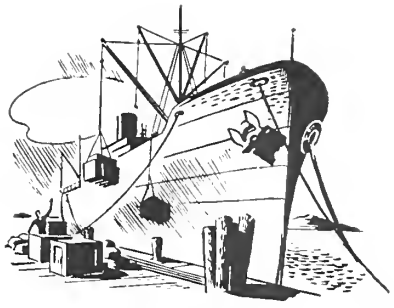
UNITED FRUIT COMPANY
See, McCORMICK S. S. CO., Agents

WEYERHAEUSER LINE
See, INTEROCEAN S. S. CORP., Agents

WICKERSHAM, W. H., & CO.
Board of Trade Bldg. ATwater 3178

WILLIAMS, DIMOND & CO.
Railway Exchange Building ATwater 8536
F. N. Mills, District Manager
W. D. Anderson, Asst. to District Mgr.
E. L. Graham, Asst. to District Mgr.
H. L. Hamilton, Shipping Master
E. F. Weiss, Stevedore Superintendent
Agents For:
BLACK DIAMOND STEAMSHIP CORP.
A. H. BULL & CO.
EASTERN STEAMSHIP LINES, INC.
MARINE TRANSPORT LINES, INC.
MORAN TOWING & TRANSPORTATION CO.
ROUNTREE, W. J., CO., INC.
SEAS SHIPPING CO. (Robin Line)
SOUTH ATLANTIC STEAMSHIP LINE
WILMORE STEAMSHIP CO.

WILMORE STEAMSHIP CO.
See, WILLIAMS, DIMOND & CO., Agents



SEATTLE

AGWILINES, INC.
See, INTEROCEAN S. S. CORP., Agents

ALASKA PACKERS ASSOCIATION
See, J. J. MOORE & CO., Agents

ALASKA STEAMSHIP CO.
Piers 50 and 51 MAin 4530
Pier 50:
E. W. Skinner, President
Lawrence Bogle, Vice President
L. W. Baker, Vice Pres. and Gen. Mgr.
H. N. Peterson, Passenger Traffic Mgr.
Pier 51:
J. D. Nelson, Freight Traffic Mgr.
W. E. Brown, Superintendent
M. J. Wilcox, Asst. Superintendent
C. O. Nelson, Purch. Agent
W. C. Hubbard, Port Steward
Capt. C. N. Goodwin, Port Captain
M. W. Felton, Port Engineer
Service To:
All Alaska

ALASKA TRANSPORTATION CO.
Pier 58 MAin 7477
A. S. Perkins, Chairman of the Board
J. A. Talbot, President
A. H. Link, Treasurer
S. J. Swanson, Vice Pres. & Gen. Mgr.
J. Hearing, Superintendent
T. J. Brinck, Comptroller
J. K. Helmer, Purchasing Agent
Service To:
Alaska

ALCOA STEAMSHIP CO.
See, McCORMICK S. S. CO., Agents

ALEXANDER & BALDWIN, LTD.
814-2nd Avenue MAin 3677
C. B. Warren, Manager
M. McKinstry, Asst. Manager
E. J. Wolfe, Freight Traffic Manager
H. M. Goodfellow, Purchasing Agent
Agents For:
MATSON NAV. CO.

AMERICAN-HAWAIIAN STEAMSHIP CO.
1305 Vance Building ELiot 8120
Seattle 1, Washington
H. M. Burke, District Manager
Service:
Intercoastal

AMERICAN MAIL LINE, LTD.
740 Stuart Building SEneca 4400
A. R. Lintner, Pres. & Gen. Mgr.
G. J. Ackerman, Oper. Manager
F. H. Howard, Supt. Engineer
Capt. A. F. Raynaud, Port Captain
R. B. Bush, Comptroller & Treasurer
H. T. Krull, General Freight Agent
S. E. Fleming, Purch. Agent
W. D. Klontz, Port Steward
Service To:
China and Philippines; 3 Sailings Monthly from Columbia River, Puget Sound, and Vancouver, B. C.

AMERICAN PRESIDENT LINES, LTD.
See, COASTWISE (PAC. FAR EAST) LINE, Agents

ANGLO CANADIAN SHIPPING CO., LTD.
See, INTERNATIONAL SHIPPING CO., INC., Agents

ARROW LINE
See, SUDDEN & CHRISTENSON, INC., Agents

BALFOUR, GUTHRIE & CO., LTD. AGENTS
Dexter Horton Building ELiot 1464
Lines:
DONALDSON LINE
KNUTSEN LINE (S. A. Service)

BERGER, HEINIE (owner)
BERGER DISTRIBUTING CO.
66 Marion Street MAin 6340
Heinie Berger, Owner
H. A. Schurman, Seattle Agent
Service To:
Seattle to Cook Inlet Ports and Anchorage; also, service between Cook Inlet Ports and Charter Work.

BLIDBERG-ROTHCHILD CO., INC.
See, INTERNATIONAL SHIPPING CO., INC., Agents

BLUE FUNNEL LINE
See, DODWELL & CO., Agents

BLUE STAR LINE, INC.
Northern Life Tower SEneca 1050
E. A. Gilbert, General Manager
C. E. Greene, General Freight Agent
Agents For:
BLUE STAR LINE, LTD.
LONDON, ENGLAND
Service To:
Liverpool, Glasgow, London, Newcastle, Hull, Dublin, Havre, Rotterdam.

BORDER LINE TRANSPORTATION CO., THE
427 Colman Building ELiot 0145
Guy F. Dodwell, President
R. A. Tinling, Vice Pres. and Mgr.
W. H. Hayden, Secretary
David B. Fairley, Treasurer
Agents For:
BRITISH COLUMBIA STEAMSHIPS, LTD.

BRITISH COLMBIA STEAMSHIPS, LTD.
See, BORDER LINE TRANSPORTATION CO., THE, Agents

BURCHARD & FISKEN AGENTS
Exchange Building MAin 7420
H. W. Burchard, President
L. J. Kenevan, Traffic Manager
Agents For:
FURNESS (PACIFIC) LTD.
JAVA PACIFIC LINE
PRINCE LINE

CANADIAN AUSTRALASIAN LINE
Agents:
CANADIAN PACIFIC S. S. CO.
1320-4th Avenue MAin 6275
A. J. Mahon, Gen. Agt., Passenger Dept.
E. M. Phelps, District Freight Agent
560 Stewart Building

CANADAIAN NATIONAL S. S. CO., LTD.
1329 - 4th Ave. (Pass. Dept.), MAin 4906
(Frt. Dept.), MAin 0971
J. F. McGuire, Genl. Pass. Agent
O. K. Daly, Genl. Freight Agent
Service To:
Powell River — Ocean Falls; Prince Rupert—Ketchikan

CANADIAN PACIFIC S. S. CO.
1320-4th Avenue MAin 6275
Agents For:
CANADIAN AUSTRALASIAN LINE

CARPENTER LINE
See, INTEROCEAN S. S. CORP., Agents

COASTWISE (PACIFIC FAR EAST) LINE
Pier 24 ELiot 1924
Seattle 4, Washington
C. L. Dodd, General Agent
Agents For:
U. S. LINES
AM. WEST AFRICAN LINE
PACIFIC TANKERS, INC.
AMERICAN PRESIDENT LINES.

COASTWISE STEAMSHIP & BARGE CO., INC.
See, JAMES GRIFFITHS & SONS, INC., Agents

COASTWISE STEAMSHIP & BARGE CO., LTD.
See, JAMES GRIFFITHS & SONS, INC., Agents

DECONHIL SHIPPING COMPANY
See, J. T. STEEB & CO., INC., Agents

DE LA RAMA STEAMSHIP CO., INC., THE
See, INTERNATIONAL SHIPPING CO., INC., Agents

DODWELL, LTD. AGENTS
427 Colman Building ELiot 0145
R. A. Tinling, General Mgr. (Pacific Coast)
Guy F. Dodwell, Asst. Gen. Mgr. (P. Coast)
Lines:
BLUE FUNNEL LINE
BORDER LINE TRANSP. CO.
J. & C. HARRISON, LTD.

DONALDSON LINE
See, BALFOUR, GUTHRIE & CO., Agents

FRUIT EXPRESS LINE
See, INTERNATIONAL PACIFIC COAST CORP., Agents

FURNESS (PACIFIC) LTD.
See, BURCHARD & FISKEN, Agents

GENERAL PETROLEUM CORP. OF CALIF.
(a Socony Vacuum Company)
Dexter-Horton Building
Service: Coastwise, Worldwide

GENERAL STEAMSHIP CORP., LTD.
553 Stuart Building MAin 4701
R. K. Brown, Jr., Local Manager
Earl M. Gall, Operating Dep't.
V. S. Benson, Traffic Dept.
Agents for:
PACIFIC ISLANDS TRANSPORT LINE
TRANSATLANTIC S. S. CO., LTD.
WESTFAL-LARSEN CO. LINE
FRENCH LINE
KERR S. S. CO.
LOS ANGELES TANKER OPERATORS, INC.

GIRDWOOD SHIPPING CO. AGENTS
Northern Life Tower ELiot 1972
Line:
LAURITZEN LINE
Service To:
Casablanca, Marseille, Tunis, Alexandria, Haifa.

GRACE, W. R., & CO. AGENTS
408 White Building SEneca 4300
W. D. Vanderbilt, Manager
Lines:
GRACE LINE
JOHNSON LINE
To:
Mexico, Central America, Panama, Colombia, Ecuador, Peru, Bolivia, Chile.

GRIFFITHS, JAMES & SONS, INC.
914 Second Avenue MAin 3340
Seattle 4, Washington
James F. Griffiths, Exec. Vice Pres.
F. J. McDowell, Vice Pres. & Gen. Mgr.
J. D. McMasters, Secretary
J. L. Sweetin, Marine Superintendent
E. L. Mottley, Asst. Secty.
J. E. Copeland, Mgr., Claims and Insurance
H. R. Davis, Executive Assistant
L. Wuthenow, Purchasing Agent
J. W. Tellgren, Port Steward
Agents For:
COASTWISE STEAMSHIP & BARGE CO., INC.
GRIFFITHS STEAMSHIP CO.
COASTWISE STEAMSHIP & BARGE CO., LTD.
Service To:
Pacific Coastwise and Offshore Ports

GRIFFITHS STEAMSHIP COMPANY
See JAMES GRIFFITHS & SONS, INC., Agents

HARRISON, J. & C., LTD.
See DODWELL, LTD., Agents

HILLCONE STEAMSHIP CO.
See J. T. STEEB & CO., INC., Agents

INTERNATIONAL FREIGHTING CORP.
See McCORMICK S. S. CO., Agents

INTERNATIONAL PACIFIC COAST CORP.
Skinner Building AGENTS
SEneca 2992
Lines:
FRUIT EXPRESS LINE

INTERNATIONAL SHIPPING CO., INC.
Steamship Agents & Chartering Brokers
Arctic Bldg. SEneca 1676
A. W. Kinney, Pres. & Mgr.
F. I. Nystrom, Jr., Oper. Mgr.
F. B. Hancock, Purch. Agt.
R. M. Malen, Auditor
McGinitie & McDonald, Port Engrs.
Agents For:
ANGLO CANADIAN SHIPPING CO'Y. LTD.
BLIDBERG ROTHCHILD CO. INC.
FRED OLSEN LINE
MERCHANTS & MINERS TRANSPORTATION CO.
J. H. WINCHESTER & CO.
W. R. CHAMBERLIN & CO.
NORTH PACIFIC SHIPPING CO., LTD.
PACIFIC ATLANTIC STEAMSHIP CO.
SIEGFRIED OLSEN SHIPPING CO.
TATHAM BROMAGE & CO.
WILLIAM J. ROUNDTREE CO.
STATES MARINE CORPORATION
DE LA RAMA STEAMSHIP CO.
R. A. NICHOL & CO.
Service To:
U. K. & Norway
Tramp Service

INTEROCEAN S. S. CORP. AGENTS
Dexter Horton Building ELiot 7014
C. Damon, Manager
Lines:
U.S.A. WAR SHIPPING ADMINISTRATION
INTEROCEAN LINE
KNUTSEN LINE
WEYERHAEUSER LINE
PACIFIC COAST DIRECT LINE
CARPENTER LINE
AGWILINES, INC.

ISTHMIAN S. S. CO.
White Bldg.
W. J. Schreter, Mgr.
M. M. Corbit, Traf. Mgr.
Service To:
Intercoastal, Philippines, China, Netherlands East Indies, French Indo-China, Straits Settlements (Malaya), Hawaiian Islands, India, Celon, Burma, Persian Gulf, Egypt, Palestine, Syria, Red Sea

JAVA PACIFIC LINE
See BURCHARD & FISKEN, Agents

JOHNSON LINE
See W. R. GRACE & CO., Agents

KEYSTONE SHIPPING COMPANY
See J. T. STEEB & COMPANY, INC., Agents

KLAVENESS LINE
See SUDDEN & CHRISTENSON, INC., Agents

KNUTSEN LINE (S. A. Service)
See BALFOUR, GUTHRIE & CO., Agents and INTEROCEAN S. S. CORP., Agents

LAURITZEN LINE
See GIRDWOOD SHIPPING CO., Agents

LOS ANGELES TANKER OPERATORS, INC.
See GEN'L. STEAMSHIP CORP., Agents

LUCKENBACH GULF S. S. CO., INC.
2902 Smith Tower ELiot 1208
H. E. Rhoda, Dist. Mgr.
R. R. Garland, Ass't. Dist. Mgr.
E. S. Ramey, Mgr. Eng. Dept.
A. J. Morrill, Dist. Marine Supt.
W. Guthrie, Wharfinger
E. Basel, Cashier
Service To:
Houston, New Orleans, Mobile, Tampa

LUCKENBACH S. S. CO., INC.
2902 Smith Tower **ELiot 1208**
Service To:
Boston, Camden, Philadelphia, Brooklyn

McCORMICK S. S. CO.
Pier 48 **ELiot 4630**
E. J. Barrington, District Mgr.
Capt. John Lass, Dist. Oper. Mgr.
F. M. Lawson, Dist. Accountant
A. L. Arvidson, Ass't. Dist. Opr. Mgr.
J. C. Harper General Freight Agent
H. J. Thompson, Dist. Pur. Agent
Agents For:
ALCOA SS CO.
BERNUTH LEMBCKE CO.
INTERNATIONAL FREIGHTING CORP.
SMITH & JOHNSON
PRUDENTIAL STEAMSHIP CORP.
POLARUS STEAMSHIP COMPANY
SPRAGUE STEAMSHIP COMPANY
STOCKARD STEAMSHIP CORP.
U. S. NAVIGATION CO.
WESSEL DUVAL & CO., INC.
Service To:
Norfolk, Baltimore, Philadelphia

MATSON NAVIGATION CO.
814 - 2nd Avenue Bldg. **MAin 3677**

MOORE, J. J., & CO. **AGENTS**
Empire Building
Agents For:
ALASKA PACKERS ASSOCIATION
LATIN AMERICA LINE
SOUTH AFRICA DISPATCH LINE
AUSTRALIAN DISPATCH LINE

MOORE-McCORMACK LINES, INC.
Dexter Horton Building **ELiot 2732**
C. J. Gravesen, Manager
W. P. Lyman, Traffic Manager
F. W. Sayles, Operating Manager
M. A. Fowler, Purchasing Agent
Agents For:
W. S. A.
ALL U.S.S.R. VESSELS
Service To:
Carribbean & East Coast So. America

NORTHLAND TRANSPORTATION CO.
Pier 56 **MAin 4600**

NORTH PACIFIC SHIPPING CO., LTD.
See INTERNATIONAL SHIPPING CO., INC., Agents

NORTON LILLY & CO.
Smith Tower **ELiot 6840**

FRED OLSEN LINE
See INTERNATIONAL SHIPPING CO., INC., Agents

OLYMPIC STEAMSHIP CO., INC.
Pier 57 **MAin 4520**
E. C. Bentzen, President
Geo. Van Waters, Vice President
Eric A. Johnston, Vice President
E. L. Skeel, Secretary
Nat S. Rogers, Treasurer
G. S. Cleverdon, Comptroller
Capt. C. E. Gannon, Marine Supt.
M. M. Stewart, Exec. Ass't.
G. R. Seefeldt, Operating Manager
H. C. Wahlquist, Paymaster
A. Northrup, Purchasing Agent
F. J. Ewers, Ass't. Frt. Traffic Mgr.
E. S. MacDonald, Mgr. Claims & Insurance
A. R. Palmer, Port Steward
Agents For:
BURNS S. S. CO.
SHEPARD S. S. CO.

PACIFIC-ATLANTIC S. S. CO.
See INTERNATIONAL SHIPPING CO., INC. Agents

PACIFIC COAST DIRECT LINE
See INTEROCEAN S. S. CORP., Agents

PACIFIC ISLANDS TRANSPORT LINE
See GENERAL S. S. CORP., LTD., Agents

PRINCE LINE
See BURCHARD & FISKEN, Agents

PUGET SOUND FREIGHT LINES
Canadian National Dock **ELiot 1600**
Clarence H. Carlander, President
George Foss, Vice President
Edith R. Lovejoy, Secretary-Treasurer

RICHFIELD OIL CORPORATION
Harbor Island Marine Terminal

ROYAL MAIL LINES, LTD.
1731 Exchange Building **ELiot 4944**
C. W. Varney, Pacific Coast Manager
K. K. Barker, Traffic Manager
Service To:
U. K. & Continent, from British Col., and U. S. Pacific Coast Ports

SANTA ANA STEAMSHIP CO.
Colman Building **MAin 0583**

STEEB, J. T., & CO., INC. **AGENTS**
410 Insurance Building **ELIOT 1891**
Agents For:
DECONHIL SHIPPING CO.
HILLCONE STEAMSHIP CO.
KEYSTONE SHIPPING COMPANY
W. H. WICKERSHAM & CO.

SUDDEN & CHRISTENSON, INC.
Arctic Building **AGENTS**
Seattle, Washington **MAin 1194**
S. H. Guenther, Dist. Mgr.
H. B. Blair, Operating Mgr.
R. W. Love, Office Mgr.
Lines:
ARROW LINE
KLAVENESS LINE

SWEDISH AMERICAN LINE
White Building **MAin 5640**

TEXAS COMPANY, THE
Republic Building

TRANSATLANTIC S. S. CO., LTD.
Stuart Building **MAin 4701**

UNION OIL CO. OF CALIFORNIA
2901 Western

UNITED FRUIT COMPANY
1053 Empire Building
J. C. Hickey, Manager

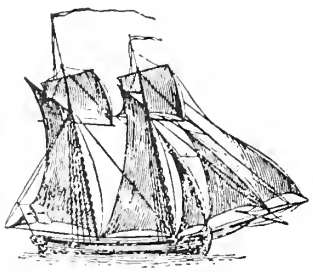
U.S.S.R. VESSELS
Agents:
MOORE-McCORMACK LINES, INC.
Dexter Horton Bld. ELiot 2732

WESTFAL-LARSEN CO. LINE
Agents:
GENERAL S. S. CORP.
553 Stuart Bldg. MAin 4701

WEYERHAEUSER LINE
Agents:
INTEROCEAN S. S. CORP.
Dexter Horton Bldg. ELiot 7014

WICKERSHAM & CO., W. H.
Agents:
J. T. STEEB & CO., INC.
410 Insurance Bldg. ELiot 1891

WILLIAMS, DIMOND & CO.
Vance Building **ELiot 8120**
H. M. Burke, Agent
Agents For:
SEAS SHIPPING CO.
MARINE TRANSPORT LINES
A. H. BULL & CO.
MORAN TOWING & TRANSPORTATION CO.
SOUTH ATLANTIC S. S. CO.
EASTERN S. S. LINES
WILMORE S. S. CO.
Service To:
World Ports



VANCOUVER

ALASKA STEAMSHIP CO.
See: CANADIAN BLUE STAR LINE, LTD., Agents

AMERICAN-HAWAIIAN S. S. CO.
See: CANADA SHIPPING CO., LTD., Agents

AMERICAN MAIL LINE
See: CANADIAN BLUE STAR LINE, LTD., Agents

AMERICAN PRESIDENT LINES
See: CANADIAN BLUE STAR LINE, LTD., Agents

ANCHOR LINE
See: CANADIAN PACIFIC STEAMSHIPS, LTD., Agents

ANGLO CANADIAN SHIPPING CO., LTD.
Marine Building **AGENTS**
MArine 4221
A. B. Graham
L. S. Richardson
Managing Operators of Park S. S. Co. Vessels
Service:
General chartering and berth service to world ports as inducement offers.

AUSTRALIA-BRITISH COLUMBIA LINE
Managers:
CANADIAN TRANSPORT CO., LTD.

B. C. STEAMSHIPS, LTD.
See: BRITISH COLUMBIA STEAMSHIP LTD.

BALFOUR, GUTHRIE & CO. (Canada), LTD.
744 W. Hastings **AGENTS**
MArine 0211

H. S. Cove, Manager
G. S. Jones, Manager, S. S. Dept.

Lines:
KLAVENESS LINE
DONALDSON LINE
KNUTSEN LINE—SOUTH AMERICAN SERVICE
MOORE-McCORMACK LINES, INC.

Klaveness Line To:
Manila, Hong Kong, Dutch East Indies, Straits Settlements.

Donaldson Line To:
United Kingdom Ports.

Knutsen Line To:
West Coast-South America.

Moore-McCormack Lines, Inc., To:
East Coast South America, West Indies.

BERVIN S. S. CO.
325 Howe **PAcific 2921**

C. D. Vincent, Manager

BLUE FUNNEL LINE

See: DODWELL & CO., LTD., Agents

BLUE STAR LINE, INC.

See: PACIFIC-ATLANTIC S.S. CO., Agents
See: DODWELL & CO., LTD., Agents

BORDER LINE TRANSPORTATION CO.

See: DODWELL & CO., LTD., Agents

BRITISH COLUMBIA STEAMSHIPS, LTD.
NORTHERN STEAMSHIPS, LTD.
470 Granville

E. B. Clark, President
Capt. H. J. C. Terry, Manager
Alexander Wood, Gen. Frt. Agt.

Service To:
B. C. Coast Points
Queen Charlotte Islands
West Coast Vancouver Island
Limited Service S. E. Alaska

BRITISH COLUMBIA-UNITED KINGDOM LINE

Managers:
CANADIAN TRANSPORT CO., LTD.

CANADA SHIPPING CO., LTD.
355 Burrard **PAcific 0131**

E. F. Riddle, Manager

Agents For:
INTEROCEAN LINE
KNUTSEN LINE
AMERICAN-HAWAIIAN S. S. CO.
WEBSTER LINE

Managing Operators:
PARK STEAMSHIP CO., VESSELS

CANADIAN AUSTRALASIAN LINE, LTD.
999 W. Hastings **PAcific 3271**

P. B. Cooke, Gen. Manager
T. W. Brawn, Asst. Manager

Agents For:
PARK STEAMSHIP CO., LTD.
UNION STEAM SHIP CO. OF NEW ZEALAND, LTD.

CANADIAN BLUE STAR LINE (1940) LTD.
355 Burrard **PAcific 2157**

Gec. F. Wales, British Columbia Dist. Mgr.

Agents For:
BLUE STAR LINE, LTD. (LONDON)
AMERICAN PRESIDENT LINES
AMERICAN MAIL LINE
ALASKA STEAMSHIP CO.

Service To:
Round the World and Far East, Orient, Alaska, United Kingdom, Continent, South America.

CANADIAN NATIONAL STEAMSHIPS
Foot of Main **MArine 9112**

W. T. Moodie, General Superintendent
G. A. McMillan, Superintendent

Ship's Officers:
Capt. E. B. Caldwell
Capt. N. MacLean
Chief Engineer, A. Monro
Chief Engineer, R. P. Williams

Service To:
Vancouver, Powell River, Ocean Falls, Prince Rupert. Ketchikan.

Agents For:
CANADIAN NATIONAL S. S. CO., LTD.

CANADIAN PACIFIC STEAMSHIPS, LTD.
Pier BC **PAcific 2212**

J. J. Forster, General Passenger Agent

Agents For:
ANCHOR LINE

CANADIAN TRANSPORT CO., LTD.
837 W. Hastings **PAcific 3511**

H. A. Stevenson, Managing Director
A. L. Palmer, Assistant Manager
J. C. Cunningham, Marine Superintendent

Managing Operators For:
PARK STEAMSHIP CO., LTD.

Service To:
United Kingdom, Australia, New Zealand, South Africa and India, China, Mexico

Managers For:
VANCOUVER-WEST INDIES LINE
To Trinidad, Barbados and other W. I. ports.
VANCOUVER-ST. LAWRENCE LINE
To: Between British Columbia and Eastern Canadian ports.
AUSTRALIA - BRITISH COLUMBIA
To: Between British Columbia and Australia.
BRITISH COLUMBIA - UNITED KINGDOM
To: From Pacific Coast ports to United Kingdom.

CARPENTER LINE

See: W. R. CARPENTER OVERSEAS SHIPPING, LTD.

CARPENTER W. R. OVERSEAS SHIPPING, LTD.
Foot of Dunlevy **HAstings 4177**

Agent:
W. R. CARPENTER (CANADA) LTD.

E. R. Palfreyman, Manager

Service To:
Australia, New Zealand and Pacific Islands.

COASTWISE S. S. & BARGE CO., LTD.
510 W. Hastings **MArine 0731**

P. A. Curry, Manager

CUNARD WHITE STAR LINE, LTD.
626 W. Pender **MArine 2842**

C. A. Whitelock, Manager
Mrs. C. B. Colwell, Asst. Mgr.

Agents For:
CUNARD WHITE STAR, LIMITED
DONALDSON ATLANTIC LINE

Service To:
From Montreal, New York, Boston, Halifax, St. John, to United Kingdom ports.

DE LA RAMA STEAMSHIP CO., INC.

SEE: PACIFIC-ATLANTIC S. S. CO., Agents

DINGWALL COTTS & CO., LTD. **AGENTS**
486 Howe Street **PAcific 3235**

F. J. Pickett, Manager

Agents For:
SWAYNE & HOYT, LTD.
OCEANIC & ORIENTAL NAVIG. CO.
SILVER JAVA PACIFIC LINE
SUN SHIPPING CO.
WALTER RUNCIMAN & CO., LTD.
REARDON-SMITH LINE

DODWELL & CO., LTD.
Marine Building **PAcific 9242**

Guy F. Dodwell, Asst. Gen. Mgr. (Seattle)
J. Henry Davidson, Asst. Mgr.

Agents For:
BLUE FUNNEL LINE
BORDER LINE TRANSPORTATION CO.

DONALDSON ATLANTIC LINE

See: CUNARD WHITE STAR LINE, LTD., Agents

DONALDSON LINE

See: BALFOUR, GUTHRIE & CO., (CANADA) LTD., Agents

EAST ASIATIC CO.

See: B. L. WALTON JOHNSON CO., LTD., Agents

EMPIRE SHIPPING CO., LTD. **AGENTS**
966 W Hastings **PAcific 7121**

Agents For:
GENERAL S. S. CORP., LTD.
WESTFAL-LARSEN CO. LINE
TRANSATLANTIC S. S. CO., LTD.
SIMPSON, SPENCE & YOUNG
PACIFIC ISLAND TRANSPORT LINE

Operators:
PARK STEAMSHIP CO. VESSELS
F. H. Clendenning, President
F. C. Garde, Vice Pres.
E. T. Clendenning, Manager
H. W. Furniss, European and South American Services

FOREIGN TANKSHIP CORPORATION

See: B. L. WALTON JOHNSON CO., LTD., Agents

FRUIT EXPRESS LINE

See: B. W. GREER & SON, LTD., Agents

FURNESS (PACIFIC) LTD. **AGENTS**
Marine Building **PAcific 6141**

Capt. H. F. Harrison, Manager

Agents For:
FURNESS LINE
FURNESS WITHY & CO., LTD.

GENERAL STEAMSHIP CORP., LTD.

See: EMPIRE SHIPPING CO., LTD., Agents

GRACE LINE

See: C. GARDNER JOHNSON, LTD., Agents

GREER, B. W., & SON, LTD. **AGENTS**

B. W. Greer, President
J. A. Barker, Vice President
W. B. Davidson, Secretary

Agents For:
FRUIT EXPRESS LINE
ISTHMIAN S. S. LINE

GRIFFITHS, JAMES & SONS

See: PACIFIC-ATLANTIC S. S. CO., Agents

HOLLAND AMERICA LINE

See: ROYAL MAIL LINES, LTD., Agents

IMPERIAL OIL LTD.

See: B. L. WALTON JOHNSON CO., LTD., Agents

INTEROCEAN LINE
Marine Building **FAcific 0131**

ISTHMIAN S. S. LINE

See: B. W. GREER & SON, LTD., Agents

JOHNSON, B. L., WALTON CO., LTD.
Marine Building **AGENTS**
Vancouver, B. C. **PAcific 4311**

Capt. B. L. Johnson
H. W. Clyne
A. C. Law
J. S. Marshall

Agents For:
EAST ASIATIC CO., LTD., Copenhagen
IMPERIAL OIL LTD.
STANDARD OIL CO. OF CALIF., INC.
STANDARD OIL CO. OF B. C., LTD.
TIDE WATER ASSOCIATED OIL CO., INC.
FOREIGN TANKSHIP CORPORATION
PACIFIC TANKERS, INC.

Managing Operators:
PARK STEAMSHIP CO., VESSELS

JOHNSON, C. GARDNER, LTD. **AGENTS**
991 Hastings St., West **PAcific 7271**

Hon. H. H. Stevens, M.P., Pres.-Director
R. E. Borchgrevink, Vice Pres.-Director
James K. Cavers, Secr.-Treas.-Director
Harry McT. Elliott, Oper. Mgr.-Director
Hercules Worsoe, Mgr. Insurance Dept.

Agents For:
GRACE LINE
JOHNSON LINE
UNION OIL CO. OF CALIF.

General Insurance:
Specializing in Aviation, Marine, Casualty, Automobile and Fire.

JOHNSON LINE

See: C. GARDNER JOHNSON, LTD., Agents

KINGSLEY NAVIGATION CO., LTD.
744 W. Hastings **MArine 0321**

F. W. Harvie, Vice Pres. & Gen. Mgr.
F. McNicholl, Freight & Operating Mgr.
J. Blain, Marine Superintendent

Agents For:
KINGSLEY LINE SERVICE
McCORMICK LINE

Service:
Kingsley Line Service from British Columbia to California ports.

KLAVANESS LINE

See: BALFOUR, GUTHRIE & CO. (CANADA) LTD., Agents

KNUTSEN LINE
355 Burrard **PAcific 0131**

Pacific Coast-European Service

Agents:
BALFOUR, GUTHRIE & CO. (CANADA), LTD.

LAURITZEN LINE

See: NORTH PACIFIC SHIPPING CO., LTD., Agents

McCORMICK STEAMSHIP CO.

See: KINGSLEY NAVIGATION CO., LTD., Agents

MATSON NAVIGATION CO.
355 Burrard **PAcific 0131**

MOORE-McCORMACK LINES, INC.

See: BALFOUR, GUTHRIE & CO., (CANADA), Agents

NORTH PACIFIC SHIPPING CO., LTD.
966 W. Hastings **MArine 8231**

J. MacInnes, Manager
E. Coltart, Secretary-Treasurer

Agents For:
LAURITZEN LINE

Managing Operators:
PARK STEAMSHIP CO., VESSELS

Service To:
South African Ports, Portuguese East Africa

NORTHERN STEAMSHIPS, LTD.

See: British Columbia Steamships, Ltd.

OCEANIC & ORIENTAL NAVIGATION CO.

See: DINGWALL COTTS & CO., LTD., Agents:

PACIFIC-ATLANTIC S. S. CO.
1010 Washington St. **AGENTS**
ATwater 1361

Agents For:
BLUE STAR LINE, INC.
JAMES GRIFFITHS & SONS

PACIFIC ISLAND TRANSPORT LINE
966 W. Hastings **PAcific 7121**

PACIFIC TANKERS, INC.

See: B. L. WALTON JOHNSON CO., LTD., Agents:

PARK STEAMSHIP CO., LTD.

E. F. Riddle, President
A. J. Myers, P. C. Manager
Capt. J. S. Clarks, Ass't. Marine Supt.
H. V. Byrnell, Ass't. Eng. Supt.
J. A. Barker, Gen. Mgr., (Montreal, P. Q.)

Operating Managers:
EMPIRE SHIPPING CO., LTD.
966 W. Hastings PAcific 7121
CANADIAN TRANSPORT CO., LTD.
837 W. Hastings PAcific 3511
ANGLO CANADIAN SHIPPING CO., LTD.
355 Burrard St. MArine 4221
CANADA SHIPPING CO., LTD.
355 Burrard St. PAcific 0131
SEABOARD SHIPPING CO., LTD.
LTD.
355 Burrard St. PAcific 6331
JOHNSON, B. L. WALTON STEAMSHIPS LTD.
355 Burrard St. PAcific 4331
NORTH PACIFIC SHIPPING CO., LTD.
966 W. Hastings St. MArine 8231
CANADIAN AUSTRALASIAN LINE, LTD.
966 W. Hastings St. PAcific 3271

Service To:
United Kingdom, India, South Africa, Australia, New Zealand, China, Mexico

QUAKER LINE

See: PACIFIC-ATLANTIC S. S. CO., Agents

REARDON SMITH LINE

See: DINGWALL COTTS & CO., LTD., Agents:

ROYAL MAIL LINES, LTD., THE
Marine Building **PAcific 3484**

E. Cunningham, Manager
J. L. Howell, Asst. Mgr.

Agents For:
ROYAL MAIL LINES, LTD.
HOLLAND AMERICA LINES

Service To:
United Kingdom & Continental ports.

RUNCIMAN, WALTER, & CO., LTD.

See: DINGWALL COTTS & CO., LTD., Agents:

SEABOARD SHIPPING CO., LTD.
355 Burrard St. **PAcific 6331**

Managing Operators:
PARK VESSELS

SILVER-JAVA PACIFIC LINE

See: DINGWALL COTTS & CO., LTD., Agents:

STANDARD OIL CO. OF B. C., LTD.

See: B. L. WALTON JOHNSON CO., LTD., Agents:

STANDARD OIL CO. OF CALIF., INC.

See: B. L. WALTON JOHNSON CO., LTD., Agents:

SUN SHIPPING CO.

See: DINGWALL COTTS & CO., LTD., Agents:

SWAYNE & HOYT, LTD.

See: DINGWALL COTTS & CO., LTD., Agents:

TIDE WATER ASSOCIATED OIL CO., INC.

See: B. L. WALTON JOHNSON CO., LTD., Agents:

TRANSATLANTIC S. S. CO., LTD.
966 W. Hastings St. **PAcific 7121**

UNION OIL CO. OF CALIFORNIA

See: C. GARDNER JOHNSON, LTD., Agents:

UNION STEAM SHIP CO. OF BRITISH COLUMBIA, LTD., THE
Foot of Carrall **PAcific 3411**

Gordon Farrell, President

UNION STEAM SHIP CO. OF NEW ZEALAND, LTD.

See: CANADIAN AUSTRALASIAN LINE, Agents

VANCOUVER - ST. LAWRENCE LINE

Managers:
CANADIAN TRANSPORT CO., LTD.

VANCOUVER - WEST INDIES LINE

Managers:
CANADIAN TRANSPORT CO., LTD.

WEBSTER LINE

See: CANADA SHIPPING CO., LTD., Agents

WHO'S WHO AFLOAT AND ASHORE

SKIPPER OF SWEDISH MOTORSHIP BIO-BIO: Captain Karl Andreason, who until the war, served as Port Captain for the Johnson Line with headquarters in San Francisco, was on the bridge of the Motorship Bio-Bio when this vessel arrived on the Pacific Coast last month.

A large group of friends welcomed the popular skipper upon his return, from Sweden. On his return to Gothenburg, Captain Andreason will leave his command to assume one of the key posts in the Operation Department of the Johnson Lines General Office.

ANOTHER RETURNS TO PEACETIME DUTIES: Howard H. Wickersham, member of the firm of W. H. Wickersham Company, steamship agents with offices in Los Angeles Harbor, has returned to his business duties after serving as Tanker Operation Officer with the Navy. At the time of his deployment he held the rank of Commander in the United States Naval Reserve.

PACIFIC WESTBOUND CONFERENCE MANAGER: The appointment of Harry Hornung as manager of the Pacific Westbound Conference, places in this important post an official, who by experience and acquaintance is especially qualified for the post.

Hornung, who rose to the rank of Colonel during this war, was in command of some of the most important troop cargo handling assignments in Australia and the Philippines during critical operations. Before the war he served for fifteen years as freight traffic manager with the N. Y. K. Line. He is regarded as being one of the outstanding marine traffic executives in the transpacific trade. Hornung's knowledge of rates, rules and practices in the Oriental trades, and his experience in ports of the Far East, will serve him well in handling problems which will arise in the affairs of the Pacific Westbound Conference.

Lieutenant Commander Ray Cox, USCG, Merchant Marine Technical Division.

LT. COMDR. RAY COX resigned from the United States Coast Guard Merchant Marine, Technical Division, to become associated with Walter Kidde & Company, Inc., as assistant manager of its Marine Division. Lt. Comdr. Cox assumed his new duties on November 1. Cox is a graduate of the U. S. Naval Academy at Annapolis, class of 1935, and upon graduation became associated with the Department of Commerce, Bureau of Marine Inspection and Navigation, as naval architect.

FOLLOWING MATSON'S FIRST-OF-THE-YEAR BOARD MEETING, William P. Roth, chairman of Matson Navigation Company, announced election of Platt Cooke of Honolulu, as a director.

Cooke is well-known in Hawaiian trade circles. He is vice president and general manager of Alexander and Baldwin Ltd. He fills a position on the Matson Directorate left vacant by the death of John Waterhouse of Alexander and Baldwin.

NOW ON THE STAFF OF ADMIRAL TISDALE in the Twelfth Naval District is Stanley "Sea" Allen, who is remembered as the first secretary of the Mariner's Club of California, and, until shortly before the war, a member of the Marine Department of Standard Oil Company of California.

After joining the Navy, Allen served in various assignments, most of the time attached to Caribbean Naval posts. He holds the rank of Commander following a recent upgrading upon his return to the States.

MAJOR EUGENE J. "BUD" JUDGE, stationed in the Hawaiian Islands with the U. S. Army, is expected to be discharged and return to San Francisco shortly, to join forces with W. R. Grace and Company. He will take charge of the passenger activities of the Johnson Line, which he handled for many years prior to entering the service.

Major Reginald V. Grady, son of Dr. Henry F. Grady, American President Line's president; is shown above being presented with the "Most Excellent Order of the British Empire" by Field Marshal Sir Harold R. L. G. Alexander. The award to Major Grady was for his outstanding service as Industry & Commerce Officer for Italy.

BREAKDOWN AT BY ALERT G-E

Careful inspection and cleaning of tanker's propulsion motor, completed in only 72 hours, forestalls salt water damage

Acting on a hunch that trouble was brewing in his propulsion motor, the tanker's chief called in a G-E marine engineer for a thorough inspection. Opening a port in the motor casing, this engineer noticed a powdery white deposit on the rotor. Salt! It could only mean that salt water with its highly corrosive effects on insulation was present in the cooling air for the motor.

The problem was double-edged—first, locate and repair the leak. Second, remove every trace of salt deposit. Time was short—but the only alternative was a potential breakdown of the motor's windings, possibly far out at sea.

Working 'round the clock for three days, G-E motor experts found and fixed the leak. Every inch of insulation was carefully cleaned and tested, the only really foolproof way to completely rid the motor of the salt. The tanker was able to sail after a seventy-two-hour tieup, half the delay that had been expected.

Catching trouble in the making

A vitally important part of G-E keep-'em-sailing service is the *prevention* of trouble. By careful routine inspection and thorough preventive maintenance of steam and electrical propulsion machinery, skilled G-E personnel can help eliminate the causes of major breakdowns.

Wherever your ships dock, they can conveniently use this service. For G-E maintains 28 fully-equipped service shops, eight of them in coastal cities. Moreover, a qualified marine superintendent is on call 24 hours a day in every major port. Should repair or replacement parts be needed, we can make immediate shipments from warehouse stocks strategically located for fast marine service.

You know that every hour you can lop off port time means greater earning power for your ships. That is why we have streamlined our entire marine service organization to give you fast reliable service that will keep your ships at sea, operating efficiently, earning dividends. Apparatus Dept., General Electric Company, Schenectady 5, N. Y.

Removing field coil from the rotor for cleaning and inspection. Skilled G-E workmen with years of specialized marine experience stand ready to help you get fast, reliable shipboard repairs and save days of unprofitable port time.

SEA PREVENTED

KEEP 'EM SAILING SERVICE

Cleaning and testing the windings on this huge propulsion motor kept a full G-E service crew busy night and day for 72 hours. In addition to fast, reliable maintenance service, ship owners can also get "off-the-shelf" delivery of urgently needed replacement parts from G.E.'s million-dollar warehouse stocks in New York and San Francisco.

Or, worn or damaged motors may be turned in under the G-E exchange plan (now covering some 30 types of marine induction motors) for immediate delivery of completely re-built motors. (Right) G-E technician checking the insulation on the collector rings of a motor with a meghometer.

GENERAL ELECTRIC

200-49

Eric L. Pedley, manager of San Francisco office of Martin & Turner.

Marine Supply Firm Enlarges in San Francisco

James S. Martin of Martin & Turner.

Martin & Turner recently moved to larger quarters, located at 134 Sacramento Street, and activities in this area will be under the management of Eric L. Pedley who has recently arrived in the United States from the China-Burma Theater of War, where he was a Lieutenant Colonel in the Army Air Forces. Mr. Pedley is well known in San Francisco and throughout the United States and abroad—where he was one of the ranking polo players prior to the war.

Martin and Turner have been actively engaged in the marine supply business in the Los Angeles Harbor for the past four years, and represent some of the larger concerns in the United States. It is the intention of the firm to broaden their scope in the San Francisco Bay area, and they are taking on additional lines in San Francisco and increasing their personnel.

Messrs. Martin, Turner, and Pedley are well known to one another as they were all partners in business in Los Angeles before the start of hostilities abroad.

Captain Lloyd E. Rogers, formerly with the Lloyd E. Rogers Company and the Crane Company and well known on the San Francisco waterfront, is in charge of sales in the Bay Area.

Captain Lloyd E. Rogers, sales manager with Martin & Turner.

Rest Centers for Merchant Seamen to Be Run by United Seamen's Service

The United Seamen's Service has taken over administrative control and continues operation of two rest centers for American merchant seamen hitherto operated jointly by the USS and the War Shipping Administration and scheduled to close the end of the year. The U. S. Public Health Service will cooperate with the USS by supplying medical attention and consultation at the centers.

The centers are located on the estates of Mrs. C. Suydam Cutting, Gladstone, N. J., and the late Darius Ogden Mills, Millbrae, Calif., and are the only two remaining in existence of seven operated by the USS and WSA during the war.

The decision to assume responsibility for operation of the two centers to meet needs on both the East and West Coasts was made by the USS Executive Committee, of which John E. Bierwirth, president of the New York Trust Company, is chairman. Operation of the centers will continue pending the determination of future programs for American merchant seamen.

Public Health Service physicians at the centers will care for seamen suffering from operational fatigue who can be restored to health so they can ship out again, as well as seamen suffering from traumatic war neuroses, including a considerable number of seamen prisoners of war, and seamen such as post-operative cases, who do not require hospital care or constant treatment or observation but who are unable ot work until after some convalesence.

The services provided in the centers will be good food, a pleasant, restful environment and planned but not regimented recreation, besides medical attendance and guidance.

The USS Executive Committee was influenced by surveys which indicated that hundreds of merchant seamen would suffer from the closing of the centers. Many of these seamen are repatriated prisoners of war.

Xzit Sales Company and Brickseal Refractory Co. entertained a large group of prominent executives of shipping lines at an Open House held at the Downtown Athletic Club, New York City. In this photo are a part of those who attended.

First row, left to right: G. W. Couch, R. H. Govan, W. S. Jackson, J. L. Callender, Victor Paul, W. Johnson, Charles LaPlante, H. P. Gibney, Sidney Pollock, A. J. Collins, Joseph Leahy, Bill Partridge.

Second row: Capt. F. I. Shaw, Capt. J. S. Poche, Capt. A. McKay, Capt. W. Mello, H. A. Steiner, Jim Howe, S. Price, Harold Bradbury, Harry Wilson, Edgar Timmons, Charles Hall, J. Hutchinson, Walter Charles, V. J. Carey.

Third row: Hugh Taylor, F. Cowan, Herbert Lagenberger, M. O. Devinney, F. E. Hansen, J. H. Patterson, P. Seibel, Robert Gray, A. Oakes, John McGinn, J. B. Springs, A. C. Thompson, R. W. Armour, Ray Risher, Bob Williams, Charles Buno, R. C. Klein, W. J. Hanna.

Fourth row: W. J. Zeller, E. T. Williams (between 3rd and 4th rows), J. B. Harrington, Frank Yankers, F. Lavezzo, Al Pierce, James Buckley, O. Cioli, Herbert Shimmin, L. T. Kanapaux, H. Cook, T. J. McTaggart, W. W. Kilpatrick, W. E. Stein, W. Lindner, George Huff, Mike Doyle, Harold Baumgartner, Charles Holmgren, Lester Thomas, Henry Stuart.

SHORESIDE PERSONALITIES

New Leslie Agents

Leslie Co., Lyndhurst, N. J., manufacturers of regulators, controllers and whistles, announces the appointment of the following agents to handle marine sales and services:

Bruce Greaves Co., St. Louis, Mo., eastern Missouri and southwestern Illinois; Gulf Engineering Co., Inc., Savannah, Ga., South Atlantic Ports; Robinson Electric Co., Ltd., Vancouver, B. C., Canada, in that territory.

Presidential Appointment

President Truman nominated Rear Admiral Joseph F. Farley to be commandant of the United States Coast Guard for a four-year term. He will hold the rank of admiral.

Farley, 56, is a native of Oxford, Ohio. He has been serving as chief personnel officer for the Coast Guard.

Farley will succeed Admiral R. R. Waesche, who has been ill. Waesche commanded the Coast Guard during the war.

Westinghouse Names New Arizona Manager

W. E. Lee, formerly of Los Angeles and a sales engineer in the mining industries for the Westinghouse Electric Corporation there since early April, 1945, has been named manager of the company's Phoenix office.

Louis G. Berger, of Los Angeles, Southern California District manager, Westinghouse Electric Supply Company.

Louis G. Berger of Los Angeles, Calif., has been named Southern California district manager for the Westinghouse Electric Supply Company with headquarters there. Mr. Berger succeeds B. S. Manuel, vice-president of the supply firm. Mr. Manuel will continue as vice-president, with overall responsibility for operation of the southern California, northern California and north Pacific districts of the company. A native of Michigan, Mr. Berger joined the Illinois Electric Company at Los Angeles in 1920, and when this organization was dissolved, in 1927, he transferred to the Westinghouse Electric Supply Company there. He was appointed assistant district manager in February, 1945.

Gelhaus Returns

Henry F. Gelhaus has returned to San Francisco after approximately five years with the Todd Shipyards Corporation, as assistant general manager of their Brooklyn Yard.

He is now Pacific Coast sales manager for the company with headquarters at 485 California Street, San Francisco.

He is well known on the Pacific Coast and for many years was marine superintendent for the Swayne & Hoyt Company.

S. F. Office of Roto Division

C. L. Gould has been placed in charge of the new San Francisco office of the Roto Division of Elliott Company, manufacturers of tube cleaners. The office is located at 526 Folsom Street. Gould, who has been with the company for over ten years, was previously in charge of the New Jersey district.

HERE IT IS!

The

"Mariners Pathfinder"

Raytheon's Radar

FOR AMERICA'S MERCHANT SHIPS

Designed by the SOLE MAKERS of the SG and SO Radar on America's Fighting Ships!

AT LAST we can show you a picture of the new gear! Fuller details will follow.

But even without the picture *you know what you are getting* when you specify Raytheon Radar. You know you are getting *the same basic radar equipment* used by every Navy combat ship from destroyer to battlewagon, and even down to landing craft. You are getting a simplified, compact version of the famous SG or SO radar built for the Navy by Raytheon, and now built in commercial form for you.

Remember that Raytheon was the Navy's chief supplier of *surface-search* radar, the one type of radar that a merchant ship needs. Remember, too, that factory-trained technicians will be available for service in nearly every major seaport. Remember *the name that means most* in surface-search radar!

Watch for further announcements. Meantime, count on Raytheon Radar to safeguard your ships and speed up operating schedules. Early delivery and installation can be expected. Inquire. Write or wire to Marine Department, 107 Foundry Ave., Waltham 54, Mass.

The INDICATOR can be mounted on the bridge—on deck, bulkhead, or overhead. Note that the head is rotatable vertically and horizontally through 45°... *adjustable* for greatest comfort and convenience!

RAYTHEON

RAYTHEON MANUFACTURING COMPANY,
ELECTRONIC EQUIPMENT DIVISION

Excellence in Electronics

Shoreside Personalities

N. A. Moore, since 1936 assistant district manager at San Francisco for the American-Hawaiian Steamship Company, has been named to succeed **Fred N. Mills** as district manager at Portland for the company. The appointment took effect February 1.

Mills, who has served American-Hawaiian for thirty-eight years and who has been Portland manager since 1927, has announced his retirement. During his many years in Portland, Mills has been active in various steamship groups. He has served on many occasions as president of the Portland Merchants' Exchange and is now acting as vice president of the Waterfront Employers' Association. He and Mrs. Mills plan to spend their time in Oregon and California.

David Shipley, new production manager, Rodpak Manufacturing Co.

David Shipley, New Rodpak Production Manager

Rodpak Manufacturing Company, makers of Rodpak floating seal metallic packing, announces the appointment of David G. Shipley as production manager for their San Francisco plant. Shipley comes to Rodpak from Bethlehem Steel Company, where he held the position of assistant superintendent of the Submarine Repair Base.

WSA Appointment

Appointment of George E. Talmadge, Jr., as special assistant to Deputy War Shipping Administrator, Captain Granville Conway, was announced by the WSA.

Mr. Talmadge will be in charge of the development and coordination of WSA programs aimed at the resumption of private ownership and management of vessels operating in the domestic trade.

From 1940 until 1944 he was Director of the Bureau of Water Carriers for the Interstate Commerce Commission. During that period he worked with various war agencies—Lend-Lease Administration, WSA, and Office of Defense Transportation. Recently he has been transportation engineer and general sales representative of the Higgins Industries, Inc., New Orleans, La. Prior to his government service, Mr. Talmadge had been engaged in steamship work over a period of 20 years.

Naval Architect-Marine Engineer Opens Offices

Karl French, naval architect and marine engineer recently announced the opening of offices at 286 West Seventh Street, San Pedro, California.

Enlarges Quarters

To keep pace with rapidly expanding business, the George E. Swett & Co., engineers, have moved to larger quarters at 256 Mission Street, San Francisco 5, California.

San Francisco will be the principal West Coast port, according to George E. Swett, manager of the firm, and their complete organization of engineers, installation and service crews is available for marine refrigeration and other specialized marine products.

Penn Instrument Acquires Cochrane Meter Line

Penn Industrial Instrument Corporation of Philadelphia has purchased the Flow Meter Division of Cochrane Corporation of Philadelphia. The firm is headed by William C. Bennett, president and general manager, with William Melas, vice president and chief engineer, and Kenneth C. Markley, vice president and works manager.

Penn will manufacture the present line of Cochrane Flow Meters exclusively for The Hays Corporation, who will market them under the name Hays-Cochrane Meters.

San Francisco Marine Exchange

President's Report

Roy C. Ward, Cosgrove & Co., retiring president of the Marine Exchange.

Since the inception of the present form of the Marine Exchange in March 1938, as an independent, non-profit association, the Exchange has increased its services to its members; tripled its membership, and assumed new responsibilities as a ship-reporting agency to Maritime Commission representatives of the San Francisco Bay Area. The finances and income of the Exchange seem to be adequate to carry it through the reconversion period.

It can now be told that, to our knowledge, the Marine Exchange of San Francisco is the only one of all similar privately-operated agencies in this country that continued its ship-reporting activities during the war. This was made possible not only by the well merited reputation of the Exchange Staff, but particularly by the foresight of Commodore Milton S. Davis, director of the Port of this, the Twelfth Naval District, who had jurisdiction over local harbor activities from the time of Pearl Harbor and for a continuing major period of the war.

H. H. Pierson, new president of the Marine Exchange.

The Marine Exchange operated during the period of hostilities under the guidance and control of the Port Director's office of the Navy. Information on ship movements was only given to those approved by that office. Under this arrangement, private telephone lines were installed to the Army's Port of Embarkation, to naval and military intelligence offices. The Exchange switchboard provided private interchange of information to all government departments concerned with the local activities of shipping.

The trust placed in the Exchange and particularly its members was well merited. During the hectic war period, when the Bay Area handled far in excess of the tonnage of vessels and cargo ever thought possible, no misuse of information has been reported. For this the integrity and watchfulness of the members is to be greatly commended.

Now let me say a few words regarding the activities of the Exchange in fields other than ship-reporting. Necessarily, an association such as this, of steamship companies, shipyards, marine underwriters, terminal operators, ship chandlers, manufacturers' agents, jobbers and wholesalers of marine equipment machinery and supplies, ship service organizations, banks handling marine organization funds, exporters, importers, shippers in general, forwarding agents, customs and ships' brokers and others, is frequently asked to take a hand in public matters.

Requests for help came from individuals and companies who preferred dealing with government and its agencies through an association rather than in their own name, in order to secure changes in legislation and regulations, whether in effect or proposed.

In this respect, we have learned that our weight of numbers and because the Exchange can speak for the maritime industry of the Bay Area, that as a maritime association we do receive genuine consideration.

In the early part of 1941, for example, a committee of the Exchange secured a change it requested in a ruling of the Bureau of Customs of the Treasury Department placing a heavy fine on steamship companies whose vessels discharged at San Francisco merchandise which a vessel's manifest indicated would be discharged at Los Angeles.

Another committee of the Exchange was successful in the latter part of 1940 in securing amendments to proposed regulations on inflammables and explosives, that would have placed a severe handicap on the cargo movement of the port.

Again in the early part of 1941, a committee of the Exchange was helpful in defeating the adoption by the State Legislature of laws that would have adversely and seriously affected the sale of small craft.

These are a few examples of what an association can do. They have also proved, and very definitely, that the San Francisco Bay Area labors under an onerous handicap, due to its separation into twelve politically divided counties, as compared with Los Angeles County. To assist in overcoming this handicap, the Exchange proposed the formation of a Bay Area Maritime Committee. The Junior Chambers of Commerce of the Bay Area took up the suggestion. The resulting Bay Area Maritime Committee, with well selected representatives of the twelve counties, is an effective group.

San Francisco County is represented by Supervisor Chester MacPhee, Port Manager Neil Laidlaw, Don Fazackerley, executive vice president of the San Francisco Junior Chamber of Commerce and our own secretary manager. The Sacramento delegation, for instance, includes Charles Deterding, the county manager, Luke Conrad, a Sacramento County supervisor and William G. Stone, manager of the Sacramento Chamber's transportation and industrial committee.

By means of this committee, it is possible to secure support in Sacramento and Washington, D. C., similar to, but of course not on a par, to that available to Los Angeles County.

I come now to present and future activities of your Marine Exchange. We have supported resumption of intercoastal and coastwise operations by the War Shipping Administration. While government operation is not desirable, we are convinced, along with the operators, that only in this way could costs of running ships today be arrived at.

The WSA has, as you know, reestablished intercoastal service, with the former operators acting as its agents. The resumption of coastwise service still remains to be put into effect. To push this along, we have asked for support of all Chambers of Commerce in ports along the coast. Subsequently the Interstate Commerce Commission ruled that the rail port-to-port rates must include the specified differential over and above the vessel rates. This is a step in the right direction which the coastwise operators have sought for a long time.

The next step, of course, is private operation of both intercoastal and coastwise services. This depends on the experience developed by WSA operations.

Let me conclude by saying this: During the past years, the port of San Francisco, "serene and indifferent to fate" pursued the even tenor of its ways. Then the war came along and this Bay became the principal staging area in the conflict with Japan. We found it necessary not only to raise our sights, we threw the sights away. This area became the world's principal shipbuilding plant. We not only shipped most of the men and supplies to the Pacific combat area, we are handling most of the returning troops now. Why—because

San Francisco Marine Exchange

we have more facilities than any port on the coast.

There is a lesson in that for all of us.

In the past, our shipping in San Francisco declined because perhaps, among other reasons, we were not organized as an area to stop that decline. We have been indifferent. No matter what the explanation is for the past, we must work together for the future. We have all the means to make this a much greater port in peace than it ever was in war. To this end, the Marine Exchange is preparing to meet its responsibilities in the days to come.

The offices of the Marine Exchange, with your support, look for an eventful 1946.

Following the recent election, the directors to hold office are:

Leo P. Bailey, Balfour, Guthrie & Co., Ltd.; W. J. Bush, American President Lines, Ltd.; J. Harding Jensen, Matson Navigation Co.; A. E. Kihn, Standard Oil Company of California; Joseph A. Lunny, (Pope & Talbot), McCormick S. S. Co. Div.; Howard N. Middleton, War Shipping Administration; W. F. Minehan, Bank of America, N. T. & S. A.; Joseph A. Moore, Jr., Moore Dry Dock Company; John Parker, American Marine Paint Company; H. H. Pierson, De La Rama S. S. Co., Inc.; Roy C. Ward, Cosgrove & Company.

The directors chose the following officers:

H. H. Pierson, president; John Parker, first vice president; A. E. Kihn, second vice president; Joseph A. Moore, Jr., third vice president; J. Harding Jensen, treasurer.

Interocean's Operating Managers

Howard G. Beadle, operating manager, San Francisco. Mr. Beadle originally joined the Interocean family in 1937 and went into the Navy in March, 1941. Mr. Beadle will handle the operation of all vessels in the San Francisco Bay District including Intercoastal, European and Oriental, coming under that jurisdiction.

Homer B. Harris, operating manager, Los Angeles Harbor. Mr. Harris joined the Interocean family in 1934, and became experienced in the work of practically all departments until outbreak of the war when he joined the Army, gaining further shipping experience along the Pacific Coast and in the Philippines.

R. G. Jubitz, Jr., traffic manager, Intercoastal service, Portland, Oregon. Mr. Jubitz originally joined Interocean in 1938, as assistant in the Portland office. At the beginning of the war he went into the Navy and was recently discharged after an eventful career, including service as commander of Navy vessels carrying refugees from the Orient to this country.

J. G. Pacey, operating manager, Seattle, Washington. Mr. Pacey joined the firm last year to assist Mr. Alflee, district manager, Seattle, in the handling of War Shipping Administration vessels in the Puget Sound territory. In recognition of his good services he has been promoted to the position of operating manager.

Shoreside Personalities

JULIUS BAYARD, in charge of the marine service activities of the Foster-Wheeler Company on the Pacific Coast, is now located in the San Francisco office at 206 Sansome Street.

Previous to joining the company's organization in 1942, he learned his marine engineering fundamentals in Charleston, S. C., later sailing in the Gulf Oil Corporation vessels. He advanced to chief engineer with a steam and diesel license.

From 1942 to 1944 Bayard was stationed in the Pacific Northwest in connection with the installations on board the C. V. E. vessels built in Tacoma and Vancouver, Washington. In 1945 he became civilian technician for the company, attached to the U. S. Navy at Guam.

Joseph L. Turner, director of Industrial Relations, Columbia Steel Company, San Francisco.

The appointment of Joseph L. Turner to the position of Director of Industrial Relations of Columbia Steel Company, a U. S. Steel Corporaton subsidiary, was announced by Wlliam A. Ross, president. Turner, who has been in the steel business since 1928, succeeds Henry T. Lintott, resigned.

Turner started his career with Lukens Steel Company in Coatsville, Pennsylvania. After eight years with this firm, he joined Wheeling Steel Corporation as assistant to general manager of the Portsmouth, Ohio, Works. Four years later he was promoted chief industrial engineer at Wheeling, West Virginia, which position he held until his new post with Columbia Steel Company.

J. Edward Meyer, Jr., who, while Lieutenant Colonel in the United States Army Transportation Corps, established "a record of daily discharge per ship unequaled anywhere in the world," has been appointed assistant operating manager of Grace Line, Inc., it has been announced by officials of the line.

Beginning his steamship career as an ordinary seaman with Grace Line in 1934, Mr. Meyer has been subsequently employed in various capacities in pier and traffic operations. In his present capacity he replaces D. P. Darling, who was recently promoted to assistant manager of Panama Agencies Co., a Grace subsidiary in Cristobal, C. Z.

After serving in the United States Navy as a Lieutenant, Stanley G. Coppel has returned to the Weyerhaeuser Steamship Company as assistant manager of the San Francisco office.

Pennington, Vice President Of N. F. A. S.

Gearing itself to meet the many problems which will confront the American Merchant Marine upon its resumption of private, commercial operations after March 2, National Federation of American Shipping announced the elevation of its secretary-treasurer, **Maitland S. Pennington,** to the position of vice president.

Almon E. Roth, president, in announcing the promotion, stated that Pennington was elevated to the post by the Board of Directors of the Federation.

Roth also announced that the Board had elected Mrs. Marjorie Nave to the position of secretary and assistant treasurer.

Pennington, 38, only recently returned from Copenhagen, Denmark, where he represented American shipowners at the Preparatory Technical Maritime Conference of the International Labor Office.

The conference made recommendations for international and minimum standards on wages, hours of work aboard ship, training and promotion at sea and recognition of seafarers' organizations which are to be presented to the International Labor Office Conference to be held in Seattle, Washington, the end of May and beginning of June, this year.

The Briggs Filtration, Clarifier Companies Merge

The engineering and manufacturing enterprise founded in 1933 by Chase Donaldson and S. W. Briggs as the Briggs Clarifier Company took its final peacetime form on December 1, when the business was acquired by the Briggs Filtration Company, a Maryland corporation. The officers of the new company, all of whom served with the old company, are Chase Donaldson, president; S. W. Briggs, vice president; R. C. Zschiegner, treasurer; W. E. Furey, secretary-counsel; Cecil Hopkins, assistant secretary. The directors are Chase Donaldson, president; S. W. Briggs, vice-president; Richard P. Dunn, partner, Auchincloss, Parker & Redpath; Bradley J. Gaylord, vice president, the Pennroad Corporation, Wilmington, Delaware; Clark W. McKnight, Wilmington, Delaware.

The Briggs Filtration Company, which owns all patents, processes and trade names, will continue to design and manufacture the extensive line of oil filters which won the Army-Navy "E" three times. The famous Briggs Clarifier, which has won general acceptance in the diesel, automotive, maritime, railroad and aviation fields, has been further perfected by design simplification and the development of additional types of refills to meet every oil filtration need with the greatest economy.

Harry J. Price To Edit New Travel Magazine

Harry J. Price, formerly director of public relations, advertising and publicity of the Todd Shipyards Corporation, has been named Executive Editor of The Smart Traveler, a new independent national travel magazine, the first issue of which will appear April 10. The Smart Traveler will have a guaranteed circulation of 100,000 copies and a print order of 150,000, which is to be increased as printing facilities become available.

Mr. Price, a former newspaper man and foreign correspondent, is a vice president of the Overseas Press Club. He is no stranger to travel at home or abroad and his work in the travel industry is well known to all transportation executives and travel agents dating back to 1931 when his Line on Liners and Eight Bells or Thereabouts columns won him wide distinction as the Brooklyn Eagle's travel editor.

New Southern California Corp.

Formation of a new corporation, the Dauby Equipment Company of Santa Monica, California, was announced in the December issue of the Pacific Marine Review. Sales and advertising will be headed by O. J. Gilman, recently connected with the National Screw and Manufacturing

O. J. Gilman, sales and advertising manager, Dauby Equipment Company.

Company of Cleveland, Ohio, in similar capacity. Mr. Gilman's past record includes technical engineering and sales in the marine and aircraft hydraulic control field.

The remote controls manufactured by this firm are trade-named BOS'N'S MATE and include throttle, power clutch and power steering controls of the non-automatic, direct hydraulic type.

Geddco Record in War Earns Navy Award

The record of General Engineering and Drydock Company, of San Francisco and Alameda, in sending back to sea during the war over 3000 repaired and converted vessels has earned the Navy's Certificate of Achievement, the Company has been notified by Lieutenant Frederick W. Wile, Jr., USNR, Acting Chief, Industrial Incentive Division.

In a letter to George A. Armes, president of General Engineering, Lieutenant Wiles said:

"It is my distinct pleasure to advise you that the Navy's Certificate of Achievement has been awarded to your organization.

"This Certificate, which is being sent you under separate cover, signalizes the Navy's recognition of the splendid effort put forth by the men and women of your organization in support of the war production program."

Lieutenant Wile added that he hoped the Navy's "sincere appreciation" would be communicated to all of GEDDCO workers.

WSA Awards Certificate Of Appreciation

Clyde Williamson, San Francisco manager for Hagan Corporation, Pittsburgh combustion and chemical engineers, has been presented with a Certificate of Appreciation from the War Shipping Administration for help given in the cadet-midshipman training program during the war. Mr. Williamson is the first Pacific Coast man, and one of the few in the nation, to be given this form of recognition by the WSA. The presentation was made by Lt. Com. E. G. McDonald, district cadet-midshipman supervisor for San Francisco.

Nine of the company's port offices assisted the WSA by teaching and providing combustion and chemical data for the use of men being trained to operate the vast wartime fleet of merchant marine vessels.

Business Tour of Orient

Colonel Oliver Vickery, of Owesen & Company, marine electric supply house of San Francisco, will soon leave by American President liner on a business tour of Oriental ports. He will establish a branch office in Manila to take care of the company's expanding trade in that territory, and will return to San Francisco some time in May.

Colonel Oliver Vickery

Manager of Marine Transportation at Socony-Vacuum

The retirement of Charles H. Kunze and the appointment of Frederic R. Pratt to succeed him as general manager of the Marine Transportation Department were announced by the Socony-Vacuum Oil Company, Inc.

Mr. Kunze started with the company in 1904 as office boy and served in various capacities throughout the years. On December 1, 1941, he was appointed general manager of the Marine Transportation Department.

Mr. Pratt recently returned to Socony after four years in the Coast Guard. He entered the Marine Transportation Department in 1931 and in 1940 was transferred to the Distribution Department until he entered the service.

Opening Law Offices

William Radner, recently general counsel for the War Shipping Administration, and from 1939-1942 officer of Matson Navigation Company, announceves the opening of law offices in the Hill Building, Washington, D. C.

Resumption of Upgrading Training

Resumption of upgrade training for Merchant Seamen by the U. S. Maritime Service, suspended in December as a step toward overcoming the shortage of crews to man ships bringing troops home and carrying relief supplies aboard, was announced January 16 by the War Shipping Administration.

Because of continuing shortages, for the time being, officers will not be accepted for upgrade training. However, WSA will resume acceptance of applications from unlicensed personnel in deck, engine and stewards departments for admittance to Maritime Service upgrade training schools. As soon as shortages are overcome, officer upgrading will be resumed.

To be eligible, seamen must apply for such training within one week of discharge from a WSA vessel. The WSA through the U. S. Maritime Service has operated upgrade schools and examining systems during the war, and since, to help provide sufficient experienced seamen for higher ratings and officer ranks needed by the rapidly expanding Merchant Marine.

The ports at which the U. S. Maritime Service maintains upgrade schools are New York, San Francisco, Los Angeles, Wilmington, California; Portland, Oregon; Seattle, Boston and New Orleans.

Waterfront Employers Association News

The dual post of Secretary and Treasurer of the Waterfront Employers Association, vacated by the untimely death of Abraham Boyd on December 31, is now being temporarily filled by Kenneth F. Saysette as acting treasurer, and James A. Robertson as interim secretary, it was announced by Frank P. Foisie, president.

Joseph H. Travers, former Colonel in the U. S. Army, has resumed his old position as assistant manager of the Accident Prevention Bureau of the Waterfront Employers Association, Pacific Coast.

Lt. Col. John W. Hubbell, Assistant to the President of Simmons Company, in charge of merchandising and advertising.

Hubbell Returns to Simmons Company

Lt. Col. John W. Hubbell, recently released from the Army, has returned to the Simmons Company, according to an announcement by G. D. Wrightson, vice president in charge of sales. Colonel Hubbell, formerly promotional and sales advertising manager, has been appointed to a new position in the company, Assistant to the President, in which he will direct all merchandising and advertising.

New President of C. H. Wheeler Mfg. Co.

The executive officers of the C. H. Wheeler Mfg. Co., Philadelphia, Pa., manufacturers of steam condensers, steam jet air ejectors, heat exchangers, water cooling towers and deck machinery (hoists, windlasses, etc.) now consist of C. M. Brown, chairman of the board; P. S. Lyon, president, and general manager, F. L. Yetter, vice president; L. A. Droescher, vice president; J. J. Bolton, Jr., vice president, and J. S. Gabel, secretary and treasurer.

Mr. Lyon is a newcomer to the company, but he is well-known in power plant and general industrial plant circles. Until recently, he was president and general manager of the Cochrane Corporation of Philadelphia, and resigned when the company ownership changed. He was with Cochrane Corporation and the Turbine Equipment Co. of New York (Cochrane's exclusive sales representative) for a total of about 26 years, during which time he perfected and marketed the Cochrane mechanical Flow Meter. Further, he developed on a new principle, engineered and sold Cochrane's first successful deaerators for boiler water. He also was chief engineer for the Hall Electric Heating Co. of Philadelphia, and later headed the Engineering Section of the Air Conditioning Dept. of the General Electric Co. in New York City.

P. S. Lyon, President of C. H. Wheeler Mfg. Co.

Jorgensen Expands Facilities

Earle M. Jorgensen Co., steel distributors, are practically doubling their warehousing facilities in Oakland by building an additional warehouse of all-steel construction 70 feet wide by 526 feet long on the property adjoining their present warehouse, and then are enlarging their office to about three times its present size. Construction is now under way and will be rushed to completion.

Equipment for the new warehouse and additional equipment for the existing warehouse, which is also being extensively improved, will include two 5-ton overhead cranes and a 24-inch capacity friction saw for cutting structural shapes. Burning equipment will consist of 70 feet of burning tables, two 150-lb. generators for generating acetylene gas and a Cascade unit for oxygen, one 4-torch and one 2-torch shape cutting machines for cutting circles, rings, sketches, etc. In addition, two portable cutting machines for straight line cutting will be used. All torches will be equipped to cut plate up to 10 inches thick with special attachments available for heavier sections. Additional delivery equipment will include a 5-ton truck and trailer with a 30-foot bed.

The Jorgensen Company plans to carry one of the most diversified lines of steel available anywhere. Stocks will include carbon, alloy, stainless, tool and specialty steels in the form of bars, billets, plates, sheets, strip and structurals.

Clarence J. Hunter, president and general manager of The Dampney Company of America.

On Tour to Coast

C. J. Hunter, chairman of the board and technical director of the Dampney Company of America, manufacturers of Apexior for stationary boilers, locomotives and steamships, toured the Pacific Coast territory on company business during January.

Joins Research Corporation

Election of Howard G. Vesper as president of California Research Corporation, Standard of California's research subsidiary, was announced by R. G. Follis, president of Standard.

Vesper succeeds Ralph A. Halloran, who is retiring after 26 years spent as head of Standard's research activities, during which time he has been credited with directing many notable developments in petroleum processes.

Both Vesper and Halloran played important parts in Standard of California's war work, Vesper in handling allocations of all bulk products, except aviation gasoline, for essential civilian use and military requirements and Halloran in directing a research program devoted 95 per cent to government and military projects.

SELECTION OF SAFETY AND RELIEF valves simplified by new Catalog No. 45, just issued by the Farris Engineering Company. Many new valve designs and improvements in old designs are included.

A "ready-reference pictorial index chart" shows line drawings of all the basic Farris valve types. With this chart a valve user can pick out the valve he needs without having to thumb through a whole catalog. Directly opposite the pictorial index chart is a detailed index showing what the valve can be used for and where to find its specifications in the catalog.

A condensed bulletin and price-sheet is contained in a supplement (No. 45A) to the Farris catalog. In this supplement a user or jobber can readily find the net price (accompanied by an illustration) of any valve without discount computations, as all prices are net on the price-sheet.

Eccles & Davies Machinery Co., Inc., Los Angeles, California, has issued a 16-page, two-color booklet "Edco Electrodes" which describes in detail the physical and chemical properties of these time-tested phosphor bronze electric welding rods. It gives uses and techniques for welding copper, bronze, cast iron, steel and their alloys; and contains a polarity table and directions for best welding results. The information will prove valuable to every welder and shop man.

"Industrial Logistics," a 12-page, illustrated booklet issued by The Elwell-Parker Electric Co., Cleveland. Subtitled "A Survey for Management," the booklet explains how a planned system of materials transportation reduces costs in procurement, production and distribution of goods. Outstanding examples of economics are cited, such as a reduction of $20.65 per car in unloading sheet metal, $41.00 per car in unloading bagged materials; a saving of $64.00 a day through utilizing full warehouse capacity.

Auxiliary booklets entitled "Logistics of Boxes," "Logistics of Barrels," "Logistics of Bags" and "Logistics of Bales" also have been prepared.

Copies of any or all of these booklets may be obtained by addressing Pacific Marine Review.

Hot Off the Press

The Meehanite Research Institute, New Rochelle, N. Y., has published a bulletin known as DM-345 which contains design data, including an analysis of stress-strain diagrams. Other engineering applications indicating strength and toughness are also described.

Deaeration: A restatement of the science of deaeration and its effectiveness in controlling corrosion is treated in a 20-page booklet just issued by the Elliott Company, Jeannette, Pa., manufacturers of power plant equipment.

Fully illustrated with charts and photographs, the booklet describes corrosion in general and the part which deaeration plays in checking it. Included in the text is a table showing the derivation of the pH. factor and graphs indicating the effect of pH. on the rate of corrosion, the solubility of oxygen and carbon dioxide in water at various temperatures, and the solubility of the oxygen component of air in distilled water at various temperatures and pressures.

Wide Range Oil Burner: Peabody Engineering Corporation, of New York, has issued a new bulletin, No. 109, describing the Peabody CD (constant differential) wide range oil burning system. It explains how the system achieves efficient combustion over a range in capacity as great as 50 to 1, controlling any number of Peabody burners.

Pocket Library of Engineering Data: For all industrial users of screw and other fasteners the Manufacturers Screw Products Company, manufacturers of fasteners, has printed a pocket size Library of Engineering Data on four vari-colored cards enclosed in a durable handy pocket envelope.

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Book Reviews

The Practical Design of Welded Steel Structures

This publication, which is bound in cloth and sells for $1.00 per copy, can be be obtained from the American Welding Society, 33 West 39th Street, New York 18, N. Y.

This book contains information of value to designers, engineers and fabricators who use welded construction. The text explains general and detail design considerations for simple welded joints and connections, and their application to typical structural members. Beam connections are fully treated and considered in the light of continuous structures, and a brief section deals with rigid frames. A useful feature of the book is the numerous charts to facilitate the design of welded joints and structural members. These charts are so arranged as to be applicable for any specified unit working stress.

Also included in the book are brief, yet adequate, discussions of the various welding processes, specifications for electrodes, types of welds, welding positions, qualification tests and inspection. The subject of weld geometry and stress concentration is treated at some length. Temperature effects, both physical and metallurgical, have received extended attention, and one section is devoted to the codes of the American Welding Society, which have been widely adopted for most welded construction and form the basis for the numerous charts and tables. The growing importance of fatigue in many types of structures is covered by another section dealing with this topic.

CARGO DEADWEIGHT DISTRIBUTION by Martin Heuvelmans, ninety pages 5″ x 7″ bound in blue buckram with numerous diagrams and illustrations. It is published by Cornell Maritime Press, price $1.50 net.

This is a very timely treatise on a most important stevedoring specialty of how to load all sorts of general cargo into the cargo holds and 'tween decks of a modern steamer and maintain her stability, trim and balance. The fundamental principals are comprehensively covered and adequately indexed.

This small volume should be of great value to all who have any interest in the loading of ships. The author has superintended commercial stowage of cargo in ships for his entire working career.

HOW TO CUT CAST IRON: The Technical Service Department of National Cylinder Gas Co., Chicago, Ill., has just issued an illustrated circular, N-606, completely covering the "how to" on the cutting of cast iron with the oxy-acetylene flame. For many years cast iron cutting was considered almost impossible, but now with proper apparatus and technique the job can be done both successfully and economically.

Included is discussion of proper types of equipment, preheating conditions, cutting positions, need of adequate protective clothing, proper oxygen and acetylene pressures.

RIPPLE ROCK

(Continued from page 151)

Work is now suspended until the spring of 1946.

In the meantime, Ripple Rock, one of Nature's most cunningly arranged death traps for ships, still remains in place just as it did on that eventful day in 1792 when Captain Vancouver sailed through Seymour Narrows and noted its turbulent waters in his log.

Ripple Rock, dangerously crouching, still lurks—the ancient menace it has always been. In the slang phrase of the day, it cries to all mariners: "I'll be seein' you!"

DECK-EDGE ELEVATORS

(Continued from page 156)

with a tremendous force that must be absorbed without injury.

For this deck-edge elevator a radically different type of hydraulic drive was created. Electric motors pump oil continuously into a reservoir at high pressure. To make a lift, this oil is admitted to a ram, which is a cylinder and piston some two feet in diameter and 14 feet long. The outward movement of the piston is translated by steel ropes and sheaves to vertical movement of the platform with its load. For the downward trip, the valve to the reservoir system is opened and the energy of the platform and load is absorbed by the hydraulic system. This not only provides means for braking the load, but returns to the system about one-fourth of the energy required for the next lift. Use of hydraulic mechanism provides an energy storage and partial recovery system by which the peak load on the aircraft's electrical plant is reduced by nearly three-fourths.

The new hydraulic system has an incidental but important advantage over the hydraulic plunger systems heretofore used aboard ship. The hydraulic ram nestles horizontally just inside the hull, whereas previous elevators have required two vertical rams rising through the interior of the hangar deck. Hence they form serious obstacles to the handling of stowed planes.

Numerous safety features are built into the elevator. Should the steel hoisting ropes be shot away, the platform is gripped tightly by a spring mechanism at the guide rails to prevent a load from being dumped into the sea. Ordinarily the elevator is controlled electrically by an operator at the flight deck level, but in the event of any electrical failure the elevator valves can be operated manually. All of the aircraft carriers of the Essex class are provided with Westinghouse deck-edge elevators amidships. The performance in battle has been wholly satisfactory, so much so that many features of the hydraulic system are being applied to the conventional airplane elevators in the bow and stern of the carriers.

Pacific MARINE REVIEW

MARCH 1946

MODERN VERSION OF THE Rope Trick

During four long years of war, the mills of the Tubbs Cordage Company were forced to learn many rope "tricks." How to "stretch" each pound of precious fiber to meet the vital needs of our armed forces. How to adapt substitute fiber so that non-military users might have some rope to meet the needs of industry.

With the war over, there is still a critical shortage of Manila fiber which means that you must still wait for your Manila rope. No rope "trick" can overcome this situation.

When you once more see the famous EXTRA SUPERIOR MANILA trademark, you will know that the top grade of selected Manila fiber has been used in its construction to assure you a rope of utmost dependability.

TUBBS EXTRA SUPERIOR MANILA CORDAGE COMPANY

TUBBS CORDAGE COMPAN

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Pacific MARINE REVIEW

OFFICIAL ORGAN
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Steamship Association
•
Shipowners Association
of the Pacific Coast

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Pacific MARINE REVIEW

An American Shipowner's Nightmare

Not the least of the worries of the American shipowner is the great number and complexity of Federal Government departments, bureaus, divisions and agencies with which he has to deal in order to conduct his business in a legal and customary manner.

One of the large American steamship owning firms recently prepared a large chart showing all of these agencies of the Government and illustrating the complexities of American marine transportation methods.

Briefly stated, this chart shows that there are in the Legislative Branch eight committees of the House and eight committees of the Senate; in the Judicial Branch five federal courts; in the departments sixty-five divisions or bureaus; three divisions in the Executive Office of the President; forty-two in Independent Bureaus and agencies; three in the Federal Security Agency and in the Security Exchange Commission, the General Accounting Office, the Employees' Compensation Commission and the National Board of Investigation and Research. This adds up to 140 Government contacts affecting the business of the ship. Then there is the American Bureau of Shipping, a private corporation, that is in some of its functions, notably "Load Line," a Government agency. In addition there are seven International bureaus or agencies.

In some of these contacts there is no difficulty, and to the well-regulated and smooth running offices of our large ship operating firms these are merely routine matters. But in an increasingly large number of the contacts with the Independent Bureaus and Agencies there is much irritation and delay caused by the inevitable red tape of civil service and the "stuffed shirt" attitude of officials. Several of the Agencies have the power of life or death over the American ship owning business.

The American ship owner is therefore in the same position as a man undergoing torture from a cage of spikes. Whichever way he moves he is certain to run afoul of the sharp point of some Government regulation. If he howls loudly enough that point is withdrawn but the act of withdrawal brings up another point at some other location on the walls of the cage, while ranged round the outside are several wicked-looking individuals with long rapiers to administer the coup de grace should the ship owner too persistently avoid the pin pricks of the spikes.

Under such circumstances it is indeed wonderful that there is any privately owned American Merchant Marine. The cure for this is within the power of the United States Maritime Commission and Congress and would be very simple were it not for entrenched civil service and bureaucracy at Washington.

> The Maritime Commission should make a comprehensive study of American Maritime Law and codify that law into a simple body of legislation covering modern marine transportation.
>
> The Maritime Commission should make a comprehensive study and investigation of the various bureaus and agencies having jurisdiction over American shipping and should recommend to Congress legislation eliminating all overlapping jurisdiction, and so far as possible consolidating all maritime jurisdictional functions under one bureau or agency, preferably the Maritime Commission.

The U. S. M. C. is instructed by law to investigate all matters relating to American shipping. Therefore, Congress should see to it that the U. S. M. C. does a thorough job of investigating and recommending and then Congress should pass the necessary legislation to make the recommendations effective.

INSIDE STORY

NEW PACIFIC VESSELS FOR AMERICAN PRESIDENT LINES

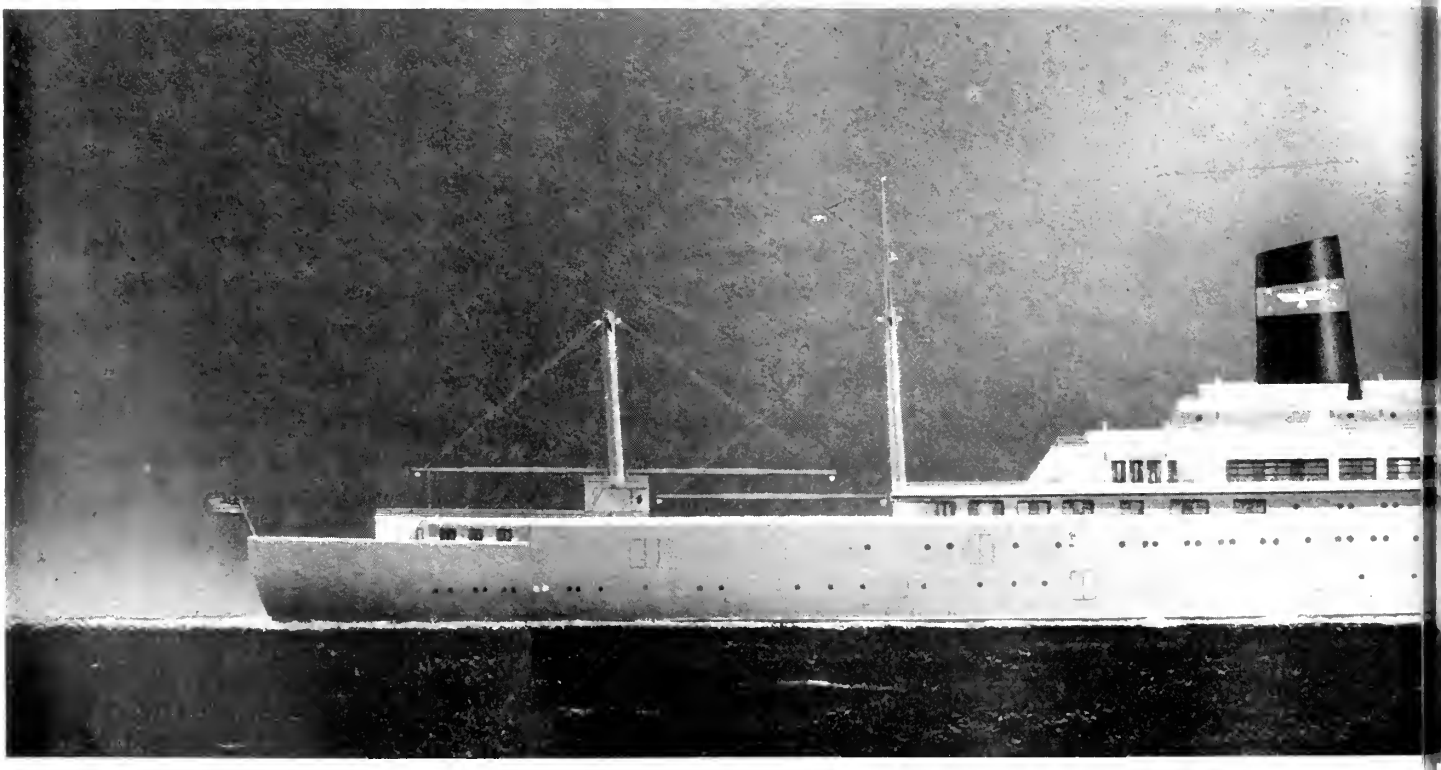
INTERIORS FORETELL DESIGN TREND OF FUTURE LINERS

By Jack Heaney

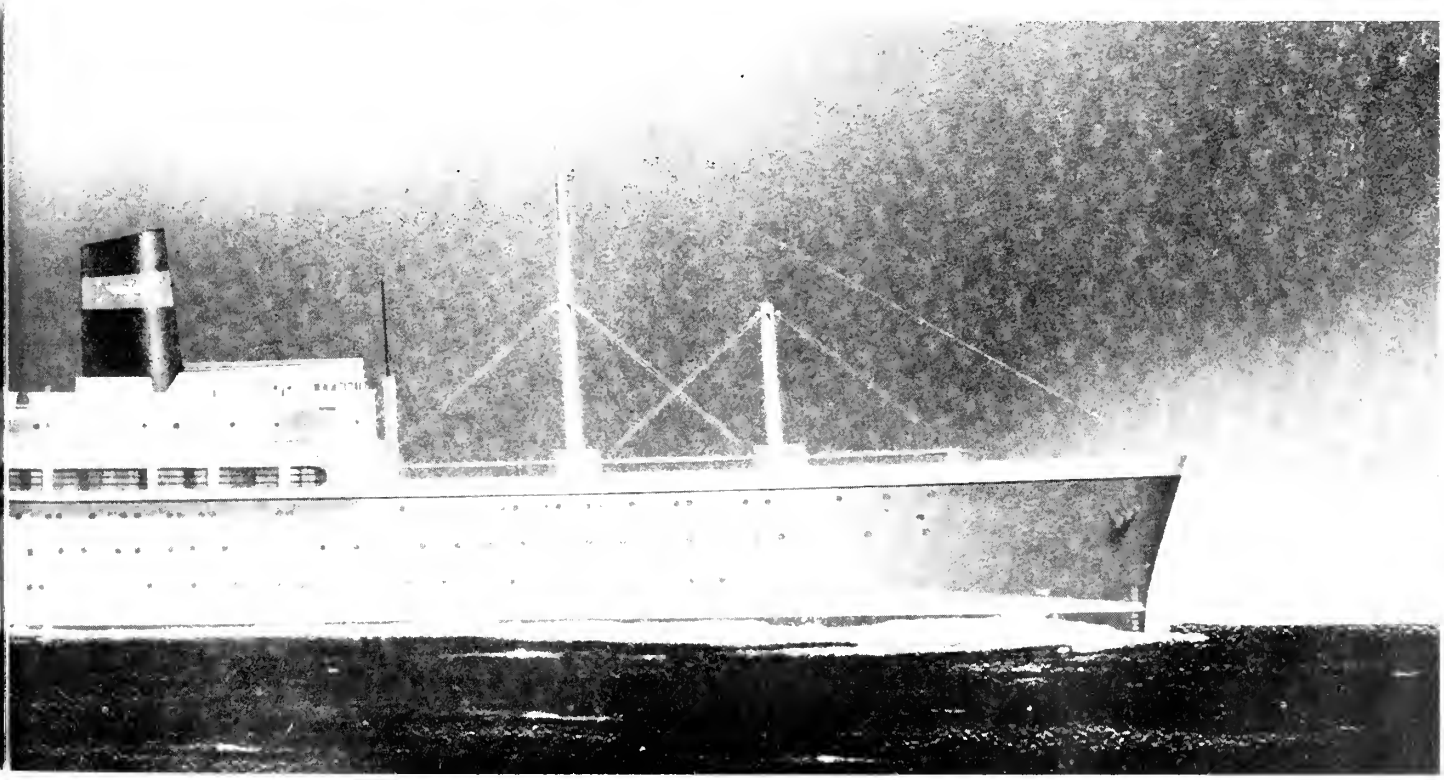
Special to Pacific Marine Review

New York, March 1, 1946. The first public look inside new Pacific passenger liners will come this year when the S.S. Presidents Wilson and Cleveland are commissioned. Into the interior design of these three-class vessels has gone the outpouring of four years' war-bound ideas. And although all of a designer's accumulated thought could not be contained in the space of one vessel, the P2-SE2-R3's indicate the trend which future marine design may follow.

Already sample staterooms, built by the joiner contractor, Aetna Marine Corporation, reveal the luxury and comfortable convenience which travelers may expect to enjoy in their quarters on these ships. With very few exceptions, cabin class staterooms are located at the ship's side. They vary in size and passenger capacity, but the average room with its generously proportioned private bath and extensive wardrobe and trunk space is equipped for three people. Through careful design and arrangement of furniture, the atmosphere of an intimate sitting room or lounge is created, suiting the room to daytime living. Beneath one or two softly draped airports, unified as one large window by a venetian blind, sits a sofa bed. It is upholstered in an original pin-stripe mohair and has the dimensions and appearance of a regular sofa. The existence of wall-flush upper and lower berths opposite is barely indicated by their outlines on the wall. At night passengers put the modern love of button-pushing to use—berths glide from their vertical, stowed position and with further digital pressure on another disk, the back of the sofa bed



CABIN CLASS STATEROOM, OUTBOARD, SHOWING SOFA BED—BY DAY



Below: **TOURIST STATEROOM DAY—**

Above: **MARINE VERANDA**

slips casually down to rest on the seat. Thus, quickly and easily, the room is transformed into a bedroom beds made up and ready for use without depending on help from a steward.

In the evolution of planning the staterooms, their furniture and other facilities, the interior design section of George G. Sharp has "aimed to please" the passenger whether his desire of the hour be to sleep thoroughly on a luxurious mattress of foam neoprene-rubber, or to entertain from a comfortable lounge chair upholstered in the same resilient material. If he likes to read late into the night, without disturbing others, he may flick off the end table lamp, turn on a light in the serrated glass cylinder which forms the lamp's base and direct light to his book only. And speaking of lighting: a space-saving floor lamp whose stem grows from the very edge of its round base fits pat in tight corners, its stem against the wall, its head leaning over and its feet completely under a piece of furniture. The simple expedient of a hinge in the armature which supports shade, bulbs and sockets makes this same lamp convertible

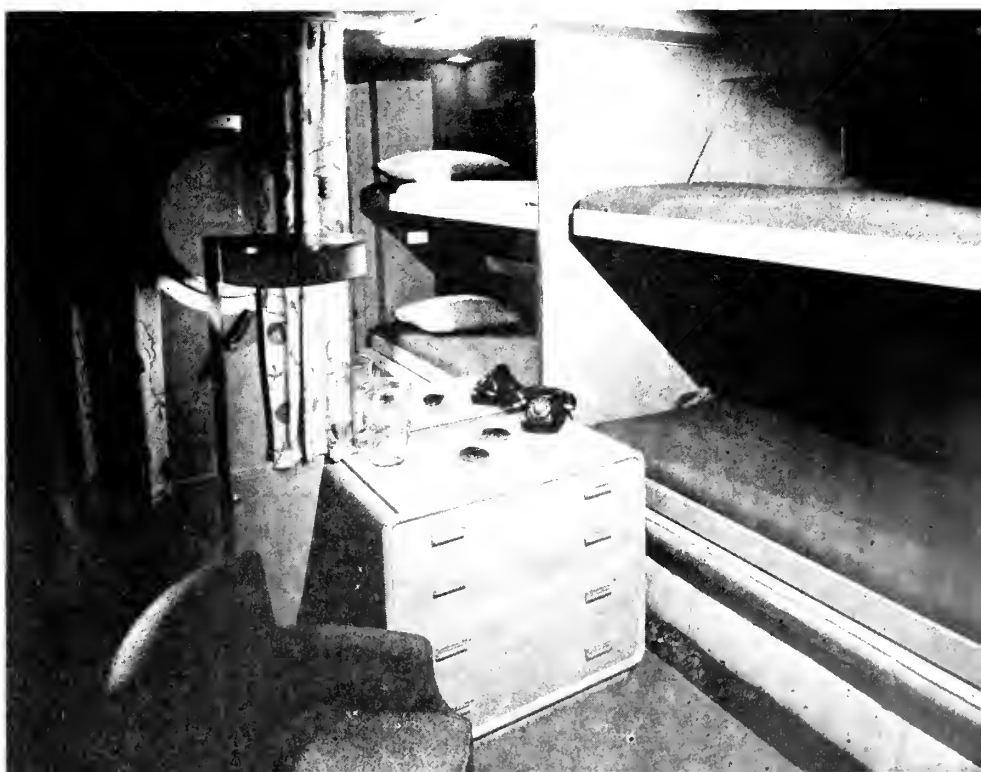
Above: **CABIN CLASS LOUNGE**

Below: **TOURIST STATEROOM —NIGHT**

from the usual indirect standing type to a direct bridge lamp.

To serve the traveling feminine world, a vanity unit is concealed in the graceful modern dresser. Miss America, or her sister, simply pulls out the top drawer of the dresser, raises and tilts back a mirror-faced lid revealing a spacious compartment made to care for small bottles, jars and such necessities. Thus, reposed in a neat vanity chair, surrounded with equipment and adequate lighting she goes painlessly to work. When she finishes, another job can be accomplished with the top down. The smooth surface of the open drawer's cover heartily suggests that the stationery in the next compartment is destined to be used for a letter home. Thus the dresser becomes a desk!

Behind the scenes, as usual, hides the construction. Upon its details, its strength, durability and flexibility for handling depends the successful culmination of design. Joiner material on these ships, manufactured and erected by Aetna Marine, fulfills this purpose. Flush, steel divisional bulk heads and similar linings are double-faced and contain an inorganic filler. The panel edges are ingeniously



formed to provide a strong interlocking joint which acts as a stiffener and thus in bulkhead erection, eliminates posts or fastenings other than retaining members top and bottom. Joiner doors and frames are fashioned to blend naturally into this modern structure, a style which is carried through, even to the Vee-joint marine veneer ceiling.

To those who wish to travel in luxury beyond that of cabin class accommodation, each ship offers two de luxe suites of three rooms each, specially endowed to please the most demanding critic. The layout comprises a real bedroom, a sitting room and a "veranda" lounge with large observation windows. Instead of creating a contrast, as in other staterooms, by setting bleached oak furniture and light shades of upholstery against darker, shadow-soft walls, the designer has done these suites in the more conventional, reverse color scheme, maintaining at the same time the simplicity and grace found in modern lines of furniture throughout the ship. With rich mahogany used for woodwork of dressers, tables and chairs, he has mixed a warm blue carpet, light pastel blue walls, textured drapery and upholstery fabrics in tones of beige, rose and dark blue, all of which blend with or complement each other. To match the woodwork, cigarette-and alcohol-proof formica used for dresser and table tops is made of "realwood" mahogany. A curvacious little end table is brought stictly up to date in material; its transparent tempered glass top is supported by delicate golden legs of anodized aluminum. Such superb surroundings suggest conveniences in the same style, and they're there in multiples of what may be found in one-room accommodations!

But let the picture of sample staterooms give a more graphic idea of useful and attractive details. In each stateroom—for comfort's sake—a "Weathermaster" unit and fan counteract the heat or cold with air conditioning and circulation. In case of any failure, airports may be opened to ocean breezes. And of course, to encourage more hot air, rooms have private phones for intraship communication, and from public booths all ship-to-shore business may be taken care of. Facilities in the tourist bathroom include a space-saving combination unit with toilet, Monel-metal wash basin, a medicine cabinet and light. Suspended on the wall are a streamlined thermo-carafe and a handy satin-finish steel Kleenex cabinet. A full-length mirror on the outside of bathroom or wardrobe doors affords a passenger opportunity for final self-appraisal before stepping out to meet the public.

Although staterooms are designed for daytime living, gregarious, fun-loving Americans will always spend more than half their waking time out on deck and in public rooms. Eating, as well as the conventional diversions of promenading, playing deck tennis, swimming, or sunning, is a favorite sport. Dining "cabin class" cannot help but be an appetizing treat in decor as well as in food. Imagine a sumptuous, Hawaiian foliage mural by a prominent artist, Andre Durenceau, blended into a soft grey-blue and beige color scheme: modern red gum buffets trimmed on top with edge-lighted Harriton carved

THE THERMOS BOTTLE*

glass panels; add comfort in gold leather chairs at regular tables or congenial chatter at diagonally patterned banquettes beneath a long range of lighted windows—it's all in one room on the President ships. Try Tourist Class—more carved glass—more mirrors, some bleached oak fluted columns—red chairs contrasting with French gray walls, and it's all done with the light hand of restraint for long durability.

A cafeteria-style arrangement for third class passengers offers quick service mid pleasant surroundings. Diners sit in well upholstered alumium chairs at spacious formica topped tables. Their lounge and smoking room has a large seating capacity, lengthy banquettes, card tables, writing desks, lounge chairs and prevailing gay, faintly Oriental atmosphere. Designed specifically for the immigrant traveler, these spaces and the third class living quarters have been handled with full knowledge of requirements, and a mind on the budget, as well as a deft space-making wand to carry comfortably and graciously all who may wish to travel this way.

Minute description of the ship's interiors, room by room, feature on feature, would make this a yarn on the installment plan. But, to be general, we could say that up on "Prom" deck there's a lot of public space, into every inch of which went months of productive thought. Renderings on these pages help tell the story and show the results till they can be seen in reality.

Since the ships will sail between the West Coast and the Orient, their public rooms have been flavored, but sparingly, with Chinese modern design. The cocktail lounge is perhaps the most evident example: the aft wall, curving out and upwards from above booths to the ceiling, is painted a deep Chinese red and adorned with a Chinese line design in gold wire. The color scheme, even the forms of chairs, tables, bar stools, their pedestals and the bar itself are reminiscent of Chinese art and architecture.

In other rooms — the masculine, mahogany paneled Smoking Room, for example — the Oriental feeling may exist only in jade handles on a modern Chinese chest, or in the decorated base of a table lamp. In the Main Lounge, a specially designed Chinese style clock, almost jewel-like in appearance, is placed in a similarly shaped niche cut in the mirror over the fireplace. Two porcelain figurine lamps sit on top of green lacquered cabinets, embellished with golden bronze trim. Faint traces of the exotic can be recognized in many other places—in a table leg, a chair back or a curving wall. But actually not half of the ship feels the influence of the Orient. Quiet, modern, American design characterizes the bleached oak paneled library and the writing room as well as the lounge and smoking room.

The Marine Veranda—as the rendering indicates—follows the suggestion of its name and creates the feeling of outdoors and a night club at the same time. Heavy white classical moldings outline doors and contrast with the dark blue walls. Windows on three sides of the room are richly draped in eggshell mohair with a banana leaf design. The orchestra backing—painted the same as the wall—is combed to show its silver lining. To carry out further the veranda effect, chairs are made of open-work cast aluminum, painted white. Pierre Bourdelle, an artist well known for his work in carved linoleum, is

*(By the American Thermos Bottle Co., Norwich, Conn.)

CABIN CLASS STATEROOM • SMALL

READY FOR BED

Cabin Class Stateroom shows wall beds down ready made up. Open dresser drawer shows vanity unit, with mirror-faced lid, large compartment to hold cosmetics. Reflected in large mirror is softly draped wardrobe.

COMBOLET

In Tourist Class bathrooms space saving unit combines regular toilet, folding wash basin of monel metal, medicine cabinet with mirror and lights top and bottom. Opposite is spacious "Koroseal"-curtained shower.

doing panels for the face of the movie projection booth and for wall space above the windows. (For Pursers' office lobbies, he is also doing track charts showing the course and location of the ship at sea). As in all cabin and tourist public spaces which are not carpeted, vinyl tile is used as deck covering in the Veranda. An off-white feature strip circles the midnight blue dance floor, repeating the curved design of lighting ingrown into the ceiling above the tables.

Hailed by many, of late, as the "new wonder plastic," vinyl is as yet unproved, but all tests predict that it will be the material of the future. Its wearing qualities are many times that of rubber or linoleum for floor coverings, and its surface is easily kept clean and unscarred because it is so hard. To the shipowners and operators who yearn to eliminate the expense of maintenance and replacement, vinyl tile may prove a godsend. For a dance floor, it offers a surface smoother and as danceable as hardwood. For promenade decks, it can be molded into a pattern with a semi-abrasive surface to prevent slipping in case of wet weather. For the President ships we have obtained a line of colors which will augment the appearance of any interior reds, neutral beige good for passage-ways, tones of grey or dark blue which, accented with white, may be worked into a pattern or fashioned into a feature strip to suit the design of the individual room. By various arrangements of the 9" square tiles in which it is laid, any desired effect may be obtained a pin-stripe such as is being used in the cabin class Cocktail Lounge, for example.

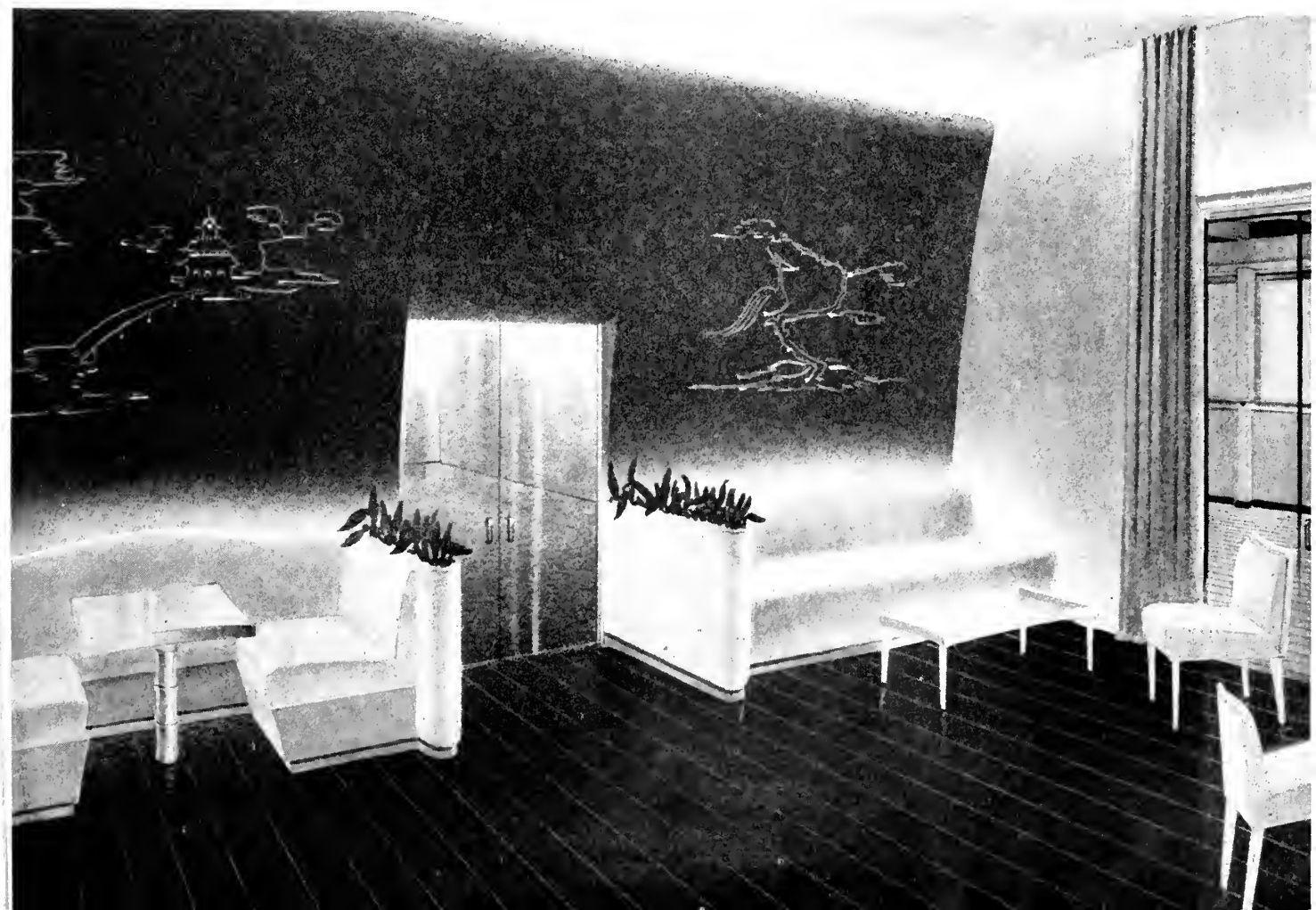
In two of its other forms, simulated leather and patent leather, vinyl is entering the upholstery field. A fire resistant, water-proof, highly resilient but tough material, it is used easily over rubber upholstery with no fear of stretching as leather does. In less expensive quarters, in place of shorter-lived, less attractive chair coverings, it is being used aboard the Wilson and Cleveland on banquettes and chairs in public rooms. In the Marine Veranda, a pure white patent leather type is prescribed to cover the white aluminum chairs.

On the whole, in public rooms lighting is concealed in soffits, in coves and so forth. In the Tourist Class Cocktail Lounge, a dropped ceiling with wavy edges extends the length of the room and hides fixtures which throw light down on walls covered with mirrors, and a mural. Naturally, decorative lamps are necessary and apparent to add character and touches of color to lounges and smoking rooms. Each public room or stateroom fixture, whether it be decorative per se or in its effect from a hidden source, was individually designed to do the job planned for it.

In honor of its home port, the President Cleveland will have, in its forward stairhall, stretching between Prom and Shelter decks, a perspective mural of San Francisco its hills, its bay and its bridges. Both ships will salute America with their design and decorative appointments so typical in origin, at the same time deftly introducing the fantasy of the Chinese. Several murals, both photographic and painted, will portray the reality of this country, while others will seem to wear the lei of Hawaii or bow a head to the revered ancestors of the Orient. So, to those travelers eagerly coming home to the U. S. or to those whose heads are turned with excitement towards the "Far East" across the ocean, the President ships will give first touch with what they are seeking, and at the same time they will inobtrusively provide all comforts, safety, conveniences and the facilities for a most enjoyable and happy trip on the Pacific.

CORNER OF COCKTAIL LOUNGE

AFT WALL SHOWS TREATMENT OF CHINESE DESIGN IN GOLD WIRE



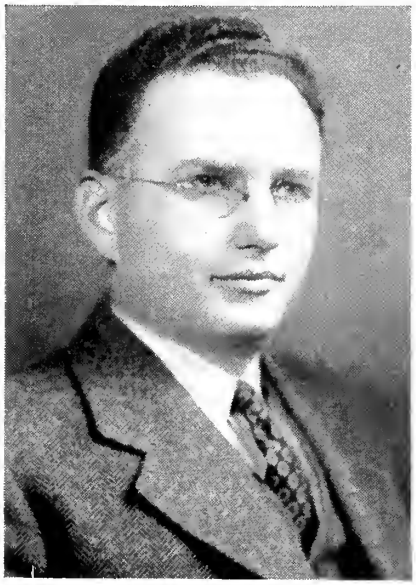
American President Lines Back In World Service

By E. Russell Lutz

Executive Vice President, American President Lines
President, Pacific American Steamship Association
Written expressly for *Pacific Marine Review,*

IN CONVERTING from war to peacetime operation, American President Lines is confronted with a number of difficulties, not the least of which stems from the unprecedented backlog of traffic, both passenger and freight, which is literally begging for shipping space across the Pacific and to ports around the world. This situation results from the inevitable timelag which occurs between winding up the traffic of war and the outfitting and equipping of suitable vessels for the commerce of peace. It is a problem more or less common to the whole maritime industry.

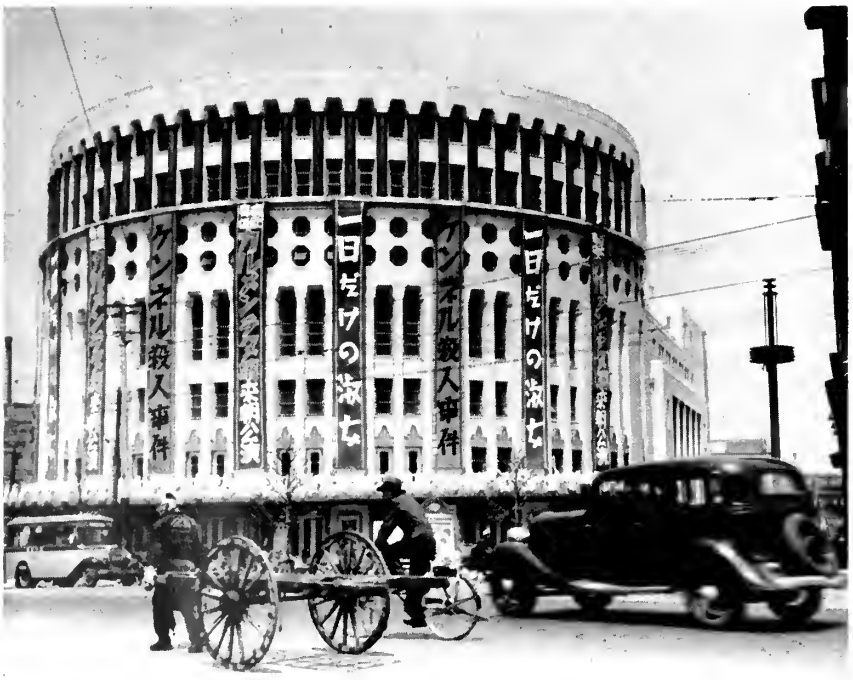
American President Lines is meeting this particular problem by acquiring certain vessels from the Government's great merchant war-built fleet, said vessels to be operated in essential services on an interim basis until such time when ships of a more permanent character, and designed especially for President Line routes, can be constructed or otherwise acquired. It is a paradox growing out of the waste and extravagance of war that in a world full of ships still more ships must be built. In no other way, however, can special trade requirements be accommodated.



E. Russell Lutz

Our company is about to take delivery of two P-2-type Navy troopships which will undergo limited conversion and then be assigned to the immediate and imperative job of relieving the transpacific traffic jam. They will continue to operate until two ships of similar hull design—S.S. President Wilson and S.S. President Cleveland—now nearing completion at Bethlehem's yard in Alameda, are commissioned into service, probably in September or October of this year. The P-2 Navy troopers will then be laid up and a real conversion job done on them. They will come out finely appointed ships, after which all four will maintain a fast passenger express schedule across the Pacific on a basis of fortnightly sailings from San Francisco and Los Angeles.

The P-2's are somewhat smaller and less pretentious than the late Presidents Hoover and Coolidge, but in many respects, notably in refinements and comforts of passenger accommodations, they will be superior to the former transpacific luxury liners. The new P-2's are 622 feet long, 76 feet wide, displace 23,000 tons and have a cruising speed of 19 knots. The Presidents Cleveland and Wilson will carry three classes of passengers with total accommodations for 552 and a full merchant crew of 331. The converted troopers will carry approximately the same totals, but will provide accommoda-



Scenes throughout this article are prewar views token along the A.P.L. routes. At left is a department store in Tokyo.

Hong Kong by day.

tions for only two classes of passengers.

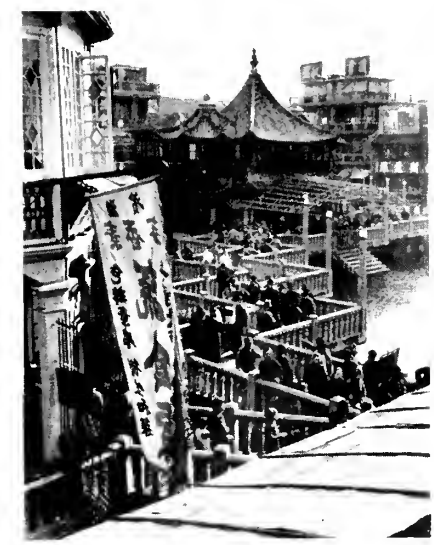
It is evident that these new P-2 President liners are all that their designers, builders and outfitters claim for them. They are truly fine ships, trim, safe and serviceable, styled and built in the best American tradition. And yet, insofar as American President Lines' long-range plans for the Pacific are concerned, they are merely interim ships; highly satisfactory for the urgent near-term job at hand, but destined within a few years to yield to even larger, much faster and more luxurious passenger express liners.

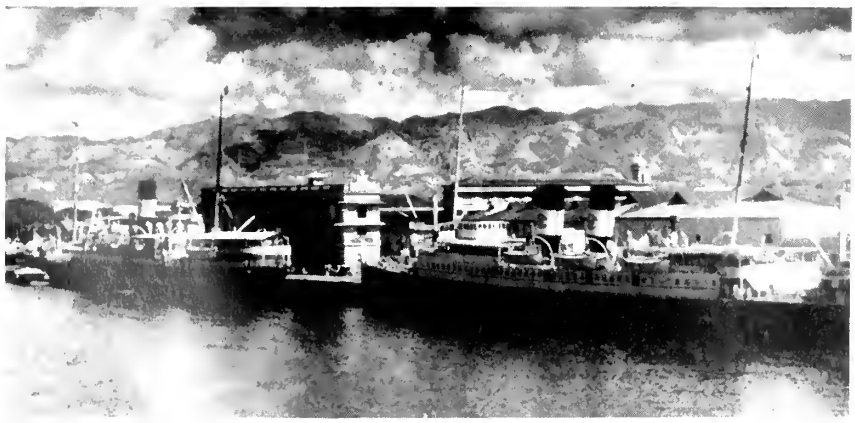
In order to bring this interim fleet into its proper perspective it is necessary to glimpse the whole of American President Lines' operations, present and projected, including the old established pre-war services plus other services for which applications are now pending before the United States Maritime Commission.

Prior to the war the company owned and operated a total of 19 combination passenger and cargo vessels, although a few of the original round-world vessels were being used solely as freighters. With a few exceptions these 19 ships were employed in three services over two essential trade routes — transpacific and around-world. Today, only three of the company's pre-war fleet remain in the ownership of American President Lines. They are the Presidents Monroe, Polk and Johnson. The first two were constructed, along with five others, for President Lines' round-world services by the Mari-

Hong Kong by night.

Scenes in Shanghai.





time Commission and were completed just before Pearl Harbor. Known as C-3P's, they were taken under charter by the Navy, and are just now being returned to the company. The President Johnson, ex-Manchuria, is an older ship which we operated as a transport during the war.

Trade routes presently accredited to the American President Lines are known as "Line A" and "Line B." These represent, however, three distinct "services," two operating over Line A and one over Line B.

Service No. 1 (over Line A) is the company's pioneer passenger express run between California ports (San Francisco and Los Angeles) and ports in Japan, China and the Philippine Islands via Honolulu, formerly dominated by the palatial luxury liners President Hoover and President Coolidge. It is for Service No. 1 that the four interim ships, known as P-2's are now being made ready. Schedule frequency: fortnightly sailings.

Service No. 2 (Line A) is a freighter service which closely parallels service No. 1 over Line A, but in which the vessels may call at additional ports as cargo offerings warrant. Minimum vessel requirements for this service, to provide 26 sailings per year, are specified as five C-3-type freighters, with 17 knots speed. The company is now operating in this trade (under WSA agreement) three such freighters, recently turned out by Western Pipe & Steel at South San Francisco. They are the Presidents Taft, Grant and Pierce. Three sister ships in the same yard are awaiting final finishing touches, currently delayed by the machinists' strike. These ships represent the last word in modern cargo carriers. They have the latest automatically-controlled refrigerated boxes, an abundance of deep-tank space for both vegetable and mineral oils, and are equipped throughout with Cargocaire.

Service No. 3 (Line B) is the company's famous and ever-popular

Top: Shanghai Bund.

Center and bottom: Shanghai Harbor.

round-the-world service over which seven comfortable combination passenger and cargo vessels on a fortnightly schedule will eventually resume calls at 22 fascinating ports in 14 countries . . . New York and Boston, Havana, Cristobal, Balboa, Los Angeles, San Francisco, Honolulu, Yokohama, Kobe, Shanghai, Hong-Kong, Manila, Singapore, Penang, Colombo, Bombay, Port Said, Alexandria, Naples, Genoa, Marseilles, then back to New York.

Minimum requirements for the round-world service are seven C-3P's of modified design, to accommodate 150 passengers. (The former C-3P's of the Presidents Monroe-Polk type accommodated only 97 passengers.) The design of the new group of vessels, which is now in progress, and their construction will take some time. These new globe-girdlers, although modest in size, will have built into them all the modern refinements and luxurious appointments known in present-day shipbuilding art. Meanwhile, until the new vessels are available, the company has made application to the War Shipping Administration for the allocation of seven C-4 freighters to be operated in the round-world service. Presumably such vessels would come from the war-built fleet. To date the company has been allocated five C-4 vessels, four with required refrigeration and deep-tank space and one without.

The three services outlined above are substantially those covered by the American President Lines' Operating Subsidy Agreement, and represent the established routes and services under scheduled operation at the outbreak of war. Since then the company has applied to the Maritime Commission for two additional services, which have been identified as Services Nos. 4 and 5.

Service No. 4 would employ a minimum of five C-3 freighters in what would be known as the Atlantic-Straits service, operating between ports on United States Atlantic Coast

Top: B.P.O.E. and Army and Navy Club, Manila.

Center: Plaza Gaiti, Manila.

Bottom: Hong Kong Harbor.

Above: Waikiki Beach, Honolulu.

Below: Pasig River (Manila) at night.

and the Malay Peninsula via the Caribbean, Panama Canal, ports in California and Hawaiian Islands and ports situated in the Philippines, with privilege of calling at other ports in Japan, China, Hong Kong, French Indo-China, Netherlands East Indies, Thailand, Burma, Borneo, New Guinea and at Central and South Pacific islands lying within the general area of the route, also at Atlantic Canadian ports.

Service No. 5, known as the Pacific-India Service, likewise would use a minimum of five C-3's (freighters) between ports situated on the United States Pacific Coast and Hawaiian Islands and ports in the Philippines, Netherland East Indies, Malay Peninsula and India, with the privilege of calling at other ports in Japan, China, French Indo-China, Thailand, Burma, and Central and South Pacific islands lying within the general area of the route, also Pacific Canadian ports. Studies on essential trade routes by the Postwar Planning Committee of the Mar-

Coolie raincoats, Hong Kong.

itime Commission have led to a recommendation that this proposed India service be extended from California to the East Coast of the United States, via the Panama Canal.

American President Lines and its direct predecessors have a continuity of service between the United States and the Orient dating back more than a half century. Its famous round-world service dates back nearly a quarter of a century. The importance of these two American flag services in fostering world commerce and en-

Remnants of Spanish fleet in Manila Bay.

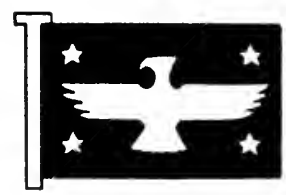
A small bit of the merchant marine of the Orient.

hancing the prestige of the American Merchant Marine can hardly be exaggerated. With the additional services outlined above, American President Lines will have one of the best balanced and most comprehensive operating units in the merchant marine.

Already the company has made remarkable strides on the road back to peacetime commercial operation. Those members of the organization who joined the Armed Services or took special wartime assignments with the Government are returning to the company as rapidly as they are being released. The company's training program, which had been dropped during the war, has been resumed with added features. Details are being studied with a view to integration with the G. I. training program. The planning for a post-war advertising campaign has been completed and advertisements will soon be appearing in media of large circulation. Our passenger offices, which were subleased during the war period, have been recovered and are in the process of being modernized and refurbished with a view to their early reopening to serve the public.

The company's offices have already been re-established in Manila, Shanghai, Hong Kong and Singapore, and in Naples, Italy. Another group of Far Eastern company representatives will leave soon for Japan, where they will be engaged by the War Shipping Administration until such time as they can resume commercial operations for the company. The fabled cargoes of the Far East, silk, spices and precious jewels and metals, are already making new "first" arrivals at West Coast ports on President Line ships. Soon this life-giving commerce, so vital to our own and the world's economy, will be flowing freely, on a two-way basis, through our ports for the enrichment of all mankind. American President Lines hopes to be a constant and dependable factor in contributing by ever-increasing measure to this essential public service.

Flower vendor, Hong Kong.



A San Francisco pier at departure time.

The P-2 Passenger Liners

President Cleveland AND President Wilson

By A. J. Dickie

A PASSENGER and cargo liner is a small city afloat and equipped with means of propelling itself over long distances and of taking care of its inhabitants in the manner of living to which they are accustomed. The changes in the design and equipment that are developed for each new liner are of great interest to the marine engineer, the naval architect, the shipper, and the traveling public. This article is written mainly with the purpose of showing the advances in these matters made by the Maritime Commission, by George Sharp, naval architect, and by the American President Lines in the hull, machinery and equipment of the P-2 design as demonstrated in the S. S. President Cleveland and the S. S. President Wilson now under construction at the Alameda, California yard of the Shipbuilding Division of the Bethlehem Steel Company.

This design was produced as a troopship for war purposes and considerable thought was expended in making it possible to convert from troopship to passenger liner with the least cost of labor and material. In January of this year we published the general arrangement plans, midship section, outboard profile and inboard profile of the passenger liner. In Pacific Marine Review for November, 1945, similar plans and profiles of the troop transport appeared. (The inboard profile and arrangement plans for Promenade Deck, Upper Deck and "A," "B" and "C" Decks are shown on the insert herewith reprinted from the January issue.) A comparison of these two sets of plans shows the structural changes made in converting from troops to passengers. The principal characteristics of the passenger liner are shown in the table herewith.

Design and construction comply with all the applicable laws of the United States and the rules and regulations of the American regulatory bodies as follows:

(a) American Bureau of Shipping for special survey to the highest class in that Bureau's Record Book;

(b) U. S. Coast Guard Division of Inspection and Navigation;

(c) International Load Line Convention;

(d) U. S. Public Health Service rat proofing instructions, and instructions for carrying and distribution of fresh water and the disinfecting of drinking water;

(e) International Convention for Safety of Life at Sea;

(f) Senate Report No. 184;

(g) U. S. Customs Admeasurement;

(h) Panama Canal Regulations; and

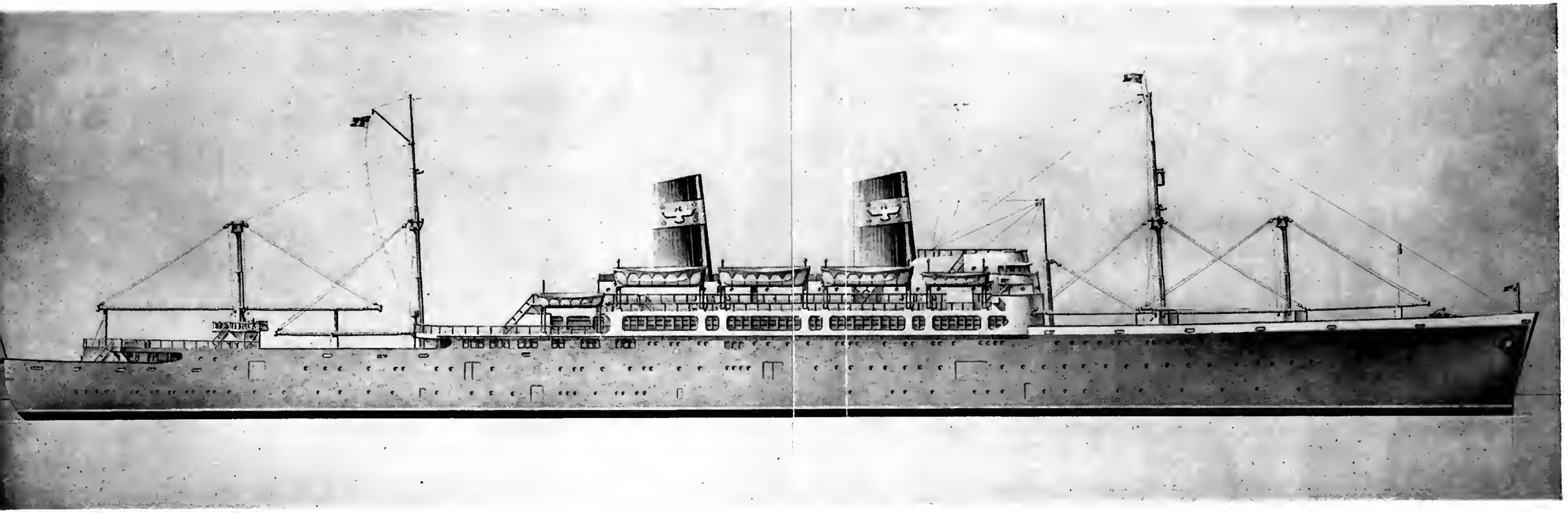
(i) Suez Canal Certificate

(Incidentally, these P-2's are the first passenger vessels built on the Pacific Coast under Senate Report No. 184).

The hull is of combined riveted and welded steel construction with a curved stem, a cruiser stern, and with three complete decks and a partial deck. These decks are designated A, B, C, and D. Above these are: an upper deck extending from the stem almost to the stern; a promenade deck extending from the stem to frame 168; a boat deck covering the midship house; and a navigating bridge deck. The midship house above the boat deck is of riveted aluminum construction which we understand saves some 75 tons in weight at a position where weight saving is important. This use of aluminum is new in merchant ship construction although the U. S. Navy has used this metal on the superstructures of destroyers and cruisers with very satisfactory service results. In this work all rivet holes are drilled or punched to a diameter 1/16th inch less than that of the rivet. After assembly and packing, with every third hole bolted, the holes are reamed to a diameter 1/32 inch larger than the rivet. Up to and including 3/8" diameter the rivets are driven and set up cold. Above 3/8 inch diameter they are driven hot.

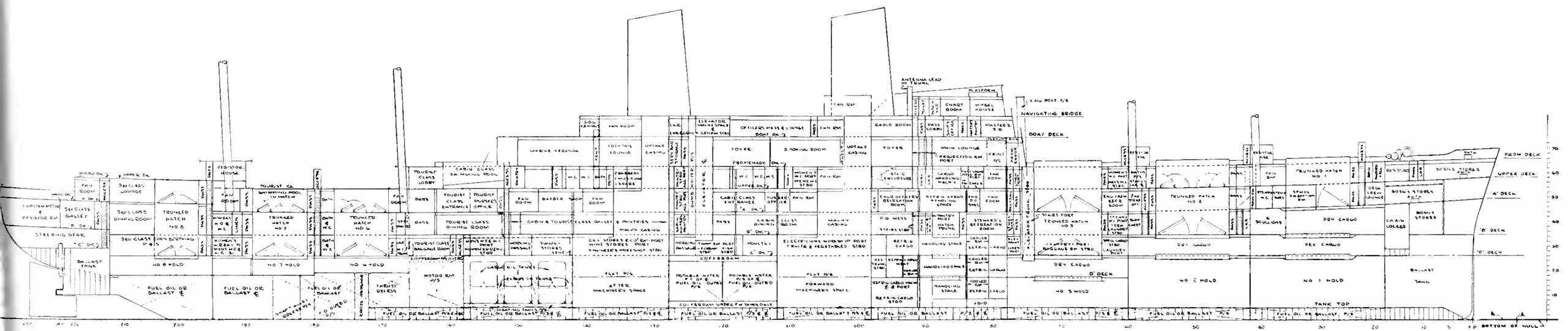
This use of aluminum makes an interesting saving in weight and it is rather unfortunate from the commercial standpoint that in this particular hull design there is no commercial opportunity to take advantage of it by carrying more pay load. It is evident from a study of the characteristics table that in order to achieve stability under all conditions some 800 tons of fixed ballast had to be built into the hull. Thus the principal commercial advantage of the use of aluminum in the superstructure is lost by the great weight of fixed ballast necessary to maintain stability in the light condition. The hull evidently should have had four of five feet greater beam in which case somewhat less than 800 tons additional steel in the hull would give: necessary strength; additional volume providing greater hold capacity and larger and better arranged cabins; and additional displacement allowing large increase in deadweight of cargo on the same draft.

Another feature that is very noticeable in the general arrangement plans is the huge space in very desirable locations allotted to crew's quarters. Practically everything on A and B Decks forward of amidships is for the crew. Using a little "horseback arithmetic," to quote President Truman, we find that considering cabin space alone each member of the crew gets on an average 0.71 frame spaces, and each passenger gets as an average for all classes 0.473 frame spaces. Thus the average crew member, in-



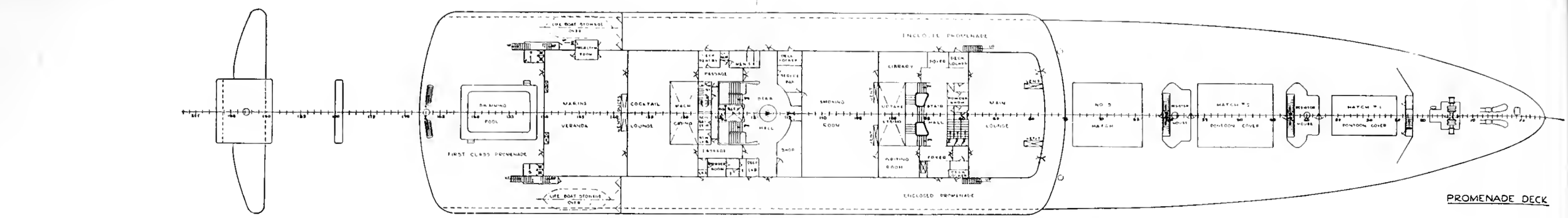
P-2 PASSENGER LINERS

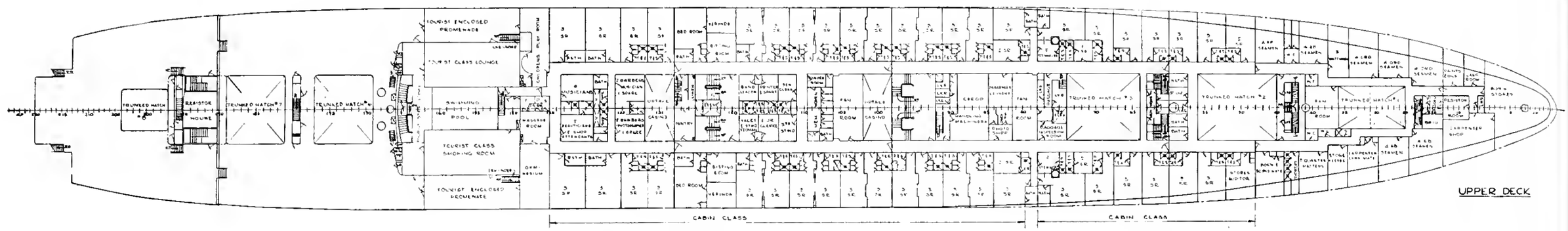
Artist's conception of the converted P-2 liners being completed at Bethlehem Alameda Yard for the American President Lines. Each of these two passenger liners will cost seven and a half millions for the conversion items, in addition to the seven and a half millions already expended on the vessel as a Navy transport, so that the total cost will be approximately $15,000,000 for each ship. On launching they will be christened PRESIDENT CLEVELAND and PRESIDENT WILSON.

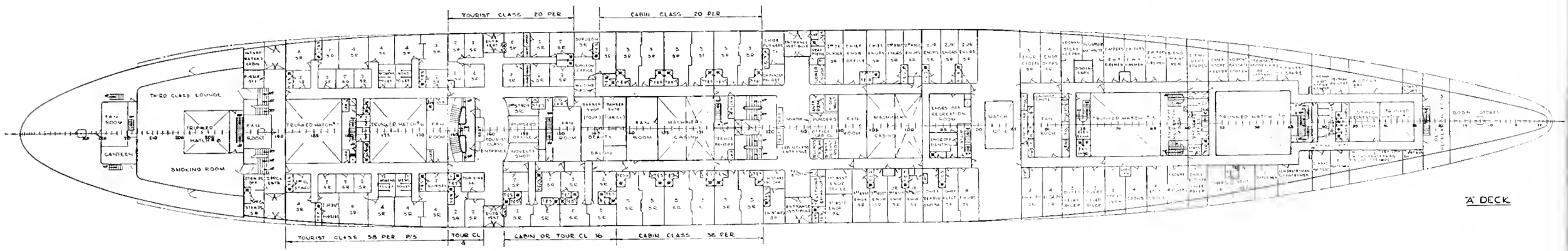


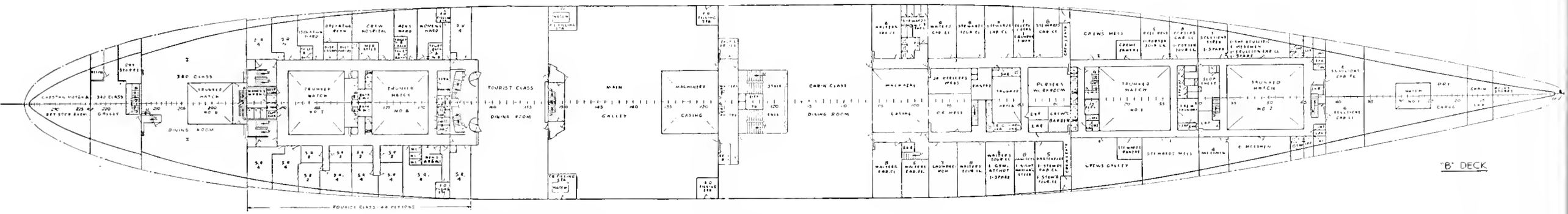
INBOARD PROFILE

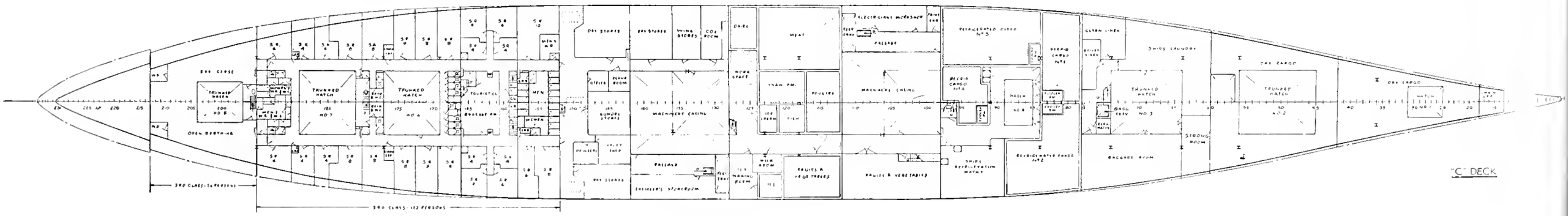
PACIFIC MARINE REVIEW


PROMENADE DECK
ENCLOSED PROMENADE
FIRST CLASS PROMENADE
SWIMMING POOL
VERANDA
COCKTAIL LOUNGE
SMOKING ROOM
LIBRARY
MAIN LOUNGE
WRITING ROOM
ENCLOSED PROMENADE
NO 3 HATCH
HATCH No 2
HATCH No 1
POONTOON COVER


UPPER DECK
TOURIST ENCLOSED PROMENADE
FIRST CLASS LOUNGE
SWIMMING POOL
TOURIST CLASS SMOKING ROOM
TOURIST ENCLOSED PROMENADE
CABIN CLASS
CABIN CLASS
TRUNKED HATCH No 3
TRUNKED HATCH No 2
TRUNKED HATCH No 1


"A" DECK
TOURIST CLASS 20 PER
CABIN CLASS 20 PER
THIRD CLASS LOUNGE
SMOKING ROOM
CANTEEN
TRUNKED HATCH No 7
TRUNKED HATCH No 6
TRUNKED HATCH No 5
TRUNKED HATCH No 4
TRUNKED HATCH No 3
TRUNKED HATCH No 2
TOURIST CLASS 58 PER P/S
TOUR CL 4
CABIN OR TOUR CL 16
CABIN CLASS 38 PER


"B" DECK
TOURIST CLASS
DINING ROOM
MAIN
MACHINERY CASING
CABIN CLASS
DINING ROOM
TRUNKED HATCH No 8
TRUNKED HATCH No 7
TRUNKED HATCH No 3
TRUNKED HATCH No 2
TRUNKED HATCH No 1


"C" DECK
OPEN BERTHING
TRUNKED HATCH No 7
TRUNKED HATCH No 6
MACHINERY CASING
MACHINERY CASING
TRUNKED HATCH No 3
TRUNKED HATCH No 2
TRUNKED HATCH No 1

cluding officers, gets approximately 50 per cent more sleeping space than the average passenger. On pointing out this ratio to a government shipping operator he remarked, "Why not, don't they sleep more?"

The decorative and luxury features and the construction, equipment, and arrangement of the passenger accommodations are described fully in an article by their designer appearing in this issue. We will, therefore, confine this article to the deck, navigating, cargo handling, and propulsion equipment.

All decks above A deck have both camber and sheer, A deck has sheer but no camber, decks below A have no camber and no sheer. As has been usual for some years in American passenger liners of this type, the promenade deck, in way of the house amidships, projects about 2 feet outboard from the hull, port and starboard. This serves the purpose of helping to keep boats clear of hull when lowering and allows the installation of flood lights under this overhang to illuminate the sea. It gives, of course, a wider promenade which is a decided advantage for passenger recreation and loafing space.

Provisions for air conditioning and ventilating are very complete. Air conditioning is provided: for all cabin and tourist class passenger staterooms; for a number of ship's officers staterooms and offices; for all mess rooms; for tourist and cabin class dining rooms; the library, waiting room, writing room, and shops; and for tourist, cabin, and officers' lounge rooms. Mechanical ventilation is provided for practically all the enclosed spaces on the ship. In general the air supply to all uncooled spaces is required to equal 30 cubic feet per minute for each occupant. In unoccupied spaces the air change varies from a complete change every two minutes in the battery room to a change every 30 minutes in dry cargo spaces, air supply to be for the gross cubic measure without benefit of deductions for furniture or other contents and no space to receive less than 25 cfm. Air conditioning machinery is supplied by the Carrier Corporation and the ventilating and air conditioning systems are equipped with Ilg fans. Air conditioning systems are served by heaters and cooling coils supplied by McQuay, Inc.

Deck Equipment

On the boat deck there are installed under aluminum gravity type davits 10 lifeboats as follows:

Four—36′ 6″ by 11′ 9″ by 5′ 3″, 135 person lifeboat hand propelled;

Two—36′ 6″ by 11′ 9″ by 5′ 3″, 105 person lifeboats motor propelled, and radio equipped;

Two—26′ 8″ by 8′ 3⅝″ by 3′ 7¼″, 46 person lifeboats; and

Two—26′ 8″ by 8′ 3⅝″ by 3′ 7¼″, 46 person rescue boats oar propelled.

The total person capacity here is 934, or more than enough to take care of the full complement of 890 passengers and crew.

Each pair of davits is served by an electric winch of capacity for hoisting the fully loaded boat safely at 20 fpm and for safely lowering at 100 fpm. In addition to the lifeboats there are sufficient life rafts carried to take care of 25 per cent of the total personnel. These rafts may be launched over the side or will float free in the case of sinking of the vessel. A life preserver for every person aboard and 18 life buoys are also carried for emergencies. All of the boats, davits and winches were supplied by Welin Davit and Boat Corp. All of the boats except the after pair are handled and passengers embarked from the Boat Deck. In the case of the after pair of boats they are handled from the Boat Deck and passengers embarked from the promenade deck.

The electric drive Lidgerwood windlass is mounted forward on the promenade deck and is of the horizontal shaft double wild cat double gypsy type, the entire assembly including electric motor being installed above the weather deck. This equipment is capable of hoisting two stockless cast steel anchors each weighing 15,575 lbs. and two 30 fathom lengths of 2⅝″ steel stud link chain, each weighing 11,630 lbs. at a rate not less than 30 fpm. Either gypsy head must have a line pull of 20,000 lbs. at a speed of 30 fpm. and a no load speed

The zig-zag wake of the P-2 made during the trial run as a transport. In the distance a Russian freighter heads out to sea.

P-2 PRINCIPAL CHARACTERISTICS

Length Overall	609′ 5¾″	
" 32 Ft. Waterline	593′ 2 ″	
" 29 Ft. Waterline	590′ 0 ″	
" Bet. Perpendiculars	573′ 0 ″	
Beam molded	75′ 6 ″	
Draft Subdivision	30′ 0 ″	
Draft Scantling	32′ 0 ″	
Normal Shaft Horsepower	18,000	
Sustained Sea Speed	19 Knots	
Depth Molded Promenade Deck	61′ 6 ″	
Height Upper Deck to Promenade Deck	9′ 0 ″	
" A Deck to Upper Deck	9′ 0 ″	
" B Deck to A Deck	9′ 0 ″	
" C deck to B Deck	8′ 6 ″	
Crew including spares	338	
Passengers (about)	552	
Lightweight of ship including 800 tons fixed ballast		12,345 tons
Deadweight in long tons—		
Stores, passenger, crew and effects	450	
Fresh water	388	
Fuel oil	4,367	
Cargo oil	800	
Cargo oil heating water	114	
Refrigerated cargo	621	
General cargo	3,808	
Total Deadweight		10,548 tons
Total Displacement at 29′ 6″ draft		22,893 tons

of not less than 75 fpm. The motor for this windlass is rated 125 hp 230 volts, approximately 600 rpm.

The steering gear is of the Lidgerwood hydro-electric double ram four cylinder Rapson slide type, located directly over the rudder on "C" deck. It is capable of moving the rudder from hard over to hard over (70°) in less than 30 seconds when the ship is going ahead at a speed corresponding to the maximum designed shaft hp and at full load draft and in less than 60 seconds when going astern at 40 per cent of the maximum shaft horsepower. The rudder may be independently operated by either ram. The maximum working pressure ahead or astern must never exceed 1500 psi. The hydraulic pumps for these gears are in duplicate, each pump having capacity to handle the gear. Each pump is driven by a 50 hp 440 volt A.C., 3 phase 60 cycle motor operating at 1800 rpm. These motors may be controlled from four steering stations: a pair of trick wheels in the steering gear room; a mechanically connected after deck steering wheel station; the standard station in the pilot house; and a station on the pilot house top. At the last two the control is by hydraulic telemotor connection for manual steering, and by Gyro Pilot system for automatic holding to the course. Suitable switch-over arrangements prevent any interference between the steering systems.

The engineer at the controls stands by to put her "full ahead" when the skipper telegraphs the order. He is watching the General Electric propulsion control board, and it takes only a slight movement of his hand to send this P-2 clipping through the salty.

Ten single drum and six double drum electric drive winches, of double reduction gear type are provided for cargo handling at the six hatches. These winches are driven by 50 hp d.c., 600 rpm, 230 volt motors, and are capable of handling: 1½ tons at 290 fpm; 3 tons at 220 fpm; and 10 tons at 56 fpm. They were manufactured by Lake Shore Engineering Co. with motors and controls by Westinghouse.

Two 24 inch vertical Lidgerwood capstans driven by 35 hp, 230 volt d.c. motors through gearing are each capable of exerting a 20,000 pound pull at 30 fpm on warping or other hawsers. Motor and gearing are installed on deck below.

An interesting advance in the design of cargo handling machinery is the Lake Shore Engineering Co. side port loading-discharging crane for hatch No. 4 which tops on "A" deck. Two bridges each carrying one trolley and each capable of handling 2½ tons safely are installed for athwartship travel in unison. The travel of the bridges is served by a 10 hp motor; the travel of the trolleys by a 15 hp motor, and the hoist drums are operated by a 50 hp motor. A complete description of this under deck cargo hoist will be found in a separate article elsewhere in this issue. The bridges at the limit of their travel have sufficient outboard pro-

jection to give the trolley 15 feet clearance from ship's side.

Another interesting item of cargo handling equipment is a pair of portable cargo oil pumps supplied by the Waterous Company. These are of the rotary type with herringbone reduction gears driven by Westinghouse 30 hp, 1800 rpm motors and each pump will discharge 350 gpm against 100 psi with 440 rpm of the pump rotors. These pumps are handled by three electric motor drive whip type hoists each with a capacity for lifting two tons at 25 fpm.

Two elevators by Otis are installed, one for passengers and one for baggage each capable of lifting 2000 lbs. at 100 fpm. The passenger cage travels from "B" deck to the promenade deck and the baggage elevator from "C" deck to the upper deck.

Navigating Equipment

The pilot house, navigating bridges and pilot house top are equipped with all the most modern devices for making navigation simple and safe.

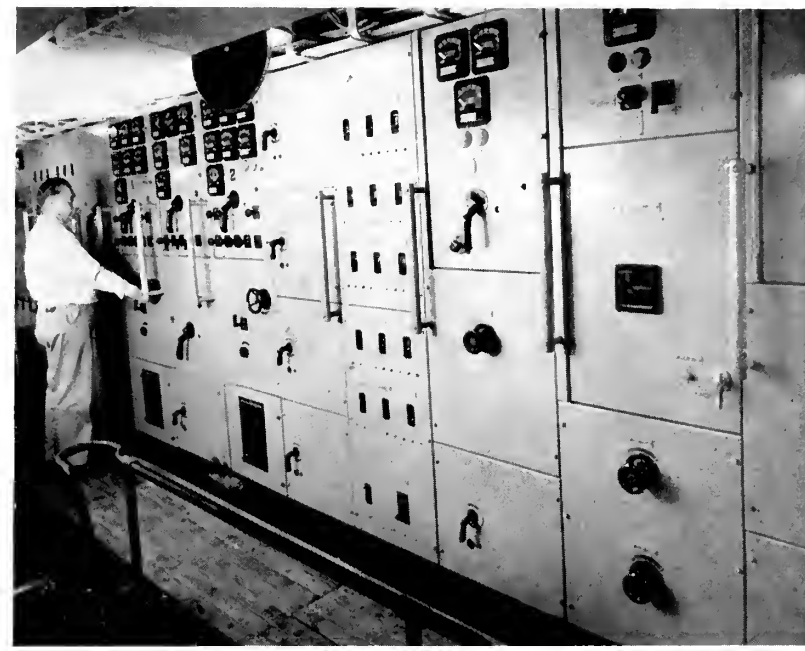
Gyrocompass system includes one Sperry Mark XIV master gyrocompass and eight repeaters mounted and located as follows: steering type repeater on gyro pilot control stand in wheelhouse; steering type repeater on column stand on wheelhouse top; bearing type repeater on column stand at after steering station; bearing type repeater on column stand, port and starboard on bridge wings; bearing type repeater bulkhead mounted in master's office; steering type repeater bulkhead mounted in steering room; and repeater mounted in radio direction finder. An automatic course recorder of the gyrocompass repeater type in the chart room keeps accurate records of all courses.

A Sperry gyro-pilot system is installed which provides complete and independent electric telemotoring for either manual or automatic control of the stroke of the main steering gear pumps. The control unit of this system is mounted in the wheelhouse.

A Submarine Signal Co. echo depth sounder provides visual and recorded reading of the depth of water under keel. This instrument has a range of from three fathoms up and its readings are accurate within 2 per cent.

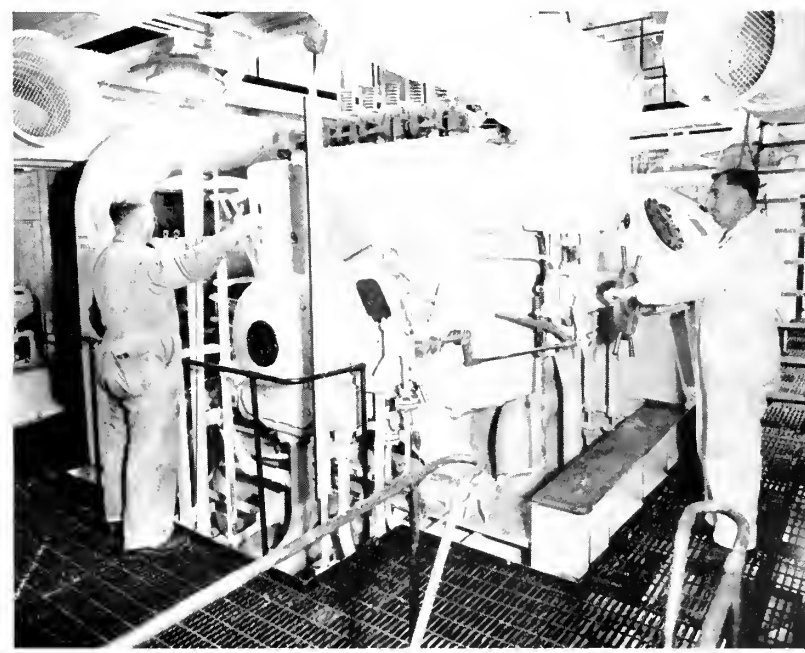
Two systems of sound powered telephones are used. System A keeps the wheel house in communication with: the wheelhouse top; the chart room; the forecastle head; the crow's nest; the captain's office; the radio room; the stern capstan; the steering gear room; and the after steering station. System B connects the wheelhouse with: the forward engine room operating station; the after motor room; the Chief Engineer's office; the emergency generator room; the steering gear room; and the electric distribution room. Voice tubes connect the wheelhouse with the radio room, the wheelhouse top, the master gyro room, and the captain's stateroom.

Port and starboard propeller shaft revolution indicators indicate the rpm and direction of rotation of each propeller. A waterproof mechanical



One of the auxiliary control boards.

Turbine-generator unit.



seven digit counter and electrical transmitter are installed on each shaft and waterproof electrical indicators: at each engine control stand; on forward bulkhead above windows in the wheelhouse; and in the chief engineer's office.

A Navy standard magnetic compass with complete azimuth circle is mounted on top of wheelhouse; a standard magnetic steering compass and binnacle in the wheelhouse; and a standard magnetic steering compass at the steering station aft.

Complete General Electric equipment for radar navigation will be installed so that regardless of visibility the navigating officer will be able to detect visually any approaching vessel or other floating object and any landfall in ample time to avoid collision or stranding.

The radio direction finder will be the latest model of the Marine Corporation of America and will be located in the chart room.

A Tyfon whistle and whistle control with control stations in the wheelhouse and on the navigating bridge, port and starboard, is arranged for both electric and manual operation.

The ship's radio telegraph and telephone installation will be supplied by R.M.C.A. and will consist of four radio telegraph transmitters of various frequencies and four receivers of various frequencies covering all the regular and emergency requirements of a passenger liner radio service. A harbor type radio telephone transmitter receiver takes care of ship to shore conversations in or near harbors. Each motor lifeboat is equipped with a radio telegraph transmitter and with a storage battery of sufficient capacity to operate this transmitter receiver continuously for at least six hours.

In connection with the ship's radio there will be installed an automatic alarm that responds to the ship's radio call letters and rings bells in the pilot house, in the radio room, and in the radio operator's cabin.

One broadcast and high frequency receiver will be provided together with loud speakers in the mess rooms, the dining rooms, the lounges, the dance floor and in other public rooms to provide for entertainment of passengers and crew.

On the pilot house top, in the pilot house, on each wing of the navigating bridge, and at the after steering station there will be installed transmitters for the Henschel electric engine-order telegraph. Two receivers for this systm are located in each of the engine rooms.

Safety Systems

A complete C-O-Two Fire Equipment Co. fire detecting and extinguishing system provides detection of smoke by eye, ear and nose through a cabinet in the wheelhouse which indicates the space from which the smoke comes and is combined with a carbon dioxide fire extinguishing system in all the spaces covered. These spaces include: cargo holds, cargo 'tween deck spaces, trunks to cargo spaces; and special cargo lockers; paint and lamp rooms, carpenter shop, engineer's paint locker and oil lockers; wiring trunks; provision and other store rooms. Separate C-O-Two systems are provided for the machinery spaces and for the gyro room, the projector booth film locker, the emergency generator room and similar spaces.

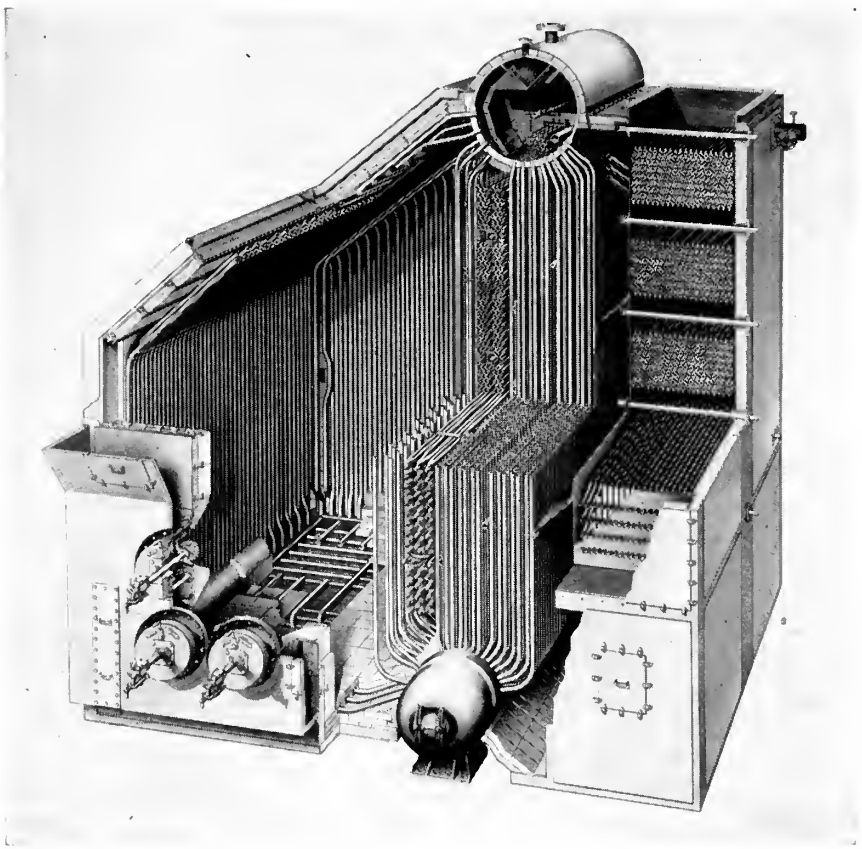
In each engine room a hose reel unit is installed having two 50 lb. carbon dioxide cylinders and sufficient length of flexible reinforced hose to reach any part of the space.

The special C-O-Two hose reel fire extinguishing equipment for the propulsion generators and propulsion motors is furnished by Walter Kidde and Company, Inc.

A complete water fire extinguishing system is served by four horizontal centrifugal pumps, two in each engine room. Each of these pumps is driven by a 50 hp motor and has a capacity for 400 gpm against 55 psi or 225 gpm against 125 psi. This system has an 8-inch pressure gage located in the fire control room so that the watchman on duty there can see at all times that the necessary pressure is maintained. Fire hydrants and hose racks are installed so that any point may be reached by two separate hose outlets.

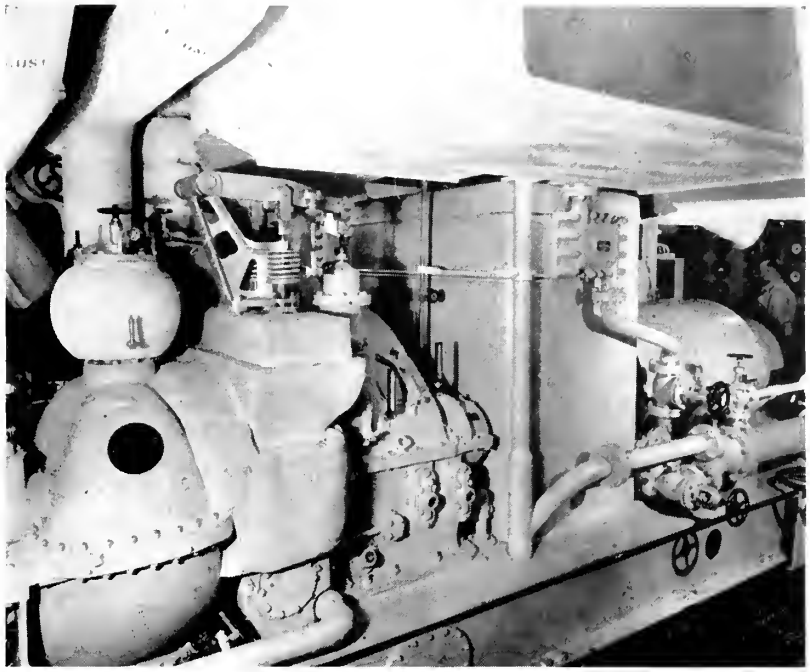
An electrical thermostat and annunciator system covers all spaces not protected by the smoke detection system, and this system will ring an alarm and indicate space and zone affected on an annunciator panel in fire control room. Fire doors are fit-

Cutaway view of one of the four boilers, showing the interior arrangement of boiler tubes, superheater tubes, and economizer tubes.



ted to stairway enclosures and to fire screen bulkheads. These are of the hinged self-closing type and can be released by electric control from the Fire Control room. A system of watchman's clocks monitors the watchmen and is supervised by the fire control room. Thus a man on watch in the fire control room can supervise all fire risks and extinguishing systems on the vessel and promptly apply the water or the CO_2 to the best advantage.

Watertight doors of the electrically operated horizontal sliding type are fitted between the motor rooms and the shaft alleys and between the motor rooms in the centerline watertight bulkhead. Same type doors provide access through the watertight bulkheads on "B" and "C" decks. These doors are controllable locally and from a central control station.



One of the auxiliary turbines. There are two of these installations in each engine room to supply power for refrigeration, pumping, lighting, etc.

Refrigeration Machinery

There are thirteen refrigerated cargo compartments in each vessel with a total volume of 52,350 cubic feet. Estimated load for the total volume with each compartment maintained at the most severe conditions is 90.05 tons of refrigeration.

The nine ship service compartments have a total volume of 17,575 cubic feet.

In addition to the above there is the refrigeration load in connection with the extensive air conditioning system. Each of these is a separate system of the direct expansion Freon type.

All the machinery for these systems is installed in one compartment.

For cargo refrigeration there are three Frick Freon-12 systems, each compressor being driven by a d.c. 240 volt 100 hp Westinghouse marine type motor.

For ship's service there are six sets of Frick Freon-12 systems with compressors driven by 15 hp d.c. 240 volt Westinghouse marine type motors.

On the air conditioning load there are two Carrier systems each served by a Carrier multi-stage centrifugal compressor. One compressor is driven by a 150 hp 3 phase 60 cycle 440 volt a.c. Westinghouse marine type motor, and the other by a reduction geared steam turbine. This air conditioning refrigeration takes care of the cooling of air for the cargo hold air conditioning system in addition to the extensive air conditioning load for the passenger and crew accommodations.

The pumps for these refrigerating systems are Warren Steam Pump Co. centrifugals.

Propulsion Machinery

The P-2 design is for turbo-electric drive and its most distinctive feature is the complete separation of its two power plant units and of its two motor units. Each power unit comprises two Combustion Engineering Company boilers generating steam at 600 psi and 840°F for a General Electric turbo generating set that has an output of 6890 K.W. at 3500 volts

One of the 10,000-hp propulsion motors. Completely enclosed, these synchronous motors are cooled by a recirculating air system and the heat is released to the atmosphere through a surface air cooler.

In the forward engine room.

3 phase 60 cycle at 3600 rpm and supplies this current to a synchronous propulsion motor normally rated 9000 shp at 120 rpm and with a maximum capacity for 10,000 shp at 124 rpm—3610 volts. Each generator is normally at full power direct connected to one of the motors giving a normal shaft horsepower of 18,000 on the twin screw propellers or a maximum rating of 20,000 shp.

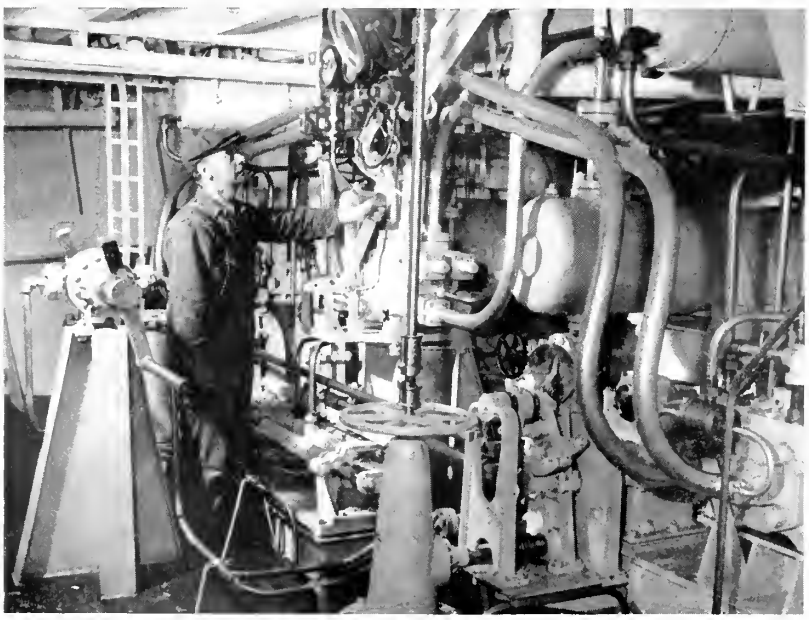
In each engine room there are two General Electric five unit turbo-generating sets. Each set consists of a steam turbine rated 600 K.W. at 10,033 rpm connected, through an enclosed reduction gear, to a 500 K.W. 450 volt 3 phase 60 cycle 1200 rpm a.c. generator, a 200 K.W. 3 wire, 240/120 volt 1200 rpm d.c. generator, and a booster exciter 750 amp. at 100 volts 1200 rpm. The a.c. generators supply power for general auxiliary ship's service. The d.c. generators supply excitation current for the propulsion generators and the propulsion motors.

The boilers in each engine room are served by Hagan Automatic Combustion Control equipment that maintains a constant steam pressure and the correct fuel and air ratio for complete combustion of fuel. Todd Hex-Press oil burners take care of correct atomizing of the fuel. Copes thermostats mounted at the front of the boiler drum operate the feed water regulating valves. Reliance water gages are used to indicate the water level. In each boiler uptake there is installed a Wager smoke indicator. In each boiler 10 Diamond Soot Blowers are fitted—three in the superheater section, two in the small boiler tube bank, and five in the economizer. Three Crosby safety valves protect each boiler, two in the drum and one at the superheater outlet. All the miscellaneous valves used in these boilers are Edward with EV alloy seats. Furnished with the boilers for cleaning the interiors of tubes are Wilson pneumatic turbine drive tube cleaners.

Specifications call for a maximum consumption in each boiler of 3002 lbs. per hour of 18,500 B.T.U. oil. That would be 12,028 lbs. per hour for all four boilers which figures at close to 0.66 lbs. of oil per brake horsepower hour for propulsion or something like 0.635 lbs. per shp hour for all purposes. This indicates a very high boiler efficiency and also the importance of the steam generator in low fuel consumption per unit of power. As will be noted in the cut-away view herewith the sides and rear of the furnace space are lined with 2" water-wall tubes. On the uptake side there are three rows of these 2" tubes, back of which are the superheater elements which are held in position by two sets of alloy support castings clamped at each side to two pairs of 2¼ inch support tubes. Back of the superheater is a bank of 1¼ inch boiler tubes. Two baffles and a partition plate direct the flow of the hot gases up through the superheater elements, down through the bank of 1¼" boiler tubes, and up through the economizer. The feed water enters the economizer at the top and emerges at the bottom on its way to the boiler steam drum. An economizer is thus a last stage feed water heater utilizing the heat left in the combustion gases from the boiler furnace.

A forced draft blower is provided

In the steering gear room. The vessel is normally steered from the wheelhouse, not from this location.



for each boiler. This blower takes its suction air from the machinery space and delivers it to the furnace front of the boiler through an air preheater which is heated by 75 lbs. steam bled from the main turbines. This pre-heater raises the combustion air from 100° F to 280° F.

Two fuel oil service pumps each capable of serving both boilers are provided in each engine room. These pumps take suction from the fuel oil settling tanks and deliver it to the burner headers on the boiler fronts through the fuel oil heaters. Three of these heaters are provided in each engine room. Any two are capable of heating 6500 lbs. of Bunker C fuel oil per hour from 100° F to 230° F when supplied with steam from the contaminated evaporator at 50 psi gage. The water drains from all oil heaters are pumped to the contaminated evaporator where they are heated to wet steam at 100 psi by desuperheated steam at 250 psi.

Steam from the boilers comes through a short pipe lead to the main turbine in each engine room at 590 psi 815° F total temperature for normal operation at 9000 shp and at 585 psi 845° F total temperature for maximum output at 10,000 shp. The turbines are of the impulse reaction General Electric type. Each turbine is mounted over and exhausts directly into its condenser which is of capacity to maintain a vacuum of 28.75 inches hg when its unit of the propulsion machinery is developing 9000 shp ahead with normal extraction from the turbine. Condensate and feed water system is of the closed type and follows the U. S. Navy-Maritime Commission flow type that has become practically standard on marine turbine drives. There are two condensate pumps to each condenser. The suctions of these pumps connect to the hot well under the condenser. The discharge is through the intercondenser of the main air ejector, the drain cooler, the gland cooler, the after condenser and the first stage heater to the deaerating heater. From the deaerating heater one of the two main feed pumps takes the feed water and discharges it through the economizer to the steam drum of the boilers. A 20-ton distilled water tank in each engine room provides make up feed where necessary. Each auxiliary condenser is served by a similar condensate and feed system discharging to the deaerating feed heater. Arrangement of piping and tankage in each engine room provides for feeding of boiler compound into the feed pump discharge.

Steering in the wheelhouse.

Each main generator is equipped with a totally enclosed ventilating system having fans integral with the generator rotor. The air coolers are mounted below the generator frame. Cooling water is forced through the tubes of these coolers by a motor driven pump and the capacity is such that at maximum power requirement the ventilating air must be kept at 40°C when the circulating water enters at 85°F. The same type of ventilating system with the same requirements is used on the propulsion motors with the exception that the fan is external and operated by a separate motor.

A main control panel in each engine room adjusts the circuits between each main generator and its corresponding propulsion motor. These panels are of the dead front type. Combined with transfer panels in the motor rooms these panels make possible any workable combination of generators and motors.

With the exception of the main feed pumps and a few stand-by pumps practically every auxiliary machine on these ships is motor drive. All of the auxiliary power circuits and lighting, cooking, and heating circuits are distributed from the switchboards in the main engine rooms through a panel board system. The panel boards, the motor controls and practically all of the motors in these systems are supplied by Westinghouse.

Culinary Equipment

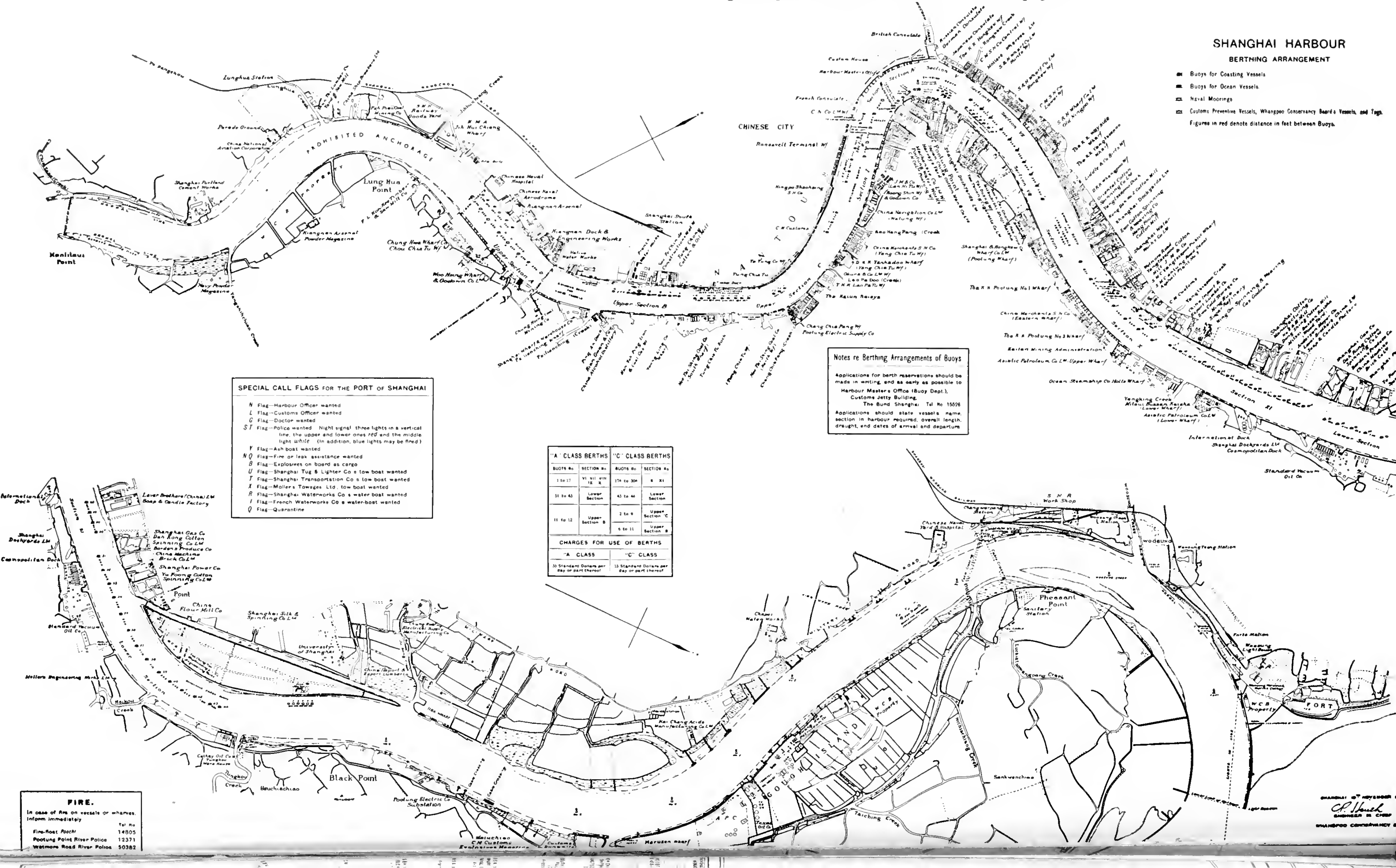
There are three galleys on "B" deck that in combination with dumb waiter service and pantries provide good food for the three classes of passengers, the officers and the crew. These galleys are equipped with the most up-to-date electric ranges, charcoal broilers, coffee urns, bains-marie, baking ovens, mixing machines, and all the other items that are required by the up-to-date chef and his various assistants. Blickman Bros. are supplying the galley and pantry equipment.

It will be apparent from the foregoing rather sketchy description of these vessels and their equipment that they are complicated intricate mechanisms complete in themselves to transport and care for all the needs of nearly 900 modern luxury-loving humans.

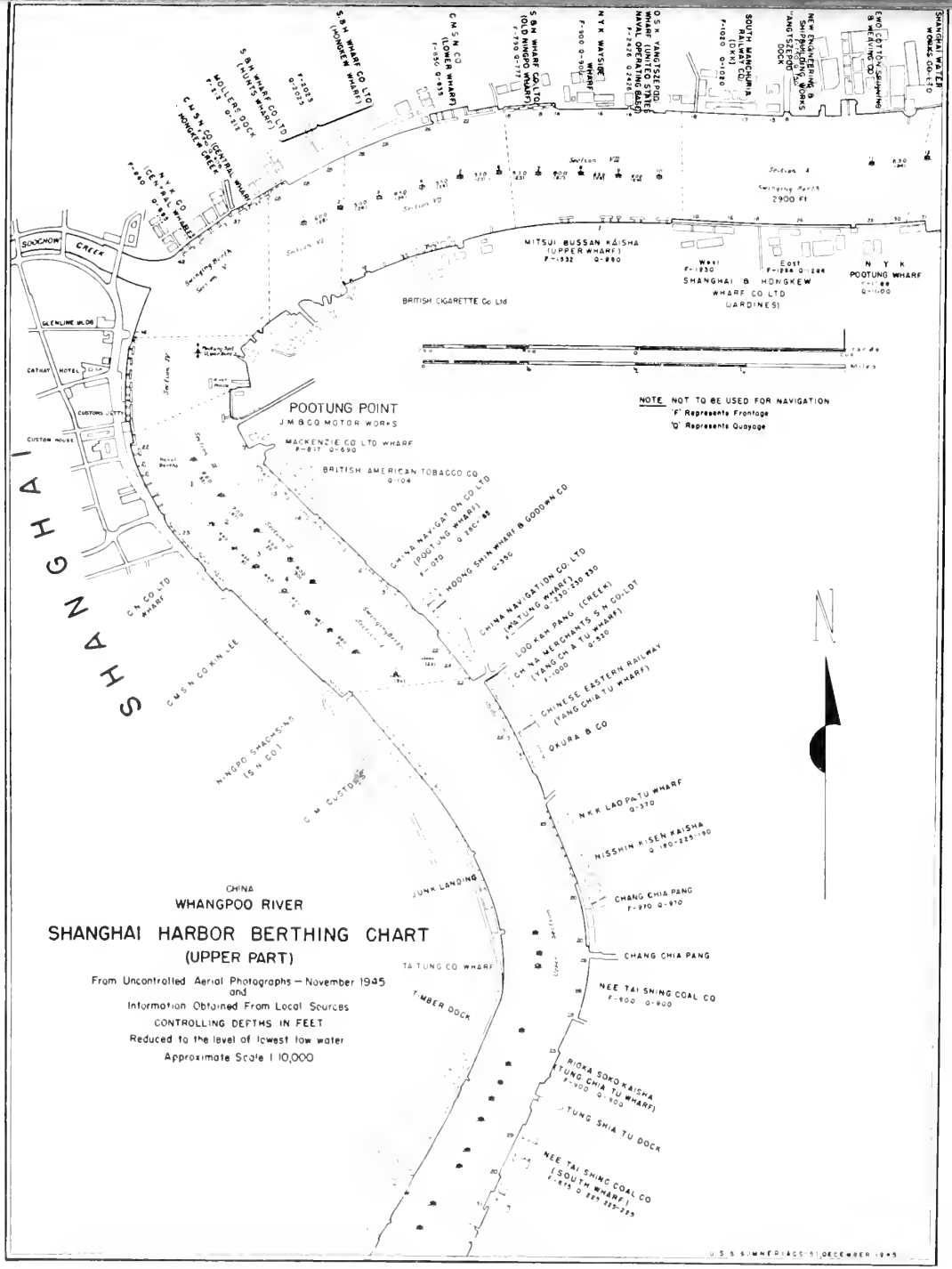
The Alameda yard of Bethlehem has already completed successfully several hulls of the same model propelled by the same power plant and outfitted as troop ships. These vessels have made many transpacific voyages with great satisfaction to their operators. The President Wilson and President Cleveland will be the first passenger liners anywhere near this size built and equipped on the Pacific Coast. Therefore, the Pacific Coast ship operators and ship experts are watching the progress and will await the trials and the maiden voyages of these vessels with more than usual interest.

SHANGHAI PORT FACILITIES

The China-America Council of Commerce and Industry has made available to its members a special report giving existing conditions and aids to navigation in the Yangtsze River approaches and the present Shanghai port and drydock facilities. The report, 49 pages of text and many charts, was prepared on the spot under the direction of U. S. Navy personnel and is as recent as December 1, 1945. Through the cooperation of the Council, Pacific Marine Review is privileged to publish the charts shown on these pages.



"A" CLASS BERTHS		"C" CLASS BERTHS	
BUOYS No	SECTION No	BUOYS No	SECTION No
1 to 17	VI VII VIII IX X	27A to 30A	X XI
31 to 43	Lower Section	43 to 46	Lower Section
11 to 12	Upper Section B	2 to 9	Upper Section C
		6 to 11	Upper Section B
CHARGES FOR USE OF BERTHS			
"A" CLASS		"C" CLASS	
35 Standard Dollars per day or part thereof		15 Standard Dollars per day or part thereof	



CHINA

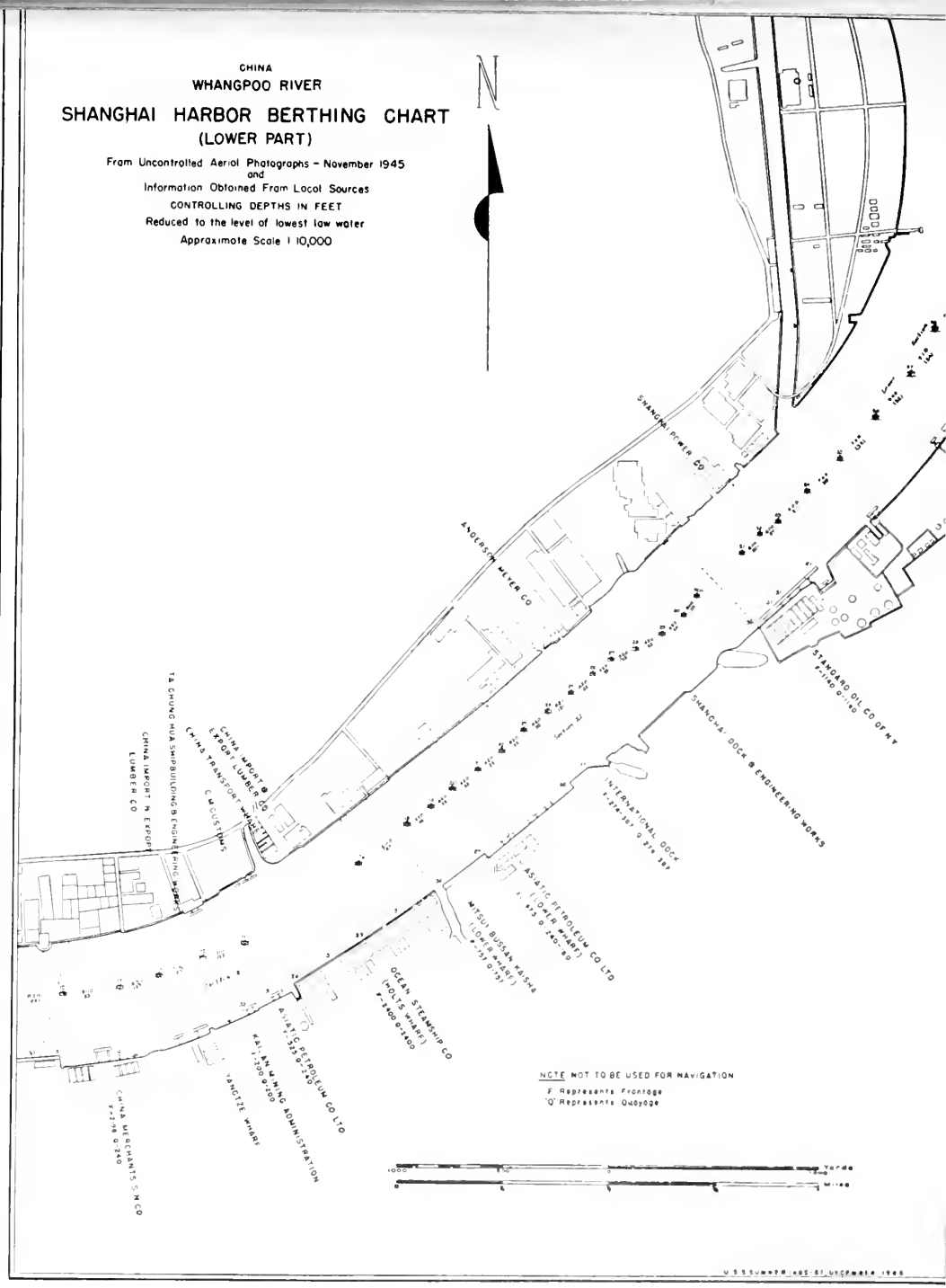
WHANGPOO RIVER

SHANGHAI HARBOR BERTHING CHART

(UPPER PART)

From Uncontrolled Aerial Photographs – November 1945
and
Information Obtained From Local Sources
CONTROLLING DEPTHS IN FEET
Reduced to the level of lowest low water
Approximate Scale 1 10,000

U.S.S. SUMNER PIAGS-51 DECEMBER 1945



CHINA

WHANGPOO RIVER

SHANGHAI HARBOR BERTHING CHART

(LOWER PART)

From Uncontrolled Aerial Photographs – November 1945
and
Information Obtained From Local Sources
CONTROLLING DEPTHS IN FEET
Reduced to the level of lowest low water
Approximate Scale 1 10,000

U.S.S. SUMNER PIAGS-51 DECEMBER 1945

The Future of U. S. Navy Plastic Type Antifouling Paints in Commercial Shipping

By

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Lt. Comdr. F. J. Dannenfelser, USNR
Former Docking Officer, AIM, S. F.

Lt. R. M. Mueller, USNR
Former Hull Inspector, AIM, S. F.

This is a paper presented at the February meeting of the Northern California Section of the Society of Naval Architects and Marine Engineers, which meeting is more fully reported elsewhere in this issue.

Comments from the floor following the reading by Mr. Burns served to point out the difference between Navy practice during war conditions and peacetime commercial practice, with particular emphasis on costs, and also on the utility of certain proprietary paints made especially for particular types of cargo vessels and in certain zones of operation. A factor of great importance in any comparison is the rule requiring annual drydocking of commercial vessels under which the item of drydocking costs shown in the charts would be materially affected—Ed.

MARINE FOULING is an age-old problem which has been estimated to cost the shipping industry of the United States at least $100,000,000 per year. Many surveys have shown that fouling on vessels can result in losses of top speed approaching 50% and fuel consumption increases of at least 40%. In extreme cases large vessels have collected several hundred tons of fouling having an average thickness of over 6 inches. It has been the practice of the British Admiralty, for design purposes, to allow for an increase of frictional resistance of ¼% per day out of dock in temperate waters and ½% per day out of dock in tropical waters. Such inefficiency in ship operation has generally been accepted as a necessary evil which can be controlled only by frequent and expensive dockings.

Although a myriad of fouling forms exist, examination of several hundred vessels which had operated under a wide variety of conditions has shown that barnacles, worm tubes, hydroids, algae, sea squirts and molloses are the only organisms which seriously affect ship operation. Barnacles and hydroids appear to be the most dangerous forms for ships operating in temperate waters. Together with worm tubes these same organisms constitute the most serious fouling hazard to ships operating in tropical waters. Very heavy mollusc and sea squirt fouling is frequently observed on hulls which have been moored for periods exceeding six months but these organisms are seldom observed on active ships. Algae fouling is encountered on almost all vessels, but this growth is generally restricted to a narrow belt at the water line.

It is well established that practically all fouling results from the attachment and subsequent growth of larvae or underdeveloped juvenile fouling organisms which are brought into contact with a ship's hull by water currents. The larvae form a temporary and generally weak attachment which rapidly increases in strength as the organism grows. Recent work has demonstrated that the common fouling larvae are not capable of attaching to a flat surface moving at a speed of more than 2 knots and that speeds in the excess of 10 knots will remove most fouling organisms up to one week after the initial larval attachment. It is obvious that fouling attachment does not occur while vessels are under way but only during inactive periods in a harbor or at a mooring. Thus ship operation can have a large effect upon fouling attachment, since vessels which are in port only for short intervals rarely foul.

Most fouling organisms are indigenous to shallow water and do not occur in the open sea where few surfaces are available upon which they may attach and grow. The only fouling larvae in the open sea are those carried by ocean currents from an

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Battle of Barnacle Hill

Oh, the barnacle is a curious thing,
It has such stick-to-it-ive pride;
In its realm it is known as King of Cling,
With many fine ships to ride.

Some barnacles are quite choosey, too,
Having their specific hankers;
They won't lounge on rocks to bill and coo
If they can cruise on husky tankers.

But there are many kinds of barnacles, lad,
And they all cut your speed, 'tis true;
They're a weight and a drag that drive men mad—
So don't let 'em get on you!

—Barnacle Ballad

area where colonies of adult organisms exist. As a result there is little chance of fouling attachment at any great distance from the coast line.

During the past 2000 years many people have attempted to develop antifouling ship bottom coatings, almost invariably without success. A large number of theories have been propounded whereby fouling could be either killed or repelled. Perhaps the most popular of these has been the theory that fouling organisms could be poisoned or repelled by toxic or noxious substances incorporated in ship bottom paints. As a result almost every disagreeable or poisonous substance available has been tested as an antifouling agent. Another interesting theory has been the proposed use of exfoliating paints which chalk or flake off in successive thin layers, thereby preventing fouling growths from developing a firm attachment. Since the larvae of many fouling organisms are negatively phototropic and do not attach as readily to light as to dark colored surfaces, the use of light colored paints has been proposed as an antifouling remedy. Other workers have proposed the use of slick, resilient, smooth, non-wettable, greasy or hard coatings to which fouling organisms presumably could not attach, this being known as the surface texture theory of fouling prevention. Electric currents, high pressure steam, revolving knives, under water concussions and many even more visionary schemes for the elimination of fouling have been recommended at various times.

Probably the first effective antifouling coating to be employed on ships was copper sheathing, introduced by the British Admiralty during the 18th century. This material was expensive and difficult to maintain but was quite effective in preventing fouling attachment and teredo attack. As a result copper sheathing was widely adopted and soon became a standard treatment for wooden vessels.

With the development of iron ships, bottom fouling again became a serious problem. It was soon found that copper sheathing, which proved so effective on wooden ships, could not be used on iron ships. The galvanic couple established by contact of iron plating with copper sheathing in sea water resulted in rapid corrosion and destruction of an iron hull. In addition, since iron coupled copper sheathing is cathodically protected

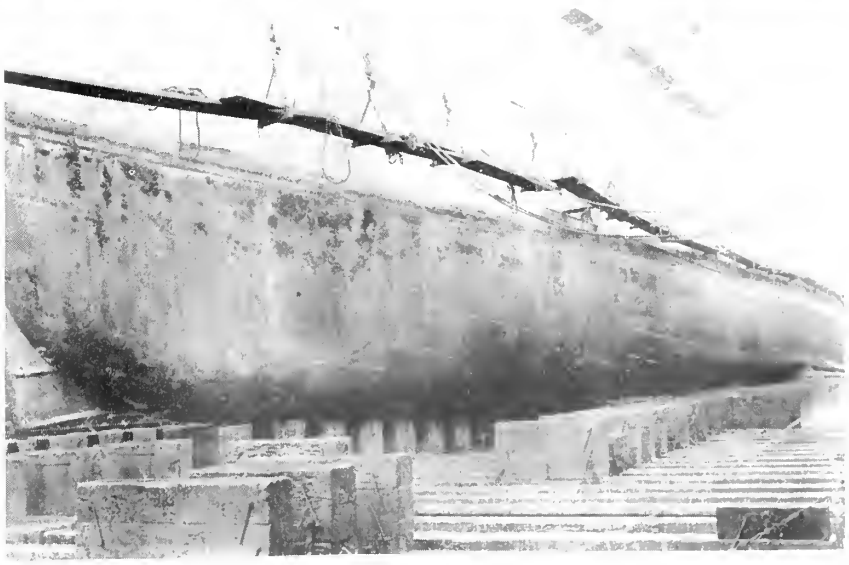


Fig. 1, top of page: Comparison cold plastic left, Old 15RC center and hot plastic right. USS Arctic, eight months waterborne.
Fig. 2, center: Comparison old 15RC left, hot plastic right. YT-39, 17 months waterborne.
Fig. 3, bottom: USS Concord. Navy plastic, 16 months waterborne.

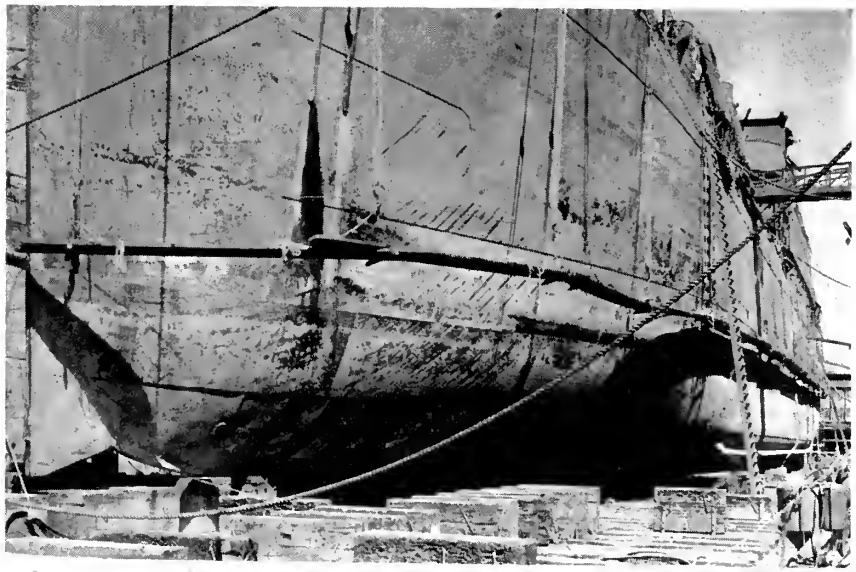


Fig. 4, top of page: USS Boreas, Navy hot plastic, 19 months waterborne.

Fig. 5, center: USS Augusta, Navy hot plastic, 28 months waterborne.

Fig. 6, bottom: USS Ford, Navy hot plastic, 18 months waterborne.

and no longer free to corrode, soluble toxic copper is no longer available at the surface to repel fouling growth. As a result the coupled copper sheathing has very poor fouling resistance.

The failure of copper sheathing on iron ships stimulated the search for effective antifouling paints. By the end of the 19th century a few moderately statisfactory paints had been developed and put into general use. Perhaps the best of these were the hot metal composition of McInness, the tar base paint of Tarr and Wonson, the shellac base paint of Rahtjen and the hot melt composition developed in Italy, known as Italian Moravian. As far as is known all these materials employed copper, mercury or arsenic compounds as toxics to inhibit marine growth. Although relatively poor by today's standards, these paints were a notable advance over the previous ineffective compositions.

The U. S. Navy commenced manufacture of ship bottom paints for its own use in 1908 at the Norfolk Navy Yard, being forced to this action by the unavailability of standardized, effective commercial compositions. The first Navy antifouling paint utilized shellac as a binder and mercuric oxide as a toxic pigment. This paint, or modifications thereof, constituted the standard antifouling coating of the Navy from 1908 until 1926, when formula 15RC was adopted for general use. Formula 15RC utilized a coal tar plasticized rosin binder and contained both cuprous and mercuric oxides as toxic pigments. This coating, which had an effective life of 3 to 6 months in waters of high fouling intensity, was abandoned in 1939 in favor of the far superior Mare Island hot plastic paint. An antifouling paint, very similar in composition and effectiveness to the old formula 15RC, is currently used in large quantities by the U. S. Maritime Commission. Many presently available commercial antifouling paints are also similar in composition and performance to the 15RC formulation.

In 1922 the Chemical Warfare Service at the Edgewood Arsenal was requested by the Navy to undertake an antifouling paint research program. Since Italian Moravian, a hot melt composition manufactured in Italy, was generally conceded to be the most effective antifouling paint available at that time, a major part of the Edgewood Arsenal work was

directed toward the formulation of hot melt coatings. A large number of compositions were developed and tested by panel exposure at Beaufort, North Carolina. In 1924 the most promising hot melt composition was applied to a naval vessel. However, the paint proved only moderately successful in ship service tests and eventually the Mare Island Navy Yard undertook the development of hot melt coatings, using the Edgewood Arsenal research as a starting point. After several years of empirical research this Navy Yard developed a new hot melt paint which differed widely from the composition of either the Moravian or Edgewood formulations. Extended ship service tests indicated the Mare Island hot plastic to have outstanding performance and led to its eventual adoption as the standard Navy antifouling composition, which, in somewhat modified form, it remains today. The almost startling contrast in performance between the Mare Island hot plastic and old formula 15RC is illustrated by figures No. 1 and 2.

Prior to the Mare Island developments, hot melt compositions had been melted, poured into paint pots and swabbed on a hull with ordinary paint brushes. The first applications of the Mare Island hot plastic were made in a similar manner. It was recognized that this method of painting had serious limitations, and Captain A. S. Pitre, USN, who had been placed in charge of ship bottom paint research at Mare Island, conceived and pressed the development of hot plastic paint spray equipment which would allow the rapid and uniform application of hot melt coatings. After much experimentation, satisfactory electrically heated pressure pots, spray hoses and spray guns were developed. This equipment made practical the present large-scale use of hot plastic paint.

The name "hot plastic paint" has frequently been termed a misnomer, since this hot melt composition bears little resemblance to an orthodox paint. By strict definition, the material is not a "plastic," this term having been employed, perhaps inadvisably, because of the composition's physical properties. Hot plastic is a resinous composition which exists as a soft, somewhat plastic solid at room temperature and melts rather sharply at about 130°F. It is quite fluid at higher temperatures and has a very low viscosity at 300° F., the normal application temperature. When sprayed onto a hull, the molten, solvent free composition cools and solidifies almost instantaneously. Thus no "drying" period is required and a ship can be undocked immediately after painting.

Since its adoption as the standard Navy paint in 1939, hot plastic has been used in very large quantities to coat practically all major units of the fleet. Although the Pacific fleet operated throughout the war in prolific fouling waters, ship fouling never became a serious problem. Vessels operated at high efficiency for long periods out of dock and were seldom docked primarily for bottom painting. Based upon this experience, it can be safely stated that hot plastic paint has established an entirely new standard of antifouling performance far superior to anything attained previously. The excellent performance of this paint on naval vessels is illustrated by Figures 3 and 4, 5 and 6.

The outstanding durability of hot plastic paint can be attributed to several factors. The paint has been carefully designed to liberate copper toxic at an adequate but not excessive rate during its entire life. Its average copper leaching rate generally falls in the range of 10-15 ug/cm²/day. On panels the paint has given complete protection from fouling for over 5 years. A normal application contains sufficient toxic for at least a 10-year life. The physical durability of hot plastic results largely from the fact that it is a hot melt coating. Up to 50 mils of paint is applied in a single pinhole-free coat to provide an essentially water impermeable barrier. As long as the antifouling film is physically intact, the underlying steel hull is completely protected from corrosion. Thus the superior corrosion resistance of the hot plastic paint system results from the use of a very thick, water impermeable antifouling film. With solvent type antifouling paints 5 to 10 coats are required to obtain a film thickness equivalent to hot plastic. A solvent applied antifouling film is always more permeable and less durable than a hot melt film of equal thickness and similar composition.

As might be expected, hot plastic paint has several weaknesses which tend to limit its use under some conditions. Satisfactory application of the coating requires the use of relatively expensive and highly specialized electrically heated spray equipment. The present formula is somewhat difficult to apply at temperatures below 50° F. and should never be applied at temperatures below 30°F. There is also room for considerable improvement in the flexibility and adhesion of the present hot plastic, particularly in cold waters. The relatively low melting point of the paint is a disadvantage in a warm climate where direct rays of the sun may cause the coating to soften and sag before a vessel is undocked unless precautions are taken to hose the hull down with cool water. In order to obtain the best performance from hot plastic, a better quality bottom cleaning job is required than that used for the present commercial antifouling paints. Improved hot melt formulations now under extensive test should eliminate most of these deficiencies, but it is certain that specialized spray equipment, skilled labor, careful supervision and a relatively good job of bottom cleaning will always be required for satisfactory application of hot plastic paint.

Since hot plastic paint could not be used in very cold weather and in the absence of specialized spray equipment, a good quality solvent type antifouling paint was required by the Navy for use at advance bases, in small building yards and in northern yards during the winter. As a result "cold plastic" paint was developed to duplicate as far as possible the outstanding durability of hot plastic. Cold plastic is a brushable solvent type paint which has an effective life at least 3 times that of the old formula 15RC formulation. On ships this coating has given complete protection against fouling for 12 to 16 months. On test panels two coats of the paint have an effective life in excess of 24 months. The best of many commercial antifouling paints tested under identical conditions have failed in less than 8 months.

It is doubtful if an improved cold plastic or other solvent paint can ever equal the performance of hot plastic under practical conditions. At least 25-50 mils of hot plastic can be applied in a single coat as contrasted to maximum of about 6 mils of solvent type paint per coat. Since these paints must wear at the surface to continu-

ously expose active toxic, their service life is theoretically determined by the paint film thickness. Actually, at equal thickness solvent applied paint films tend to be more water permeable than hot melt films and may fail prematurely by blistering. Thus a better anticorrosive paint system is required for solvent type paints than for hot melt paints.

It is obvious that both hot melt and solvent type antifouling coatings have a place in the ship bottom paint field. Hot melt coatings are indicated where the ultimate in durability is required and where proper facilities for their application are available. Although intrinsically less durable than hot plastic, paints such as Navy cold plastic are much more effective than the average commercial antifouling paint available today. These paints can be applied with presently available dockyard spray equipment and without major changes in present docking procedure.

Millions of dollars are spent to obtain an extra knot from a naval vessel whose top speed may easily be reduced a much greater amount by marine fouling. Obviously the maintenance of top speed and maximum cruising radius is of such tremendous tactical importance that selection of an antifouling paint can be based entirely upon efficiency and not upon cost. Undeniably the present U. S. Navy antifouling paints are far superior to the proprietary paints used by commercial shipping companies. However, this fact alone does not necessarily guarantee that the Navy type of paints could be utilized economically in the commercial shipping field, if and when they are released for general use. Their intrinisically higher initial cost would have to be more than counterbalanced on a dollars and cents basis by increased operating efficiency. In the following sections of this paper an impartial analysis of the subject will be attempted.

Commercial ship bottom painting practice has generally been based upon a one-day docking schedule. In a typical case the vessel is docked in the early morning and the bottom superficially cleaned of fouling, corrosion products and loose paint with long handle hoe scrappers. Little care is exercised in the cleaning operation and the surface is usually in poor condition for repainting. A single coat of anticorrosive is applied and rapidly followed with a coat of antifouling paint. The vessel is then undocked late the same day.

Ship cleaning and painting contracts are frequently awarded at a unit price per gallon of paint applied. It has been observed that in many commercial docks paint is sprayed on ship bottoms by use of a 10-or-15-foot length of pipe flattened at the discharge end to provide a crude spray fan. When such spray equipment is used, the bottom paint is frequently a mass of runs and sags with many icicles of paint hanging from the plate laps and many gallons of excess paint in pools on the dock floor. Obviously such painting procedure leaves much to be desired and is not conductive to satisfactory paint performance.

In an effort to obtain valid and representative costs for the docking and painting of commercial vessels, a number of shipping companies in the San Francisco Bay Area were contacted by the authors. These companies were very cooperative and readily supplied the desired data. Table I lists the various charges incurred in docking, cleaning and painting an 18,000-ton passenger liner in the San Francisco Bay Area immediately prior to the war. This ship was docked on a one-day schedule and received what is considered to be an average commercial bottom paint job.

The docking procedures and paint application techniques of the Navy have been selected primarily to obtain optimum bottom paint performance. Hulls are generally wet sandblasted to obtain the best possible surface upon which to paint. This process removes all old paint, scale, corrosion products and fouling growth.

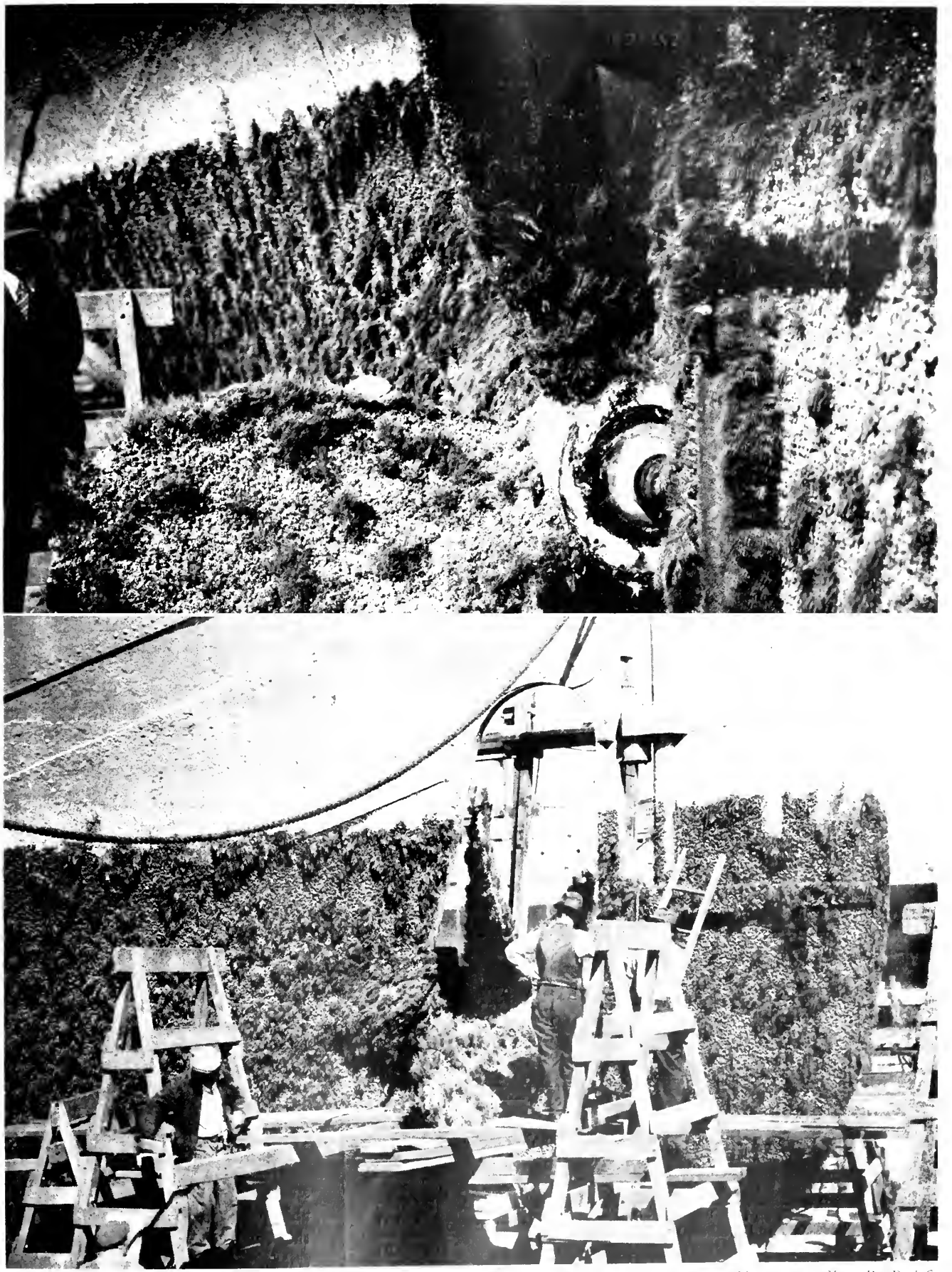
The wet sandblasting process developed by the Navy differs from the common dry sandblasting process in that a slurry of wet sand is used as the cutting agent. Very little sand or dust spreads from the immediate blasting area. The spent sand and

TABLE I

COST OF COMMERCIAL BOTTOM PAINT JOB ON AN 18,000-TON VESSEL

Painting (and Bottom Cleaning)					
Labor					
Anticorrosive	50 gal. brushed	@	$2.50 gal.	$125.00	
Anticorrosive	225 gal. sprayed	@	2.00 gal.	450.00	
Anticorrosive (Special)	20 gal. brushed	@	2.50 gal.	50.00	
Antifouling (Standard)	170 gal. sprayed	@	2.00 gal.	340.00	
Antifouling (Special)	100 gal. brushed	@	2.50 gal.	250.00	
Boottopping	50 gal. sprayed	@	2.00 gal.	100.00	
					$1,315.00
Material					
Anticorrosive	275 gal.	@	$1.40	$385.00	
Anticorrosive (Special)	20 gal.	@	3.00	60.00	
Antifouling	170 gal.	@	2.60	442.00	
Antifouling (Special)	100 gal.	@	2.95	295.00	
Boottopping	50 gal.	@	2.25	112.50	
					$1,294.50
Dock Charges					
18,000 tons @ $0.10 ton/day				$1,800.00	$1,800.00
					$4,409.50

NOTE: (Charges for bottom paint application include the bottom cleaning operation.)



(Photos courtesy Moore Dry Dock Co.)

The Mahukona in Moore drydock for miscellaneous repairs and cleaning.

TABLE II

ESTIMATED COST FOR APPLICATION OF STANDARD U. S. NAVY HOT PLASTIC PAINT SYSTEM TO AN 18,000-TON PASSENGER HULL

Sandblast Cleaning:			
Labor			
Sandblasting	988 man-hrs. @ $1.32	$1,304.16	
Maintenance	80 man-hrs. @ 1.32	105.60	
Sand cleanup and handling	480 man-hrs. @ 1.32	633.60	
Chemical treatment	168 man-hrs. @ 1.32	221.76	
		2,265.12	
Depreciaton and overhead @ 30% direct labor		679.54	
			$2,944.66
Material			
Sand—160 ton @ $4.30		$ 688.00	
Chemicals		175.00	
Air—5,000,000 C.F. @ $ .005/1000		25.00	
			888.00
Painting:			
Labor:			
Anticorrosive (2 coats)	234 man-hrs. @ $1.32	$ 308.88	
Hot plastic	200 man-hrs. @ 1.32	264.00	
Boottopping	50 man-hrs. @ 1.32	66.00	
Maintenance	50 man-hrs. @ 1.32	66.00	
		704.88	
Depreciation and overhead @ 30% direct labor		211.46	
			916.34
Material			
Anticorrosive	400 Gallons @ $1.80	$ 720.00	
Hot plastic	17,000 Lbs. @ 0.25	4,250.00	
Boottopping	50 Gallons @ 2.00	100.00	
			5,070.00
Dock Charges:			
Docking and undocking day	18,000 ton @ $ .10/day	$3,600.00	
3 Lay days	18,000 ton @ $ .07/day	3,780.00	
			$7,380.00
Contractor's profit on cleaning and painting			579.15
TOTAL COST OF WORK			$17,778.15

TABLE III

ESTIMATED COST FOR APPLICATION OF STANDARD U. S. NAVY COLD PLASTIC PAINT SYSTEM TO AN 18,000-TON PASSENGER HULL

Sandblast Cleaning:			
Labor			$2,944.66
Material			888.00
Painting:			
Labor			
Anticorrosive (2 coats)	234 man-hrs. @ $1.32	$308.88	
Cold plastic	400 man-hrs. @ 1.32	528.00	
Boottopping	50 man-hrs. @ 1.32	66.00	
Maintenance	50 man-hrs. @ 1.32	66.00	
		968.88	
Depreciation and overhead @ 30% direct labor		290.66	
			1,259.44
Material			
Anticorrosive	400 gallons @ $1.80	$ 720.00	
Cold plastic	430 gallons @ 4.00	1,720.00	
Boottopping	50 gallons @ 2.00	100.00	2,540.00
Dock Charges:			7,380.00
Contractor's profit on cleaning and painting (15% direct labor and overhead)			630.61
			$15,642.71

blasting byproducts are eliminated in the form of a mud which is washed from the work during the blasting. Either wet or dry sand may be fed to the blasting machine. Superficial corrosion of the freshly blasted bright metal surface can be controlled by adding chromate inhibitors to the wet sandblast slurry or by applying phosphoric acid painting pretreatments after the blasting operation.

After cleaning the hull, two coats of anticorrosive are applied with conventional paint spray equipment. A minimum drying time of 2 hours is normally allowed before the antifouling paint is applied. Navy hot plastic, formula 15 HP, is melted and raised to 300°F. in large reducing kettles. The molten paint is transferred to special electrically heated pressure spray kettles equipped with electrically heated spray hoses and spray guns. A 0.030 inch film of hot plastic is rapidly applied in a single coat with this equipment.

Navy cold plastic paint, formula 143, can be easily applied by either brush or conventional paint spray equipment. A film averaging about 0.005 inches thick is normally obtained in a single coat. Whenever time permits, a second or even third coat of cold plastic is applied to obtain a thicker, more water impermeable and durable paint system.

Cost estimates for application of the Navy hot and cold plastic paint systems to the previously described 18,000-ton vessel are listed in Tables II and III. These cost analyses are based upon labor and material records obtained from the Naval Shipyard, Mare Island, California, the United Engineering Co., Ltd., Alameda, California, and the Kaiser Company, Shipyard No. 3, Richmond, California. During the course of the war these shipyards applied hot and cold plastic antifouling paints to many vessels of the U. S. Navy.

The paint costs assumed in this study are estimates of what comparable products could be sold for on the commercial market. The contractor's profit for sandblasting and cleaning has been estimated at 15 per

Photos courtesy Moore Dry Dock Co.

Other views of the Mahukona in drydock.

TABLE IV

ESTIMATED COST FOR APPLICATION OF NAVY HOT PLASTIC TO AN 18,000-TON HULL BY PROPOSED COMMERCIAL PROCEDURE

Cleaning:			
Labor			
Hosing, scraping, etc., 180 man-hours @ $1.32		$237.60	
Overhead @ 30% direct labor		71.28	
			$308.88
Painting:			
Labor			
Anticorrosive	117 man-hrs. @ $1.32	$154.44	
Hot plastic	200 man-hrs. @ 1.32	264.00	
Boottopping	50 man-hrs. @ 1.32	66.00	
Maintenance	50 man-hrs. @ 1.32	66.00	
		550.44	
Depreciation and overhead @ 30% direct labor		165.13	
			715.57
Material			
Anticorrosive	200 gallons @ $1.80	$ 360.00	
Hot plastic	17,000 pounds @ 0.25	4,250.00	
Boottopping	50 gallons @ 2.00	100.00	
			4,710.00
Docking Charges:			
One day—18,000 tons @ $ .10 ton/day			1,800.00
Contractor's profit on cleaning and painting (15% of direct labor and overhead)			153.71
			$7,688.16

TABLE V

ESTIMATED COST FOR APPLICATION OF NAVY COLD PLASTIC TO AN 18,000-TON HULL BY PROPOSED COMMERCIAL PROCEDURE

Cleaning:			
Labor			
Hosing, scraping, etc., 180 man-hours @ $1.32		$ 237.60	
Overhead @ 30% direct labor		71.28	
			$ 308.88
Painting:			
Labor			
Anticorrosive	117 man-hours @ $1.32	$ 154.44	
Cold plastic	400 man-hours @ 1.32	528.00	
Boottopping	50 man-hours @ 1.32	66.00	
Maintenance	50 man-hours @ 1.32	66.00	
		814.44	
Depreciation and overhead @ 30% direct labor		244.33	
			1,058.77
Material			
Anticorrosive	200 gallons @ $1.80	$ 360.00	
Cold plastic	430 gallons @ 4.00	1,720.00	
Boottopping	50 gallons @ 2.00	100.00	
			2,180.00
Docking Charges:			
One day—18,000 tons @ $ .10 ton/day			1,800.00
Contractor's profit on cleaning and painting (15% direct labor and overhead)			205.15
			$5,552.80

TABLE VI

PROPOSED DOCKING INTERVALS FOR COMMERCIAL SHIPS

Paint	Passenger Ships	Freighters
Present Commercial	9 Months	12 Months
Cold plastic	15 Months	18 Months
Hot plastic	24 Months	30 Months

TABLE VII

DIRECT DOCKING COSTS OVER A 72-MONTH PERIOD

Paint	Number of Dockings in 72 months	Cost of One Docking	Docking Costs for 72 months	Docking Cost per Year
Hot plastic	3	$7,688.16	$23,064.48	$3,844.08
Cold plastic	5	5,552.80	27,779.00	4,629.83
Commercial	8	4,409.50	35,276.00	5,879.33

cent of direct labor and overhead. The commercial dock charges are the same as those used in Table I.

The high cost of the standard Navy plastic paint applications would in all probability restrict their use by commercial shipping operators. Anaylsis of Tables II and III show that these high costs result largely from the sandblast cleaning operation and from the long and expensive docking interval. The Navy has considered sandblasting necessary to assure optimum paint performance. Due to war conditions, vessels could seldom be docked at regular intervals, although most of the Pacific fleet operations were in waters of high fouling intensity. The complete elimination of fouling for periods up to two years was considered to be of paramount importance in order to avoid unacceptable losses in top speed and cruising radius. The Navy antifouling paints and painting procedures achieved this goal and fouling never restricted fleet operations. It must be emphasized, however, these same conditions do not apply to commercial ship operation, where any extra expenditure for painting must be justified on an economic rather than strategic basis.

It is the conviction of the authors that commercial operators, who can set definite drydocking intervals for their ships, can dispense with regular sand blast cleaning without seriously reducing the service life of the Navy type of bottom paints. There have been many cases where Navy hot plastic paint has been applied to ships which were not sandblasted, and these applications have given excellent service for periods ranging up to 30 months. In fact, the outstanding durability of hot plastic was conclusively established during the late thirties by ship service applications on vessels which had been superficially cleaned with hoe scrapers and wire brushes.

If sandblast cleaning is eliminated, the cost of a standard Navy plastic application is greatly reduced and the time in dock is appreciably shortened. While it is believed that sandblasting could be eliminated as a regular procedure, it would always be desirable to sandblast hulls which were in very poor condition. At subsequent

dockings sandblast cleaning would not be required and the cost of the initial operation would be more than repaid by improvement in paint performance and reduction in hull corrosion over a period of several years.

When the Navy type of antifouling coatings are applied over old paint, only a single coat of anticorrosive is required. The primary function of the anticorrosive in such a case is to improve the adhesion of the antifouling coating. Elimination of the second coat of anticorrosive obviously lowers the cost and time required for a bottom paint application.

The estimated costs for application of hot and cold plastic paints to the previously described 18,000-ton vessel are listed in Tables IV and V. Sandblasting has been replaced by the commercial type of bottom cleaning and the use of single coat of anticorrosive paint has been assumed.

Bottom painting is not the only factor which determines the drydocking interval of a ship. The underwater fittings, bearings, overboard discharges and legal requirements as to the pulling of tail shafts must be considered. A ship must be drydocked at least once every 3 years for pulling and inspection of the tail shafts. The time that the other underwater fittings can go without inspection or repair is usually governed by the quality of materials used. Lignum vitae or micarta bearings should give satisfactory service for 5 years. Sea valves should give satisfactory service for 24-30 months. Based upon these data and the established service records of the Navy paints, commercial operators could safely increase their drydocking intervals by adoption of the Table IV or V bottom paint systems. It is believed that the docking intervals for hot and cold plastic paints proposed in Table VI below are conservative and entirely practical. The present average docking interval of commercial ships has been included for comparison.

A comparison of docking costs over a 72-month period for the Navy plastics and present commercial ship bottom paints has been prepared in Table VII, using the docking intervals proposed in Table VI and the docking costs of Tables I, IV and V.

It is indicated, therefore, that substantial savings in direct docking charges would result from use of either the Navy hot or cold plastic paints by commercial shipping operators. In addition, several other savings and benefits would accrue from use of these effective paints. The decreased frequency of drydocking would result in considerably less time lost in dock and would simplify ship operation. Corrosion of the shell plating should be materially reduced from what is encountered at present.

Matson steamer Mahukona—after cleaning.

As far as can be determined, fouling on commercial ships, at the present time, is controlled more by operating conditions and frequent drydockings than by any action of the bottom paints. With present drydocking schedules, active ships generally foul rather lightly while inactive ships almost invariably foul very heavily. Most active commercial ships appear to suffer a 5 to 10 per cent loss in operating efficiency from fouling after 9 months out of dock. Much higher losses are encountered with ships which spend considerable time in harbors. Use of the Navy type of antifouling paints should completely eliminate the fouling of commercial ships and result in substantial increases in operating efficiency. The potential savings from elimination of fouling cannot be accurately estimated, but they undoubtedly would be very large.

During the war period many commercial dockyards were equipped with hot plastic spray equipment. These yards painted hundreds of naval vessels with hot and cold plastic paints. Therefore suitable equipment and trained personnel for application of the Navy type of antifouling paints are already available in commercial dockyards.

The formulas for the Navy hot and cold plastic paints were naturally considered important war secrets. These compositions are still classified as confidential by the Navy Department and consequently are not available for use on commercial ships at this time. The authors have no knowledge regarding the possible declassification of the Navy plastic paints for commercial use, but consider such action a distinct possibility.

Heavy Tools at Hunters Point

By Frank A. Stanley

Fig. 1: The two original docks, huge machine shop and parking lot.

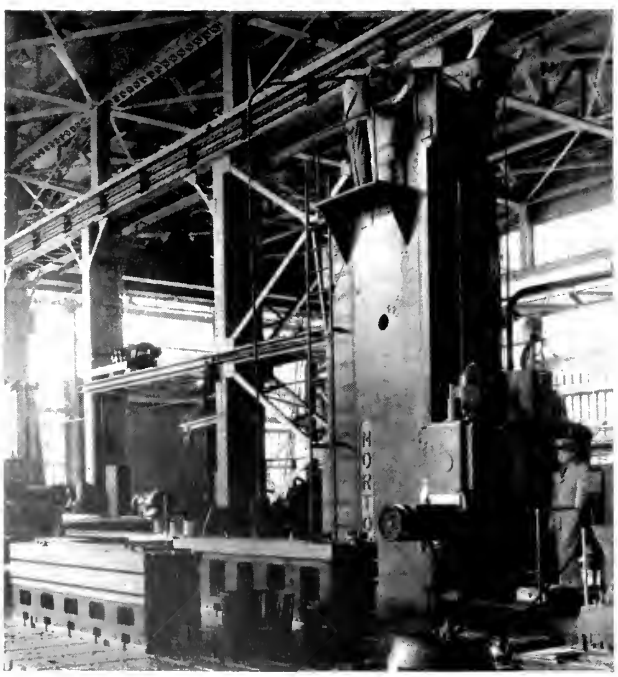
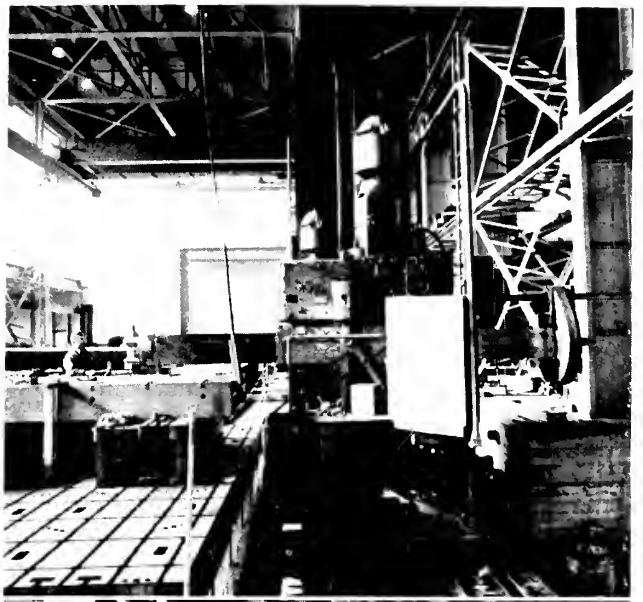
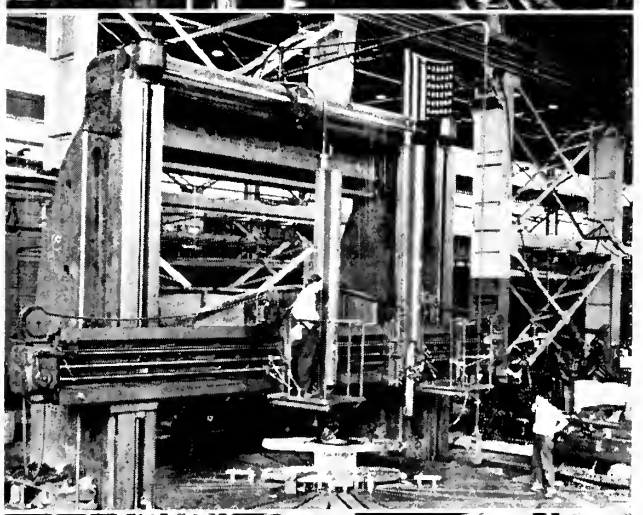


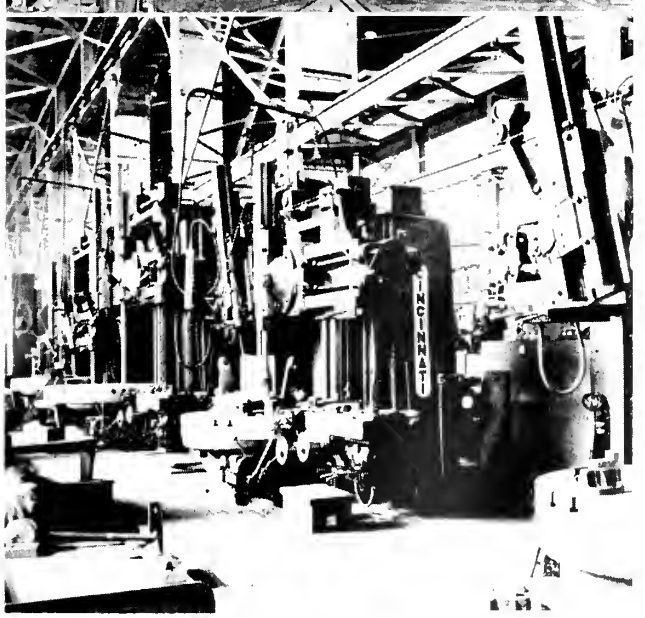
Fig. 2: World's largest size boring, milling and draw cut machine.
(U. S. Navy Official Photograph.)

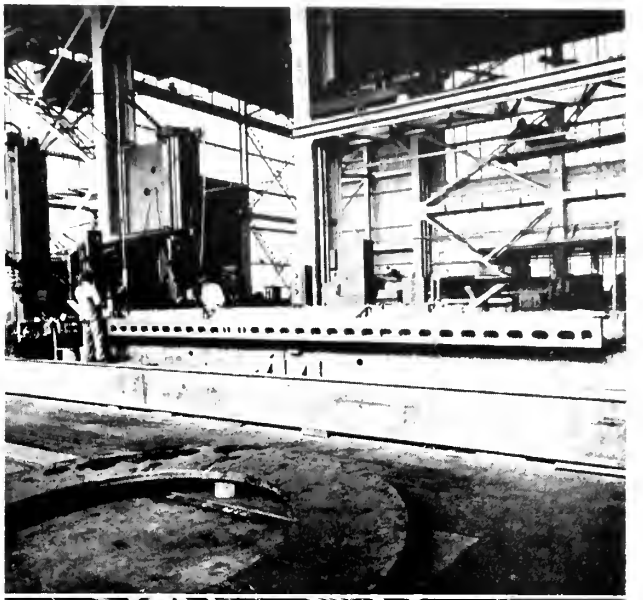
The main machine shop at the U. S. Naval Dry Docks at Hunters Point, San Francisco Bay, is provided with facilities for overhaul and repair of machinery and equipment from all classes of ships and craft of the Navy. The shop structure is a two story building 600 feet in length by 170 feet wide equipped throughout with modern tools occupying all available floor space on main and upper floors. Among the machines on the main floor are some of the most massive and largest capacity tools ever constructed by their builders. The complete installation is adapted to the performance of standard and special operations in the way of drilling, turning and boring, planing, milling, grinding and other machine work on an apparently unlimited variety of undertakings related to the class of

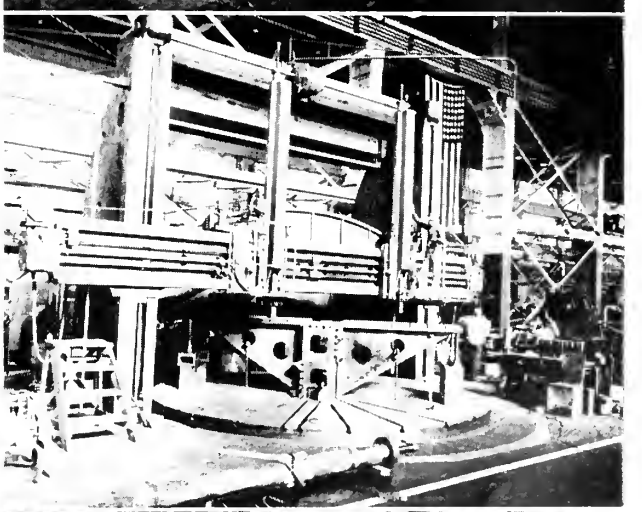
(Frank A. Stanley is long-time editor of Western Machinery and Steel World and co-author of American Machinists' Handbook, and author or co-author of 20 or more books on mechanical subjects.)











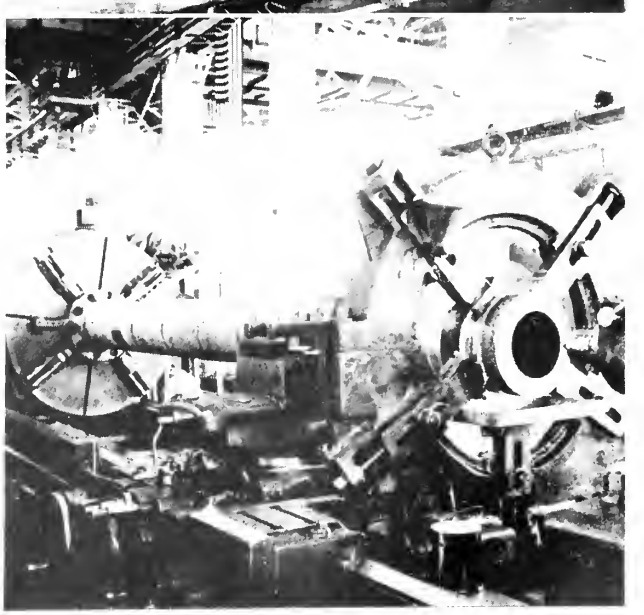


Fig. 3, upper left: Draw cut machine milling T-slots in floor plate. Fig. 4, upper right: Cincinnati 132″x96″ Hypro convertible open-side planer. Fig. 5, center left: Sellers vertical boring mill with 20-foot table. *(U. S. Navy Official Photograph)* **Fig. 6, center right: Another view of 20-foot boring mill. Fig. 7, lower left: Large Hypro vertical boring mills. Fig. 8, lower right: 60″x150′ bed lathe.**

Fig. 9: Machining pump casing on horizontal boring machine.

jobs necessitated by naval machinery repair and maintenance.

An excellent general view of the exterior of the great machine shop is reproduced here in Fig. 1, where it will be seen in the right distance, with the two original dry docks at the left and the liberal parking area in the foreground. Without entering into specific details of the docking facilities in this article, it will be of interest to note that under the great expansion program which has been carried out at Hunters Point there is now a total of six docks with a combined capacity greater than the entire graving dock capacity of the Pacific Coast pre-war. Its No. 4 dock will accommodate any ship afloat, whether naval or mercantile, and No. 3 dock will take all such ships, with one or two exceptions. These facts regarding docking facilities and a wealth of other pertinent information regarding Hunters Point are contained in a feature article in the October 1945, issue.

It is the purpose in this present story to confine details largely to machine tool equipment of the shops. In all some 800 or more important tools are included in the machining facilities for large, medium and smaller work, as handled here.

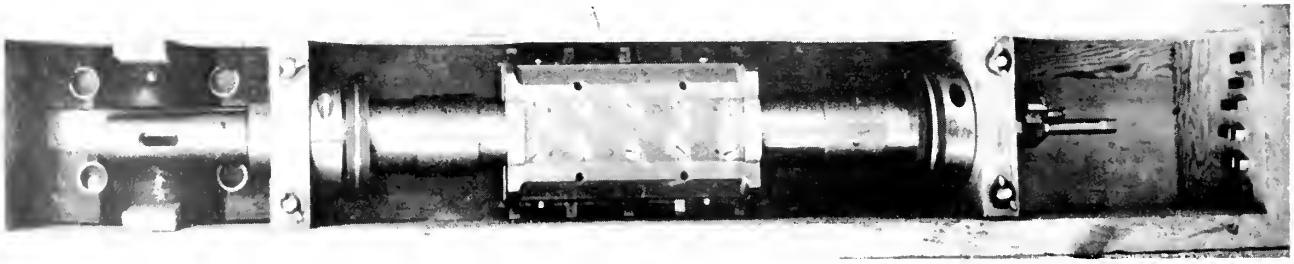
Mammoth Draw-cut Machine

The latest big machine tool to be installed in the main shop and the largest design of its type is illustrated in Figs. 2 and 3. This is a Morton boring, milling and draw-cut machine whose installation was completed the early part of November last, or some four months ago. It is known officially as a 96-inch horizontal boring, drilling and milling machine and draw-cut traveling head planer, and is an outgrowth or development of the well-known Morton draw-cut shaper so familiar to railroad shop machinists and Navy Yard craftsmen.

This machine, universal in its flexibility, was built with one other of precisely the same dimensions for machining heavy armor plate in an Eastern steel mill. Both machines were provided with 36-foot base plates or beds proper for the horizontal travel of the massive upright column or housing for the vertically adjustable saddle, in which is mounted the draw-cut planing ram and boring bar and operating mechanism. It was decided to divert one of these machines to Hunters Point, and the excessive bed length being considered unnecessary for marine shop activities the bed was cut in two, or to an over-all length of 18 feet, which is now the maximum length of horizontal feed for the machine illustrated here.

Consider a few major dimensions of this draw-cut unit. The ram which does the work of planing is 15″ x 15″ in section and has a maximum cutting stroke of 96″ and an extreme length of stroke of 108″. It handles an 8″ boring bar, and an outboard housing for mounting on the big floor plate converts the draw-cut into a large

Fig. 10: Boring bar with multiple cutters for pump casing.



capacity horizontal boring machine. In Fig. 2 the ram is seen with a large inserted tooth face milling cutter mounted on an arbor carried in the ram. Face milling with such a cutter is one of the typical operations to which this machine is adapted. The height of the machine may be estimated by comparing it with the person standing on the operating platform at the right of the column. This is Lt. J. D. Stoddard, Machine Tool and Shop Facilities Officer, whose many courtesies and assistance in connection with the gathering of material for this article are here gratefully acknowledged.

Wide Range of Operations

The shaping or planing head is shown removed in Fig. 2 to permit the application of the face mill. In place, the head carries planing tools 2″ x 2½″ in size, and the hand feed of the tool head is 12″. Another entirely different type of work is shown in Fig. 3, where the ram is shown fitted with a head for carrying an end mill or drill, an obvious convenience when a relatively small job is to be performed at some very difficult point on a large piece of work.

In this instance the mill is at work cutting T-slots in a section of the big floor plate which is being installed at the front of the draw-cut for all classes of heavy jobs that may be required to be machined here. These sections are cast blocks 6 feet by 12 feet in area and about 12″ thick and the T-slots enable the outboard support for the boring bar to be situated wherever required as well as allowing work of all kinds to be set up and properly secured.

Spaced a few feet apart will be noticed across the floor plate a number of groups each of three counterbored holes. These represent the seats of as many adjusting jack screws and hold-down bolts and nuts by which the big sectional floor plate may always be kept truly level. The counterbored seats are sufficiently large in diameter to provide ample clearance for the special socket wrenches used on the screws and nuts. The T-slots cut in the bed are sized for 1¼ inch bolts.

The main drive motor for this machine is 20 horsepower and the feed motor is 7½ horsepower. The machine stands above the floor plate a height of 22 feet 6 inches. To people unfamiliar with the cost of modern, large capacity, heavy machine tools, an item of interest will be the statement that the draw-cut machine here described represents—with various appurtenances not included in the views—an outlay closely approximating $350,000.

Convertible Openside Planer

Turning now to another class of heavy tools, let us refer to Fig. 4 and the Cincinnati convertible openside Hypro planer there illustrated. This planer is rated as a 132-inch machine with a maximum height under the rail of 96 inches. The left-hand housing can be removed when work wider than the planer's regular capacity is to be machined. The housing can also be adjusted to slide on its base to bring it close to the bed when so desired in order to make full use of the left-hand-side head. This is a particularly valuable detail when handling certain classes of work in the same manner in which machining would be done with a conventional two-housing planer.

The planer has also a supplemental rolling table to take care of any size job regardless of width. At the time this photograph was made two long steel bars were being finished on the regular planer table; they do not in any way suggest the very heavy jobs the machine is adapted to handle, but do emphasize the fact that in any maintenance plant the hurry-up work that comes in has to be taken care of in the first available machine which may be standing open at the moment on the shop floor.

This Hypro planer has a 36-foot table and a bed 80 feet long. The main drive consists of a 75-horsepower direct current reversing motor combined with a motor-generator set—a 125-horsepower unit operating under 440 volt, 3 phase, 60 cycle alternating current. This motor-generator set will be seen in Fig. 4 installed in the overhead structure near the center background of the photograph.

Normally the type of drive provided with this maker's planers gives a range of cutting and return speeds from 8 to 240 feet per minute. Wide experience of the company with machining of various kinds of metal has led them to definite recommendations as to roughing and finishing speeds for planing. Some of the data they have developed in connection with the operation of their variable

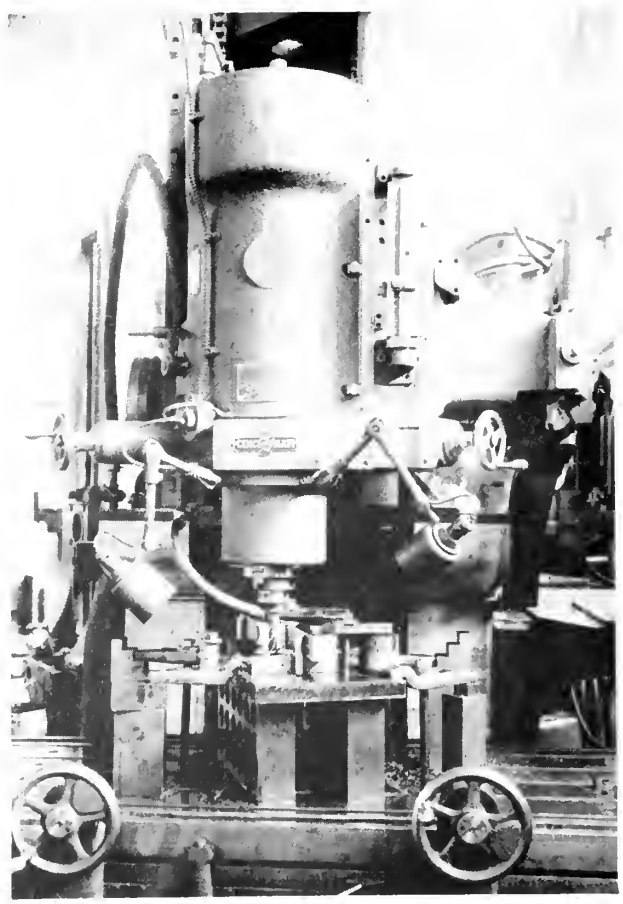


Fig. 11: Cincinnati Hydro-tel milling machine.

speed planer drives have aided in establishing standard practice in respect to both cutting and return rates, particularly on large and medium-sized work.

Big Vertical Boring Mill Capacity

Another type of big machine tool is illustrated in Figs. 5 and 6. This is a Sellers vertical boring and turning mill with table 20 feet in diameter. Here again the work under way at the time of making these photographs does not do justice to the spectacular proportions and capacity of the machine itself. Note the massive columns, arch and cross rail with the long tool rams and their long range of travel when the rail is elevated to extreme height.

The work shown in Fig. 5 is a simple boring and facing operation accomplished with the two tools in simultaneous action, one fed downward by its ram for boring, the other fed crosswise by the ram traveling on the rail. The job in Fig. 6 consists of facing a pair of heavy brackets or angles forming part of a special table for one of the big machine tools. The two angle castings are secured to a central support and are finish faced on their upper working surfaces by rotation under the two cutting tools in the rams, one set for roughing, the other for taking a finish cut by following up the lead of the roughing tool. The angle castings measure 6 feet by 3 feet across the working surface.

A row of Hypro vertical boring mills is illustrated in Fig. 7. These range up to large capacity in diameter of table and height under rail in uppermost position. The piece of work seen in the second machine in the row is a bronze sleeve which is chucked in the table jaws for boring to diameter and facing off to length.

A Long Bed Lathe

The 60-inch lathe in Fig. 8 is a Betts-Bridgeford tool, designed as a turning and boring lathe for long work, as a gun barrel lathe, or as used here for turning and handling long propeller shafts. It swings between centers work 60 feet long and its 150-foot bed fits it for boring work 60 feet in length. The job in the lathe is an 18-inch destroyer shaft which has had its bearings built up by the metal spraying process, and the work under way here is the finishing of the sprayed surface to diameter. The long shaft section is centered at the coupling end by the chuck jaws and supported at the outer end in the big steady rest. The turning tool is immediately behind the supporting rest.

Work of this character has of course to be centered carefully at the outer end before setting up the steady rest jaws. A portion of the smoothly finished bearing surface will be noticed directly behind the ends of the jaws. This practice of rebuilding and refinishing shaft bearings by metal spraying is a common one today, particularly in marine shops. It must necessarily be carried out with proper attention to preparatory operations, and after building up, the surface must be machined with due care in respect to the use of the finishing tools.

The surface to be built up must be clean and rough, and is often prepared by using a lathe tool which will produce what appears like a roughly threaded job; or the shaft can be sand blasted or steel grit blasted to give a rough surface. In any case, the purpose is to provide a surface to which the sprayed metal will be keyed or bonded securely as it is melted in the flame of the gun and shot against the work. The effect is to produce a sleeve of new metal which can be refinished to size by turning or grinding.

If a lathe tool is employed the cut should be light and the feed equally so in order to avoid all possibility of tearing the bonded metal loose from the parent surface. In fact, much of the work of this class is finished by the grinding process, and in the shop under description here a specially designed Dumore grinding attachment has been built for application to shafts of this size as well as smaller ones, the work being handled according to size in certain lathes arranged for the purpose.

Another big machine soon to be installed in the same section with the large tools already described is a lathe from Meata Machine Company, who had started to build a 36″ mortar designed for use against the Japs when the end of the war brought this project to an end. The mortar was designed to fire a missle weighing two tons. Although of large caliber the mortar was relatively short and the lathe intended for turning and boring was designed for 60 feet between centers and had a swing of 110 inches. To adapt the machine especially to the requirements of the Hunters Point shop, raising blocks supplied will increase its swing to 132 inches.

Other Lines of Operations

A few more operations, these on machines of more moderate capacity, are illustrated in the views which follow. Thus in Fig. 9 a high pressure pump casing is shown in the process of being roughed out on a Universal boring, drilling and milling machine. This casing, divided in halves along the longitudinal center, is a pair of steel castings which have been built up over all worn places by tough alloy electrode application to dimensions sufficient for machining back to original size. This tough weld metal is machined by single point tool, and time and patience are required in handling the work.

The boring bar, Fig. 10, is used in a following operation in a horizontal boring machine for roughing and finishing the interior for the impellers, with five cutting tools working at once in as many annular channels which have to be definite width and depth. Two sets of square stock tools are located in the body of the boring bar; five roughers adapted to be fed out automatically from one side of the central location and five finishing cutters directly opposite in the body of the bar. The latter tools are retracted during the time the roughing tools are at work, and upon withdrawal of the roughing cutters the finishing tools are fed out radially to complete the grooving operation.

During the channel operation the boring bar is mounted in the impeller bearing seats and is thus in truly central position. An ingeniously arranged register at the outer end of the bar gives the operator an accurate indication of the depth to which the tools are fed in to the work.

Vertical Hydro-tel Milling Machine

A Cincinnati vertical Hydro-tel miller with hydraulic automatic depth control is represented in Fig. 11. Longitudinal travel of the table, cross travel of the cross slide and vertical travel of the head provide a three-dimensional combination of movements adapting the milling ma-

chine to handling any class of work in the line of dies or other intricate shapes. With the automatic control copying can be done from a master or a template.

The illustration shows the set-up for producing a cam-shaped bucking bar for the sheet metal shop, this being a heavy piece of steel about 2 inches square with peculiar offsets for convenience of handling and applying to the work.

In this instance the copying is done from a template secured to a bracket at the extreme right of the photograph.

The work piece is about 18" long and is secured crosswise to the longitudinal table. The actual milling to shape is accomplished by cross travel of the cross slide.

All movements, longitudinal, cross and vertical, are actuated hydraulically, and all controls are so located as to be most conveniently handled by the operator. This is brought out clearly in the photograph. The method of holding the work is seen with the supporting plate in the immediate foreground, and the helical tooth mill will be noticed in actual cutting operation upon the edge of the work.

Some Balancing Operations

Two Gisholt Dynetric balancing machines are illustrated in Figs. 12 and 13. The first of these half-tones shows a large machine with reversible propeller in place for balancing. The other machine is shown balancing a ship's blower unit. These are only two sizes in the above company's regular line of balancing outfits, which in total cover a range of work from parts weighing as little as a fraction of a pound up to a piece weighing several tons.

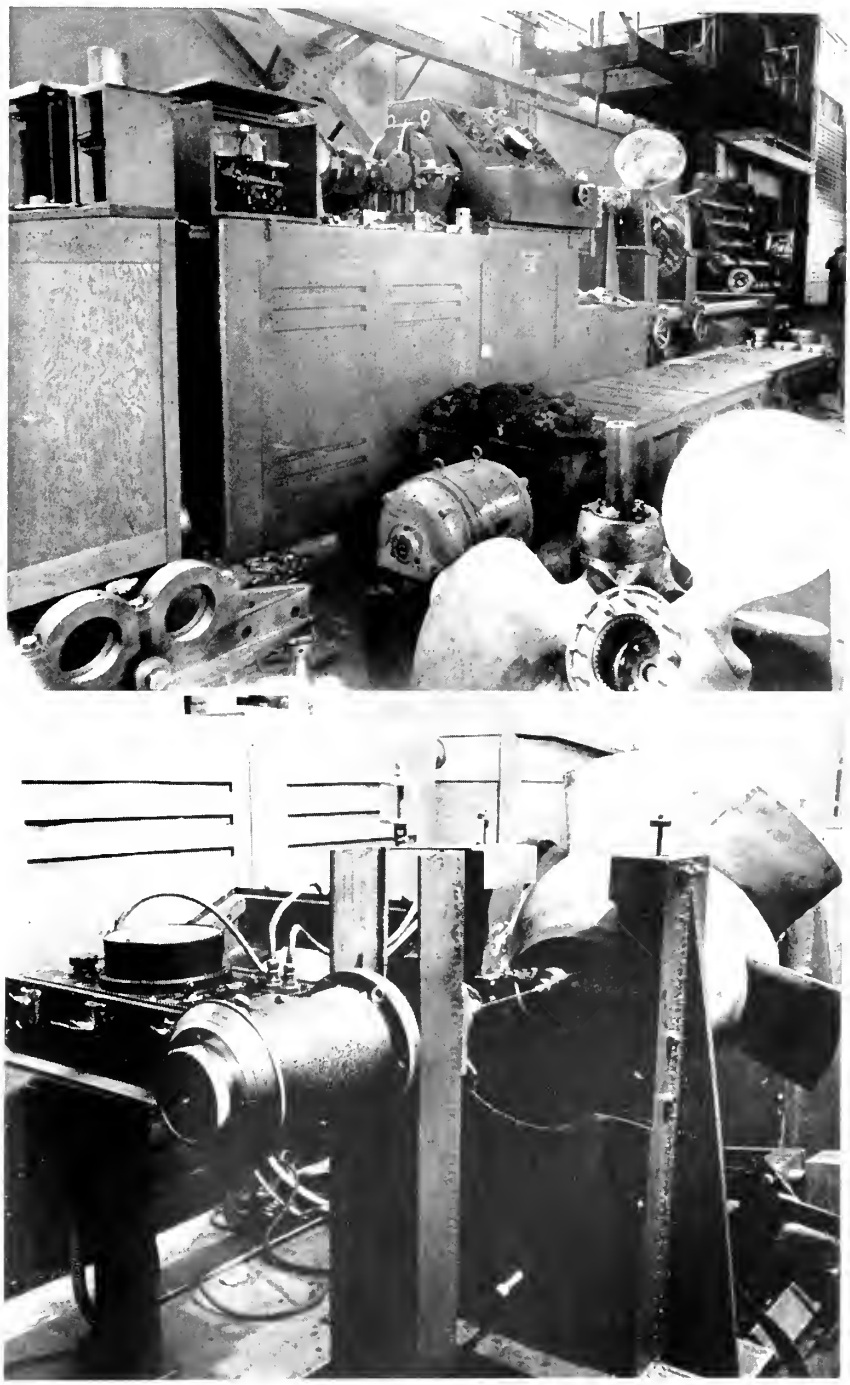
The requirement of higher speeds in modern equipment, the demand for noiseless operation free from vibration, and the desire to cut down maintenance delays and troubles, are among the reasons why proper balancing of many classes of parts is essential today.

Unbalance may be due to a number of factors, such as lack of concentricity of the part; lack of homogeneity in materials; lack of uniformity or squareness of the work about its axis, due perhaps to improper machining operations; or to one of a number of other causes. In any event correct balancing of rotating parts has become of utmost importance.

The elimination of vibration due to unbalance is accomplished by application of corrections which may be in the form of weights added to the body or material removed from the body. These machines locate and measure the amount of unbalance in rotating parts with great accuracy.

Fig. 12, upper: Gisholt Dynetric balancing machine with reversible propeller in place.

Fig. 13, lower: Another Dynetric machine balancing a blower.



Large Cargo Carrier for A. P. Lines

S.S. Marine Leopard Runs Successful Sea Trials

The S. S. Marine Leopard, a U. S. Maritime Commission Type C-4-S-A-4 cargo vessel, ran successful trials on February 8, 1946, and was delivered to the American President Lines.

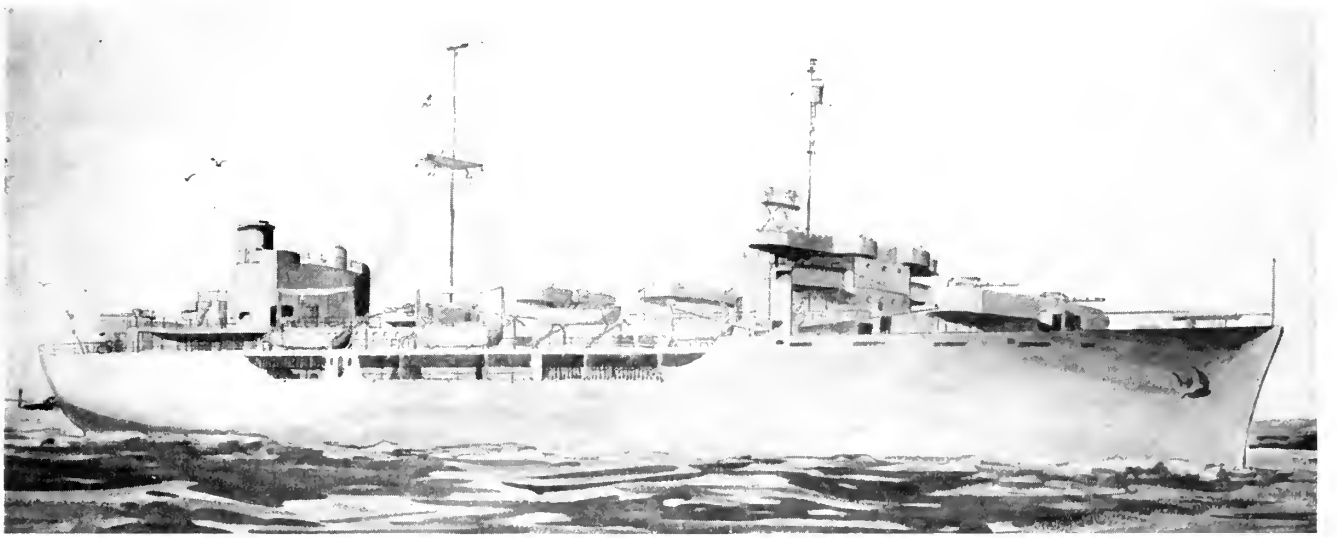
This type of vessel was described in the November issue of Pacific Marine Review when the drawings of the profile, general arrangements, and midship construction section were also published.

She was originally constructed as a C-4 troop transport, one of the 35 built at Yard No. 3, Richmond, California, by the Kaiser Company Inc. Since the end of August, 1945, in the process of reconversion she has undergone removal of an estimated 700 tons in miscellaneous bulkheads, deckhouses, gun emplacements, machinery, and other defense features, as well as changes from troop accom-

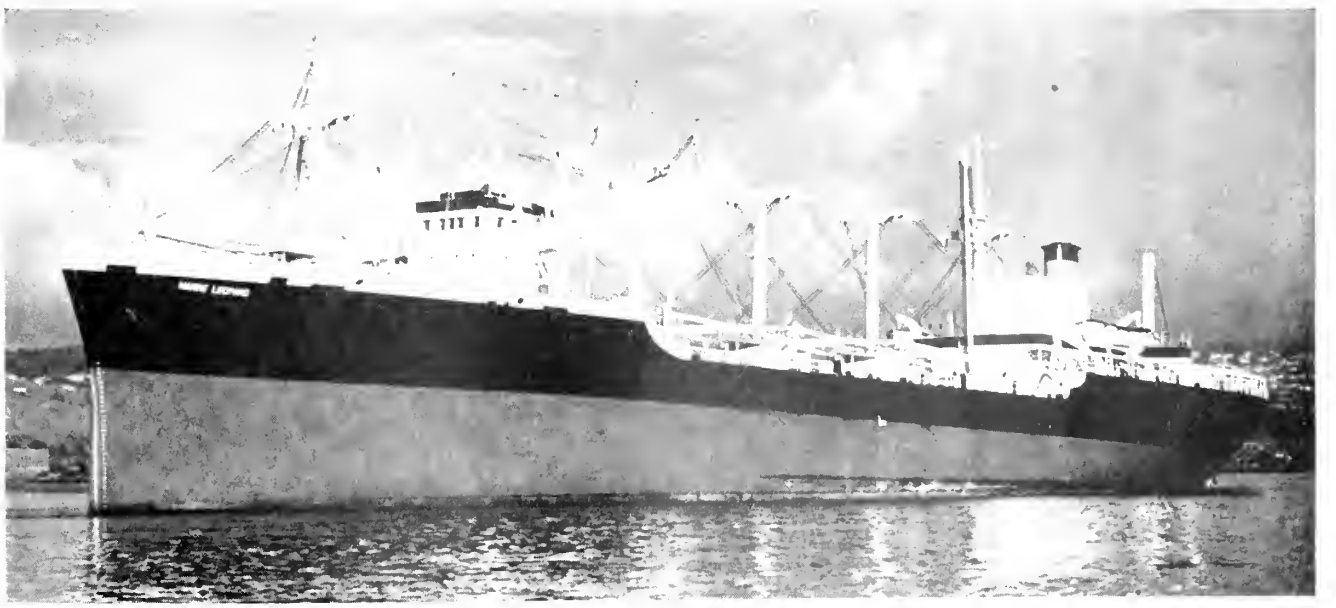
Looking forword of bridge superstructure. Port side.

Port side, looking forward.

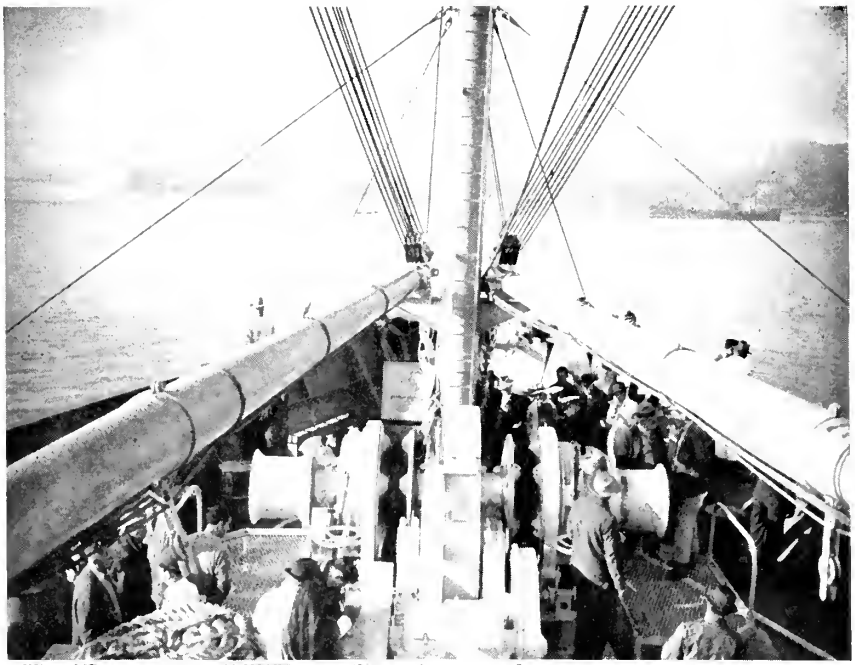
The C-4 as originally designed for the American-Hawaiian Steamship Co.

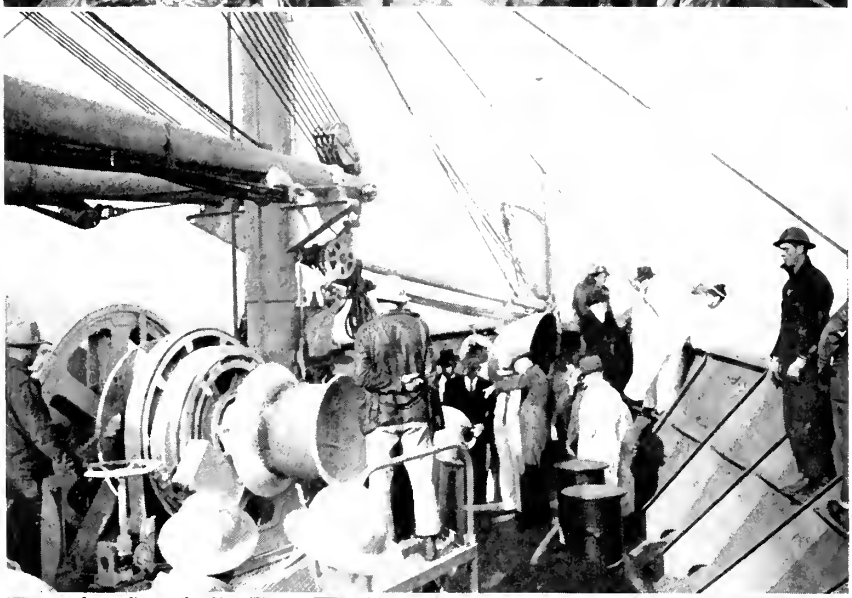


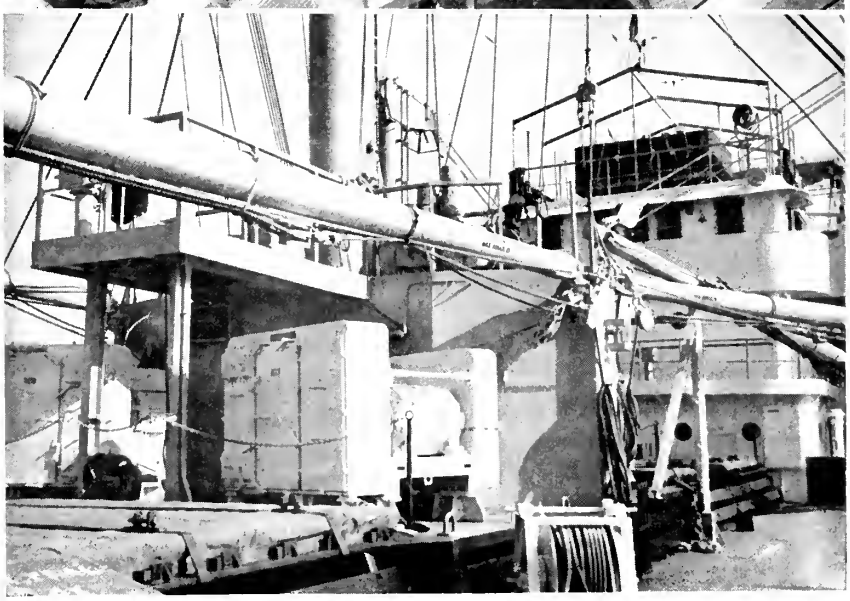
The C-4 hull converted during the war for Navy use as a transport.



The C-4 completed as the carga carrier Marine Leopard for the American President Lines.
Photo taken after completion of trial run.





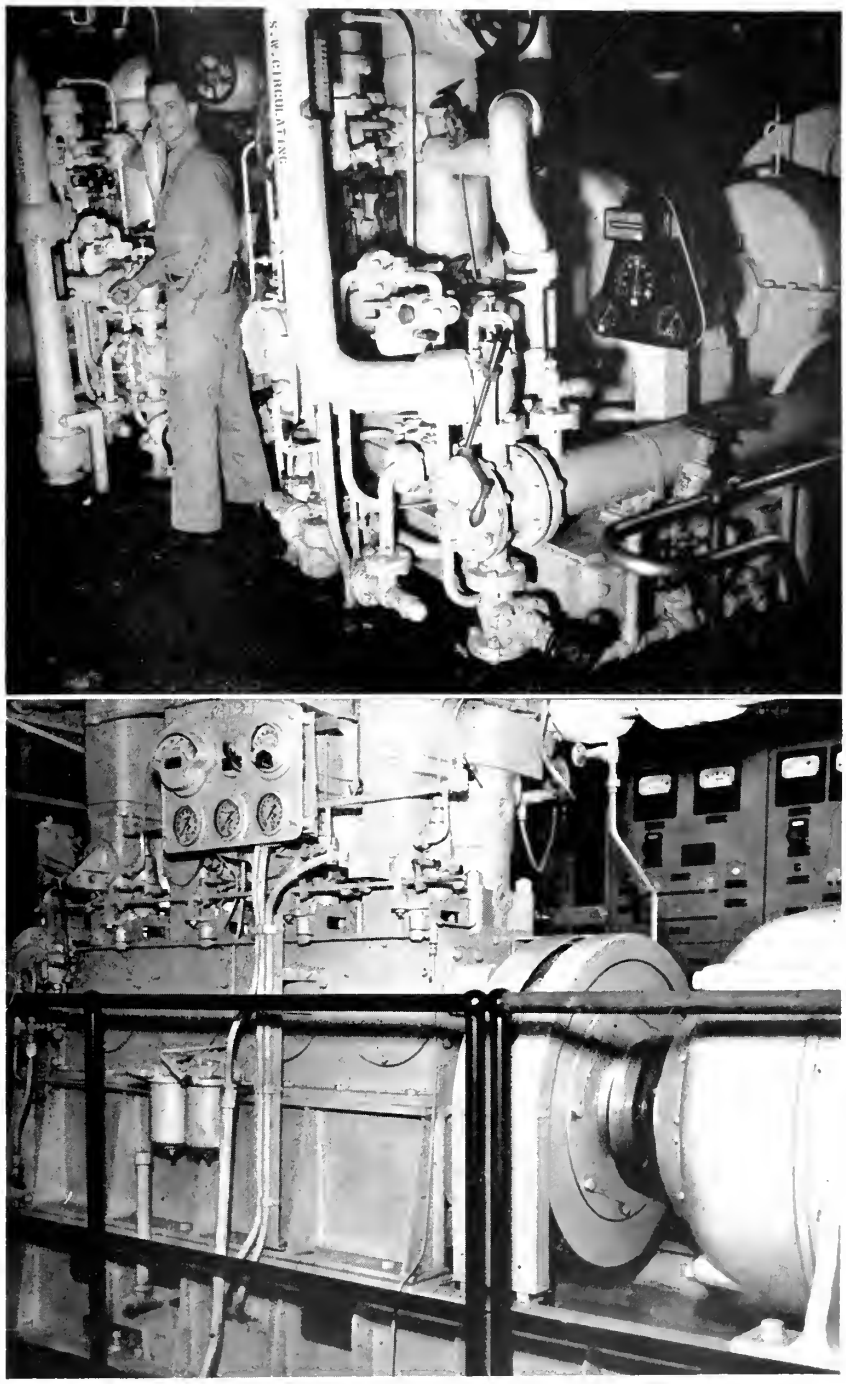


Above and below: Interesting shots of the weighing of the anchors.

modations for 4209 persons to cargo space.

The following is a list of her main particulars:

Length	522 feet 10 inches
Beam	71 feet 6 inches
Depth	43 feet 6 inches
Draft (loaded)	32 feet 0 inches
Horsepower	9,000
Speed	18 knots
Total Displacement	19,850 tons
Deadweight	13,096 tons
Lightweight	6,754 tons
General Cargo	10,493 tons
Wet Cargo	836 tons
Dry Cargo	9,284 tons
Refrigerated Cargo	373 tons
Complement	58
Keel laid	May 17, 1945
Days in Basin	71
Launched	July 27, 1945
Ordered Converted	Aug. 12, 1945



Right column, facing page:

Top: View looking forward during anchor tests.

Center: Anchor windlass test.

Bottom: View showing cargo booms, hatches and General Electric controlled winches by Lake Shore Engineering Co.

At the right, upper: Two Worthington turbo-driven 400-kw generators by Crocker Wheeler.

Lower: Four-cylinder, 4-cycle Lorimer diesel 75-kw emergency generator.

(Additional machinery pictures on page 267)

New C-4's at Portland

A series of trial runs by the C-4 class of ships being built in Portland-Vancouver area started at Portland in January when the SS Louis McHenry Howe, built at Kaiser's Vancouver shipyard, ran her trial. This is the largest general cargo type built during the war period. Her main house is forward and engine compartment is aft. When one-half of an ordinary shipload of lumber is carried on her main decks the cargo capacity is some 14,500 tons. When she was laid down on the ways last spring, the Howe was scheduled to be a troop carrier with berths for about 3500 men, but the sudden end of the war caused this vessel and seven other hulls to be converted into peace time cargo carriers of a new class. The Howe is scheduled to go into intercoastal service with the Luckenbach S. S. Company if her trials proved her as good a ship as her builders believe. New features incorporated in the Howe are steam schooner type of rigs with special remote-controlled topping lift winches and three-section hatch covers for quick handling, and vertical battens in the holds to increase capacity and decrease damage claims. The Howe has seven large holds. No. 3 hold has four 400-ton cargo oil tanks, with special heating and cleaning systems. No. 7 hold is fully refrigerated. The power plant is a 900-hp double-reduction turbine.

37,778 Ships Handled By Bethlehem During War

FOUR LARGEST ALLIED TRANSPORTS ARMED AND CONVERTED

The Queen Elizabeth, Queen Mary, Aquitania and Mauretania, the four largest ships available to the Allies as troop transports after the burning of the Normandie, were all armed and converted by Bethlehem Steel Company in New York Harbor.

Lifting the veil of security which shrouded many phases of its wartime activities, the company has disclosed that it handled a record total of 37,778 ships during the war years. Aggregating 302,224,000 dw tons, this armada represented a tonnage more than five times as great as the world's pre-war merchant fleet and more than 25 times the size of the American merchant marine in 1939.

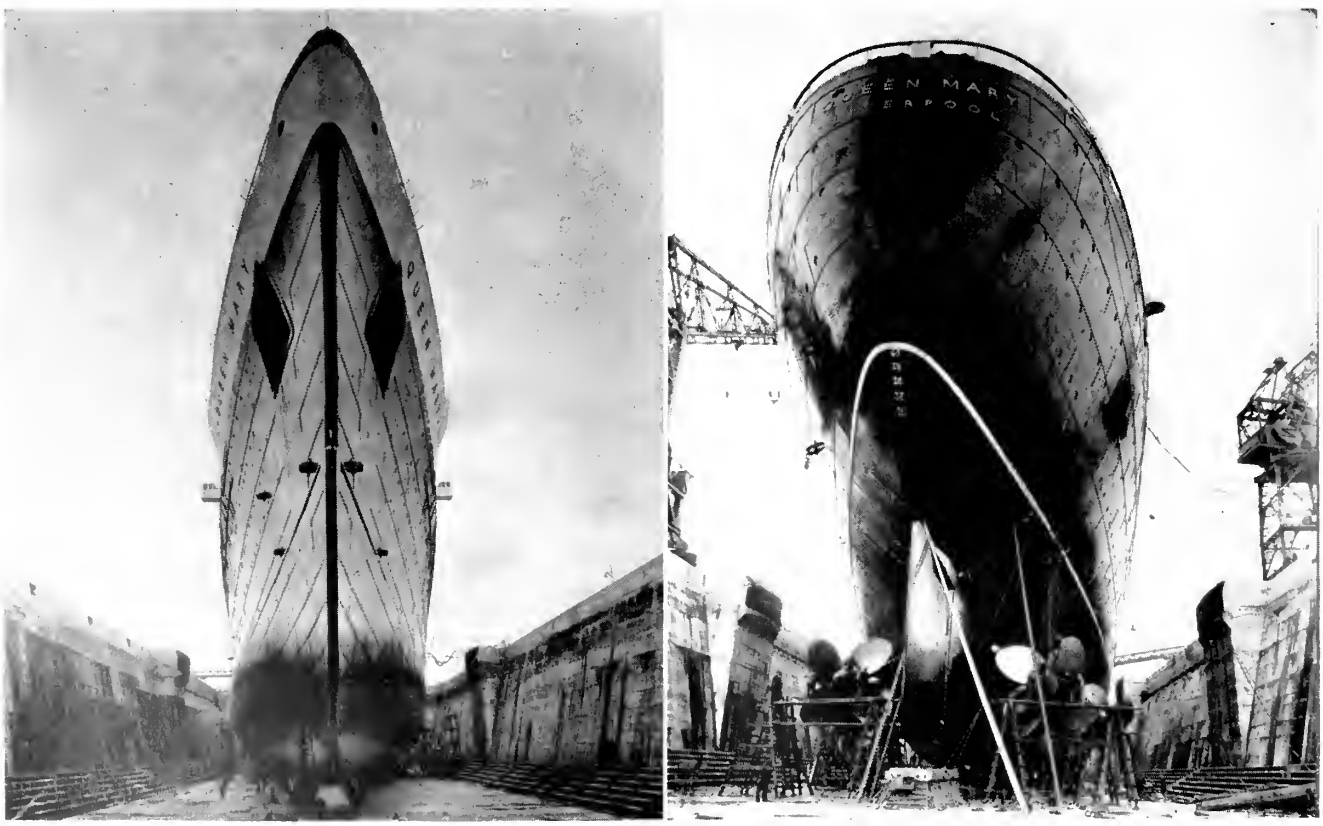
Ships of virtually every type afloat were handled, including battleships, aircraft carriers, submarines and other warships, in addition to merchantmen.

The four largest Allied transports were among 16 of the world's largest troopships which were regularly assigned to Bethlehem yards for repair and servicing from shortly after Pearl Harbor to the surrender of Japan. Other ships on the "regular list" were: Pasteur, Britannic, Andes, Orion, Argentina, Brazil, Uruguay, Franconia, Scythia, Samaria, Mariposa and Monterey.

Conservative estimates are that these 16 vessels transported more than one-third of all the troops moved from America to the war zones. The Queen Mary and Elizabeth alone were reported to have moved some 800,000 American troops to Europe. The Mariposa and Monterey, crack Matson liners, were among the largest carriers of U. S. personnel to the Pacific theater.

The urgent need for these large troopers necessitated special planning for their maintenance. They were

Queen Mary—Bow and stern views in drydock.



boarded by a Bethlehem representative at the conclusion of each voyage, even before they had completed docking. Together with officials of the shipping company, work was surveyed and laid out on the basis of the ship's sailing date.

So efficient was this method that not a single big ship under Bethlehem's care ever missed a departure date or broke down at sea.

With a rated speed too high for convoy, the 81,225-ton Queen Mary was armed with 33 guns, including one six-incher; 12 rocket projectors; one range finder; and one central gun control house. In addition, the big vessel was completely degaussed to protect her from the mine menace. Concrete and steel emplacements were built for the armament.

Conversion of the 975-foot vessel, a veritable floating seven-story hotel, was completed in three weeks, or in less than one-third the time originally estimated. The luxuriously-appointed dining saloon, built to feed 500 passengers at a sitting, was converted to a mess hall at which 2000 troops could be fed at a time. Troop quarters, galleys, recreation areas, hospitals were fashioned out of swimming pools, cabin spaces, etc. De luxe one-bed staterooms were converted into 12-bunk troop cabins.

Bethlehem also reconditioned the vessel's propulsion machinery, the first time that job had been done in the United States.

The 83,673-ton Queen Elizabeth, largest vessel in the world, was armed similar to the Queen Mary, with the exception of one 20-mm gun. She also was degaussed and converted by Bethlehem.

Biggest job on the liner came when she suffered heavy sea damage. Following one of the worst Atlantic gales in years, the big ship arrived here with her forward deck smashed down 14 inches, and heavy superstructure damage. It was originally estimated that repairs would take three months but the job was completed in less than a month.

Slated for the scrap heap before the war broke out, the 44,786-ton Aquitania also was pressed into service as a troop transport. The one-time "Mistress of the Seas" had been built before World War I, however, and one of the biggest reconditioning jobs of the war was necessary to put her into proper operating condition. The ship's turbines, the largest direct-drive marine engines in the world, were disassembled, renovated and cleaned, and then reassembled. Her boilers required virtual rebuilding and into them went 36 miles of 2-inch piping. Some of the decks were almost rebuilt. The Aquitania, because of her lower speed, carried two six-inch guns, in addition to 27 other guns, 17 of which were installed by the British and 12 by Bethlehem. Bethlehem also armed the ship with four rocket projectors and installed a central gun control house.

Completed just before Germany marched on Poland, the 35,677-ton Mauretania, which replaced an older Cunarder bearing the same name, also was brought to Bethlehem for arming and conversion.

One of the most spectacular repair jobs of the war was completed on this ship. At the height of the movement of troops for the North African invasion, the liner, loaded to the rails with American soldiers, was in a collision with another ship in New York Harbor. A survey showed that she had suffered heavy damage at the water line. Estimates were that the vessel could not be repaired sooner than from three to six days. Plans had already been made to disembark the troops when the Bethlehem representative promised to have the ship ready to sail in 24 hours. On that pledge, the troops were maintained on board.

In order to get the vessel to sea in the shortest possible time, it was decided to rivet huge plates over the damage. Plates of that type were not immediately available there so an emergency call was put through to one of Bethlehem's steel plants. Within a few hours the big plates arrived and selected riveting crews went to work. Twelve hours after the liner had limped back to her berth she was ready to sail again. The speed with which this job had been completed allowed the vessel to join a convoy she had been scheduled to make half a day earlier.

The emergency repair job stood up so well that permanent repairs were not made until six months later, when the troop movement to the European theater slackened.

San Francisco Port Engineers' Association

A group of San Francisco port engineers met on February 1 at El Jardin and took the initial steps in the organizing of a Port Engineers' Association.

The society, which is of a professional nature, is organized for the benefit of port engineers, and the main object of their association is the study of problems in the operation of the engine room department.

The officers of the society are Joe Gisler, port engineer of Interocean S. S. Corp., president; Frank Smith, port engineer of American Mail Line, vice president; and Charles Steel of Interocean S. S. Co., secretary.

Six-Star Admiral Has Six Ships

China's top admiral, Chen Shao-kwan, has six stars—one more than any other admiral in the world. He also has six small ships in his entire navy.

"What kind of sailors are they?" asked St. Peter.

"Yanks," replied the gatekeeper.

"Oh, let 'em in," said the Saint, "in six months they'll be asking for a transfer anyway."

F.-M. Opposed-Piston Two-Cycle Diesel

Some 10 years back Pacific Marine Review announced the first in a series of Fairbanks-Morse diesels built to a new and then very promising design. This was the opposed-piston two-cycle diesel with upper and lower crankshafts connected through bevel gearing by a splined vertical shaft. A number of these engines were in satisfactory operation when World War II came along and the Navy contracted for a group to drive various small auxiliary craft. Performance was so satisfactory that many more orders were received, and today there are now engines of this type developing about 3,000,000 shp in active service as marine, stationary and locomotive installations.

Cylinder Block

As shown in the cutaway views here, with the cylinder block is the main structural unit of the engine. This is a weldment, with all parts cut from steel plate and assembled on jigs by welding. This block has compartments for: the control end; the vertical shaft assembly; the upper and lower crankshafts; the camshafts and fuel pumps; the injection nozzles; the air receiver; and the exhaust manifold. The air receiver, vertical drive, and control end compartments are fitted with access covers. A sheet metal top cover is fitted with several small inspection holes with spring loaded covers. An oil pan closes the lower crankshaft compartment, and suitable large covers at the sides complete the closure.

Plate for this frame is cut into the various forms needed by automatic gas flame cutting machines. The pieces thus formed are assembled in small weldments and are then placed in a specially designed fixture which holds them rigidly in position while they are tack welded in place. The entire frame is then moved to a huge positioner where welding is completed.

As first designed there was a shrinkage of 1/8 inch to the foot during the welding process. Redesign reduced this shrinkage to 0.039 inches to the foot.

The frame is then sandblasted and Magnaflux tests made to check all vital points in the welding. It is then stress-relieved to remove the internal strains due to the welding process.

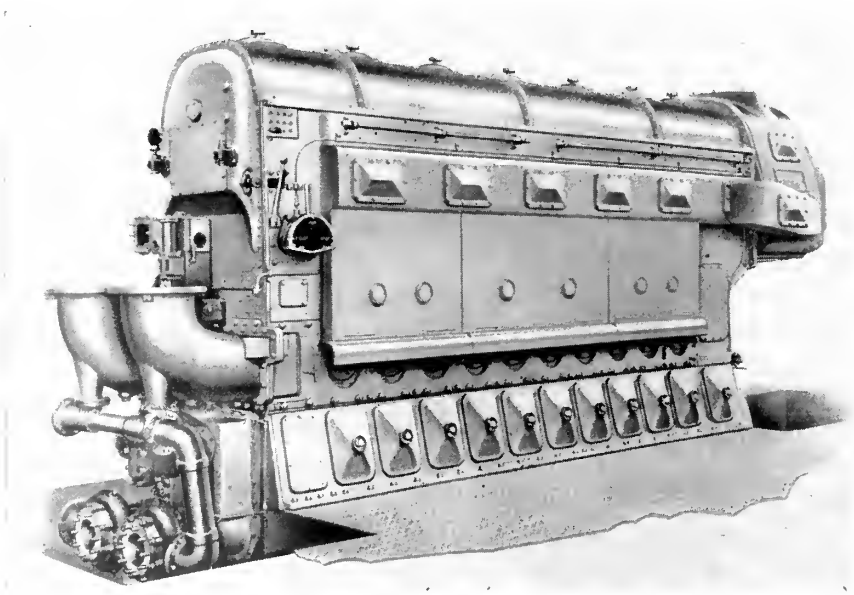
Cylinders

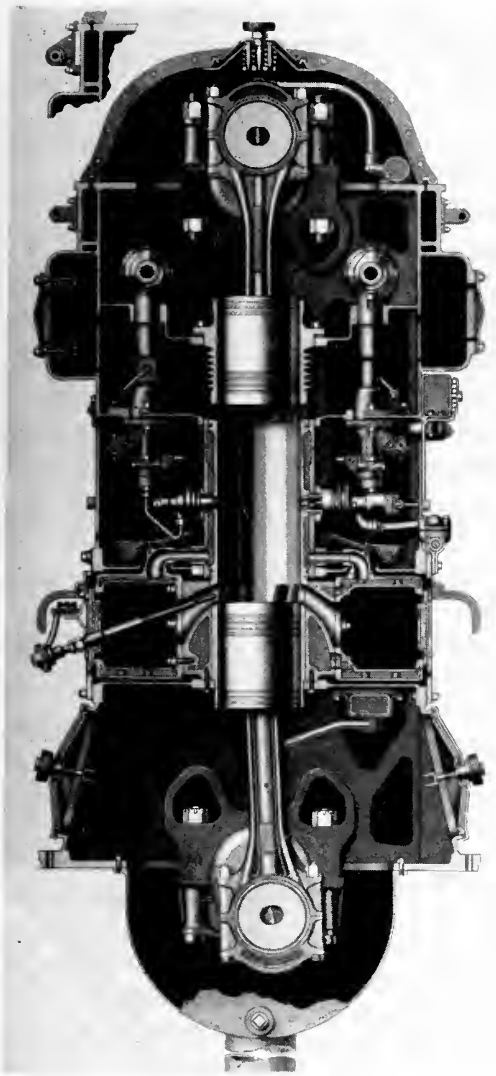
A close-grained cast iron of great tensile strength is used for the cylinders, which are bolted into the main frame along its center line, the holes being bored in accurate alignment with the crankshaft throws. Each cylinder is composed of a liner, a jacket, rubber rings, and a lock ring. The water jacket is rolled from steel plate and welded at the seam. After accurate machining it is hydraulically pressed onto the liner. The rubber rings act as a water seal and the lock ring prevents any movement of the jacket due to expansion. The circular ribs near top of liner act to help cool this part of the liner which is surrounded by scavenging air. The vertical ribs in the jacketed space act as guide vanes for, and present a larger radiating surface to, the action of the cooling water.

Piston Assembly

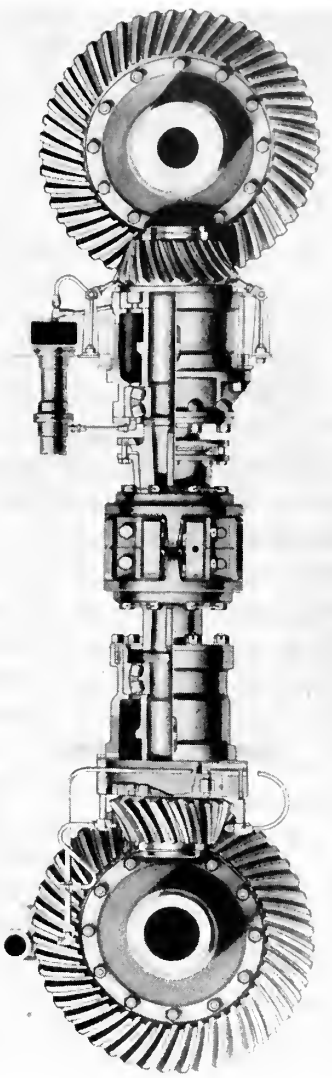
In this design there are no cylinder heads. The two pistons in each cylinder therefore have four basic functions: (1) to act as movable gas and compression tight closures; (2) to act as exhaust and scavenging air valves; (3) to form the combustion space at inner dead center; (4) to transmit the energy of the expansive forces to the connecting rods and crankshafts. Upper and lower piston and connecting rod design is similar, with the ex-

10-cylinder Model 38D8-1/8 O.P. diesel engine, control side.





Model 38D8-1/8 O.P. engine, cross section.



Model 38D8-1/8—8 1/8 x 10 O.P. engine, crankshaft vertical drive.

Connecting rod and piston parts, bronze bushing type 8 1/8 x 10 O.P. engine.

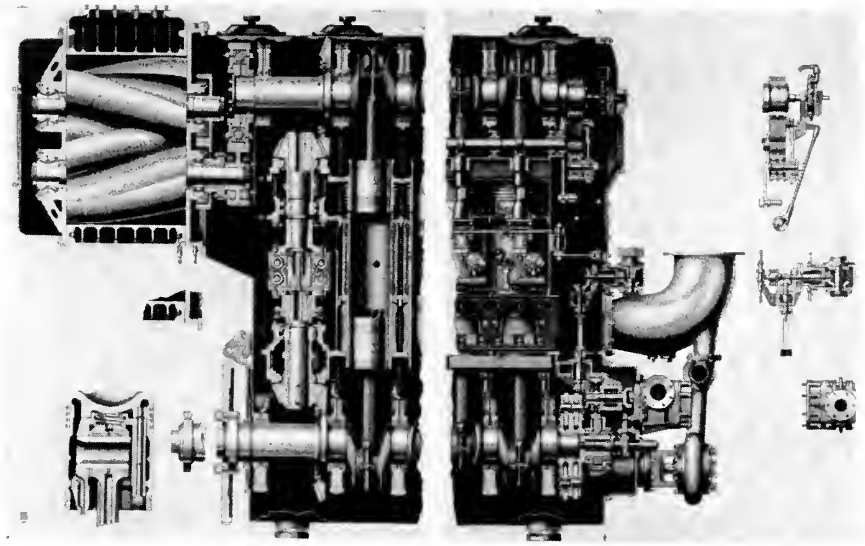
ception that the lower con-rod is 4 inches longer than the upper one.

The wrist pin is held in a separate bracket which fits into and is bolted to the cylinder so as to form an inner wall for the oil cooling jacket. Lube oil for the wrist pin bearing and cooling oil for the piston are both forced under the pressure system through drilled holes in the con-rods and into the wrist pin bearing and out into the piston cooling jacket, then out through a discharge-fitting into the crank cases, from which it drips down to a sump tank under the lower crankcase. This design gives an unbroken smooth cylindrical surface on the outer face of the piston, which is fitted with compression rings at its closed end and with oil control and oil drain rings at its open end.

Crankshaft Assembly

Crankshafts on this engine are of chrome - nickel - molybdenum alloy, precision machined to insure perfect wearing surfaces, and perfectly balanced. At its after end the upper shaft drives through spur gearing the scavenging air blower, and at its forward end, through sprocket chain, the camshafts. Power is taken off the after end of the lower crankshaft through a flexible coupling. At its forward end the lower shaft is fitted with a torsional damper to eliminate criticals. The gear for driving the governor and all attached pumps is keyed to the spider of this damper.

One of the novel features of this design is the vertical shaft assembly that connects the two crankshafts. This assembly is in three main parts, an upper and a lower vertical pinion shaft and the flexible coupling that connects them. Each pinion shaft runs in a large roller bearing next to its pinion and is supported by a substantial thrust bearing. The two halves of this shaft can be adjusted



Model 38D8-1/8 opposed piston engine.

to "time" the upper crankshaft properly in relation to the lower shaft.

Fuel Oil Supply

A fuel supply pump driven by gears from the lower crankshaft draws oil from the fuel service tank and delivers it through a strainer-filter to the engine inlet, building up and maintaining a pressure of around 15 psi in the fuel header, which is fitted with a regulating valve that by-passes back to the tank any excess oil. There are two injection pumps and two injection nozzles for each cylinder. The pumps are mounted vertically directly under the camshafts. They are of the constant stroke, single valve, rotating plunger type, the amount of oil delivered being dependent on the position of a helix machined on the plunger relative to the inlet port on the pump barrel. The angular position of this helix is adjustable through a rack and pinion mechanism controlled by the Woodward governor. Each pump is connected to its differential type, spring loaded, injection nozzle by a short (equal length for all pumps) section of high pressure tubing.

Cooling

Two pumps on the forward end circulate water, one fresh water, the other sea water. The fresh water is circulated through the cooling water jackets of the engine in a closed system that includes a heat exchanger. The salt water is circulated through this heat exchanger to cool the fresh water.

Scavenging

The scavenging blower of positive displacement type is mounted on the after end of the engine frame and supplies abundant quantities of 3 to 6 psi air to the air receiver compartment, which extends the full length of the frame and completely surrounds the tops of the cylinders at the upper port level. Thus, the air enters the cylinders under pressure and completely sweeps out the products of combustion through the lower ports and into the exhaust manifolds. Enough scavenge air remains in the cylinders to provide fresh air for the next compression stroke.

Starting is by air at 250 psi supplied to the cylinders through a header and spring loaded check valves in each cylinder. These valves are pneumatically opened by air from a distributor valve, controlled by a cam at the forward end of the upper crankshaft. A single lever at the control station governs the maneuvering positions. A second lever resets the emergency speed governor, and a push-button actuates the emergency stop.

The design is standardized around an 8 1/8 inch cylinder bore with 20 inch combined piston stroke. The normal speed is 750 rpm and the 10 cylinder size develops 1500 shp at that speed with 79.5 psi mep. The weight is approximately 25 pounds per shp and the over-all dimensions for 10 cylinders are: length 18′ 10 3/16″, width 4′ 7½″, and height, 9′ 8½″. The height above engine room floor required for removing cylinder liner is 8′ 7″.

New G. E. Industrial Electronics Training Course

An Industrial Electronics talking slidefilm training course which offers a thoroughly practical understanding of the subject of industrial electronics has been announced by the General Electric Company. This new course is expected to have wide use throughout the industrial and power company fields.

In industrial plants, the course should provide electrical personnel with sufficient theory and application information to acquaint them with electronics in general; production, design and process engineers as well as production managers and plant superintendents should obtain increased electrical knowledge and much stimulation, and should find that it offers innumerable practical suggestions and new ideas. The course is certain to provide new sales power to engineers with background necessary to deal helpfully with customers and for training their own sales staff.

Presented in a clear, non-technical manner, the course consists of 12 talking slidefilms (35-mm film strips and 16-inch, 33-1/3-rpm records) each approximately 30 minutes in length; 25 copies each of 12 lecture review booklets keyed to the slidefilms; and an instructor's manual covering the 12 lectures; and an attractive carrying case designed to accommodate the complete course.

Admiralty Decisions

By Harold S. Dobbs
of the San Francisco Bar

Bargeman Held to Be "Member of Crew"

For many years both the employer and underwriter have been plagued with the difficult task of determining in any given case whether injuries suffered by its personnel should be reported to the United States Employees' Compensation Commission and compensation paid according to the statutory schedule or, on the other hand, should be treated as a P & I[1] claim, assuming negligence is one of the factors. The decision is, of course, especially important from a dollars and cents liability standpoint. In the case of a true longshoreman's claim, namely one where the injury occurs upon navigable waters and the injured employee is **not** a member of the crew as defined by the Act,[2] the employer makes certain reports to the Compensation Commission and regular weekly compensation payments follow after the first seven days of disability. Of course there are many ramifications to the handling of these claims through the Commission which are too voluminous to discuss in the space provided. If the claim falls within the category of P & I claims, we have a vastly different problem. If the claim comes within this group we must assume that the injured employee was at the time of his injury a "member of the crew" and not a longshoreman, harborworker or similarly entitled maritime employee. It is this category, as previously mentioned, that gives the employer and underwriter so many sleepless nights. Litigated cases upon the subject have repeatedly and consistently required a strong and complete showing of facts upon which the court could say without fear of contradiction that the subject employee was a "member of the crew." With this background in mind, it is interesting to examine **Dillon's case** (1945 A.M.C. 1486, United States Cir. Ct. of Appeals, Third Circuit), where the court breaks away from the old standards previously discussed and announces a new liberal standard or measure for determining the definition of a member of a crew in any given case. Of course this case involves the question of the application of Section 3(a) (1) of the Longshoremen's and Harbor Workers' Compensation Act (33 U. S. Code sec. 903[a] [1]), in that it must be determined whether one Dillon was a "master or member of the crew" of the barge ARMY. The Deputy Commissioner found that ". . . Dillon was not a master or member of a crew . . . his status being that of a laborer or harbor worker . . ." and allowed compensation to his minor grandchildren. The pertinent findings of the Deputy Commissioner are as follows:

"(1) that on . . . (August 9, 1941, the day of death) and for about ten years prior thereto . . . Dillon had been employed on the barge ARMY as a caretaker . . .; (2) that it was the duty of Dillon when excessive leakage occurred, to attend to and to supervise the loading and unloading thereof, to fasten and unfasten lines as necessary and at all times to protect the barge from damage and otherwise safeguard the interest of its owner; (3) that his duties were limited to the barge ARMY; (4) that he was the only person employed thereon; (5) that he lived, ate and slept on the barge and bought his own meals; (6) that he was not a qualified or licensed seaman and held no seaman's papers; (7) that said barge had no motive power of its own and was towed by tug boats; (8) that its operations were confined principally to the Philadelphia harbor; (9) that the duties performed by the deceased employee prior to his death did not relate principally to the navigation of the said barge, but on the contrary his duties had substantially no relation to navigation, being principally the duties incident to common labor and custodial service . . .; (10) that . . . Dillon was not a master or member of a crew, within the meaning of section 3(a) (1) of the Longshoremen's Act, his status being that of a laborer or harbor worker . . ."

The District Court concluded that the Deputy Commissioner's finding that Dillon was not a master or member of a crew within the purview of Section 3(a) (1) of the Act ". . . is not supported by any evidence adduced before him and hence is not in accordance with law." The higher court continued by concluding that "on the contrary, the basic facts found by the Deputy Commissioner rightly call for the conclusion that Dillon was a member of a crew within the meaning of the . . . Act and therefore outside the scope of that Act."

It was held, therefore, that the Deputy Commissioner misconstrued the Act. As Mr. Justice Douglas stated in **Norton** v. **Warner Co.,** 321 U. S. at page 569, 1944 A.M.C. at page 341: "If the award were to stand, there would be brought within the Act a group of workers whom we do not believe Congress intended to include." The history of the Act was reviewed by the Supreme Court in **South Chicago Coal & Dock Co.** v. **Bassett,** 309 U. S. 251, 1940 A.M.C. 327, and in **Davis** v. **Department of Labor,** 317 U. S. 249, 1942 A.M.C. 1653. Nothing can be added by this court's opinion to those cogent recitals. The barge ARMY in the instant case is a vessel, despite the fact that it had no motive power of its own. It was a means of transportation on water. Dillon was on board the ARMY and aided in her navigation as the evidence demonstrates and the Deputy Commissioner found in his second finding of fact. Compare the facts in the **Bassett case,** 309 U. S. 251 at page 260, 1940 A.M.C. 327. The fact that the Deputy Commissioner concluded that Dillon was a caretaker is immaterial. He did take care of the barge but no one fact is conclusive. The purpose of the Longshoremen's and Harbor Workers' Compensation Act, as is pointed out in S. Rep. No. 973,

[1] Protection & Indemnity.
[2] Longshoremen's and Harbor Workers' Compensation Act.

69th Cong., 1st Sess., p. 16, was to provide compensation for persons ". . . mainly employed in loading, unloading, refitting, and repairing ships." These persons ordinarily are longshoremen and ship-fitters. Dillon was not such. He had some duties in respect to the loading and unloading of the ARMY. These duties, however, as the court below pointed out, were for the purpose of making sure that the loading or unloading of the barge was done in such a way that it would not be injured by excessive strain or capsized by unequal loads. In the court's opinion Dillon falls within the legal category of Rusin in the **Norton case** rather than in that of Schumann in the **Bassett case.** Accordingly the judgment of the court below is affirmed.

Removal Where Defendant Not Employee

Under the Jones Act, 41 Stat. 1007, 46 U.S.C., sec. 688, a seaman may sue his employer for personal injuries either in the state or federal courts. Experience has proved, however, that seamen and their counsel appreciate the benefits to be gained by trying their personal injury cases in state courts rather than under federal jurisdiction. It is, therefore, quite common to have the federal court remand to the state court any such case originally filed in the state court and removed by petition upon the ground that diversity of citizenship exists between the parties. In the interesting case of **Owen Steele v. American South African Line,** 1945 A.M.C. 1505, United States District Ct., No. Dist. of Calif., Sept. 19, 1945, a different result follows because the named defendant was not in fact the employer of the seaman and, therefore, was entitled to removal from the state court to the federal jurisdiction after alleging diversity and a claim exceeding $3000, even though the seaman had alleged a Jones Act situation.

In the **Steele case,** the plaintiff, a junior engineer of The S.S. CAPE BLANCO, moved to remand this cause to the state court, from whence defendant had previously caused its removal. The action is one to recover damages for personal injuries claimed to have been caused plaintiff on the CAPE BLANCO due to the negligence of defendant, whom plaintiff seeks to hold responsible as his employer at the time.

Removal of the cause to this court was accomplished on the ground that the claim of the plaintiff that defendant was his employer was colorable, if not fraudulent, and for the purpose of ousting federal jurisdiction. The removal petition asserted that plaintiff fraudulently alleged in his complaint that defendant was his employer in order to maintain the action in the state court pursuant to the Jones Act. The petition further alleged that in truth and fact, the defendant was not plaintiff's employer, and that consequently the cause was in reality a simple common-law action for negligence and therefore, because of diversity of citizenship, of federal cognizance. It was further charged in the petition that defendant was in fact the agent of the United States, the owner of the vessel. Such being the case it is asserted, the United States was plaintiff's employer and his cause, if any, based on the Jones Act, must therefore be litigated in this court, as provided in the suits in Admiralty Act, 46 U.S.C., sec. 741 et seq., and Public Law 17, 50 U.S.C., Appendix, sec. 1291.

In support of plaintiff's motion to remand, it is first urged that, in fact, defendant and not the United States was plaintiff's employer. However, by the "Service Agreement" between the defendant and the United States War Shipping Administration, the United States and not defendant was plaintiff's employer. This position has been firmly established by the following decisions of Judge Goodman: **Conlon v. Hammond Shipping Co., Ltd.,** 1944 A.M.C. 443, 55 F. Supp. 635; **Murray v. American Export Lines, Inc.,** 1943 A.M.C. 1426, 53 F. Supp. 861; **Baker v. Moore McCormack Lines,** 1944 A.M.C. 1248, 57 F. Supp. 207 (decision of Judge Roche).

It is next contended that at the time plaintiff signed on the CAPE BLANCO, he was unaware that the United States was the vessel's owner and that defendant held itself out as the vessel's owner-operator. Consequently it is urged that, on the basis of the well-known principle of the law of agency, i.e., that an agent may be held as a principal when the latter is undisclosed, defendant is suable as if it were in fact the employer. In support of this contention, plaintiff cites a decision of Judge Knox of the United States District Court (SDNY); **Lewis v. United States Navigation Co.,** 1944 A.M.C. 1241, 57 F .Supp. 652. That case, however, is distinguishable in several vital respects. Judge Knox found as a fact that the plaintiff Lewis was hired in the customary way through his maritime union by defendant shipping company and further that he was unaware that defendant, which had signed the shipping articles in its own name as "operating company," was acting as agent of the United States in servicing the ship and was without any authority over the vessel once she was on her way. Upon that theory, Judge Knox decided that plaintiff had a good cause of action against defendant under the Jones Act.

In the instant case, the Shipping Articles, signed by plaintiff, were executed by defendant as "Gen. Agts." Also attached to and a part of the Articles were certain regulations "pertaining to all American Flag vessels owned by or under bareboat charter to the War Shipping Administration." Hence plaintiff cannot here successfully maintain his position that he was in ignorance of the identity of his employer. Judge Goodman continues by stating:

"Moreover, I find myself unable to agree with the theory upon which the learned and experienced judge decided the **Lewis case.** The Jones Act fixes the rights and liabilities of seamen and their employers with respect to personal injuries suffered by seamen during their employment. It provides for the maintenance of actions by seamen against their employers. Sec. 33, Jones Act, 46 U. S. C., sec. 688. 'The statute is concerned with the relative rights and obligations of seamen and their employers arising out of personal injuries sustained by the former in the course of their employment.' **Panama R. R. Co. v. Johnson,** 264 U. S. 375, 387, 1924 A.M.C. 551. I cannot see how a cause of action specifically created by statute can be maintained against any party, other than the party statutorily charged with liability. Unawareness of the identity of the employer, at the time of signing on the vessel, is not, in my opinion, legally sufficient to fasten statutory liability upon a party not made responsible by the terms of the statute.

(Continued on page 263)

Coast COMMERCIAL CRAFT

Steel Welded Clipper Assembly Line

Steel welded tuna clippers are being built in a West Coast yard on an "assembly line" basis that is speeding up production, enhancing economy of plant operation, and insuring uniformity in standards.

Until the war, National Iron Works San Diego, California, specialized in steel fabrication for large industrial and commercial structures and similar projects. Closest it had come to a strictly marine product was its famed Ingle ranges, used widely by fishing craft, and by the Navy.

But during World War II, National was assigned to produce numerous steel barges, and the company developed a "know-how" that in recent months has been adapted to large-scale output of clippers for San Diego's far-ranging tuna fleet.

Three 52-foot vessels already have been produced, and have made several long-distance voyages in fair weather and foul, surviving without serious damage some of the worst weather in the "chubasco" (hurricane) zone off the Mexican and Central American coasts.

A 70-foot ship has been launched and will be commissioned in March. The keel has been laid for a 105-foot clipper, and another one will be started soon. All this is being performed in National's spacious new yard, on San Diego's waterfront, at the same time all its traditional steel fabrication for buildings is proceeding at an accelerated peacetime tempo.

National cut its eye-teeth in the boatbuilding business with construction of the Juana, setting the pattern for the 52-foot class of tuna clippers, all of which are capable of 9-9½ knots speed and have a cruising range of 6000 statute miles. Fish-carrying capacity of the 52-footers is 34 tons.

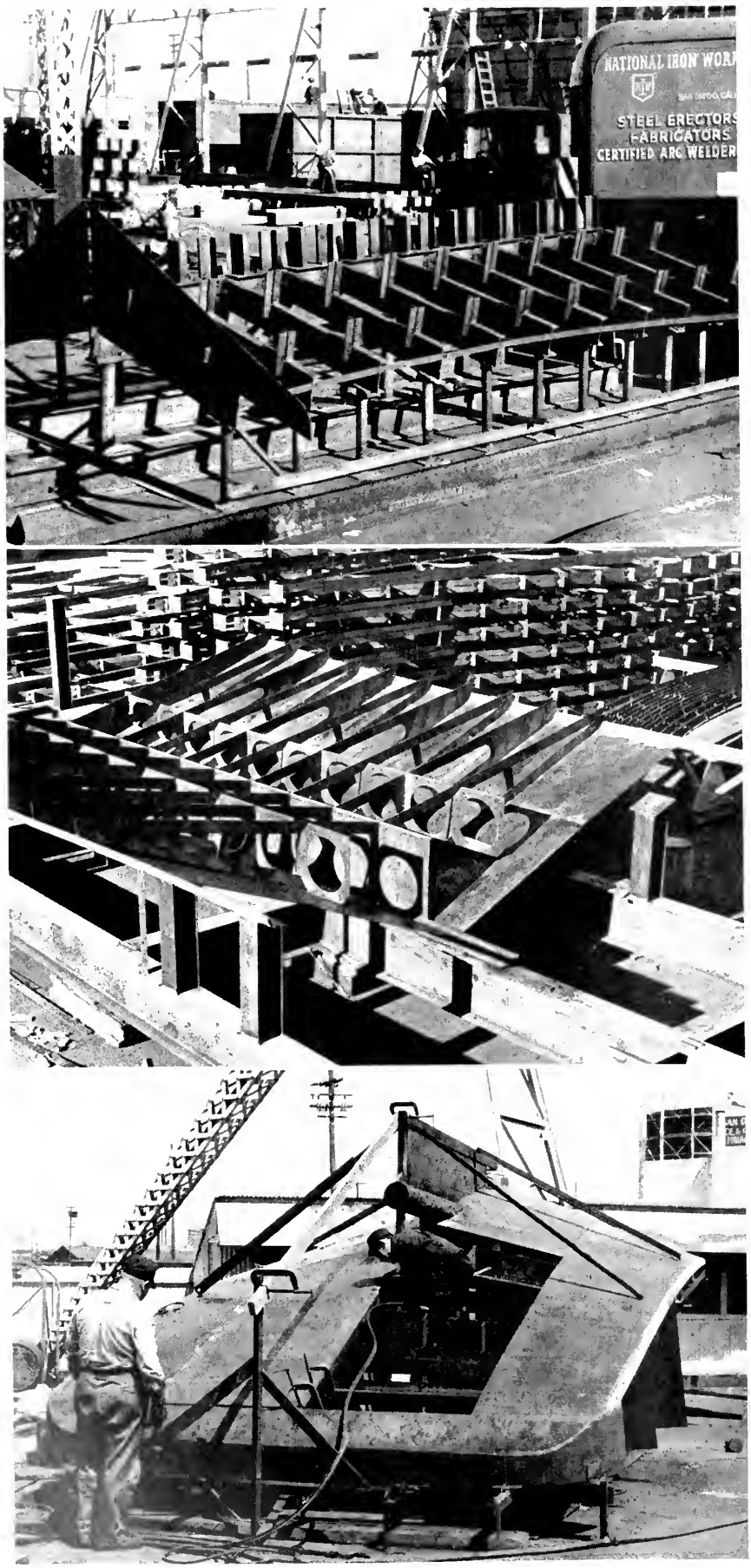
In mechanical equipment, the Juana differs somewhat from the Golden Bear and Lady, the other 52-footers. All are diesel-driven and have diesel auxiliary engines, but in the Juana the engines drive the generator, refrigeration compressor and pumps by means of belting to a line shaft. In the Golden Bear and Lady, the auxiliary engine drives a generator; the compressor and pumps are driven by means of individual electric motors.

Main engine of the Juana is a six-cylinder Model 65 Graymarine diesel with 3:1 reduction gears that can develop 165 hp at its maximum speed of 2000 rpm. The Golden Bear and Lady have Model D6-M six-cylinder Lorimer diesel engines rated 100 hp at 600 rpm.

Auxiliary engine of the Juana is a two-cylinder Graymarine diesel, equipped with a 12-volt electric starter unit with positive engagement of pinion through solenoid relay, and with a 12-volt, 250-watt generator with voltage control. Generator is belt driven. In the other two 52-footers, the auxiliary engine driving the 15-kw generator is a Model A2-S, 25-hp, 600-rpm Lorimer diesel of the four-stroke cycle, solid injection type.

Other engine room equipment on the Golden Bear and Lady includes a 7½-hp, 115-volt d.c. drip-proof, compound wound, marine type, 1750-rpm horizontal electric motor equipped with vee-belt pulley for driving ice machine; a 3-hp, 115-volt d. c. 1150-rpm horizontal electric motor for driving anchor windlass; a Campbell Machine Co. vertical impeller bait-water type pump with 5-hp ball-bearing vertical electric motor; and a Campbell horizontal and centrifugal type pump with 1½-hp ball-bearing electric motor. In addition, there is a Viking positive displacement gear pump, with built-in relief, back gear driven by a 1-hp ball-bearing electric motor for fuel transfer. Magnetic type starters, with Allen Bradley push-button control, are provided.

These vessels are equipped for ice refrigeration, and the system also provides for cooling brine in the bait well for chilling of fish. The 2-cylinder, 3½" x 3½" compressor is a Baker Ice Machine Co. product. The condenser is of the shell and tube type, 18 inches in diameter and 5



feet long. The receiver is 12 inches in diameter and 5 feet long. Approximately 1000 linear feet of 1¼-inch black steel ammonia pipe coils are provided in the fish holds, 300 linear feet in the bait tank, and 30 linear feet in the galley refrigerator box.

Insulation consists of 3 inches of granulated cork board in two layers on the underside of the deck, the sides, the end bulkheads, and the bottom, and on four sides and top of the bait tank on deck. All interior surfaces in the fish hold are finished with ½-inch waterproof plywood over the corkboard.

The shell and deck plating is of 3/16-inch steel. All frames are 3/16-inch steel bars and plates, except that ¼-inch plate is used for engine girders, engine room floors and center girder. A forepeak fuel oil tank, built integral with the ship's sides and bottom, has a 410-gallon capacity. The fresh-water tank, installed above the oil tank with a 3-inch cofferdam between them, has a capacity of 655 gallons. A lube oil tank of 85 gallons capacity is in the forward end of the engine room.

Under the fish hold is a fuel oil tank, with a capacity of 2310 gallons. Two more fuel oil tanks, one each side of a three-foot access passage to the rudder quadrant, can carry 675 gallons each.

Around the main deck is a 3/16-inch rail, with a 1-¾-inch hardwood rail cap.

Although the hulls are of steel, deck houses in all three 52-footers are of wood frame construction. Sides have ½-inch plywood exterior sheeting and ⅜-inch plywood interior sheeting. Deck overhead has ¾ inch of plywood sheathing. The deck house is securely fastened to a 3/16-inch steel coaming plate welded to the main deck.

Galley has a No. 114-S Ingle marine oil-burning range, equipped with Valjean carburetor.

The Juana has a Doran propeller, while the other two have Coolidge propellers. They are of manganese bronze, with 38-inch diameter and 22-inch pitch. The propeller shafts

Top: A special jig used to position correctly all the component members of a bottom subassembly of a 52-foot boat.

Center: This subassembly, a section of a ship's bottom, has been placed in a jig ready for joining to connecting subassemblies. It was first fabricated in an upside down position in another jig.

Bottom: Bottom plating being fitted to stern subassembly of 52-foot tuna boat.

are 2-11/16" cold rolled steel, with two intermediate Dodge Timken roller bearing pillow blocks.

The 70-foot tuna boat Pico, recently launched, has a beam of 19 feet and a molded depth of 9 feet, 9 inches. It has a raised fore deck and square stern. Fish holds include three brine wells on each side with a 3-foot shaft alley between. Forward wells are piped for fuel oil, and the middle wells for bait water. Fish carrying capacity is 74 tons, including the six wells in the hold and one well in the bait tank. Bunks are provided for eight men in the deck house, which also contains a storeroom, toilet and galley. Unlike the 52-footers, the Pico has a steel main deck house, but its pilot house is of wood.

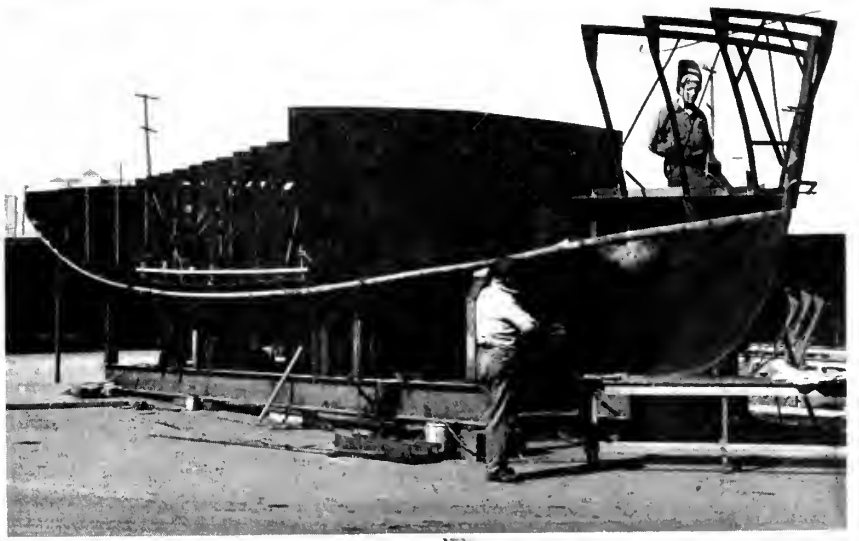
Regular fuel tanks have a capacity of 6200 gallons, and in addition, the forward fish wells can carry 6800 gallons of fuel oil, providing a combined capacity of 13,000 gallons suitable for a cruising range of about 12,000 miles. Lube oil tanks have a capacity of 400 gallons and fresh water tanks 700 gallons. Stern tanks can carry additional fresh water when used as trimming tanks.

Main engine is an 8-cylinder FA8-R Lorimer diesel, rated 200 brake hp at 600 rpm. Auxiliary engines are two Model D4 25-hp Lorimer diesel electric sets, with 15-kw Bardco generators.

Two Baker Ice Machine Co. 4-cylinder 3½" x 3½" are provided in the ammonia type refrigerating system. Galley has an Ingle oil-burning range.

The two 105-foot vessels will be the raised deck type, with slightly raked stem and modified tuna vessel type stern. They will be subdivided with five transverse oil and watertight bulkheads and transom bulkhead extending to main deck. Beam is 25 feet, and molded depth 12 feet. Brine well capacity under deck will be about 145 tons, and brine tank capacity about 27 tons. These craft will have a fish capacity of about 172½ tons.

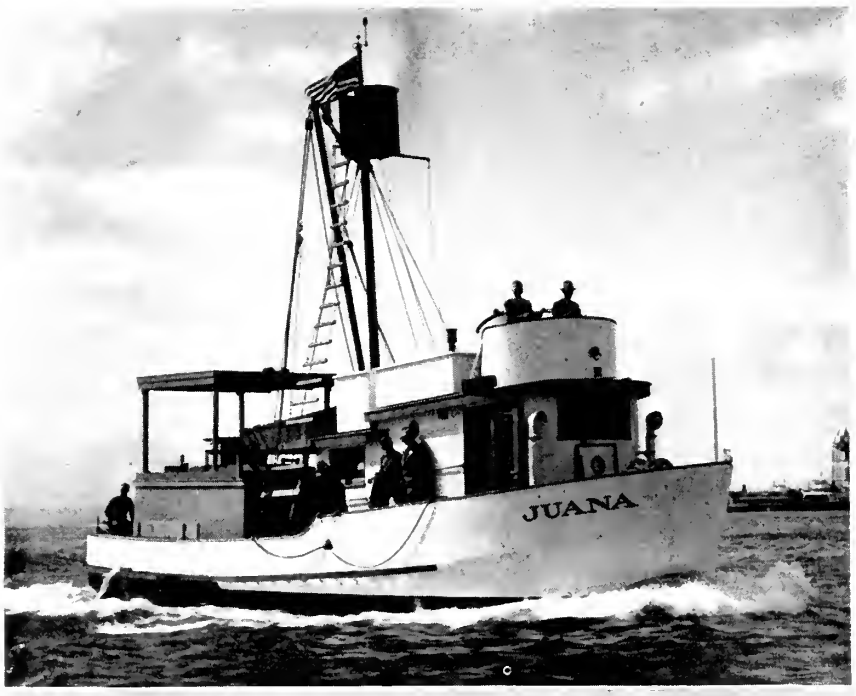
The pilot house will be of plywood. Three small boats, an 18-foot

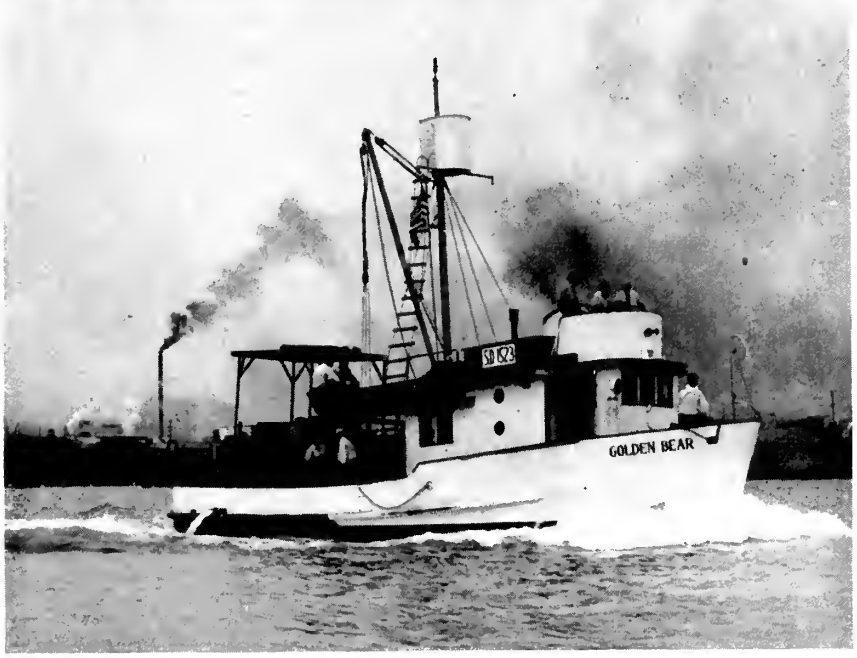


Top: A view along a portion of the waterfront in N. I. W.'s spacious yard. Shown are three of the N. I. W. built tuna vessels—the 70-foot Pico and the 52-footers Juana and Lady.

Center: Hull assembly work for a 52-foot boat in progress in a special cradle type jig.

Bottom: The Pico on stocks in the National Iron Works yard during final stages of construction prior to launching.





Upper: The Juana making 9.5 knots in her speed trials. Note the plywood construction of superstructure.
Lower: The Golden Bear on her trial run on San Diego Bay.

wood power speedboat, an 18-foot and a 13-foot skiff, will be stowed on the raised deck. Refrigeration for eight brine wells and two bait tanks will be the brine quick freezing system. Propelling engine will be a direct-reversible Model 6HM, 13″ x 16″, 550-hp, 300-rpm, 6-cylinder Atlas Imperial marine diesel engine, connected to a special William Lambie designed Doran propeller.

Auxiliary machinery will consist of two 75-kw a. c. Atlas Imperial diesel generating sets located on each side of the main propelling engine.

O. Tellefsen designed the hulls of the 52-footers and the 70-foot craft, while G. Bruce Newby of Long Beach designed the 105-foot clippers. National Iron Works contemplates a special streamlined superstructure on the larger boats, in accordance with sketches by Joslyn and Ryan, naval architects and marine engineers of San Francisco, to improve eye-appeal.

Work Boat Fire Protection

By H. H. Dierksen
Manager Marine Division
Walter Kidde & Co.

Workboats, tugs, barges, picket boats, dredges, schooners, draggers and launches are going to be turned out in quantity. They are going to be new in design and construction for small craft received a lot of scientific attention during the late war. Marine diesels have become more efficient and as a result more people will be able to afford to operate and maintain small boats.

Everyone who has been associated with the sea knows that good seamanship countenances no unnecessary risks. It is common sense to protect your boat with the most modern fire extinguishing systems. Carbon dioxide provides protection against a variety of common hazards.

In applying carbon dioxide fire protection to small craft, the owner has a choice of either a built-in system or portable extinguishers. For many reasons, the built-in type gives the best protection: for one thing, it eliminates the human element in getting the extinguisher to the seat of the fire, and it pipes the gas to the fire source in spite of fumes or flames. Also it enables the boat owner to smother an engine-room or bilge fire without opening doors or hatches.

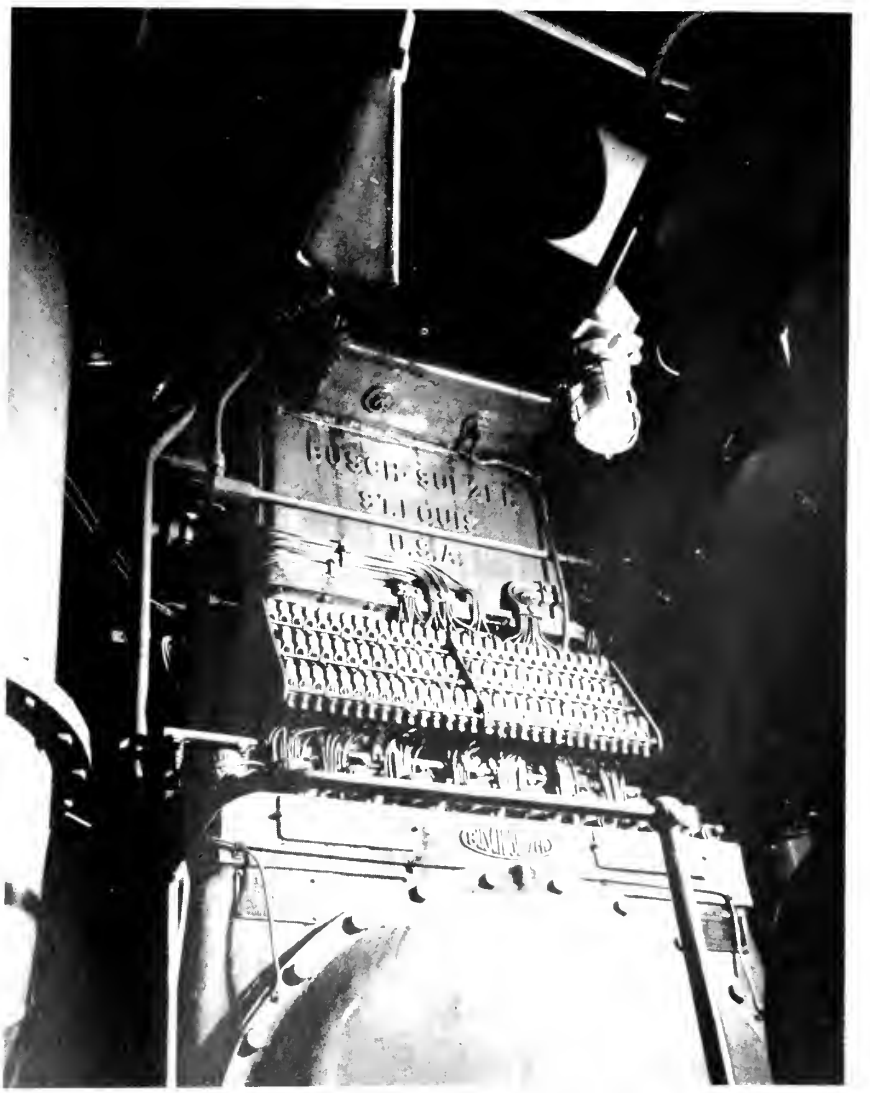
With built-in systems, discharge of the gas may be by manual control or fully automatic. Again it is best to eliminate as much of the human element as possible by the use of an automatic system, for many a boat fire occurs when no one is aboard to fight it, and many others are preceded by an explosive type of combustion that renders the crew incapable of quick, clear thinking and gives them a bad case of jitters.

In its most simple terms, a built-in extinguishing system consists of one or more steel cylinders containing compressed carbon dioxide, connected by pipes to discharge horns strategically located in the engine compartment and bilge. If and when gasoline fumes or drainage collect in proportions sufficient to catch fire, and the necessary spark or back-fire occurs, the valve is opened. Immediately the cylinder discharges a heavy, cold gas-and-snow discharge through

the horns to every nook and cranny of the engine and bilge spaces. Because this gas is inert, it so dilutes the oxygen that the fire is smothered —all in a matter of three to ten seconds.

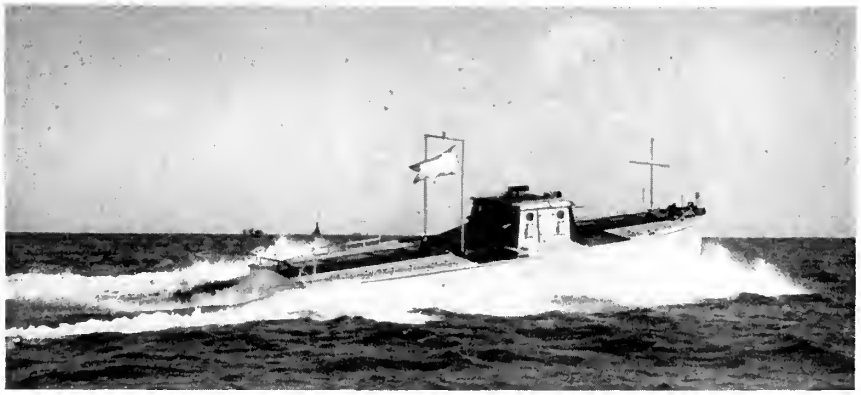
In case you have an engineering turn of mind, here is what happens—expressed a bit mathematically. There is normally 21 per cent of oxygen in the air, and gasoline needs only a 17 per cent oxygen content to burn fiercely. When the carbon dioxide gas system is discharged, it cuts the oxygen content to 14 per cent or less, and your fire is automatically out. This is true of bilge fires, fuel tank compartment fires, blazing gasoline streaming from a broken feed line, or conflagrations that fill the whole engine space. And, many boat owners have found their automatic systems discharged and smoke smudges on bulk-heads when they came aboard, but find no trace of damage. Also, there are cases of explosions blowing the hatches off the engine compartment, yet the carbon dioxide system puts the subsequent fire out immediately.

As mentioned above, carbon dioxide systems can be either automatically or manually discharged, depending on the layout of the boat and the habits of its owner. In automatic systems, for example, a small heat detector is mounted over the engine, and is connected to the discharge valve for releasing gas. Several types of detectors or actuators are available, but the one most commonly used is the "rate-of-temperature-rise" type. This consists of a small metal air chamber, the air in which expands upon sudden temperature jumps, ac-

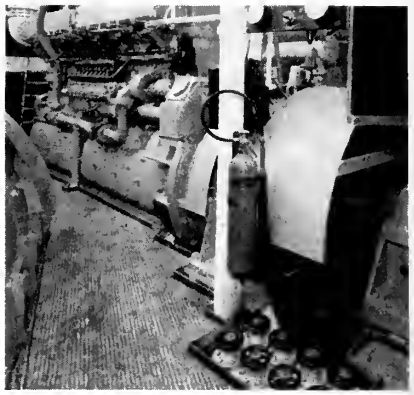


Upper: Such boat-fires as this one should be extinguished by using a portable carbon dioxide cylinder, like the one pictured. One thing that makes carbon dioxide so effective on boat fires is its three-dimensional characteristic. Fire itself is a three-dimensional phenomenon and burns around ribs, braces, pipes and all sorts of obstructions wherever oxygen is present—and it follows that an effective fire extinguisher must also move in three directions.

Lower: Machinery spaces are protected by built-in carbon dioxide systems, released from a point outside the engine room. The shielded nozzle in upper center is directed toward the potential fire hazard, and the blanketing gas penetrates the gratings in the machinery spaces to extinguish flames in hard-to-reach locations.



The ever-present danger of fires from gasoline fumes, which accumulate in the bilge of small boats like this one, can be dealt with by a portable carbon dioxide fire extinguisher. The non-toxic gas can penetrate the remotest parts of the boat, to blanket flames instantly. Galley fires also can be put out in a few seconds with such an extinguisher . . . and no harm is done to food or machinery.



Standing guard over a direct-current generator is a portable carbon dioxide fire extinguisher, ready for instant use. The non-toxic gas reduces the oxygen in the air to a point where fire can no longer burn. It is quick acting.

tuating the release valve through a length of copper tubing. Slow temperature changes, such as caused by sun or overheated engines, do not affect it, but outbreak of fire sets it off in two or three seconds. Even a candle flame held near the detector will actuate it. This system is entirely mechanical in its action, self-contained and independent of the boat's electrical system.

Smaller boats sometimes can have adequate protection by the use of portable fire extinguishing systems. At any rate, they are a mighty good "jury rig." Portables placed near fire hazards such as the engine room, and galley and the bilges can put out fires in a few seconds.

Carbon dioxide is harmless to any material, so harmless that food in the galley is perfectly edible after it has caught afire and the fire has been extinguished by carbon dioxide. When used on engine fires it does not hurt the metal or the working parts of the engine. Electrical fires can be quickly extinguished with complete safety. (Often it is forgotten that water is a conductor of electricity and electrical shocks result when some thoughtless person attempts to put out an electrical fire with a water or water solution type of fire extinguisher.)

One thing that makes carbon dioxide so effective on boat fires is its three-dimensional characteristic. Fire itself is a three-dimensional phenomenon, and burns around ribs, braces, pipes and all sorts of obstructions wherever oxygen is present—and it follows that an effective fire extinguisher must also move in three directions.

Coast Guard Announces New Line-Throwing Gun

Coast Guard Headquarters, Washington, D. C., has announced the existence of two new type guns, which were designed and developed by the Research and Development Division, Coast Guard Headquarters, Washington, D. C. Developed and designed specifically by Chief Gunner's Mate James E. Sieg of Baltimore, Maryland, the weapons carry his name.

One gun developed by Sieg is known as the Sieg Line-Throwing Gun. It was developed primarily for use by the U. S. Merchant Marine. It promises to surpass all previous models in both range and accuracy. The line-throwing gun is of .50 caliber, and uses a four-pound projectile with a 150-lb. test nylon line. It has a range of 400 yards, and a total weight of approximately 25 pounds. It uses two different types of projectiles: one of solid steel, and the other of steel, but with a mechanism in it for firing a CO_2 cartridge, which inflates a "do-nut" float upon impact against the water.

The other gun is known as the Sieg Automatic Rifle, which combines all the features of present automatic rifles, plus several new and revolutionary innovations. The gun is of 30.06 caliber, weighing 10⅝ pounds, and is 36 inches in length. It has a magazine capacity of 20 rounds. Full or semi-automatic, it has a rate of fire of 650 to 700 rounds per minute. It is composed of 103 parts. Folding sights permit the use of a "Bull Pup" stock. The double trigger is pivoted

for semi and full automatic fire. A combination safety and magazine release is located on the right side. It is equipped with a unique compensator that may be turned off for use with flash hider or grenade-launcher. This compensator does not interfere with the use of the above equipment or a bayonet. When tested by Army Ground Forces, Fort Benning, Ga., it produced excellent results. The effectiveness of the compensator is described as being so satisfactory that the weapon may be fired with one hand. Recoil is negligible, and the muzzle actually depresses unless the front is supported by hand.

The breech mechanism is entirely sealed to prevent dirt from entering working parts.

The first working model was built by Sieg aboard the USS Mohawk, C. G., in 1944. Two other models were built under the direction of the Research and Development Division of the Coast Guard Yard, Curtis Bay, Maryland. The present model was manufactured by the High Standard Manufacturing Company, New Haven, Connecticut, with plans designed by Sieg, on a contract from the Research and Development Division of Coast Guard Headquarters, Washington, D. C.

This latest model is being turned over to the U. S. Army for further test and study, and evaluation.

Sieg was born in Richmond, Virginia, in 1916. He was educated in Atlanta, Georgia, where he completed his schooling in 1936. In 1937 he enlisted in the U. S. Army as a private, and was immediately sent to Honolulu, where he served the remainder of his enlistment. In 1940 he was honorably discharged from the Army as a sergeant, and enlisted in the U. S. Coast Guard as an apprentice seaman. He received his first petty officer rating of gunner's mate 3/c in 1940, and subsequent advancements as follows: GM 2/c, 1941; GM 1/c, 1942; CGM, 1943. He has had duty aboard the cutter Tahoe, a sub-chaser on Greenland patrol duty, and the cutter Mohawk on North Atlantic patrol duty. He received his gunnery experience and training at the Coast Guard Gunner's Mate School, Curtis Bay, Maryland. Sieg is entitled to wear the European Theater Ribbon, American Theater Ribbon, American Defense Ribbon with Star, and the Good Conduct Medal.

The new Sieg line-throwing gun is demonstrated by its designer, Chief Gunner's mate James E. Sieg. Designed and developed by Sieg under the direction of the Research and Development Division of the U. S. Coast Guard primarily for use by the U. S. Merchant Marine, this gun promises to surpass all previous line-throwing guns in both range and accuracy. *(Official Coast Guard photo)*

●

Chief Gunner's mate James E. Sieg is shown demonstrating the operating advantages of the automatic rifle that he has designed and developed under the direction of the Coast Guard's Research and Development Division.

(Official Coast Guard photo)

National Marine Exposition

After more than three years as the largest U. S. Army induction center in the country, Grand Central Palace, New York City, has resumed its pre-war status as the home of expositions. For decades, "the Palace" provided the space and facilities for expositions of every character, and now, after extensive remodeling and restoration work, has reopened for business.

One of the first large post-war shows scheduled at New York's Grand Central Palace is the National Marine Exposition, which will be held the week of May 20-25. The exposition will be held under the sponsorship of the Propeller Club of the United States not only as a service to the marine industry but also as a feature in that organization's program to further develop public interest in the American Merchant Marine.

The marine exposition will be particularly timely. Public attention has been attracted to the American marine industry by its war record. In four years, American shipyards turned out a merchant fleet which today exceeds in tonnage the combined pre-war fleets of the world's leading maritime nations. Despite the loss of 743 merchant ships during the war through direct enemy action and marine hazards due to war conditions, the U. S. Merchant Marine consisted of 5,529 ocean-going vessels on February 1 of this year. Even more spectacular in the eyes of the general public was the war record of American ship operations which contributed so importantly to Allied victory.

Displays at the marine exposition will portray the part played by leading concerns in the industry during the war. Devices and equipment developed for war use but which will be adapted to peacetime service for improved navigation, safety at sea and more efficient ship operations will include radar, Loran and other electronic apparatus. Several large shipbuilding companies will exhibit models of ships constructed in recent years, while leading American steamship companies, again able to offer their facilities to the public for travel and shipment of cargo, will be on hand to show the traveler and shipper what they may expect of the new American Merchant Marine in the near future.

Other exhibitors will include manufacturers of marine machinery, engineering devices, specialties and equipment. Large oil companies will show displays, with experts in attendance to discuss problems relating to the lubrication of marine machinery. Also included will be displays of both wire and manila rope, the latest in marine paints for hull and topsides protection, and many other exhibits directly applicable to the marine field.

The present plan is to open the exposition to the general public only on certain days—the attendance for the balance of the week will be by invitation only, thus enabling the exhibitors to devote their undivided attention to shipping and shipbuilding executives, operating officials and others directly concerned with the various phases of maritime activity.

An elaborate program for the week of the exposition is now being formulated by the Propeller Club. Other leading associations in the marine field have been invited to participate, with each day of the week dedicated to a particular group or activity. Rooms will be made available in Grand Central Palace for meetings and other functions, with facilities for showing motion pictures provided for exhibitors and associations.

The week of May 20-25 was selected because this will be observed throughout the country as "Foreign Trade Week." May 22, the anniversary of the sailing in 1819 of the American ship Savannah on the first Atlantic crossing by a steam vessel, will as in previous years be observed throughout the country as "National Maritime Day." On the evening of that day the Propeller Club, Port of New York, will hold its annual Maritime Day dinner at the Waldorf-Astoria Hotel.

Three Floors—200 Exhibits

It is anticipated that the marine exposition will occupy three floors of Grand Central Palace. According to Roger E. Montgomery, general manager of the exposition, the number of exhibitors has now passed the one-hundred mark, and it is expected that that figure will be more than doubled by the time the exposition opens its doors.

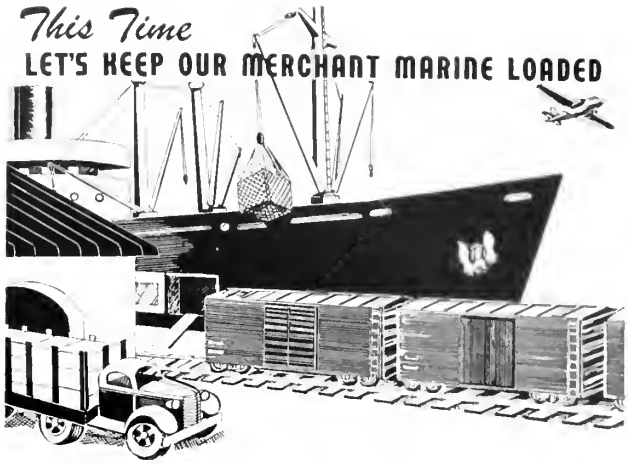
"The American Merchant Marine," said Arthur M. Tode, honorary president of the Propeller Club of the United States, and Chairman of the Marine Exposition Advisory Committee, at a meeting of the marine press on February 8, "looks forward to an era of greatly accelerated activity in the post-war years." New and fast cargo ships will provide the shipper with more rapid and efficient service. All signs point to a greatly enlarged foreign trade both in volume and ports covered, and there appears to be no valid reason why the goal of twenty million deadweight tons of American shipping cannot be employed in our foreign and domestic waterborne commerce.

One most encouraging sign is the fact that American steamship companies have undertaken a program for the construction of 89 new passenger and combination passenger-cargo vessels which will provide unsurpassed passenger accommodations and high-speed cargo carrying service to all parts of the world. This program will add approximately 1,200,000 gross tons to the American merchant fleet and involves an estimated cost of between four and five hundred million dollars. Several of these vessels are now under construction and some will be delivered this year.

In sponsoring the National Marine Exposition, the Propeller Club has made it possible for the designers, builders and operators of these as well as other vessels to meet, under one roof, many of the leading manufacturers of the equipment and materials which will go into their construction and operation.

(See list of exhibitors on page Adv. 72)

Pacific WORLD TRADE
Reg. U. S. Pat. Off.



By T. Douglas MacMullen

Dredge and Barge Built for War— Now Big World Trade Items

Post-war reconversion was no chore for the American Steel Dredge Company of Fort Wayne, Ind., and shipments are now being made of prefabricated barges, hulls and various types of dredges to foreign and domestic markets.

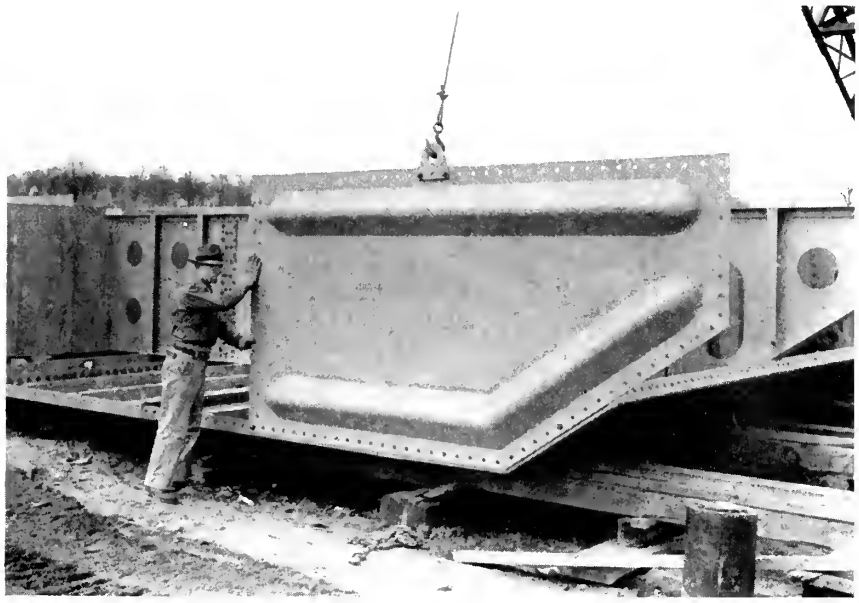
For 40 years the bolted, sectional steel craft of the American Steel Dredge Company have been working in rivers and harbors throughout the world, and early in the war when the Army asked the company to produce knocked-down barges there was little the company had to do except have the engineering department work out the particular designs the Army Transportation Corps wanted. The standard sections method of prefabrication and erection procedures was already well established. And the Army didn't want a conventional steel welded barge, but something that could be assembled in a hurry and by unskilled G. I.s if necessary. Later the Army Engineer Corps wanted a 12-inch hydraulic dredge similar to those the Fort Wayne concern had been producing for a world-wide market.

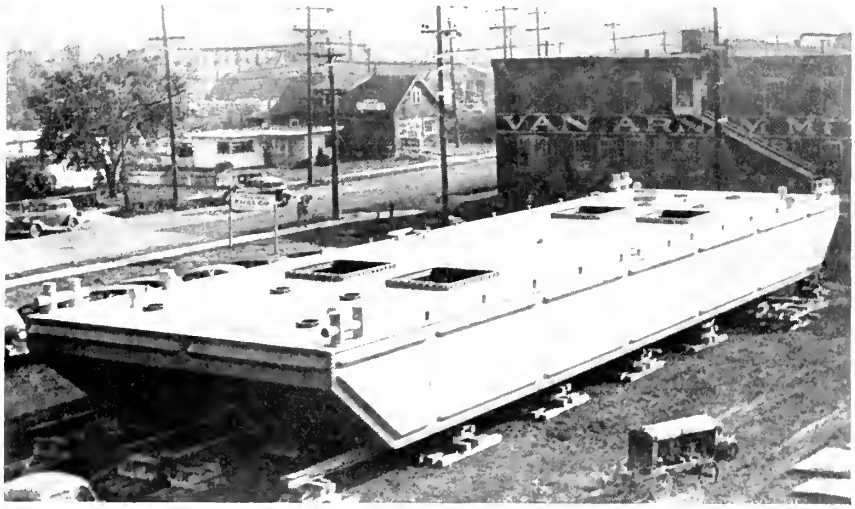
So, when the light turned green on V-J day, the company still had war contracts to complete but plans were no longer "post-war plans." They became "current business" overnight. Inquiries for dredges — hydraulic, dipper and clamshell, as well as barges—have been received from all over the world and American Steel Dredge has started shipments to those "inquiries" that have turned into orders.

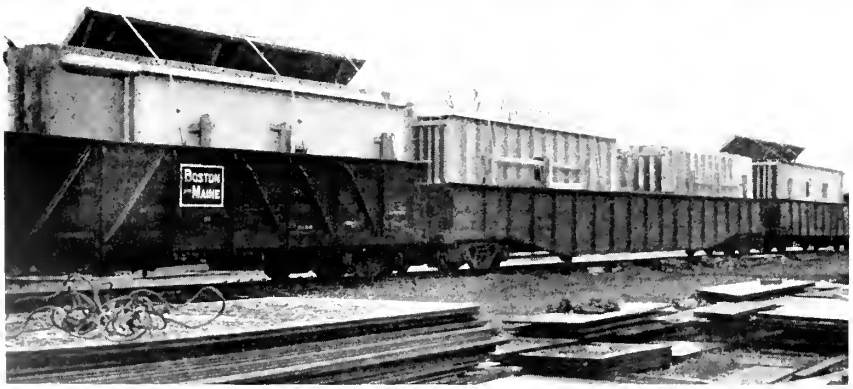
Walter W. Walb
President American Steel Dredge Co.

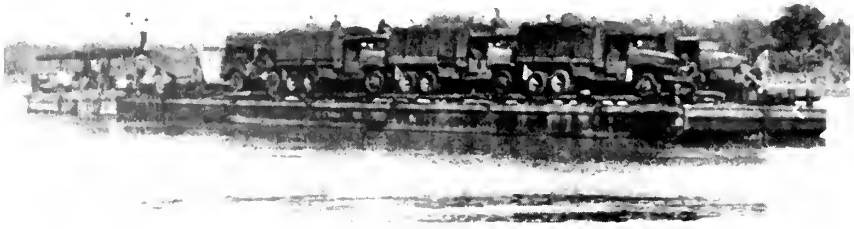
A barge designed for dry cargo only and very shallow waterways. Bow, stern and sides are raked. This type has a crew's house and rudder control. View of assembled barge, showing deck.

The company has also gone into production since the close of the war on an entirely new product. This is a rubber-mounted mobile crane unit with four-wheel drive that is being marketed under the name of "Wayne Crane." This is an all-purpose piece









of equipment and can be had with several attachments so that it can be used as a power shovel, trench hoe, dragline or clamshell as well as a utility crane.

The dredges and barges of the American Steel Dredge Company have several important points in the basic design that make them unique in the field of harbor and shallow waterways craft. All are made of prefabricated steel panels that can be shipped by rail or as hold cargo to the site of intended use where they are bolted together. The panels are made to such close tolerances that the last bolt fits as easily as the first.

After the dredge or barge has served its purpose in one spot it is possible to dismantle it and transport it to another location by rail, truck or ship and assemble it again at the new site. To make it easy for assembling and shipping the knock-down vessels, detailed assembly and packing manuals are provided with each craft. Nothing is left to the imagination in the manuals and they are so complete that assembly on many jobs has required not more than 500 man-hours, even by unskilled crews.

Ease of assembly is assured by the code-marking of each panel on the bottom, deck, sides, bow and stern as well as the longtitudinal and transverse bulkheads. All panels have been coded by the engineering department, and a marking plate with the code bead-welded on it is tack-welded to the panel. The position of these marks on each piece is important since it indicates the position of the panel when correctly installed.

To the amazement of Army and particularly Navy men of other countries who couldn't conceive that such a vessel wouldn't leak "just a little," these dredges and barges are watertight. This is taken care of by means of gaskets applied with plastic cement to the bolted joints.

For really speedy river and harbor work the barges can move under their own power through the installation of a "jumbo" outboard motor. Countless hours were saved by this means in moving supplies during the war.

The standard 12-inch hydraulic dredge of the American Steel Dredge

Reading from top to bottom: Installation of first side panel; close-up of completed liquid or dry cargo barge, showing bolted steel panel construction; all dredges and barges of the American Steel Dredge Co. are packaged like this for shipment to erection site—no deck space is required if transported by ship; a liquid or dry cargo barge with a deck-load of Army trucks going upriver in India.

A crane barge complete with crane.

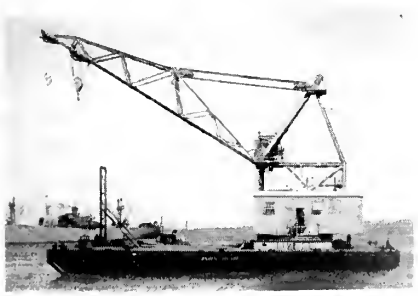
Company is on a hull 104′ x 29′ x 6′. It has a 36-foot digging ladder provided with an adequate margin of overload capacity and is fitted with interchangeable cutter heads to meet the changing character of material encountered on many dredging projects. A wooden deckhouse, enclosing all machinery, is also prefabricated to facilitate shipment.

The barges are produced in sizes from 40 to 120 feet in length. There is a crane barge in two sizes—on one of which is mounted a 30-ton crane and the other a 60-ton unit. Both earned many campaign ribbons during the war in battle-scarred harbors unloading equipment and doubling on salvage work—even to the extent of pulling up submarine nets.

Then there is the popular "348B" which is designed to transport either liquid or dry cargo. It was no uncommon sight during the war, particularly in India, to see these barges going upriver with a load of gasoline in the hold, or a deck full of airplanes or trucks.

Another barge is produced for handling dry cargo only. This is of very shallow draft and is raked on bow and stern and sides. Also included are a crew's house aft and steering control.

A 60-ton crane barge on the way to a harbor job.



What About Business In South America?

By P. P. Marion

Overseas Distributors, Inc.

Nearly everyone whom I have met—since my recent return from a business trip through the various South American countries—has evidenced a keen interest in almost anything and everything pertaining to that whole Continent, but the principal interest has been regarding the prospects for future business down there.

Now I do not presume to be an economist, or an expert business analyst, but it is quite obvious to me that the prospects for future business with all the South American countries are definitely excellent. They not only need almost every kind of product—from simple personal things to large industrial plants—but they also appear to prefer American-made goods, and to like us as a people.

However, it is my definite opinion that the extent to which anyone can take advantage of these opportunities will depend largely upon his understanding of Latin American conditions, and the manner in which such understanding is applied. By conditions, I mean the topography of the different countries and their respective economies, traits, customs and needs.

The average person does not seem to realize fully the vastness of the South American Continent or the tremendous amount of territory which is utterly uninhabitable. In the first place, the Continent is approximately twice the size of the United States—which you begin to realize when traveling by air for days upon days—and in the second place around 75% of it consists of either huge mountain ranges or vast forests or bleak, barren lands.

This rugged and difficult terrain forces the bulk of the people to concentrate in a relatively few communities, which are widely scattered, and makes it impractical to provide adequate land transportation between many of these communities. Thus, it is much more difficult and expensive to reach the various markets than in the United States, where we have excellent transportation and many communities close to each other.

Here a salesman can work several good cities during the same day—if necessary—and rarely has to make long jumps. Goods can also be shipped quickly and easily between almost any points. In nearly all the countries down there, salesmen must make long, time-consuming jumps from one buying area to another, or arrangements must be made for local representatives in each community. Delivery of goods is likewise difficult and slow, with the result that both selling and delivery costs are much higher, which in turn requires a greater allowance if maximum business is to be obtained.

Another point which many people do not seem to understand fully is the relatively small proportion of people who have any appreciable buying power in the majority of the South American countries. For example, Brazil has a total population of around 45,000,000 people, but is reputed to have a "buying population" of only three or four million. Most of the other countries have

P. P. Marion

Typical factory, Bogota, Colombia (Abbott Laboratories of U. S. A.).

about the same proportion, due to the fact that the majority of their populations consists of Indians and mixtures who have practically no income and live under the most primitive conditions.

Argentina and Chile, on the other hand, are composed principally of white people from good European stock, with the result that they have a better proportion of people with so-called buying power. This is particularly true in Argentina, where at least 90% of the 12,000,000 population are reported to be able to buy all the necessities of life, as well as many of the luxuries.

Thus Argentina, with a relatively small population, has a greater buying power than all of the other countries put together, and as soon as the current political situation has been adjusted this country should be an exceptionally fine market for American goods. Incidentally, prices were much less in Argentina, even though there has been some inflation there.

As a result of the above conditions, one cannot apply the usual U. S. formula when calculating the potential sales for a given product in a given area. Instead, it is advisable to determine first what the buying population is and then take into consideration their particular ways of living and their particular needs. For example, Ecuador and Venezuela have approximately the same population, but Venezuela has a much greater buying power, due largely to the influence of its oil resources. On the other hand, Buenos Aires is a much better market for heating units than Rio de Janeiro, as the former is fairly cold in winter, whereas Rio is always warm.

Similarly, some countries are much more agricultural than others, while certain areas are far more industrial. Likewise, some communities are still following the influence of the Spanish, or some other European country, whereas others are becoming quite modernistic, notably Brazil. Each country should be studied carefully, as they are all somewhat different in various ways. But that is what makes that Continent interesting, and offers excellent opportunities to those who really know the different conditions.

Still another important factor to take into consideration when planning South American sales is the matter of price, as this seems to take precedence over quality or value. For instance, the average person would prefer to pay $10.00 for something which would only last a year than pay $15.00 for a similar article which would last two years. This view is partly due to a lack of proper understanding of the difference between price and value—as we see it—and partly due to their relatively low incomes.

In this same connection, there is also the problem of overcoming the fact that prices seem much higher when converted into the local currency. For example, a radio might cost only $50.00 in U. S. money, but if the corresponding local unit of money is only .05c (U. S.) then the local price becomes 1,000 local units, which sounds like a lot more than 50. Furthermore, the relation of this cost to the local income is so much greater than in the States that it obviously results in considerable sales resistance.

Another price problem is the inherent trait for bargaining, which puts selling on an entirely different basis than Americans are accustomed to. Some sellers definitely provide for a sufficient additional margin so that they can satisfy this age-old trait, while others stick by their regular lists, come what may. Just what is the best method is open to considerable debate, but it is my opinion that the fixed price basis is the only safe course for Americans. The matter of so-called "greasing" is something else, however, which must be reckoned with, and provided for, as practically all business requires some special "hand-outs" here and there.

As for the extension of credit, this is indeed a problem, as South American buyers invariably want every possible advantage and more or less resent using their own capital. This attitude does not apply to all concerns by any means, but it is prevalent, and encouraged by some countries which will do almost anything to secure business. As a result, I found that the greatest criticism of American businessmen is their failure to extend sufficient credit. They seem to like us as a people, and seem to prefer American goods, but we definitely lose considerable business because of the credit angle.

Just what is the proper procedure is also open to considerable debate, especially as the majority of businessmen in the South do not seem to have the same sense of responsibility that most American businessmen have. Furthermore, we as a nation have never provided the same machinery for assisting our foreign traders as some other countries have done. The newly authorized facilities for stimulating foreign trade may enable American businessmen to extend more credit without undue risk, but if not, it would seem advisable to proceed cautiously wherever there is any doubt about the financial strength and moral responsibility of a given buyer.

There is also the matter of foreign competition, which is becoming increasingly active. This consists principally of British, Swedish and Swiss competition, which seems to have certain advantages in not only price and terms, but also delivery. This is a factor to be reckoned with, as the businessmen of these countries are very aggressive and much more realistic than many American busi-

nessmen. Everywhere you go you can see evidence of this competition in the form of machinery, motors, watches, luggage and whatnot, and with the war now ended there is bound to be still more evidence unless American businessmen wake up.

These are some of the principal problems and conditions which must be understood and met by those who want to share in the large amount of potential business which can be done with South America. And I do not believe that I am exaggerating when I say that the volume of that business can easily run into a tremendous sum during the next five to ten years.

Practically every city is in process of constructing new homes and factories and buildings of all kinds—hospitals, schools, office and Government buildings. There are also many projects for better streets and roads, improved sanitation, more playgrounds, better transportation and a higher standard of living. Furthermore, there is a definite trend towards making more and more articles locally, which will mean the purchase of all kinds of machinery and equipment. All these things will in turn create an ever increasing demand for the many related facilities and all the various things which go hand in hand with growth.

The best way to determine just what demand exists for a given product—and the best way to market it—is to make a personal tour, or entrust the problem with some responsible exporter who is in close touch with all the conditions down below. If a personal tour is to be made, it should provide for at least six months, as a quick trip to just the principal cities will only scratch the surface. One should also be able to speak the language fluently, as otherwise you will definitely miss many important things which are necessary to get a true and complete picture.

All the people you normally come in contact with are highly intelligent, very friendly and most hospitable. They have many customs, and some viewpoints, which are quite different from ours, but they also have many things in common. Furthermore, South America is not only a most interesting Continent which Americans should know more about, but it is unquestionably a field which American businessmen can cultivate to advantage and profit.

Oakland World Trade Department Has New Manager

Lyford M. Morris

Lyford M. Morris, president of the Junior Foreign Trade Association of San Francisco, has been appointed manager of the World Trade Department of the Oakland Chamber of Commerce. He takes the place of John A. Sowers, now with the Los Angeles Chamber.

Morris has a background of practical experience in world trade, having been with Matson and Moore-McCormack for many years, and during the war with the U. S. Treasury's Foreign Funds Control Division. He is a graduate of the University of California where he majored in foreign trade and shipping. The able Jack Sowers has an able successor.

Foreign Trade Week To Be Observed May 19-25

With "World Trade Puts Men to Work" as the theme, the eleventh annual National Foreign Trade Week will be observed throughout the nation, May 19-25.

Sponsored by the National Chamber of Commerce, the Week's observance serves as a means of focusing public interest on world trade as a vital factor in preserving free enterprise and expanding job opportunities.

Local chambers of commerce and other business and trade associations, farm and labor groups, factories and stores, schools and public interest organizations have been invited to participate. In his letter of invitation, Kenneth H. Campbell, manager of the Chamber's Foreign Commerce Department, outlined this background for this year's observance:

"Basic, far-reaching actions are now pending to make effective our policy toward and position in world trade. Specifically, Trade Agreements are to be negotiated with at least 14 nations; an International Conference on Trade and Employment has been announced for later this year and Congress is due to consider legislation affecting our commercial relations with the rest of the world."

As customary, the Chamber is preparing a manual and other materials which will be helpful in organizing local observance of National Foreign Trade Week through meetings, exhibits, school programs and contests, and other means of informing the public as to the contributions of world trade to the daily lives of everyone.

China-America Council Directory

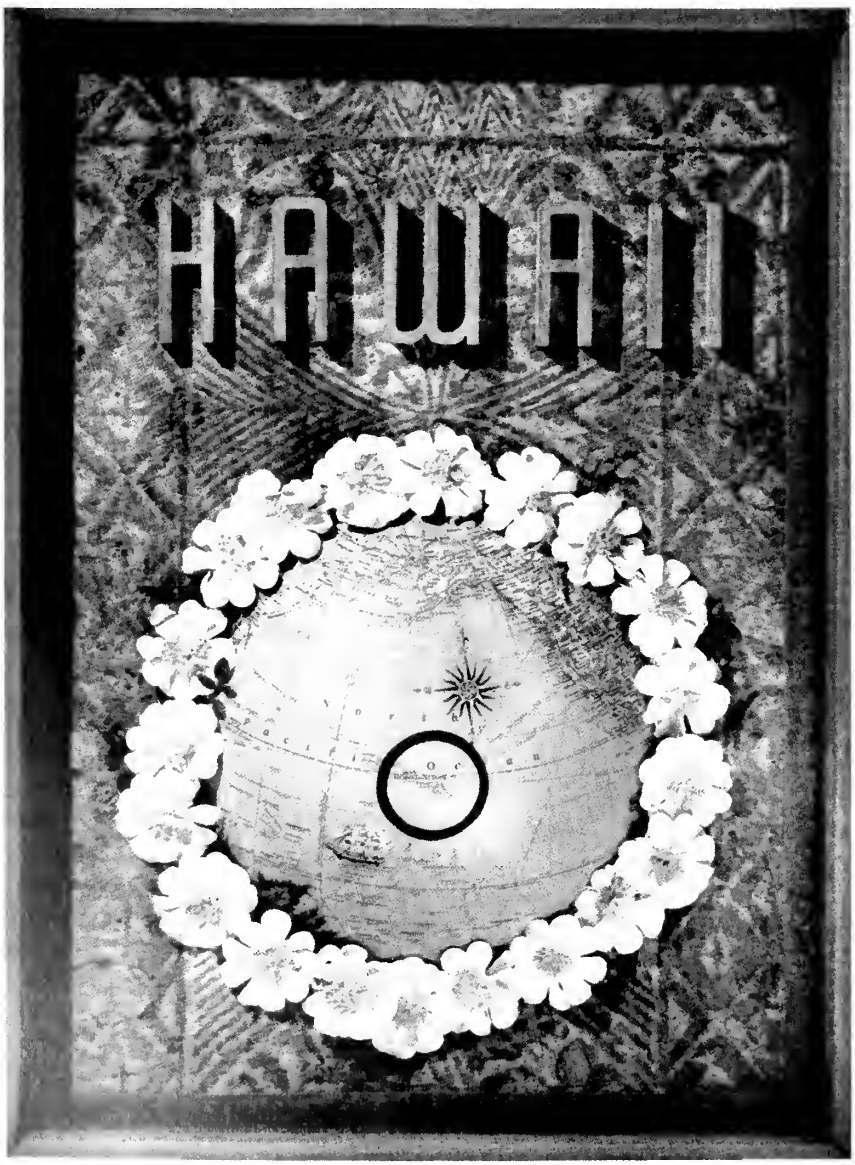
The China-America Council has started the preparation of a Directory, for distribution in China, listing and describing the goods and services handled by member companies. This Directory, the first promotional handbook of American products, services and companies to be distributed in China for many years, will be a cloth-bound book of approximately 400 pages. It will be distributed to thousands of industrial and trading organizations, government departments, financial institutions and technical schools and societies in China, as well as among the Chinese purchasing and planning organizations and commercial missions in this country. It is expected to be ready for distribution shortly after the opening of the Council's office in China, scheduled for early announcement.

Statehood For Hawaii

In Pacific Marine Review of October, 1944, we published an article urging that the Territory of Hawii be made a state, and announced that subsequent progress in that direction would be published as occasion permitted. The Congressional Delegate from Hawaii, Joseph R. Farrington, now sends us the report of the Committee which returned to Washington in January. —Ed.

Report of the Subcommittee of the Committee on Territories, the United States House of Representatives, on Statehood for Hawaii

The first congressional committee to hold hearings on the question of admitting Hawaii to statehood visited the Territory in October 1935. After extensive hearings the committee "found the Territory of Hawaii to be a modern unit of the American Commonwealth, with a political, social, and economic structure of the highest type." Nevertheless, the committee concluded that considerable further study was necessary before a favorable report might be made on a proposal to admit Hawaii as a State.



In October 1937, a joint congressional committee visited the Territory of Hawaii. The committee reported that while great progress had been made by the people of Hawaii, the question of statehood, because of disturbed international conditions, should again be deferred by the Congress until further study and consideration could be given. It was the committee's view also "that unmistakable evidence that a substantial majority desire statehood should precede affirmative action by Congress." A plebiscite to determine the wishes of the people was authorized by the Territorial legislature in 1939. Of those voting on the question at the general election of November 5, 1940, 67 percent favored statehood and 33 percent opposed it. A Gallup poll held on the mainland in 1941 revealed that opinion in the continental United States for and against statehood for Hawaii was in almost the same proportions as the Territorial view expressed in the plebiscite.

On December 20, 1945, just prior to this committee's departure, the Secretary of the Interior, whose Department has jurisdiction over the Territories, issued a statement endorsing statehood for Hawaii.

Findings

On the basis of the detailed and voluminous record made before it, the committee finds:

1. That the population of the Territory of Hawaii in 1945 was 502,122, of which 10,988 or 2.2 percent of the total population were Americans of Hawaiian ancestry; 61,422 or 12.2 percent were part-Hawaiians; 9,090 or 1.8 percent were Puerto Ricans; 172,583 or 34.4 percent were Caucasians; 30,005 or 6 percent were Chinese; 163,300 or 32.5 percent were Japanese; 7,042 or 1.4 percent were Koreans; 46,464 or 9.3 percent were Filipinos: all others 1,228 or 0.2 percent.

2. That the number of pure Hawaiians has declined from an estimat-

ed 300,000 persons in 1778 to 10,988 in 1945.

3. That the Caucasian population has increased steadily since 1878, when the percentage of the total population was only 5.09 percent.

4. That persons of Japanese ancestry in 1890 numbered 12,360 or 13.7 percent of the total population. By 1920 the percentage increased to 42.7 percent, but had declined to 37.9 percent in 1930 and continues declining, to date being only 32.5 percent, or 163,300 persons at present.

5. That since 1912 the proportion of interracial marriages has increased from 14.1 to 38.5 percent, the trend being accentuated by the recent war, during which over one-third of the children born had two or more racial strains.

6. That well over 85 percent of the present population was born in Hawaii or on the mainland.

7. That the war record of Hawaii is in every respect commendable. Hawaii had a full scale organization for civilian defense and volunteer defense units sponsored by the Army, and participated in Red Cross, USO, blood bank, and similar activities, making liberal contributions to the war chest, and oversubscribing its quota for war bonds. The Territory established a number of emergency agencies, such as a Bureau of Registration and Identification, Office of Food Control and Food Production, and a commercial rent control program.

8. That Hawaii did its part in contributing men to the armed forces. Selective Service did not apply to Hawaii during the first two years of the war, because of the Territory's crucial position and shortage of manpower. Since the application of the draft, Hawaii has met its full quota. Hawaii had two National Guard regiments which were called into the Federal service on October 15, 1940. In all, 33,000 of the citizens of Hawaii served in the armed forces. Americans of Japanese ancestry were rejected from March 1942 until February 1943 but made up for this as soon as they were accepted. Although Americans of Japanese ancestry constituted only 36 percent of the registrants under selective service, 52 percent of the total inductions from December 1940 to September 1945 came from this racial group, because of the large number of volunteers. Because of the Army policy of organizing and segregating units composed entirely of citizens of Japanese ancestry, it is possible to follow their activities and to see how they proved unwarranted the mistrust initially shown by the military commanders. Hawaii residents of Japanese ancestry constituted the entire original One Hundredth Infantry Battalion and by far the major part of the original Four Hundred and Forty-second Combat Team. The record of those units, made in major offensives in the European theater, includes 5 Presidental unit citations, 1 Meritorious Service plaque, 65 Distinguished Service Crosses, 290 Silver Stars, 782 Bronze Stars, 10 Criox de Guerre (French) 3 soldiers medals (Italian), 50 Army commendations, and 82 division commendations.

9. That, according to Robert L. Shivers, Federal Bureau of Investigation agent in charge at Honolulu, there was not one single act of sabotage or fifth-column activity committed in Hawaii before, during, or after the attack on Pearl Harbor. Hawaii's people of various racial ancestries can and do work together, and what goes on in the countries of their ancestors is of minor concern to them, compared to their interest in the United States. People of all racial ancestries cooperated in preparing for and prosecuting the war, and Hawaii, despite its polyracial composition, is essentially American in thought, purpose, and action.

10. That the people of the Territory of Hawaii are a law-abiding people. Its different racial groups live together with a minimum of friction and no racial clashes; life and property are as safe in Hawaii as in any section of the mainland.

11. Such evidence of bloc voting as exists indicates that the practice has not assumed, and is not likely to assume, serious proportions. Members of the Territorial legislature whose ancestry is Japanese constitute normally less than 20 percent of the total membership, although 32.5 percent of the total population of the islands is of Japanese descent.

12. That in 1944, 71,704 of 84,326 registrants, or 85.03 percent, voted in the general election. The percentage of registered voters of Hawaiian ancestry declined from 33.8 percent in 1932 to 24.7 percent in 1940; Caucasian voters declined from 38.2 percent in 1932 to 30.1 percent in 1940. The Japanese showed an increase from 17.6 to 31.1 percent. With few exceptions, the percentage of registrants voting in each general election ranged between 85 to 90 percent.

13. That of the Territory's 4,118,400 acres, 1,762,050 acres, or 42.78 percent, are in public ownership and 2,356,350 acres or 57.22 percent are privately owned. The largest single owner holds 8.87 percent of the total of privately owned lands and the 10 largest owners (including the largest owner) together hold 30.11 percent the 50 largest owners (including the 10 largest owners) hold 39.55 percent, and all other owners hold 17.67 percent of all privately owned lands.

14. That the largest owner is the B. P. Bishop estate, holding approximately 370,000 acres. This is a charitable trust, founded by a Hawaiian princess for the support of the Kamehameha Schools, which are devoted to the education of Hawaiians and part-Hawaiians, and the expenses of administering the trust are paid from trust funds.

15. That of the Territory's total 4,118,400 acres, 2,947,330 acres are devoted as follows: 1,045,085 acres are devoted to forest reserves; 164,205 acres to national parks; 84,040 acres to Army, Navy, or other public use (including territorial and county purposes but not including highways); 1,350,000 acres to pasturage; 220,000 acres to the growing of sugar cane; 63,000 acres to the growing of pineapples; and approximately 21,000 acres to the growing of other crops, including: 6,760 acres, truck farming; 4,000 acres, coffee; 2,090 acres, fruits; 2,067 acres, taro and field crops; 770 acres, macadamia nuts; and 5,438 acres for miscellaneous crops.

16. That in 1940 there were 2,094 farms of less than 5 acres, and 4,724 farms of less than 100 acres (including those less than 5 acres).

17. That in 1944 Hawaii produced 874,946 tons of sugar cane, the crop being valued at $65,498,532.

18. That in 1940—the latest year for which complete figures are available—Hawaii produced 22,341,429 cases of pineapple valued at $45,851,706.

19. That the coffee production of the islands in 1944 totaled 7,656,000 pounds, valued at $1,091,000.

20. That the Territory has consistently paid into the United States Treasury a considerably larger amount than the Federal Government, exclusive of military expenditures, has spent upon the Territory; its 1945 contribution amounting to $173,999,227.22.

21 That in 1944 and 1945 Hawaii exceeded several States in the total of its internal revenue collections.

22. That the finances of the Territory have been very well managed. At the end of the last biennium, on June 30, 1945, total budgetary resources of the Territory amounted to $68,339,384, with total obligations and reserves in the amount of $57,873,691, leaving an unappropriated surplus of $10,465,693. The bonded debt of the Territory as of December 31, 1945 was $16,520,000, with $7,151,344 in the sinking fund, leaving a net amount of $9,368,656.

23. That during the calendar year 1945 the following tax revenues were produced from the following sources:

Real property	$6,568,605.43
Personal property	3,697,620.65
Income, personal and corporation	3,529,447.21
Public utility	1,897,497.05
Liquid fuel	1,932,749.57
Compensation and dividend	8,819,507.92
Bank excise	50,000.00
Liquor	1,908,979.50
Tobacco	422,664.86
Gross income and consumption	10,460,310.25
Unemployment compensation	1,888,749.18
Business excise, poll, public welfare (prior years)	96,468.83
Administered by tax commissioner	41,272,600.45
Inheritance and estate	661,274.16
Insurance	451,472.58
Miscellaneous licenses	10,252.63
Administered by Territorial treasurer	1,122,999.37
Total	42,395,499.82

24. That there are 35 sugar companies operating in the Territory with a total capitalization of approximately $175,000,000 and with stock held by approximately 16,000 persons. There are five corporations, known as the Big Five, which act in the capacity of factors or agents for practically all of these plantations, and to some extent have substantial stockholdings in the plantation companies. The companies, with the number of plantations represented and the approximate percentage of sugar production for each group of plantations, are as follows:

	Number of plantations represented	Approximate percentage of total sugar production
American Factors, Ltd.	9	30.8
C. Brewer & Co., Ltd.	14	23.5
Alexander & Baldwin	4	20.8
Castle & Cooke, Ltd.	3	14.5
Theo. H. Davies, Ltd.	4	6.9
Total	34	96.5

The agency system is not used to such a predominant extent in the pineapple industry, although some of the "big five" are connected with that industry through stock ownership or other affiliation. The "big five" have other interests as well.

25. That the commerce of Hawaii with the continental United States exceeds that between the mainland and all but a few foreign countries. From 1935 to 1940, only five foreign countries—the United Kingdom, Canada, Japan, France and Germany—bought more from the mainland than did Hawaii. In 1940 the value of the Territory's imports from the mainland totaled $127,539,539, while the value of exports to the mainland was $102,145,130.

26. That bank deposits have increased from $4,662,131 in 1901 to $493,295,940 in 1945, much of the increase being due to the presence of Army and Navy personnel.

Joseph R. Farrington
Delegate to Congress from Hawaii

27. That Hawaii's gross assessed value of real property is over $500,000,000—higher than that of any State at the time of admission with the exception of Oklahoma.

28. That as of December 1945, 36,875 corporations, firms, or individuals were engaged in 54,412 different enterprises as employers or self-employers.

A. There were 12,918 persons or companies engaged in retailing, representing the following subdivisions:

Appliances, 66; auto dealers, 42; auto supplies, 69; bakeries, 61; barrooms and saloons, 380; books and stationery, 34; building materials, 10; chemicals, 17; cold drinks, 206; confectionery, 205; curios and novelties, 298; department stores, 12; drugs, 151; dry goods, 222; electric supplies, 21; equipment, 43; fish dealers and fish markets, 532; food products, 481; fountain and lunchrooms, 444; fruit and vegetable, 713; furniture, 91; general merchandise, 1,135; groceries, 641; hardware, 61; household products, 15; jewelers, 185; liquor stores, 173; lumber, 10; meat dealers and meat markets, 333; mill supplies, 11; music stores and composers, 23; newspapers, 25; nurseries, 88; office equipment and supplies, 27; optical, 17; poultry, 636; radio and radio supplies, 67; restaurants, 952; service stations, 387; shoe stores, 68; toilet articles and cosmetics, 55; wearing apparel, 172.

B. There were 2,999 companies or persons engaged in wholesaling, including the following types of wholesaling:

Appliances, 14; auto dealers, 14; auto parts, 36; bakeries, 55; beverages, 11; block printing, 19; boat-building, 10; bottle dealers, 21; building materials, 7; coconuts, 9; confectioneries, 23; curios and novelties, 137; drugs, 39; dry goods, 42; electrical appliances, 19; equipment, 16; feed, 9; fish dealers, 273; florists, 41; food products, 109; fruit and vegetable dealers, 280; furniture, 26; general merchandise, 264; groceries, 44; hardware, 12; household products, 5; jewelers, 70; junk dealers, 8; lauhala weaving, 166; leis, 19; lumber, 5; magazines, 7; meats, 56; music, 9; tobacco, 6; toilet articles and cosmetics, 11; toys, 10; wearing apparel, 32.

C. Eight thousand three hundred and fifty-eight companies or persons were engaged in producing raw products, including:

Dairies, 66; farming, 1,051; fishing, 350; flower growers, 214; hog raisers, 589; poultry producers, 811; sugar growers, 2,135; vegetables and fruits, 1,542.

D. One thousand four hundred and twenty-six persons or companies were engaged in manufacturing, including:

Alcoholic beverages, 12; bakery products, 86; block printing, 17; chemical and fertilizer, 30; clothing, 27; concrete, lime, and stone products, 11; confectionery, 20; curios, and novelties, 88; foods, 137; footwear, 21; furniture, 35; jewelry, 16; mattresses and springs, 12; nonalcoholic beverages, 38; soap, 7; wood products, 37.

29. That out of a total of 170,000 employees (not including part-time work by school children under the schools' temporary program estab-

lished to meet the manpower shortage) the sugar industry employs about 24,500 workers. Pineapple agricultural labor (not including the canneries) totals about 4,750; 11,300 are employed in manufacturing (excluding sugar); 10,700 in transportation, communication and other utility services; 23,000 in wholesale and retail trades; 13,500 in various service industries; 7,400 in diversified agriculture; 6,600 in construction and quarrying, and 3,000 in financial, insurance, and real estate establishments; 59,500 are in Government service and 4,075 in domestic service.

30. That since 1937 the Territorial legislature passed a number of labor laws, creating the Department of Labor and Industrial Relations, and dealing with such matters as apprenticeship, child labor, vocational training, vocational rehabilation, unemployment compensation, regulation of employment agencies; minimum wages and maximum hours, payment and collection of wages, workmen's compensation, and safety regulations.

31. That the Territory's Department of Labor is considered by the local representative of the Federal Labor Department as doing an able job, and the Territory's labor legislation as comparing very favorably with that of many progressive States and in some respects is in advance thereof. Hawaii's unemployment compensation law provides more liberal benefits than that of any State with the possible exception of New York.

32. That the average cash wage paid to sugar employees in 1945 is in excess of $5 per day for unskilled labor not including the value of perquisites, which include housing, fuel, water, lights, and medical and hospital services. The cash wage paid in the pineapple industry is comparable. Wages paid industrial workers have advanced in Hawaii more than on the mainland during the period 1940-45 and Hawaii now is on a par with the mainland.

33. That a standard 8-hour day is in effect throughout the Territory.

34. That Hawaii is the only Territory or State with the exception of Wisconsin to pass a little Wagner Act, extending collective bargaining to agricultural labor.

35. That unionization of labor has made strides during the past 10 years both in industry and agriculture; nearly all major industries, including the sugar and pineapple industries, are now organized or organization is pending therein.

36. That there are 46 organizations in the Territory affiliated with the American Federation of Labor, 68 with the CIO, 2 independent unions, and 5 Government employees' organizations.

37. That in 1940 there were 7 strikes involving 502 workers with 33,217 man-days lost; in 1941 there were 16 strikes involving 2,530 workers resulting in 34,241 man-days lost; in 1942 there were 2 strikes involving 49 men resulting in 67-man-days lost; in 1943 there were 4 strikes involving 202 workers resulting in 716 man-days lost; in 1944 there was 1 labor dispute involving 6 men with 60 man-days lost; and in 1945, up to November, there had been 9 strikes involving 1,047 men with 8,876 man-days lost.

38. That at the last Territorial election a majority of those elected to both houses were endorsed by organized labor.

39. That illiteracy in the islands among native-born citizens is almost nonexistent. Hawaii has well-equipped schools throughout the Territory, most villages and hamlets being provided with proper educational facilities.

40. The standards of instruction, according to United States Chamber of Commerce, are the same as on the mainland and higher than those in many States. The average number of pupils enrolled per teacher is 27.9 in Hawaii as compared with 31.4 in the United States urban schools and 26.1 in rural areas. The average pay per teacher in Hawaii is $2,014 annually as compared to $2,013 in urban centers and $1,018 in rural areas of the mainland.

41. That there is a public library on each of the principal islands. There are 82,435 registered card holders. Each island library owns a bookmobile serving rural schools and homes, and approximately $620,000 is spent annually on library facilities.

42. That the University of Hawaii compares favorably with many State universities. For the year 1944-45 there were enrolled 1,463 regular students and 1,145 graduate students. The university had financial support in the amount of $3,126,028 for the biennium 1943-45, of which territorial appropriations from general revenues provided 50.8 percent, university income 27.46 percent, and Federal grants 21.74 percent.

43. That the level of the Territory's spiritual life is in the best American tradition.

44. That in 1945 the board of health spent $1,623,385 or a per capita cost of $3.23 as compared with $1.66 in 1937.

45. In 1943, Hawaii's death rates from 18 causes were below the national median. The rate was higher for syphilis, tuberculosis, and accidents, including automobile accidents. The mortality rate of infants under 1 year had declined from 87 per thousand in 1930 to 30 per thousand in 1945; the number of mater-

(Continued on page 272)

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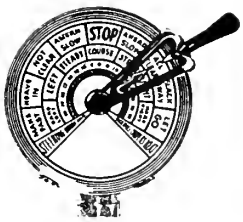

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THE SEXTANT

Chapter II

The Principle of the Sextant

In Chapter I (Description of the Sextant) we found that a small piece of glass gg′ (a movable reflector called the index mirror—see Fig. 4) is placed at I at the center of the arc AC and is attached to a movable radius IB (the index arm). By moving this index arm the plane of its surface (which is perpendicular to the arc AC) may be made to cut at any required point, e. g., B. Another piece of glass hh′ (the lower half only of which is silvered) is a **fixed** reflector, called the horizon glass, and is placed at H, perpendicular to the plane AC.

Now suppose a ray of light proceeding from the object Y in the direction YO hits the movable reflector I at the angle YIg, then by a well-known optical law, described later on, the ray will be reflected back in the direction IH, making an angle HIg′ with the movable reflector (index mirror) equal to the angle YIg.

Also at the fixed reflector H the ray IH will suffer another reflection in the direction HO, making with the reflecting surface hh′ the angle OHh′, equal to the angle IHh.

Now if we suppose an observer's eye be placed at O and another ray of light to proceed from the object Z along the same line ZHO, the two objects Y and Z will thus appear to come to the observer from the same point Z, the image of the object Y having been transmitted to him from the silvered part of H and the direct image of Z through the upper part of H, which is made transparent for this purpose.

The angular distance between Y and Z which is what is required is the angle O (60° in Fig. 4), and this angle by a second optical law is double the angle AIB (30°) measured along the arc AC.

Thus if the arc AC, which may be supposed to be the sixth part of a circle or to contain 60°, is so graduated that it reads twice that number of degrees, or 120°, then the reading off along the arc AC will be the value of the angle at O, and this is the method adopted in dividing the arc of the sextant.

Therefore, to observe the angle between any two objects such as Y and Z the observer at O looks directly at the left-hand object Z through the fixed reflector H. He then moves the index arm IB attached to the movable reflector I in the plane passing through O and the two objects Y and Z until he sees the ray proceeding from Y in the same direction as the object Z. Then the reading off on the arc AC measures the angle at O, the angular distance between the two objects Y and Z.

It should be pointed out that the observer's eye is seldom at O exactly, but at some other place in the line OH. When the objects such as the sun, moon or a star are at a considerable distance from the observer, however, this will make no appreciable difference.

Optical Laws

The two important optical laws used in the construction of the sextant are as follows:

(1) **The angle of incidence equals the angle of reflection.** That is to say, when a ray of light is reflected from a plane surface, the angle of incidence is equal to the angle of reflection. From this it may be proved that when a ray of light undergoes two reflections in the same plane with two plane mirrors the angle between its first and last direction is equal to twice the inclination of the reflecting surfaces.

In Fig. 5 a ray of light from a star strikes the plane polished surface MM, and the angle which this direction makes with the perpendicular (or normal) to the surface is called the **angle of incidence.** Now when this ray of light is turned back or reflected from the polished surface the angle which its ray makes is called the **angle of reflection,** and the law of optics is that these two rays always lie on either side of the perpendicular to the surface and equidistant from it—therefore the two angles are equal. Thus the **angle of incidence** equals the **angle of reflection.** This occurs in the sextant as described above when the ray hits the index mirror I and the horizon glass H, as shown in Fig. 4.

(2) **If a ray of light is reflected twice at the surface of two plane mirrors, the angle between the planes of the index mirror and the horizon glass is half the angle between the objects observed.** Or it may be put in this manner, that "the angle between the first and last directions of a ray is double the angle of the inclination of the reflecting surfaces to each other."

In Fig. 4, YIHO is the path of the ray of light from an observed object reflected from two mirrors I and H

(index mirror and horizon glass), which are perpendicular to the plane of the instrument.

YI meets HO at O. The angle O is therefore the angle between the first direction of the ray and the last direction; that is, the angle at the observer's eye.

The angle F between the normals (or perpendiculars at I and H) equals the angle between the planes of the index mirror and the horizon glass HBI. Now, by the law of optics just described above, this angle is half the angle between the objects observed. Therefore, in order to avoid doubling the angle HBI to get the correct angle, the sextant is graduated to double its actual reading, as shown in Fig. 4.

Admiralty Decisions

(Continued from page 244)

It may be that Judge Knox was satisfied in the **Lewis case** that the defendant there was **in fact** the employer, thus fully justifying his decision. It is only the theory set forth as the basis of decision, with which I disagree.

"Plaintiff suffers no prejudice nor loss of substantial rights. He may maintain his cause against the United States, his employer, by virtue of Public Law 17, 78th Congress, 50 U. S. C., Appendix, sec. 1291, as if he were proceeding under the Jones Act. He also has the right to maintain an action against defendant for damages for maritime tort (misfeasance). See **Brady** v. **Roosevelt S. S. Co.,** 317 U. S. 575, 1943 A.M.C. 1.

"It is finally contended that the question in issue is one of fact, which cannot be determined on this motion, but must be litigated as one of the issues triable in the state court. But the issue, upon which removability depends, appears from the record to rest upon undisputed facts and documents and hence may be resolved as a matter of law. At least the court can, on motion to remand, inquire far enough into the factual issue to ascertain whether the requisites of a cause of action under the Jones Act are present. **Aldredge** v. **Baltimore & O. R. C.** (8 Cir.), 20 F. (2d) 655."

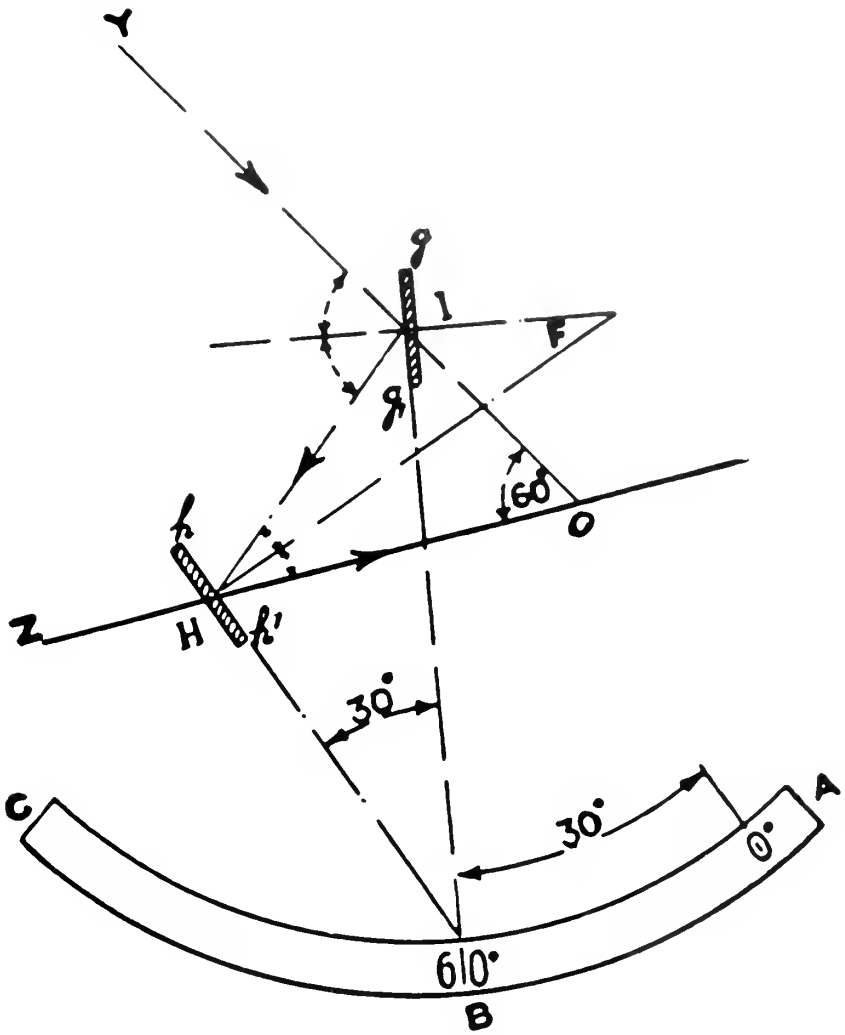
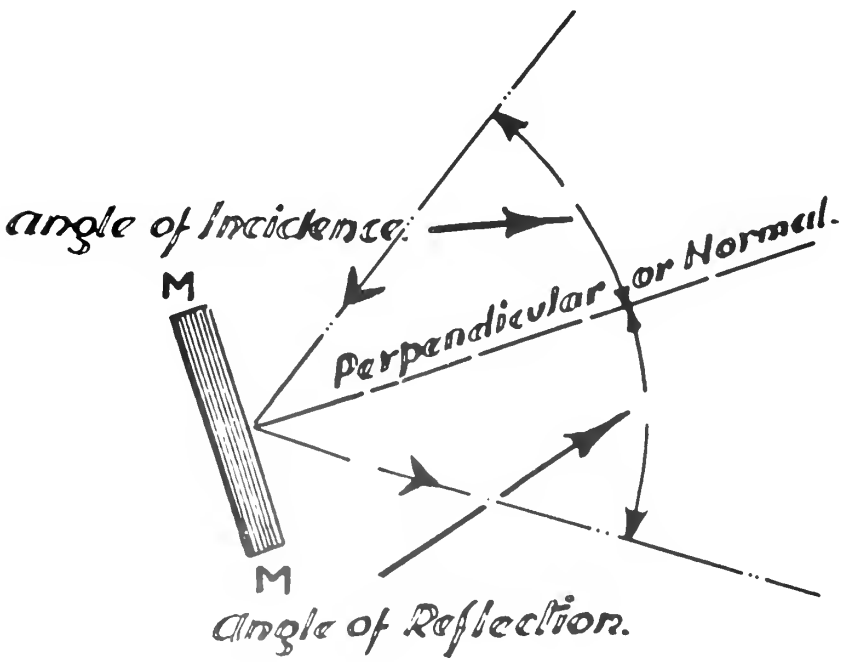
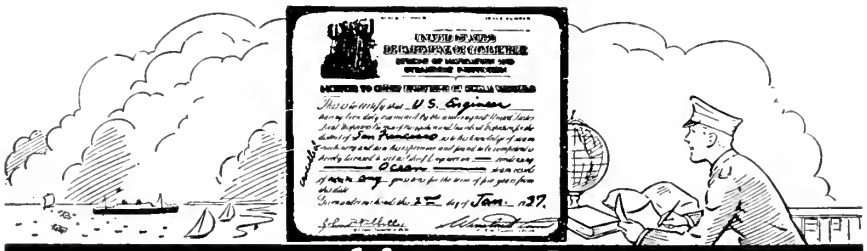


Fig. 4. The principle of the sextant.

Fig. 5. Law of optics.





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Brush Terminology and Specifications

Brush Dimensions

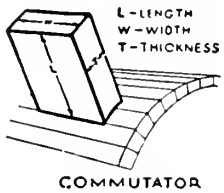


FIGURE 1

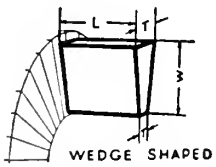


FIGURE 2

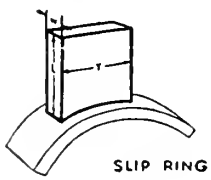


FIGURE 3

* * *

Brush Surfaces

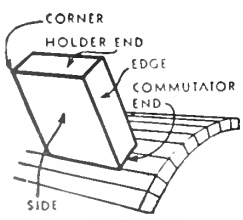


FIGURE 4

It is important that the terms used in specifying the style of brush desired should be clearly understood by both the purchaser and the manufacturer. The purpose of this article is to define and discuss some of the more important terms used in respect to brushes.

The Carbon Section of the National Electrical Manufacturers' Association has adopted numerous standard terms, definitions and practices. Much of the information presented herein is based on the recommendations of this body and some of the definitions are copied directly from NEMA standards.

Brush Dimensions

The overall dimensions indicating the size of rectangular or square brushes should always be given in the following order: length, width, thickness. For round brushes the order of dimensions should be: diameter, length. This order should be maintained regardless of the relative magnitude of these dimensions. Normally, length will be the greatest dimension of the brush and thickness the least, but on some brushes exactly the opposite relation may exist. As defined by the NEMA standards:

The length of a brush is the maximum overall dimension in the direction in which the brush feeds to the commutator or collector ring.

The width of a brush is the dimension at right angles to the length and to the direction of rotation.

The thickness of a brush is the dimension at right angles to the length in the direction of rotation.

These dimensions are indicated respectively by the letters L, W, and T in Figure 1 which represents a brush bearing on a cylindrical commutator. Brushes used on a radial commutator are wedge shaped, as illustrated in Figure 2, and thickness for both the thick and the thin edges should be specified. The thickness of slip ring brushes is frequently greater than the width, as shown in Figure 3, and may even exceed the length. However, as previously stated, the dimensions should always be given in the order length, width and thickness. A slip ring brush $1\frac{1}{2}''$ long x $1\frac{1}{4}''$ wide x $1\frac{3}{4}''$ thick should be specified as $1\frac{1}{2}''$ x $1\frac{1}{4}''$ x $1\frac{3}{4}''$, not as $1\frac{3}{4}''$ x $1\frac{1}{2}''$ x $1\frac{1}{4}''$. This is important where there is special machine work, such as a beveled or concaved face. If the latter order of dimensions were used the manufacturer would bevel or concave the $1\frac{1}{2}''$ x $1\frac{1}{4}''$ face of the brush whereas the machining should be on the $1\frac{1}{4}''$ x $1\frac{3}{4}''$ face in the proper position for rotation parallel to the $1\frac{3}{4}''$ dimensions.

Brush Surfaces

The following definitions have been adopted as NEMA standards:

The sides of the brush are the surfaces of which the limits are defined by the length and width of the brush.

The ends of the brush are known as the **holder end** and the **commutator end.** The end which is in contact with the commutator or ring is also known as the **brush face.**

When a brush has one or both ends beveled the front of the brush is its short side. (For parallel bevels, the front is the side making the widest angle with the face.)

The edges of the brush are the surfaces of which the limits are defined by the length and thickness of the brush. Edges are defined as right-hand or left-hand with the front (short side) of the brush toward the observer.

A corner of the brush is the point of intersection of any three surfaces.

Figure 4 illustrates the foregoing definitions.

Brush Shunts

It is often advantageous to equip brushes with connectors of flexible copper cable to provide a shunt or by-pass for the current between the brush and the rigid structure of the

machine. The flexible shunt provides a current path that is not affected by movement of the brush or clearance between the brush and the holder. One end of the shunt cable should be attached to the brush in a manner that provides both mechanical security and low electrical resistance and the other end provided with a suitable terminal for attachment to the brush holder or to the supporting arm on which the holders are mounted.

Five general types of shunt connections are in common use. These are the imbedded, riveted, bolted, saddle and plate types for which the following standard letter designations have been adopted by NEMA.

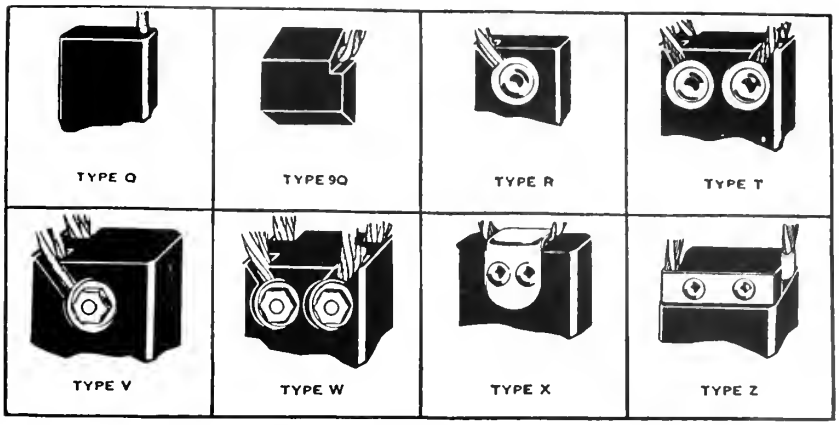


Figure 5. Shunt connections.

Embedded Types — Type M defines a connection in which the cable is molded into the brush at the time it is formed. In Type P the cable is wedged into a hole in the brush by means of a screw or driven pin. For Type Q a hole is drilled into the brush, slightly larger than the shunt cable and metallic material tamped in around the cable to secure it in place and provide electrical contact. This is the most extensively used of the various embedded types. Type S is one of the earliest types of shunt connections developed. The cable is inserted in a hole drilled in the top of the brush. Through an intersecting hole, drilled in the edge of the brush, counter-sunk and copper coated, solder is applied to secure the cable in place.

Riveted Types—In Type R connections one or more shunt cables are secured to the brush by means of a spun tubular rivet. When two rivets are used the connection is defined as Type T. Riveted connections are very stable and withstand considerable vibration or severe load conditions.

Bolted Types — When a bolt and nut are used to secure the cable the connection is known as Type V and two such connections on the same brush are defined as Type W.

Saddle Type—In this connection the shunt cable is fastened to a saddle which, in turn, is secured to the brush by means of one or two rivets. This connection is known as Type X.

Plate Type—Type Z connections are made by fastening the shunt cable to metal plates which are secured to the brush by rivets.

Typical construction of the various types of shunt connections described is shown in Figure 5. Specification of the type of shunt by letter includes all drilling, shouldering, slotting or other special machine work essential to making the connection but, with the exception of Type 9Q, does not include any other special machine work which may be desired. The Type designation 9Q covers a brush having both ends beveled, one or both edges shouldered and the type "Q" connection attached from the shouldered portion of the edge. When specifying this connection it is necessary to state the degree of bevel desired for the holder and commutator ends of the brush but the shoulders need not be mentioned. This style of brush is also known as the reaction or Baylis type.

Shunt Location

To simplify specification of the location from which the shunt cable leaves the brush the Carbon Section of NEMA has adopted a numerical code. Addition of the position code number as a suffix to the type symbol of the connection desired gives the brush manufacturer all the needed information in regard to shunt location. Figure 6 shows thirteen shunt locations for the common type of brush used on a cylindrical commutator and the code number by which each position is designated. For example, a riveted shunt with cable leaving the brush at the front side

SHUNT LOCATION

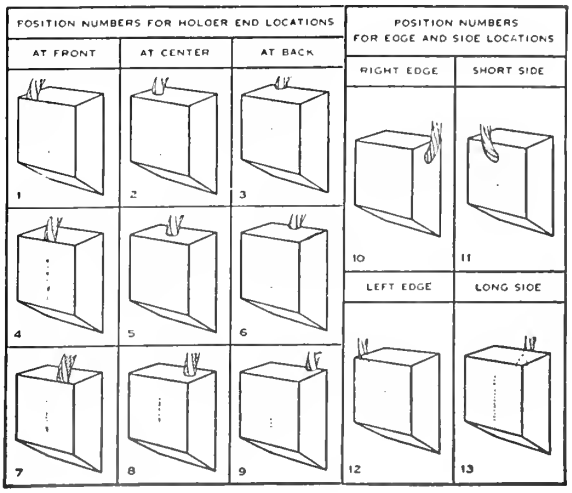


FIGURE 6

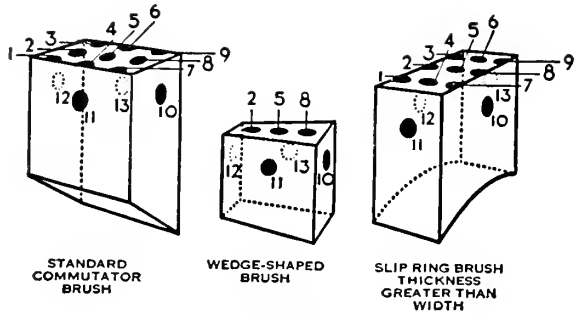


FIGURE 7

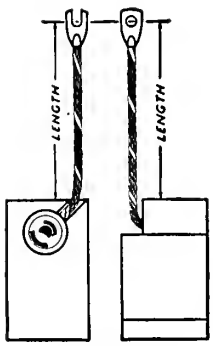


FIGURE 8
Shunt Length

and right hand edge, would be defined as a Type R-7 shunt.

In the left hand sketch of Figure 7 all of these positions are indicated on a single brush. The central sketch shows how the location code applies to a wedge shaped brush and the right hand sketch the application to a brush having greater thickness than width. In applying this code the brush should be held with the short side toward the observer. In the case of wedge shaped brushes, hold the thinner edge toward the observer's left, as illustrated.

Other Shunt Details

Length—Shunt length is defined as the distance from the holder end of the brush to the center of the hole or round portion of the slot in the terminal, as illustrated in Figure 8. Principal standard lengths for shunts on brushes ½" wide or over are 3½", 5½" and 7½". These lengths meet practically all requirements and, when shunt length is designated, a standard length should be specified. If length is not specified a 5½" shunt will usually be supplied.

Cable—The important cable sizes recognized as standard for brush shunts are shown in the table herewith.

It is not necessary to specify the size of cable when ordering brushes. Brush manufacturers base the selection of cable size on the cross sectional area of the brush, the carrying capacity of the grade supplied, and the rated carrying capacity of the cable. The rated carrying capacity is ample to insure freedom from overheating of the cable within the normal overload capacity of the brush.

Brush shunt cables are frequently insulated when the brushes are to be used on machines of compact design where there is chance of the cable being grounded or shorted by contact with the frame of the machine. Cotton sleeving, rubber, asbestos, lava beads and glass fabric sleeving are used for this purpose.

A great variety of shunt terminals are in use, some cut from heavy gauge metal, others made by folding sheet metal in a suitably formed die over the spread end of the cable and still others formed by pressing copper tubing onto the cable. There are flag type terminals, plug type both threaded and plain, button type and other special types. For most machines, other than those with cartridge type holders, folded terminals, either slotted or with hole, can be used. If the brush manufacturer's catalogue is not available, from which to select the particular style and size of terminal desired, it will usually be sufficient to specify width of slot or diameter of hole, making sure that it is large enough to pass freely over the fastening screw provided on the machine. The dimensions for terminal slots and holes most used are 5-, 7-, 9-, 11-, and 13-32". Figure 9 shows a few of the styles of terminals in common use. For unusual styles, where a standard type is not applicable, it is well to send a sample or a detailed sketch with the essential dimensions specified.

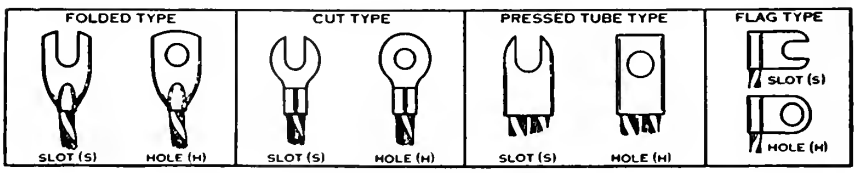


Figure 9. Shunt terminals.

Number of Strands	Conductors per Strand	Diameter of Wires Inch	Circular Mils	Nearest Size B & S	Rated Carrying Capacity
1	33	.002	132	29	3
1	33	.003+	326	25	4
2	33	.003+	652	22	8
7	15	.003+	1038	20	10
7	9	.005	1575	18	15
7	15	.005	2625	16	20
7	24	.005	4200	14	30
7	37	.005	6475	12	40
7	59	.005	10325	10	50
7	75	.005	13125	9	60
7	95	.005	16625	8	70
7	119	.005	20825	7	85
7	150	.005	26250	6	100

BOOK REVIEWS

"Science of the Seven Seas"

By Henry Stommel: 200 pages, 107 illustrations, format 5 in. x 7½ in. Published by The Cornell Maritime Press. Price $3.00.

Students, seamen, pleasure voyagers, and all who love the sea and are curious about the wonder of the seas, winds and stars will find a wealth of fascinating, easy-to-read information in this hand book of the sea.

Henry Stommel, (Fellow of Pierson College, Yale University and now on temporary leave for special research work with the U. S. Navy at the Oceanographic Institute, Woods Hole, Mass.) describes and explains, without being too technical, the natural phenomena one observes at sea. Drawing on scientific discoveries in the fields of oceanography, geophysics, hydrodynamics and astronomy the author gives a simple readable description of waves, ocean currents, chemistry of sea water, submarine topography, icebergs, marine animals, plants, sea birds, cyclones waterspouts, clouds, winds, St. Elmo's Fire, sun dogs, submarine volcanoes, the tides, terrestrial magnetism, the sun, the moon and the stars.

Divided into three parts, "Science of the Seven Seas" includes:

1. The Sea, Waves, Ocean Bottom, Nature of Sea Water, Tides, Ice, Currents, Shore and Island.

Part II. The Sky, Atmospheric Optical Illusions, Upper Air, Fogs, Clouds, Lightning, Winds, Celestial Bodies.

Part III. Ocean Life, Plants, Fish, Sea Birds.

Merchant Marine Cook Book

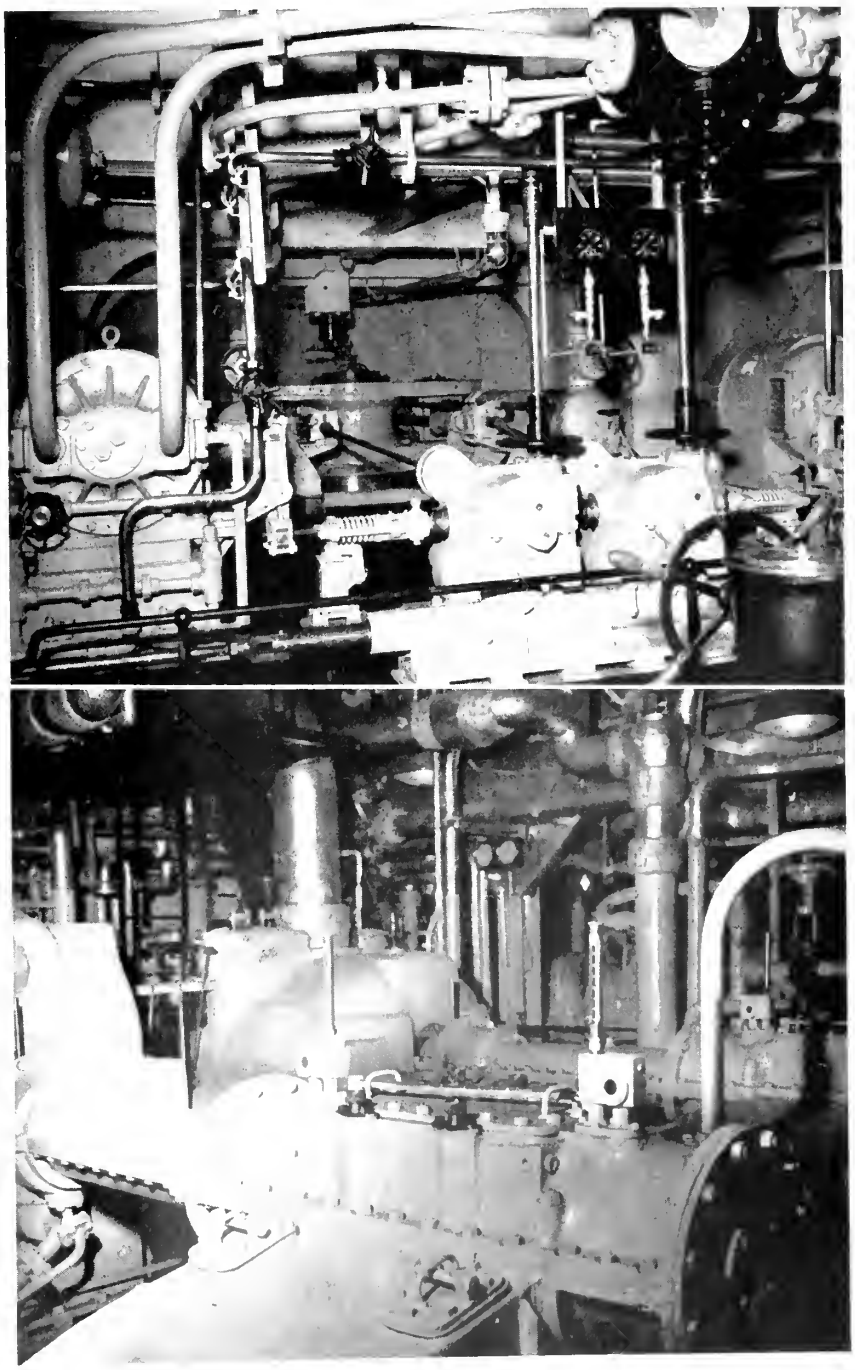
Publication of the first comprehensive cook book ever compiled for use of Merchant Marine cooks, bakers and stewards was announced by the War Shipping Administration.

The profusely illustrated 337 page manual, Cooking and Baking On Ship Board, has been prepared under the guidance of culinary experts and thoroughly covers every aspect of efficient cooking, baking and meat cutting methods. Its 450 test recipes, each set forth in tabular form for ready reference, have complete data on preparation time, use of left-overs, and suggested variations. However, it is not for the housewife, as the quantities are measured out in portions for supplying groups as great as a hundred at a meal.

The manual is being distributed among all stewards, cooks and bakers on U. S. Merchant Marine vessels holding ratings not lower than Second Cook Baker, and to all U. S. Maritime Service Schools. Qualified persons may receive copies also at Room 422, 220 Bush Street, San Francisco; Room 2, 111 W. 7th Street, San Pedro; Room 1472 Dexter Horton Bldg., Seattle; and Room 606 Porter Bldg., Portland, Oregon.

The C-4 Cargo Ship—Additional Pictures of Machinery

Top: Electric-hydraulic steering gear by American Engineering Co.
Bottom: Top of main propulsion turbines. 9000-shp reduction gear box by Westinghouse.



On the Ways—

SHIPS IN THE MAKING

Six thousand tons of meat drydocked, valued at $3,600,000 aboard this collision-damaged British freighter, the Papanui.

Drydocked Ship's Meat Cargo Saved in Unique Job by Todd

A cargo of almost 6000 tons of frozen and chilled meat for the Navy aboard a damaged freighter that had to be dry-docked was saved from spoilage by a unique operation, performed at Todd Shipyards Corporation's Brooklyn division in the closing weeks of the war, which involved hooking up special water connections to supply the 25,000 gallons of water an hour necessary to keep the vessel's refrigeration plant in operation.

The vessel, the Papanui, operated by Norton, Lilly and Company, loaded with a cargo of meat valued at $3,600,000, in addition to 744 tons of general cargo, was proceeding through Gravesend Bay last July 14 on the start of a voyage to Pearl Harbor when she was in a collision with the James Caldwell. The Papanui's bow was completely crushed.

Because of the combined weight of the 10,000-gross ton ship and her cargo, it would have been necessary to remove the cargo, with considerable expense, spoilage and loss of time, if the vessel had entered a floating drydock.

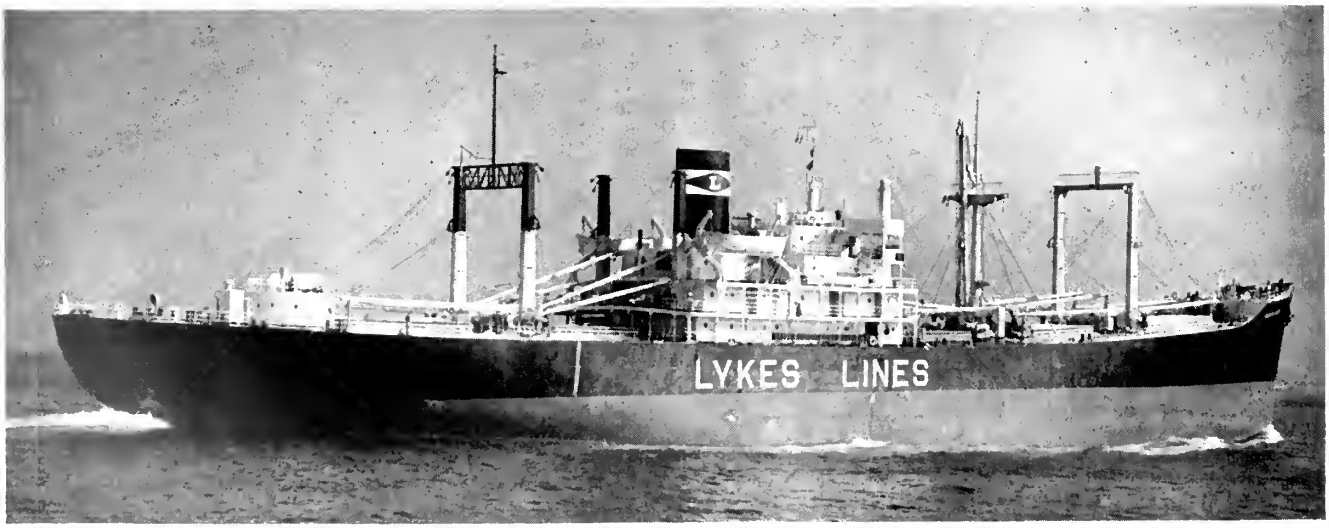
Alexander Kirkaldy, marine superintendent of Norton, Lilly and Company, decided that since the Papanui's cargo was urgently needed by the Navy, he would take the responsibility of doing something he said had never been done before—ordering a ship into drydock with a highly perishable cargo still in her holds.

Todd Shipyards Corporation took on the job, and the ship was placed in the concrete No. 1 graving dock in its Brooklyn plant. During the eight days the vessel was in the dock—while workers restored the ship's crushed bow and performed other extensive repairs—the pumping of 25,000 gallons of water an hour went on continuously. The result was that the much-needed cargo was kept aboard intact and the ship was able to depart immediately after the completion of the repairs, with days of precious time saved—as well as the meat.

Besides the restoration of the bow, which involved the removal of 32 shell plates, it was neeessary to install a new cast hawse pipe and to make extensive replacements of internal structural members. The total repairs required twenty-one days to complete.

Mormacdawn Launched

Mrs. Owen Brewster, wife of a United States Senator from 'way down east in Maine, recently sponsored a colorful launching 'way down



BOUND EAST, for Oriental peacetime trade, is the fast 12,800 ton cargo carrier Doctor Lykes, built for the Maritime Commission by U. S. Steel's Federal shipyard at Kearny, New Jersey. She has just passed all her test trials. They included a compass adjustment and anchor test. Then her engines were tuned to full speed ahead. Next was an exacting astern maneuvering operation. Taking that in her stride, she was given a series of steering manipulations. She mastered the sea with the assurance of a sea lion.

south in the still-thriving shipbuilding city of Pascagoula, Miss.

The occasion was the launching of the 18,000 ton all-welded passenger cargo liner Mormacdawn, the third of a fleet of seven vessels being built for the Moore-McCormack Lines by the Ingalls Shipbuilding Corporation.

Accompanying Mrs. Brewster on the launching stand was her husband, Senator Brewster. Others in the party included Captain and Mrs. Charles F. Brewster, of Washington, D. C.; Lieutenant and Mrs. Charles T. Mattmann, of Forest Hills, N. Y.; Mr. and Mrs. Albert V. Moore, of Forest Hills; Mr. and Mrs. G. E. Donovan, of Scarsdale, N. Y. Mrs. Charles F. Brewster, daughter-in-law of Senator and Mrs. Brewster, assisted in the formalities as matron of honor. Mr. Moore is president of Moore-McCormack Lines and Mr. Donovan is vice president.

It was the 77th ship launching at the Ingalls shipyard, and the first in a parade of launchings of peacetime liners scheduled for production at the yard during 1946.

SS Santa Cecilia Recently Launched

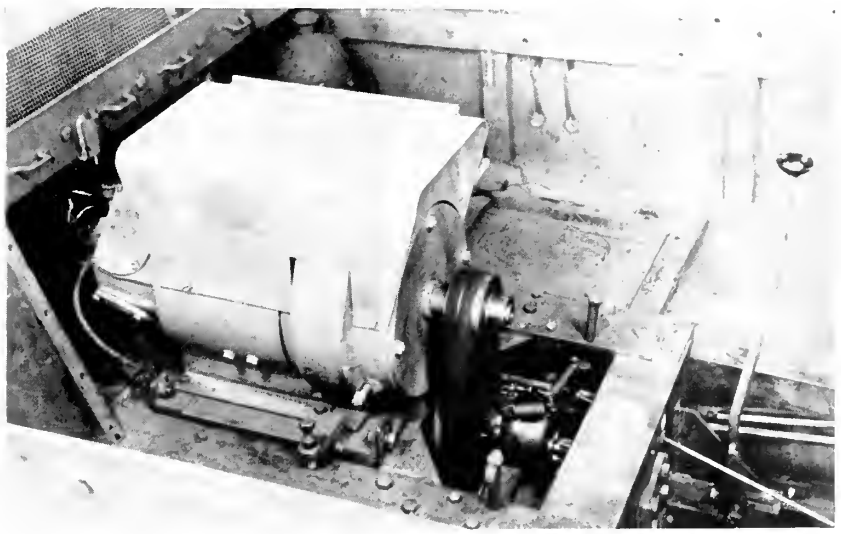
In the building program of nine new combination freight and passenger ships, which President R. Ranney Adams recently announced would be added to the fleet of 20 vessels to handle Grace Line's services in various trades, the S. S. Santa Cecilia, second in the unit now being built, was launched February 8, from the ways of the North Carolina Shipbuilding Company, at Wilmington, N. C.

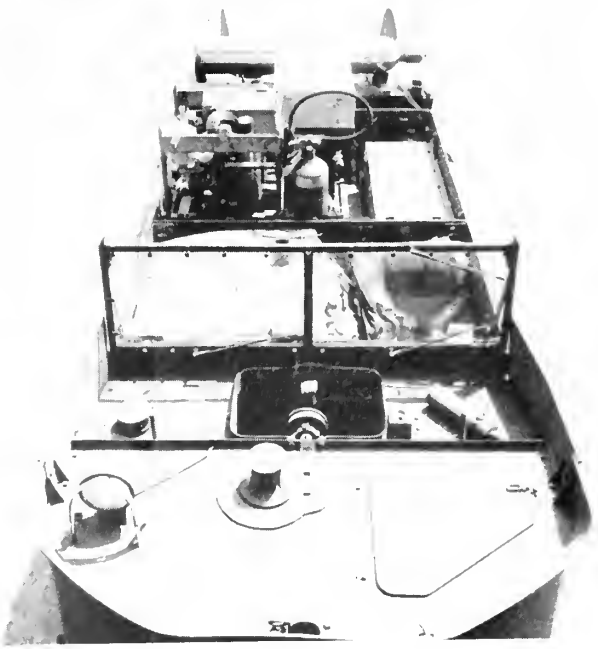
Converting "Weasels" to Amphibious Welding Units

The Navy felt that one of the prime needs during invasions was for a highly portable welding unit injured equipment repaired quickly that could go almost anywhere, get for action, and then move on to another job without loss of time. The U. S. Navy Carrier M-29-C, "Weasel," was selected by the Navy Bureau of Ships because of its maneuverability which allows it to go ashore at the same time as the units it was later to repair.

The Davey Compressor Co.'s. model 50-B heavy-duty truck power takeoffs were installed between the "Weasel" engines and differential driving assemblies, permitting the "Weasel" engines to drive 200-ampere welding generators. This eliminated the need for a special generator engine, leaving valuable space in the "Weasel" for working room, materials and personnel, and bringing it within the cargo-carrying capacity of the "Weasel" when operating in rough water.

The installation of the Davey power take-off was much the same as an installation of the take-off in a 1½ ton truck to drive an air compressor, welding generator, pump, transit mixer or other equipment. Only minor engineering changes were necessary to adapt standard Davey equipment to this special Navy use.





Above: **Close-up view of Davey model 50-B heavy duty truck power take - off installed between engine and driving assembly of U. S. Navy Carrier M-29-C, famous as the "Weasel," used to drive G. E. 200-ampere welding generator for fast repairs during invasion operations.**

At right: **The famous Navy "Weasel" equipped for fast beach head repair work.**

U. S. Seamen Have Highest Wage Rate

It has long been known that American steamship companies lead the world in the amount of wages paid to seamen. The most recent tabulations of basic wage rates for seamen in the fifteen leading maritime nations shows, according to the report of War Shipping Administration agents, the following scales:

	Basic Monthly Rate
United States	$145
Canada	81
New Zealand	68
Netherlands	63
Norway	58
Australia	57
Great Britain	56
Poland	56
France	54
Sweden	53
Belgium	49
Greece	44
Argentina	36
Brazil	25
Chile	17

Army Returns 114 Troop Ships to WSA

The War Department has scheduled the release of 114 troop ships to the War Shipping Administration in the first four months of 1946 for return to American and foreign owners, the San Francisco Port of Embarkation announces.

The release of these vessels by the Army Transportation Corps was made possible by the fact that the Army had discharged 1,665,000 more men by January 1, 1946, than had been planned under its demobilization program.

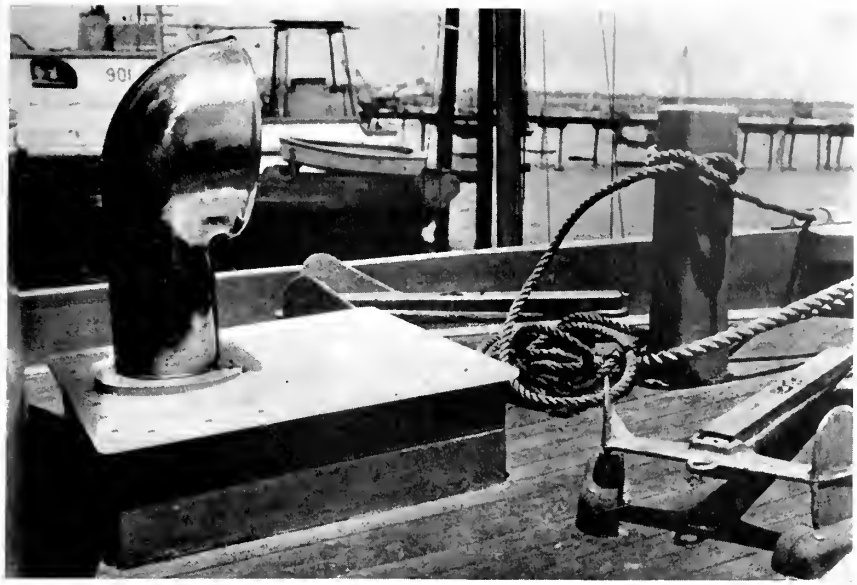
It is emphasized that troop ships remaining in Army and Navy service will be more than adequate to return the soldiers on the schedules announced by the General of the Army Dwight D. Eisenhower, Chief of Staff, in his statement to Congress on January 15.

The following list includes ships scheduled for release which sail in and out of Pacific Coast ports, their ownership, and tentative date of release to WSA for return to private control.

LIST OF SHIPS IN PACIFIC COAST PORTS

ALASKA PACKERS' ASSOCIATION	Chirikof	January
ALASKA STEAMSHIP CO.	Alaska	January
	Aleutian	January
	Baranof	January
	Columbia	January
	Cordova	January
	Cushman K. Davis	As soon as possible
	Denali	January
	George Flavel	Aa soon as possible
	Lakina	January
	Yukon*	January
ALCOA STEAMSHIP CO.	Alcoa Patriot	March
	Alcoa Polaris	March
	George Washington	January
AMERICAN EXPORT LINES	Dorothy L. Dix	March
	Excelsior	January
	Exchange	January
	Exchequer	January
	Exiria	March
	Explorer	March
	Extavia	March
AMERICAN MAIL LINES	Cape Flattery	January
	Carl Schurz	As soon as possible
	John C. Ainsworth	As soon as possible
AMERICAN PRESIDENT LINES	Carlos Carillo	As soon as possible
	Jane Addams	As soon as possible
	President Johnson	January
COASTWISE LINE	J. H. Kinkaid	As soon as possible
DE LA RAMA STEAMSHIP CO.	John B. Floyd	As soon as possible
GRACE LINES	Santa Cruz	March
	Santa Isabel	March
	Santa Maria	March
	Santa Rosa	February
LIBBY, McNEILL & LIBBY	David W. Branch	February
LYKES BROTHERS' STEAMSHIP CO.	Adabelle Lykes	February
	Arlington	March
	Frederick Lykes	January
	John Lykes	March
	Zoella Lykes	March
MATSON NAVIGATION CO.	Lurline	March
(See also Oceanic S. S. Co.)	Matsonia	February
MOORE-McCORMACK LINES	Arundel	March
	Brazil	March
	Elizabeth C. Stanton	February
	Florence Nightingale	March
	Lyon	March
	Mormacdove	March
	Mormacport	January
	Mormachawk	March
	Mormacwren	March
	Mormacsea	March
	Uruguay	April
NEWTEX STEAMSHIP CORP. (SEATTLE)	Eli D. Hoyle	January
NORTHLAND TRANSPORTATION CO.	George W. Julian	As soon as possible
	John W. Weeks	As soon as possible
	Northcoast	January
	North Sea	January
OCEANIC STEAMSHIP CO.	Monterey	February
STATES MARINE CORP.	Charles Lummis	As soon as possible
SUDDEN & CHRISTENSON (Norwegian)	Roseville	As soon as possible
THOMPSON SALMON CO.	William L. Thompson	January
UNITED FRUIT CO.	Cape Cod	March
	Cape Neddick	March
UNITED STATES LINES	Sea Witch	February
	West Point	February
WAR SHIPPING ADMINISTRATION	Belle Isle	January
	George S. Simonds	January
	F. W. Wallace	As soon as possible
	North Land	January

*The Yukon was wrecked off the Alaska Coast in February and is a total loss.



Plastic hatch covers, made of Plexiglas, appears for the first time in a fishing boat in the wheelhouse windows and forward hatch cover of the Poggy.

Plastic Hatch Covers, Windows, Used on Work Boats

Plexiglas, a transparent acrylic plastic, appears for the first time in a fishing boat in the wheelhouse windows and forward hatch cover of the Poggy, a 38-foot vessel built in San Diego. Though the plastic has been utilized before in pleasure craft, this is its initial entry into the commercial boat field.

The wheelhouse windows are made of ¼ inch Plexiglas; in the central window is a tiny "window within a window", hinged into the larger pane, which can be opened for greater vision during rough or foggy weather.

The forward hatch cover is of ¾ inch Plexiglas, sandblasted to make it translucent. This hatch cover is particularly successful because it diffuses light in such a way that there is more light below in the two forward bunks when the hatch is on than when it is off. This spreading of light rays means that the interior dries much faster, and dry rot is prevented. The hatch cover and windows were fabricated by Rohm & Haas in its Southgate, California plant, and attached in San Diego.

Towboat Engine Installation Establishes A Precedent

A new Type JS 8-cylinder supercharged Cooper-Bessemer diesel engine was installed in the towboat, Whayne H. of the Walter G. Hougland fleet at Paducah, Ky., recently without dismantling the engine or removing the boat's superstructure, marking the first time that such a large installation had been completed in this manner. (See illustration.)

Removal of the former engine and installation of the new one was completed in six weeks under the supervision of W. B. Hassell, port engineer of the Hougland fleet. The towboat's new power plant was given its initial test run off Paducah, October 17.

The engine, which weighs approximately 32 tons, was installed in this unusual manner because shipbuilders had advised that either the boat's superstructure would have to be almost entirely removed or the engine dismantled before the job could be completed. This meant that the boat would have been out of service for months at a time when river power was at a premium.

Mr. Hassell and his crew of workmen began their tremendous task by first dismantling the old power plant and pulling it through an opening which had been made flush with the deck at the location of the engine room by cutting out a small section of the side wall with welding torches. The side of a flat barge was also cut down so that the way would be clear to load it from the boat to the barge without interference. The barge was loaded with ballast to make it exactly flush with the towboat's deck. The engine was pulled out with hoists and wire rope and hauled to the barge. From there, the engine was loaded on a flatcar and taken back to the Hougland machine shop.

The new Cooper-Bessemer JS-8 supercharged diesel slips into the engine room by means of chain hoists, wire rope, some manpower and plenty of ingenuity on the part of Hougland's port engineer, W. B. Hassell.

Statehood For Hawaii

(Continued from page 261)

nal deaths for 1,000 living births had declined from 7 in 1932 to 1.6 in 1945.

46. That the venereal disease infection rate per 1,000 in Hawaii declined from 175 in 1911 to 7.5 in 1945. On the mainland the rate has declined from 163 in 1911 to approximately 43 in 1945. In Hawaii the locally acquired rate was 1.4 in 1945.

47. That according to the social security board, Hawaii's public assistance program is based on "liberal, progressive legislation." Hawaii has no maximum limitation of public assistance; and the Territory has thus placed itself in a position to make payments to needy individuals commensurate with need, and to give recognition to changes in living costs. Hawaii also has a medical and dental care program, and provides other forms of public assistance for which no Federal grants are given.

48. That in 1945 Hawaii ranked thirty-ninth in the average grant for old-age assistance, fifteenth in the average grant for aid to dependent children, thirty-fifth in average grant for aid to the blind, and fifteenth in the average grant for general assistance.

49. That the territorial legislature has enacted legislation comparable to that of many States. Hawaii has adopted 20 of the mainland uniform laws. In addition to laws mentioned above, Hawaii has a civil-service law, a modern retirement system for all employees. In the field of public health the Territory has enacted a crippled-children's act, created a bureau of mental hygiene, passed a uniform narcotic-drugs act, and established compulsory vaccination for smallpox, typhoid, and other diseases. In addition to the existing public medical-care program the legislature in 1945 provided for a study of health-insurance and hospital facilities. In 1935 the legislature created the Hawaii Housing Authority, passed the Federal Housing Act, authorizing the acquisition by any Federal agency of property suitable for housing projects, and an act entitled "Government Aid for Housing Projects" authorizing the Territory and its political subdivisions to aid in the planning, construction and operation of housing projects.

Recommendations

Therefore, since—

1. The people of the Territory of Hawaii have demonstrated beyond question not only their loyalty and patriotism but also their desire to assume the responsibility of statehood; and since

2. The policy of the United States Government is one of self-determination: that peoples be allowed to choose freely their form of political status; and since

3. Hawaii's strategic location in the Pacific plays so large a part in our country's international position in this area; and since

4. The Congress of the United States has through a series of acts and committee reports indicated to the people of the Territory that Hawaii would be admitted into the Union when qualified; and since

5. The Territory of Hawaii now meets the necessary requirements for statehood:

It is the recommendation of this subcommittee that the Committee on Territories give immediate consideration to legislation to admit Hawaii to statehood.

Henry D. Larcade, Jr.
Democrat, Louisana, Chairman,
James J. Delaney,
Democrat, New York
George P. Miller,
Democrat, California.
Homer D. Angell,
Republican, Oregon.
Dean P. Taylor,
Republican, New York.
Joseph R. Farrington,
Republican, Territory of Hawaii.

S. F. Chamber Is First to Urge Statehood for Hawaii

Immediate admission of the Territory of Hawaii to statehood was urged by the Board of Directors of the San Francisco Chamber of Commerce, which is the first chamber of commerce in the nation to take such action.

Asserting that Hawaii has fulfilled every qualification for statehood, the Board cited the Territory's well functioning, orderly government as evidence of Hawaii's capacity to conduct her own affairs.

Hawaii's self-sustaining economy and valuable resources and property also give her statehood status, the Board maintained. It was pointed out that the Territory has greater population than four states and a greater area than three states in the Union.

Though a Territory, Hawaii is subject to Federal taxation imposed on states, but without representation in Congress. Placing Hawaii on an equal footing with the other states of the United States would give the Territory fair representation and eliminate unfair discriminations, the Board stated.

From the military standpoint, the admission of Hawaii to statehood would have far-reaching international importance, for it would bind this strategic military base more closely to the United States, it was asserted.

Brayton Wilbur, president of the Chamber, pointed out that the admission of Hawaii would also have great social significance. "The heterogenous people of Hawaii have already demonstrated their ability to integrate their lives and interests into the American pattern by their harmonious relations and their loyalty to the United States during World War II," Wilbur said. "Admission of Hawaii to statehood would intensify that loyalty."

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

Head table at joint Propeller and Bilge Club meeting. Left to right: E. L. Arch, F. G. Nelson, Bob Snodgrass, Reverend J. Whitcomb Braugher, Jr., L. T. Backus, Admiral A. W. Marshall, W. J. Bryan, Jr., H. E. Pickering, President of Propeller Club, Duke Decker, President of Bilge Club, Lee K. Vermille, Leonard Roach, L. E. Archer, and K. W. Pope.

Left to right: R. W. Decker, president of The Bilge Club of Los Angeles Harbor, ond H. E. Pickering, chairman of The Propeller Club of the United States, Port of Los Angeles-Long Beach.

Joint Meeting of Two Maritime Clubs

Two hundred members and guests of The Bilge Club of Los Angeles Harbor and The Propeller Club of the Port of Los Angeles-Long Beach held a joint meeting on January 23 in the Marine Room at the Hilton Hotel in Long Beach. The guest speaker was the Hon. William Jennings Bryan, Jr., Collector of Customs at Los Angeles.

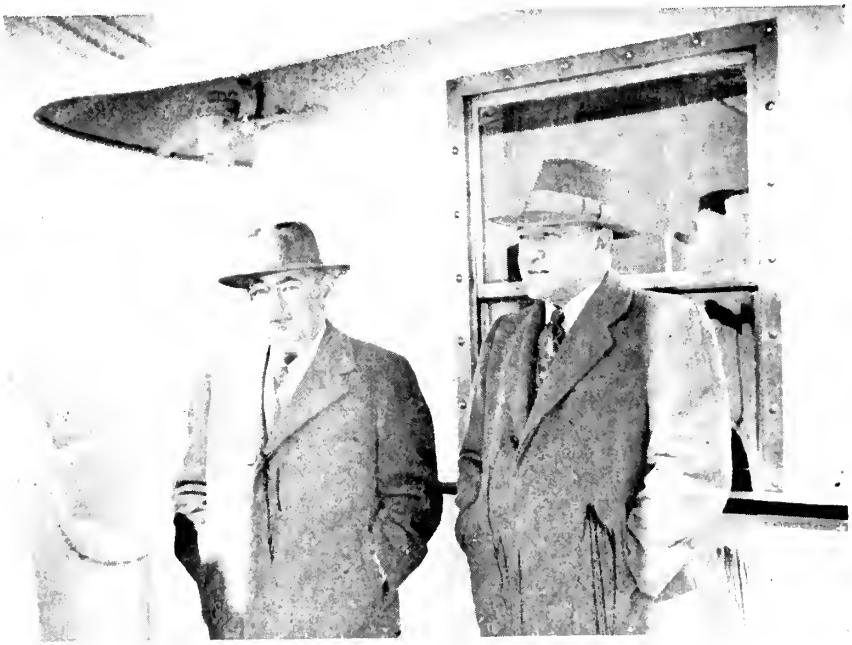
Sea Trials

Above: The Marine Leopard passing out the Golden Gate proceeding on her trials.

●

At left: John Wintersteen of Kaiser Yard No. 3, A. P. Hall, and Mrs. B. N. De Rochie, B. N. De Rochie, Jr., and B. N. De Rochie.

H. A. Holm, American Bureau's surveyor at Kaiser's Yard No. 3.



Above: Captain E. Mohr, pilot in charge of the ship, and F. M. Graham, port captain, W. R. Chamberlain & Co.

At left: T. A. Bedford, Jr., general manager, Kaiser Company, Inc.

Above, left to right: Mr. and Mrs. J. B. Miller, and Mr. and Mrs. T. Y. Sturdevant, U. S. Maritime Commission, Yard No. 3. At right: Mrs. Arthur Hatch, sponsor of Marine Leopard, Peter Ormant and Mrs. Leslie Lutz.

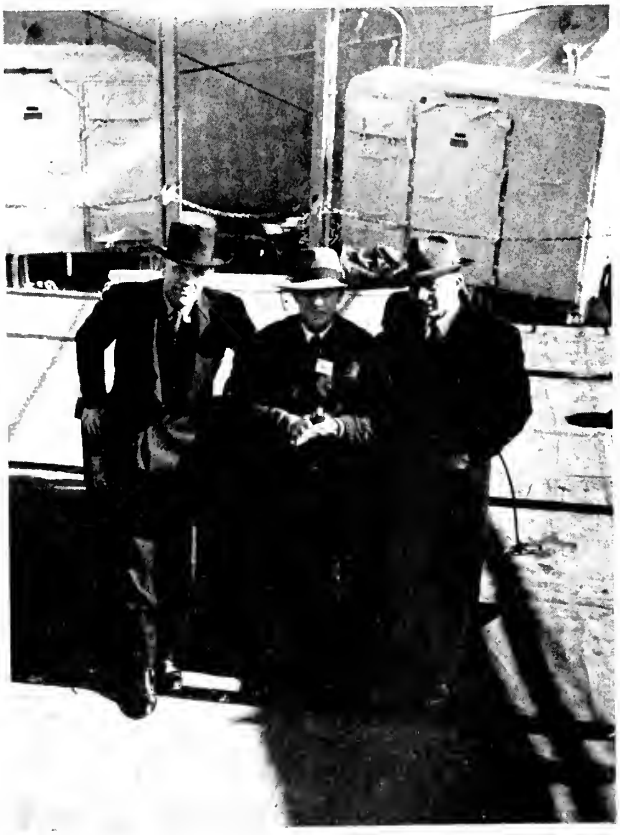
of the S.S. Marine Leopard

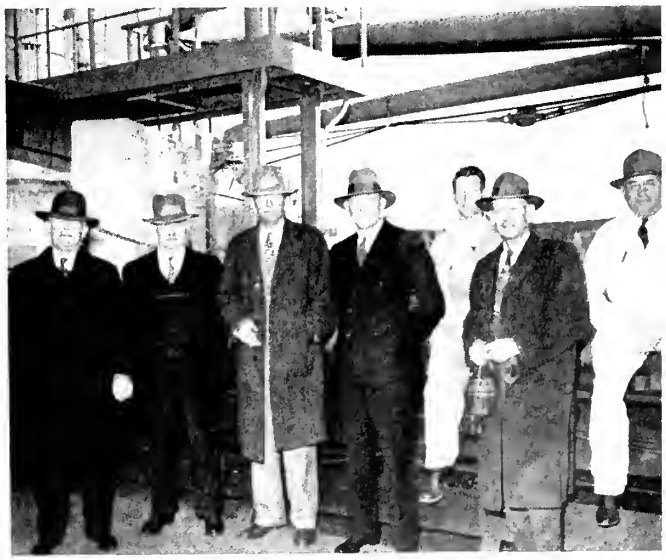
C4-S-A4 Type Vessel Built at Kaiser Company, Inc. Richmond, California

For a story on the successful sea trials of S.S. Marine Leopard, held February 8, 1946, together with ship and equipment pictures, see feature article elsewhere in this issue.

Included on these two pages are officials and guests of the Kaiser Company, Inc.; the U. S. Maritime Commission Trial Trip Board and members of the maritime industry.

Below: H. E. St. Clair, chief of Hull Technical Section, Oakland Construction Office, USMC; E. D. O'Brien, Hull Technical Section, Oakland Construction Office, USMC; and Maynard Wadworth, assistant Naval Architect, Kaiser Yard No. 3.





Above: The U. S. Maritime Commission Hull Inspection staff at Kaiser Yard No. 3. W. Anderson, former head hull inspector; Jack Hamiltan, head hull inspector; A. R. Brown, principal hull inspector; A. Perring, senior hull inspector; John T. Brusstar, former senior joinery inspectar; W. Heans, hull inspector; and L. J. Mengula, senior hull inspector.

Below: Trial trip guests and wives.

Mariners Club February luncheon guest was Jack Ruggles (at left) former Wing Commander of R.A.F., with President Tom Short and Louis Ets-Hokins.

Ex-RAF Pilot Guest of Mariners

A talk by Jack Ruggles, who piloted Winston Churchill's plane to vital wartime conferences, highlighted the program at the regular meeting of the Mariners Club of California, February 6.

Jack is one of those who joined the RAF before the United States entered the war. Assigned to the British Transport Command, he operated over many war areas, and was a member of the crew selected to pilot Churchill's B-29 to the Moscow Conference, and subsequently to carry the Prime Minister on his many war missions. His tales of the travels with the Prime Minister in the Middle East, European, and Russian territory were enjoyable.

Louis Ets-Hokin took the floor to briefly speak of the forthcoming membership drive. He requested that each member do his utmost to increase the Club's membership.

Scheduled to speak at the regular meeting was R. V. Winquist, vice president of General Steamship Corporation, Ltd., who was unexpectedly called to Washington, D. C. His speech, "The Shipping Outlook" was postponed to some future date.

The Sea Squatters—Club for Ditched Fliers

If you like adventure stories, watch the coat lapels of people you pass on the street and meet in trains. When you see a tiny gold sea gull sitting on a lapel, you know the wearer has a tale to tell, for he belongs to the world's strangest organization, The Sea Squatters Club.

Lapel pin of the Sea Squatters Club.

The idea of forming a club for survivors was born in the mind of John F. Kidde, president of Walter Kidde & Company, whose engineers designed the ingenious devices which transform a wad of fabric into a craft capable of crossing a storm-swept ocean. After hearing reports on their life-raft equipment, the idea came of banding the ditching survivors into a club after the war.

The only way one can join this ultra exclusive club is to endure one of life's most harrowing experiences: "ditch" an ailing airplane in the ocean, crawl into a bobbing life-raft —and live!

Twelve hundred American men and women now wear these sitting sea gull emblems, and most of them were earned on military flights. Among the emblem wearers are: Gregory "Pappy" Boyington, 34-plane Marine ace who ditched off Rabaul; Eddie Rickenbacker and his crew, who bobbed for 22 days in the trackless Pacific; Harold Dixon and his two companions who did a modern Captain Bligh odyssey by sailing 1000 miles in 34 days to a tiny atoll in the South Pacific. There are hundreds of other sagas of aerial shipwreck in Sea Squatter archives; even the tale of two comely girls who huddled with eight men in life-rafts, sailed to a barren shore and spun out a Robinson Crusoe existence until rescued.

USCG WILL LOAN ANTIQUATED LENSES

Coast Guard Headquarters, Washington, D. C., has put on loan status antiquated aids to navigation, lenses for museums, schools and maritime societies. Because of legal restrictions the USCG cannot dispose of them as a gift, but can loan them indefinitely to responsible institutions. Here a Coast Guardsman examines an old-style lighthouse lense. Further information can be obtained from Headquarters regarding the loan of these lenses.

Excellent War Record In Ship Joinery Installation

In 1937 James D. Tayler and Norman A. Proffitt organized the Pacific Sales and Equipment Company with headquarters in San Francisco, for the purpose of acting as manufacturers' agents on the Pacific Coast. While representing two of the more important companies, namely, the Aetna Marine Corporation and the Aetna Steel Products Corporation, they performed a most noteworthy service in the country's war effort.

Their chief activities comprised the design and installation of the joiner work, furniture, furnishings, insulation, ventilation and duct work, on all types of naval and merchant ships, in the yards of the Western Pipe and Steel Co., in San Francisco; the United Engineering Co., the General Engineering Co., the Pacific Bridge Co., and the Bethlehem Company's plant in Alameda. They performed similar work on naval vessels constructed in Napa at the shipyard of Basalt Rock Co., the Charleston Shipbuilding Corp., in Charleston, S. C., and the Lake Superior Shipbuilding Corp., at Superior, Wisconsin. In the Southern California territory they successfully handled jobs at the yards of the Los Angeles Shipbuilding & Dry Dock Co.; the Bethlehem Co., San Pedro Yard; and the U. S. Naval Drydocks at Terminal Island.

In addition they supplied similar types of materials and equipment to many other yards on the Pacific Coast.

At the present time they are handling all the activities of the Aetna Marine Corp., and the Aetna Steel Products Corp., on the Pacific Coast which includes the joinery, carpentry, furniture, ventilating, air conditioning and insulation work on the large new American President Liners, now in process of completion in the Alameda yard of the Bethlehem Steel Company.

In order to efficiently handle the business of the Pacific Sales and Equipment Company there was recently completed a new building which includes a modern service plant and administration quarters at 1245 - 22nd Street, San Francisco.

At top, left: James D. Tayler, partner, Pacific Sales & Equipment Company.

At top, right: Norman A. Proffitt, partner.

At right: A. R. Callaghan, engineer.

Class of February, 1946

Deck Officers

SECTION 6021-D: First row, left to right: Fordyce Courneen, Hamilton Ahlo, Robert Tomlinson, Lieut. William Roberts (Section Officer), Stanton Amundson, Lee Child, Billy Sanders, Lowell Prestwich. Second row: Edwin Townsend, Warren Norris, Walter Asp, Maurice Dillow, Harold Ellisan, Alexander Wiseman, Robert Bauer, Herbert Buck. Third row: Theadore Ericksan, J. Mertz Hanberry, Raymond Payton, Arnold Olsvik, Charles Rogers, John Olson, Spencer Alter, James Cauey, Alfred Schubert.

SECTION 6022-D: First row, left to right: William Norgren, Harry Diede, Alfred Whitman, Lt. (jg) Raymond Bjorkquist (Section Officer), James Nation, W. J. Hurley, Kenneth Dane. Second row: Howard Payne, Richard Stoughton, Wesley Driskell, Dean Foster, Walter Bradford, Edward Mullen, William Luse. Third row: Kenneth Fuller, Stanley Carlsen, Stanley Cyborawski, Richard Bavet, Kenneth Rush, Dale Sexton, Richard Eaton.

USMS OFFICERS' SCHOOL GRADUATES

ALAMEDA, CALIFORNIA FEBRUARY, 1946

Engineering Officers

SECTION 6021-E: First row, left to right: Jerry Plent, Marion Rose, Marvin Kropf, Roger Cooper, Lt. (jg) Laurance Butzer (Section Officer), Kenneth Foster, Fay Denny, Otis Banks, John Angove, David Walker. Second row: James Bigelow, Dallas Miller, Mayo Bybee, Leslie Ellis, Andrew Gyorke, John Bovard, Fred Huber, Charles Clement, Howard Smith, Victor McGinnis. Third row: Vernon Andersan, William Tierney, Darien Bennett, Bernard Carlin, Ralph Medley, John Hickey, Wilmer Ossinger, Franklin Young, Stephen Mandle, John McMahon, Lawrence Martin.

SECTION 6022-E: First row, left to right: Clifford Huete, Patrick Murphy, Robert House, Lt. (jg) John Rizzari (Section Officer), Raymond Lutz, Shirley Mason, Ashley Frith, Rene Lamirande. Second row: Raymond Jensen, John Bodker, William Sheppard, L. T. Gore, Henry Francis, Earl Russell, Robert Higgins, Jack Ely, Anthony Campiere. Third row: Jack Faulkner, Douglas Tangen, Richard Iverson, Duke Newsom, Archer Pratt, Philip Ryan, Joe Rucker, Richard Powell, Julius Slader.

The new General Electric Supply headquarters in Portland, Oregon.

GENERAL ELECTRIC'S NEW OFFICE; STUDENT TOUR; P. C. CHANGES

General Electric Supply in New Quarters in Portland

The General Electric Supply Corporation in Portland has just opened the most streamlined quarters available to any of its branches in the country at 300 Northwest Fourteenth Street, corner of Everett. The Portland branch serves the states of Oregon and Washington in the northwest.

Covering an area of 60,000 square feet, the new GESCO building is equipped with probably the finest lighting system in the city. The display floor and offices enjoy 70 foot candles of fluorescent illumination, provided by troffers on 7 foot spacings. Each troffer utilizes Holophane "Controlens." All private offices, as well as the large offices accommodating the clerical assistants, have GE Germicidal Lamps installed for health protection. Offices and show rooms are completely air conditioned, including refrigerating compressors and heating. The top floor of the building, specially built by Timber Structures, Inc., has a free expanse 200 feet long by 100 feet in width. The roof is suspended from wall to wall, requiring no pillar obstruction, and in this respect is similar to the design used in dirigible hangars.

College Reporters Watch G. E.'s Wheels Go Around

The reconversion picture in the Bay Area got a thorough going-over when six college reporters on a tour of representative industrial firms visited the General Electric Oakland Works to get the inside story of just what college graduates can expect when they step out to start careers of their own.

Sponsored by the National Association of Manufacturers, two reporters from each of the daily newspapers at University of California, Stanford University and San Jose State College, made a tour of widely varied fields in Oakland and in San Francisco. The General Electric plant is one of eight representative concerns being covered by the reporters who plan to take back to their fellow students a fair and comprehensive picture of opportunities in industry in general.

The tour is similar to the recent "flying reporter" trip sponsored by NAM, which brought nationally prominent newsmen to the Pacific Coast to examine at first hand and write up their versions of the industrial picture in the west.

General Electric Changes in Pacific Coast Area

Two new Pacific Coast territory assignments were announced, effective as of January, 1946, by E. O. Shreve, vice president of the General Electric Company.

The Salt Lake City, Utah, trading area has been added to the present territory of R. M. Alvord, commercial vice president, San Francisco. A. S. Moody, commercial vice president, Portland, Oregon, will be responsible for the additional trading area of Butte, Montana, and immediate territory. Both men will continue to reside in San Francisco and Portland, respectively.

The Utah and Montana territories and administrative responsibilities have been added to present areas assigned to Mr. Alvord and Mr. Moody, upon the retirement after 41 years' service of A. L. Jones, G. E.'s commercial vice president in Denver. W. B. Clayton, commercial vice president, Dallas, Texas, has been assigned to Denver area, in addition to his present territory.

Two reporters from each of the Bay Area University dailies visited G.E. and saw recent 100 per cent war production of vital transformers and cables being reconverted to peacetime uses.

Welcome Aboard the S.S. Golden State

The Propeller Club Port of Los Angeles-Long Beach Board of Governor officers were extended an invitation aboard the S.S. Golden State at Long Beach, when she docked there on January 15. The invitation was given by Captain Claude B. Mayo, superintendent, California Maritime Academy. This vessel made a stop at Long Beach Harbor en route to Mexico and South American ports, destination Valparaiso, Chile. The occasion was much enjoyed by all attending.

Recently Captain Mayo announced the training ship had arrived at her destination and was visiting in Latin American waters.

Above: A new midshipman reports aboard the S.S. Golden State, as upperclassmen greet him eagerly.

Left: "Knock off" time aboard the cruising training ship is time to relax from work and studies.

Below, left: Reveille on the Golden State rouses all hands with a blast down the hatch.

Bottom, right: Captain Claude B. Mayo, USN (Ret.), superintendent of the California Maritime Academy, Carquinez Straits, Vallejo, California, addresses the school just prior to the S.S. Golden State's South American voyage.

PACIFIC SHIPYARDS

A Directory of Shipbuilding and Repair Yards of the West Coast

ALBINA ENG. & MACHINE WORKS, Inc.
2103 N. Clark Ave.
Portland 12, Oregon

President: L. R. Hussa.
Vice President: P. L. Symons.
Secretary: T. J. Cousins.
Manager: L. R. Hussa.
Treasurer: Dale L. Caldwell.
Naval Architect: C. F. Butler.
Purchasing Agent: W. D. Hughes.

ANACORTES SHIPWAYS, INC.
Box 111
Anacortes, Washington

President: L. P. Clark.
Vice Pres.: W. P. Yaw & D. M. Drake.
Secretary: E. E. Carroll.
Naval Architect: H. C. Hanson.
General Supt.: Charles Taylor.
Purchasing Agent Harrison Newkirk.

ANDERSON & CHRISTOFANI
Innes & Griffiths Sts.
San Francisco, Calif.

ASSOCIATED SHIPBUILDERS
Plant No. 1, Harbor Island Plant
2727-16th Ave. S. W.
Seattle, Wash.

General Manager: G. H. Stebbins.
Gen. Supt.: C. M. Rohda.
Chief Engineer: C. W. Johnson.
Procurement Manager: R. K. Jaggar.
Purchasing Agent: E. B. Devener.

Plant No. 2, Lake Union Plant
1515 Fairview No.
Seattle, Wash.

General Manager: G. H. Stebbins.
Asst. General Manager: H. W. Blaney.
Naval Architect: B. R. Richards.
Purchasing Agent: A. T. Harris.

ASTORIA MARINE CONSTRUCTION CO.
P. O. Box 90, Astoria, Ore.

President: Joseph M. Dyer.
Vice President: G. T. McClean.
Treasurer: Geo. C. Sheahan.
Naval Architect: Wilfred H. Dole.
Chief Engineer: Joseph M. Dyer.
Manager & Purchasing Agent: Richard Schroeder.

BALLARD MARINE RAILWAY CO.
5351-24th, N. W.
Seattle, Washington

President: W. G. Fryberg.
Vice President: E. C. Smith.
Manager: H. F. Fryberg.

BARBEE MARINE YARDS, INC.
Foot of 26th Ave. N. W.
Seattle, Washington
Plant No. 2
Bryn Mawr, Wash.

President: E. P. Donnelly.
Vice President: D. F. Mitchell.
Manager: E. P. Donnelly.
Naval Architect: Edwin Monk.
Purchasing Agent: P. L. Douglas.

BASALT ROCK CO., INC.
8th & River Sts.
Napa, California

President & Mgr.: A. G. Streblow.
Vice Pres.: Walter Fawcett.
Asst. Mgr.: E. F. Brovelli.
Naval Architect: Don McCall.
Chief Engineer: Ed Godsil.
Purchasing Agent: J. E. Godley.

BELLINGHAM IRON WORKS, INC.
Squalicum Waterway
Bellingham, Washington

President: A. W. Talbot.
Vice President: Hilton W. Talbot.
Secretary-Treasurer: C. I. Jamieson.
General Manager: Ross W. Copeland.
Naval Architect: Oscar Lindquist.
Purchasing Agent: L. M. Brown.
Personnel Director: Alvin Anderson.

BERKELEY STEEL CONSTRUCTION CO.
1331 East Shore Highway
Berkeley 2, California

President: Thomas S. Neilson.
Vice President: Duncan S. Neilson.
Manager: N. Couzins.
Chief Engineer: Merritt M. Mason.
Purchasing Agent: R. J. Fennell.

BETHLEHEM STEEL COMPANY
Shipbuilding Division
20th and Illinois Sts.
San Francisco, Calif.

District President: A. B. Homer.
General Manager: W. M. Laughton.
Manager: T. C. Ingersoll.
Naval Architect: E. P. McRitchie.
Chief Engineer: M. Weitzner.
Dist. Purch. Agent: L. W. O'Donnell.

San Pedro Yard

Manager: E. C. Rechtin.
Asst. Manager: W. A. Harrington.

BETHLEHEM STEEL CO.
Shipbuilding Division
Alameda Repair Yard

Manager: F. S. McGuigan.

BETHLEHEM ALAMEDA SHIPYARD, INC.

Manager: T. C. Ingersoll

BIRCHFIELD BOILER CO., INC.
2503 East 11th St.
Tacoma, Washington

Pres. and Gen. Mgr.: Alvin T. Davies.
Vice President: James D. Davies.
Asst. Gen. Mgr.: Oscar E. Nero.
Chief Engineer: Ralph M. Kenton.
Purchasing Agent: Elmer Northstrom.
Pub. Relations Mgr.: C. R. Edrington.

N. J. BLANCHARD BOAT CO.
3201 Fairview Ave.
Seattle, Washington

President: N. J. Blanchard.
Vice President: E. F. Pearson.
Manager: Norman Blanchard, Jr.

BRYANT'S MARINA, INC.
1117 E. Northlake Ave.
Seattle, Washington

President: Jerry Bryant.
Vice President and General Manager: Latham L. Goble.
Sec.-Treas.: D. H. Lundin.

BURCHCRAFT BOAT CO.
1000 Mitchell St.
Aberdeen, Washington

Manager and Owner: L. P. Burch.

CALIFORNIA SHIPBUILDING CORP.
P. O. Box 966.
Wilmington, California

Chairman of the Board: S. D. Bechtel.
President: J. A. McCone.
Vice President and General Manager: J. K. Doolan.
Asst. Gen. Mgr.: Albert O. Pegg.
Adm. Mgr.: J. M. Warfield.
Works Manager: J. S. Sides.
Chief Engineer: W. C. Ryan.
Marine Engineer: Dave Charles.
Purchasing Agent: H. A. Keeler.
Hull Supt.: Carl Rettig, Jr.

CALIFORNIA STEEL PRODUCTS COMPANY—MARINE DIVISION
Foot of 16th Ave.
Oakland, California

Marine Superintendent: E. J. Shaw.

CAMPBELL MACHINE CO.
Foot of 8th St.
San Diego, Calif.

Partners: David C. and George E. Campbell.
Chief Naval Architect: E. G. Bertin.
Plant Superintendent: David C. Campbell.
Purchasing Agent: O. C. Edson.
Hull Superintendent: M. Madruga.

CHILMAN SHIPYARD
Hoquiam, Washington
President and Owner: Ivar Chilman.

COLBERG BOAT WORKS
Stockton and W. Lindsey Streets
Stockton, California

COLUMBIA RIVER PACKERS ASSN., INC.—SHIPYARD DIVISION
Astoria, Oregon
President: E. W. Thompson.
Vice President: T. F. Sandoz.
Manager: W. B. Wootton.
Naval Architect & Chief Engineer: A. Lindstrom.
Purchasing Agent: Wm. Vickerson.

COMMERCIAL IRON WORKS
Foot of S. W. Gibbs St.
Portland, Oregon
Pres. and Treas.: Winston W. Casey.
Executive Vice President and Gen. Manager: Henry A. White.
Vice President: Edward L. Casey.
Naval Architect: Willis G. Telfer.
Chief Engineer: Ray Purdy.
Purchasing Agent: Ivan Horne.

CONSOLIDATED STEEL CORP., LTD.
5700 South Eastern Avenue
Los Angeles, California
(P. O. Box 6880, East Los Angeles Branch, Los Angeles 22, California)
Wilmington, Calif., Shipbuilding Div.
Long Beach, Calif., Shipbuilding Div.
(Subsidiary Company, Consolidated Steel Corporation of Texas)
President: Alden G. Roach.
Vice President: Lloyd R. Earl.
Vice President in Charge of Finance: F. J. Knoeppel.
Vice President: C. W. Crawford.
Vice President (Texas): H. C. Cranfill.
Treasurer: Edward H. LeBreton.
Secretary: John M. Robinson, Jr.
Mgr. of Purchases: H. W. Abramson.

Maywood Plant
Maywood, California
Yard Officials:
General Supt.: R. F. Campbell.
Plant Supt.: W. J. Carter.
Chief Engineer: W. F. Pruden.
Chief Research & Devel. Engineer: R. E. DeCamp.
Chief Structural Draftsman: J. R. Helman.
Chief Structural Design Engineer: J. Boysen.

Shipbuilding Division
Wilmington, California
Production Manager: C. W. Lee.
Chief Engineer: Carl Engstrom.
Naval Architect: D. G. Warren.
Marine Engineer: C. G. Smith.
Machinery Supt.: G. E. LaFrance.
Facilities Supt.: Ran Ritchey.
Outfitting Supt.: Jack Love.
Ways Supt.: Art Williams.
Material Coordinator: N. D. Lindley.

Repair Division
Pico St. Yard
Long Beach, California
Manager: Jack Reid.
Superintendent: Howard Wiley.

CONSOLIDATED STEEL CORP, LTD.
(Continued)

Boat Division
Newport, California
Manager: John McNerney.
Superintendent: D. H. McDermott.

WESTERN PIPE & STEEL CO. OF CALIF.
So. San Francisco Plant
Plant Manager: T. R. Rooney.

San Pedro Plant
Plant Manager: M. R. Ward.

CONSOLIDATED STEEL CORPORATION OF TEXAS
P. O. Box 341
Orange, Texas
President & Treasurer: A. G. Roach.
Vice President: L. R. Earl.
Vice President: C. F. Raleigh.
Secretary: H. C. Cranfill.

Orange Shipbuilding Division
P. O. Box 481
Orange, Texas
Yard Officials:
Vice President: H. C. Cranfill.
Production Mgr.: J. B. McClellan.
Chief Engineer: Carl Engstrom.
Hull Supt.: O. S. Sollars.
Outfitting Supt.: J. A. Campbell.
Machinery Supt.: Milton Karr.
Personnel Director: F. J. Lackey.
Electrical Supt.: Frank C. Hoelzle.

COTTON ENGINEERING & SHIPBUILDING CO.
Port Townsend, Washington
President: Harry A. Cotton.
V. P. and Manager: George J. Cotton.
Chief Engineer: A. W. Mickelson.
Purch. Agent: Harry A. Cotton.

CRAIG SHIPBUILDING CO.
Long Beach 2, California
Chairman of the Board: John F. Craig.
President: James G. Craig.
Vice President: John Craig II.
Sales Engineer: Albert Myers.
Purchasing Agent: F. W. Philpot.

CRUIKSHANK ENGINEERING CO.
Seattle, Washington
President and Purchasing Agent: Arthur A. Krueger.
Vice President: Otto A. Ranft.
Naval Architects: H. C. Hanson and W. C. Nickum & Sons.
Chief Engr.: Major Barton Cruikshank

DUWAMISH SHIPYARD, INC.
5658 W. Marginal Way
Seattle 6, Washington
President: F. Flakstad.
Vice President & Business Manager: A. J. Larsen.
Manager & Purchasing Agent: Axel Larsen.

EAST BAY SHIPBUILDING & REPAIR COMPANY
Oakland, Calif.
President: James B. Howell.
Vice President: John R. Grigg.
General Manager: Jay Graves
General Engineer: Geo. C. Mills.

EVERETT MARINE WAYS, INC.
Bayside and Hewitt
Everett, Washington
President: E. J. Templeton.
Vice Pres. & Sec.-Treas.: E. W. Stuchell.
Asst. Sec.-Treasurer, Mgr., Purchasing Agent: E. L. Bishop.
Naval Architect: H. C. Hanson.

EVERETT PACIFIC SHIPBUILDING & DRY DOCK COMPANY
Tract "O"
Everett, Wash.
President: Ferdinand Schmitz, Jr.
Vice Pres.: Paul Pigott, Al Tucker.
Manager: Al Tucker.
Naval Architect: Tom Rowlands.
Chief Engineer: Roy Kamb.
Purchasing Agent: Bud Kinney.

FELLOWS & STEWART, INC.
P. O. Box 157
Wilmington, California
President and Manager: Victor B. Stewart.
Vice President: Homer H. Evans.
Sec.-Treas. and Naval Architect: Jos. Fellows, Jr.
Chief Engineer: J. J. Bommhardt.
Purchasing Agent: O. J. Michael.

F. L. FULTON SHIPYARD
Antioch, California
President: F. L. Fulton.

GARBUTT-WALSH, INC.
Terminal Island, California
Pres.: Matt J. Walsh.
Vice President: David J. Walsh.
Purch. Agent: Florence Callaghan.

GRAHAM SHIP REPAIR CO.
Foot of Washington St.
Oakland, Calif.

GEN. ENGINEERING & DRY DOCK CO.
Foot of Schiller St.
Alameda, California
President: Geo. A. Armes.
Vice Pres. and Gen. Mgr.: James H. Young.
Vice President: W. L. Montgomery.
Sec.-Treas.: P. P. Mesquita.
Plant Manager: H. C. Hanson.
Naval Architect: Robert Y. Shaw.
Chief Engineer: F. H. Fox.
Purchasing Agent: Albert P. Wanner.

GIG HARBOR SHIP CO.
Gig Harbor, Washington
Owner: Geo. A. Cruse.

GRANDY BOAT CO.
Seattle, Washington

GUNDERSON BROTHERS ENGINEERING CORP.
4700 N. W. Front
Portland, Oregon
President: C. E. Gunderson.
Vice President: A. E. Gunderson.
Naval Arch. & Chief Eng.: L. S. Baier.
Purch. Agent: E. M. Lundquist.

HARBOR BOAT BUILDING CO.
Berth 264, Fish Harbor
Terminal Island, California
President: John Rados.
Vice President: Myles Rados.
Secretary-Treasurer: J. D. Hamilton.
Plant Superintendent: Myles Rados.
Purchasing Agent: Al. W. Rados.

HOQUIAM SHIPYARDS, INC.
1400 Chenault Ave.
Hoquiam, Wash.
Phones Hoq. 835 and 836

President: H. H. McLellan.
Vice Pres. & Gen. Mgr.: L. W. Foster.
Naval Arch., Purch. Agt. and General Supt.: Gus Kobrow.
Secretary-Treasurer: Fred Foster.
Yard Foreman: J. Peterson.

JOSHUA HENDY IRON WORKS
Sunnyvale, California

President: J. A. McCone.
Vice President: Felix Kahn.
General Manager: H. C. Gunetti.
Mgr. Engineering & Sales: A. A. Browne.
Purchasing Agent: R. M. Zemke.

HICKINBOTHAM BROS.
Construction Division
Stockton, California

J. C. Hickinbotham (partner).
R. W. Hickinbotham (partner).
Manager: R. M. Guntert (partner).
Naval Architect: C. W. Gulick
Chief Engineer: L. R. Zimmerman (partner).
Purchasing Agent: C. F. Stribley.

HODGSON-GREENE-HALDEMAN SHIPBUILDERS
1409 W. 7th St.
Long Beach, Calif.

Partner and Gen. Supt.: Frank W. Hodgson.
Partner & Asst. Gen. Mgr. M. R. Mackaig.
Partner & Gen. Manager: Burch E. Greene.
Naval Architect & Yard Supt.: Arthur DeFever.
Repair Supt.: David Maxwell.
Purchasing Agent: F. A. Kazmier.

JUDSON-PACIFIC CORP.
Emeryville, Calif.

KAISER CO. INC.
SHIPYARDS Nos. 1, 2 and 3
Richmond, California

President: Henry J. Kaiser
Vice President & Gen. Mgr.: Edgar F. Kaiser.
Vice President & Asst. Gen. Mgr.: T. A. Bedford, Jr.
Asst. Gen. Mgr.: Einar T. Larsen.
General Supt.: J. C. McFarland.
Procurement Director: W. A. Cannon.
Asst. Procurement Director: M. G. Vanderwende.
Chief Engineer: Harry Bernat.
Naval Architect: C. A. Olson.

KAISER CO., INC.
Shipbuilding Division

PERMANENTE METALS CORPORATION
KAISER CARGO, INC.
Richmond, Calif.

President: Henry J. Kaiser.
Vice President & General Manager: Edgar F. Kaiser.
Vice President & Asst. Gen. Manager: T. A. Bedford, Jr.
Asst. General Mgr.: Einar T. Larsen.
Naval Architect: C. A. Olson.

KAISER CO., INC.
Swan Island Yard
P. O. Box 4259
Portland, Oregon

Vice Pres. and Gen. Mgr.: Edgar F. Kaiser.
Secretary: J. F. Reis.
Assistant General Manager: A. R. Nieman.
Yard Superintendent: E. L. Hann.
Chief Design Eng.: Alex Stoyanov.
Office Mgr.: George E. Clinton.
Purchasing Agent: Clayton Sharp.

KAISER COMPANY, INC.
Vancouver, Washington

Vice Pres. & Gen. Mgr.: Edgar F. Kaiser.
Secretary: J. F. Reis.
Asst. Gen. Mgr.: Michael Miller.
General Supt.: John Hallett.
Office Manager: Rex C. Hamby.
Chief Procurement: J. J. O'Farrell.

KIRKLAND MARINE CONSTRUCTION
P. O. Box 668
Kirkland, Washington

Partner: Carl M. Ballard.
Partner: Phil F. Toman.
Manager: Phil F. Toman.
Naval Architect: Edwin Monk.
Purchasing Agent: D. Wright.
Chief Engineer: Frank Campanella.

GEORGE W. KNEASS COMPANY
18th and Illinois Streets
San Francisco, California

President: Webster L. Kneass.
Naval Architect: D. R. Lyon.
Purch. Agent: W. H. Pierce.

KRUSE & BANKS SHIPBUILDING CO., INC.,
North Bend, Oregon

President and Manager: Robert Banks.
Vice Pres. & Naval Architect: Fred A. Kruse.
Purchasing Agent: H. G. Huntley.

LAKE UNION DRY DOCK & MACHINE WORKS
1515 Fairview Ave.
Seattle, Washington

President: H. B. Jones.
Vice President & Secy.: W. L. Grill.
General Manager: A. F. Marion.
Plant Superintendent: Harry Rogers.
Purchasing Agent: L. B. Johnson.

LAKE WASHINGTON SHIPYARDS
Houghton, Washington

President: C. A. Burchardt.
Vice Pres. & Gen. Mgr.: P. E. Voinot.
Yard Superintendent: E. H. Rich.
Naval Architect: George Nickum.
Chief Engineer: A. C. Nation.
Purchasing Agent: A. R. Van Sant.

AL LARSON BOAT SHOP, INC.
Terminal Island, California

President and Manager: Al Larson.
Vice President: J. M. Larson.
Naval Architect and Chief Engineer: Adolph W. Larson.

LESTER & FRANCK BOAT CO.
109 Northlake Avenue
Seattle 3, Washington

President: A. D. Lester.
Secretary: Ruth E. Franck.
Naval Architect: Edwin Monk.

LOS ANGELES S. B. & D. D. CORP.
San Pedro, California

President: Alfred E. Smith.
General Supt.: Edwin W. Hanney.
Secretary-Treasurer: J. B. Ingoldsby.
Direc. Eng'n & Des.: H. O. Shuster.
Naval Architect: Douglas B. McFarland.
Navy Purch. Agent: M. L. Rhodes.
Commercial Purch. Agent: T. W. McDonald.

LYNCH SHIPBUILDING COMPANY
Foot of 28th St.
San Diego, California

President and Gen. Mgr.: Frank C. Lynch.
Plant Supt.: Paul Blackwell.
Manager: Harold F. Cary.
Acting Purch. Agt.: Salvador Garcia.

MADDEN & LEWIS COMPANY
Ft. Locust St.
Sausalito, California

General Superintendent: J. H. Madden.
Plant Manager: A. E. Lewis.
Office Manager: K. B. Bassford.
Purchasing Agent: A. J. Marion.

MARINSHIP CORPORATION
Sausalito, California

President: K. K. Bechtel.
Vice President: W. E. Waste.
General Manager: Robert Digges.
Naval Architect: R. F. Grambow.
Purchasing Agent: N. D. Holland.

MARITIME SHIPYARDS
27th W. & Commodore Way
Seattle, Washington

Owner: Finn Lepsoe.

J. M. MARTINAC SHIPBUILDING CORPORATION
1501 Railroad Ave.
Tacoma, Washington

President: J. M. Martinac.
Vice President: Fred Borovich.
Gen. Mgr. & Naval Architect: J. M. Martinac.
Business Manager and Purch. Agent: Fred C. Hansen.

MARTINOLICH SHIPBUILDING CO.
Pier 52
San Francisco 7, California

Partner: Anthony C. Martinolich.
Partner: Robert Martinolich.
Partner: John Carovano.
Partner & Naval Architect: John A. Martinolich.
Superintendent: Ralph E. Steel.
Purchasing Agent: Ray Short.
Chief Superintendent: Geo. Martinson.

MONTAGUE PIPE & STEEL CO.
1999 Third St.
San Francisco, California

President: Wm. J. Glover.
Vice President: Richard C. Fisher.
Naval Architect: O. H. Fisher, Jr.

MOORE DRY DOCK CO.
Ft. of Adeline St.
Oakland, California

Chairman of the Board: Jos. A. Moore.
President & Gen. Mgr.: Joseph A. Moore, Jr.
Vice President: James R. Moore.
Vice President and Secretary: N. Levy.
Asst. Mgr.: A. R. Viner.
Naval Architect: R. J. Hischier.
Chief Engineer: J. B. Matthews.
Purchasing Agent: A. L. Wille.

NATIONAL IRON WORKS
Harbor Drive at 27th St.
San Diego, California
Pres. & Gen. Mgr.: C. Arnholt Smith.
Vice Pres.: and Comptroller: John A. Davis.
Vice Pres.: L. N. Boughton.
Asst. Gen. Mgr.: David Bell.
Naval Architect: G. Bruce Newby.
Chief Engineer: Greer W. Ferver.
Purchasing Agent: Wm. S. Petry.

NORTH AMERICAN SHIPBUILDING CORPORATION
(Formerly A. M. Rambo Company)
717 Coast Highway 101
Newport Beach, Calif.
President: Geo. H. Stricker.
Vice Pres.: W. C. Prewitt.
Manager: A. M. Rambo.
Naval Architect and Chief Engineer: August Nordlund.
Purchasing Agent: V. Degner.

NORTHWEST MARINE IRON WORKS
2516 N. W. 29th Avenue
Portland 10, Ore.
Phone Atwater 8222
President: Joseph Grebe.
Vice President: George Grebe.
Secretary-Treas.: H. R. Mendenhall.
Chief Purch. Agent: R. E. Pearson.
Asst. Sec.-Treas.: E. B. Murphy.
Chief Engineer: Warren Howe.

NORTHWEST SHIP REPAIR CO.
P. O. Box 3166
Seattle, Wash.
Owner: A. W. Copp.
Manager: H. A. Cammann.

NORTHWESTERN SHIPBUILDING CO.
Foot of Harris Street
South Bellingham, Wash.
Pres. & Gen. Mgr.: J. N. Gilbert.
Vice Pres.: A. P. Bassett.
Gen. Mgr.: J. N. Gilbert.
Asst. Mgr.: Wm. S. Coon.
Naval Architect: H. C. Hanson.
Purchasing Agent: A. G. West.

OLSON & WINGE MARINE WORKS
4125 Burns Ave., N. W.
Seattle, Wash.
Owners: Oscar E. Olson and Carl B. Winge.
Asst. Gen. Mgr.: Edward Winge.
Plant Superintendent: Ted Vadset.
Purchasing Agent: Wm. Richardson.

OLYMPIC SHIPBUILDERS
71 Columbia St.
Seattle, Washington
Plant: Port Angeles
Secretary: L. K. Smith.
Treasurer: Miller Freeman, Jr.

OREGON SHIPBUILDING CORP.
St. Johns Station
Portland 3, Oregon
Vice President and General Manager: E. F. Kaiser.
Secretary: J. F. Reis.
Assistant Gen. Manager: Albert Bauer.
Yard Supt.: Russell Hoffman.
Outfitting Supt.: F. A. Abraham.
Erection Supt.: George C. Wright.
Chief Purchasing Agent: F. D. McClintock.
Asst. General Supt.: John Tacke.
Office Mgr.: Allison MacGregor.

PACIFIC BOAT BUILDING CO.
759 Port Tacoma Road
Tacoma, Washington
President: M. I. Broback.
Exec. Vice Pres.: Thos. Henderson.
Vice President: Ivar Dahl.
Secretary: Bert Broback.
Treasurer: and Purchasing Agent: Joe M. Henderson.

PACIFIC CAR & FOUNDRY COMPANY
4th & Factory Streets
Renton, Washington
President: Paul Pigott.
Vice Pres.: H. N. Curd.
Vice Pres.: F. Schmitz.
Purchasing Agent: H. E. Ridalls.

PACIFIC COAST ENGINEERING CO.
Oak and Clement Sts.
P. O. Drawer E.
Alameda, Calif.
President: C. H. Ramsden.
Vice President: F. S. Edinger.
Manager: F. S. Edinger.
Chief Engineer: Will C. Hall.
Purch. Agent: Mrs. P. A. Matthews.

PACIFIC COAST SHIPBUILDING CO.
Port Chicago, Calif.
President: D. C. Seagrave.
Vice President: W. F. Williamson.
Manager: D. C. Seagrave.
Naval Arch. and Chief Eng.: Gordon Ennes.

PACIFIC DRY DOCK & REPAIR CO.
Foot of 14th Ave.
Oakland, Calif.
President: Thomas Crowley.
Vice President: Thomas B. Crowley.
Manager: Oliver Mahin.
Chief Engineer: Al Rogers.
Purchasing Agent: George J. Williams.

HARRY W. PARSONS, INC.
555 Illinois Street
San Francisco, Calif.
President: Harry W. Parsons.
Manager: R. J. Luick.
Chief Engineer: Alfred T. Rogers.
Purchasing Agent: Dolores Nelson.

POLLOCK-STOCKTON SHIPBUILDING CO.
Stockton, Calif.

PORTLAND SHIPBUILDING CO.
Portland, Ore.
President and Mgr.: Albert K. Nelson.

PUGET SOUND BOAT BUILDING CORP.
820 East D Street
Tacoma 2, Wash.
President: J. B. Breskovich.
Vice President: J. J. Petrich.

PUGET SOUND BRIDGE & DREDGING CO.
Ship Construction & Repair Div.
2727 - 16th Ave., S.W.
Seattle 4, Wash.
President: H. W. McCurdy.
Vice Pres.: Raymond J. Huff.
Gen. Manager: G. H. Stebbins.
Procurement Mgr.: E. H. Cummins.
Purchasing Agent: E. B. Devener.
Chief Engineer: C. W. Johnson.
Gen. Supt.: C. M. Rohda.
Gen. Ship Repair Foreman: G. Fabbri.

RELIABLE WELDING WORKS
1218 West Bay Drive
Olympia, Wash.
President: A. W. Lewis.
Vice President: A. R. Lewis.
Asst. Vice President: H. R. Lewis.
Secretary: E. H. Lewis.
Asst. Purch. Agent: J. A. Laspa.
Naval Architect: H. C. Hanson.
Production Manager: Geo. Risse.

SAGSTAD SHIPYARDS
Foot of 20th Ave., N. W.
Seattle, Washington
Owner: S. E. Sagstad.
Construction Supt.: Donald Olts.
Construction Supt. at La Conner, Wash. Plant: Alf. Hansen.
Naval Architect: H. C. Hanson.
Chief Engineer: Alex Christianson.
Purchasing Agent: Arthur Hanson.

SAN DIEGO MARINE CONST. CO.
Foot of Sampson St.
San Diego, Calif.
President: O. J. Hall.
Vice President: Ralph J. Chandler.
Manager: James N. Johnson.
Naval Architect: Dean B. Johnson.
Purchasing Agent: Harry Plumberg.

SAN PEDRO BOAT & YACHT CO.
Berth 44, Outer Harbor
San Pedro, California
President: David R. Faries.
Vice President: Robert E. Klinkner.
Manager: Robert E. Klinkner.
Chief Engineer: John M. Harper, Jr.
Purchasing Agent: W. D. Barnett.

SAUSALITO SHIPBUILDING COMPANY
1702 Bridgeway Blvd.
Sausalito, Calif.
General Manager: Robert E. Rich.
Asst. General Mgr.: Ernest Collins.
Purchasing Agent: J. T. Butts.

SEA-BELL SHIPBUILDING CO.
5400 W. Marginal Way
Seattle, Wash.
President: J. Razore.
Vice President: A. M. Morelli.
Asst. General Manager and Technical Adviser: A. W. Copp.
Naval Architect: W. C. Nickum.
Chief Engineer: H. D. Lohse.
Purchasing Agent: G. H. Elliott.

SEATTLE S. B. & D. D. COMPANY
2629 West 54th
Seattle, Wash.
President: Fred Bianco.
Vice President: Robert Scobie.
Manager and Sec. Treas.: R. B. Bivins.
Naval Architect: W. C. Nickum & Sons.
Chief Engineer: Fred Foerster.
General Superintendent: Wm. Larsen.
Purchasing Agent: A. R. Pickering.

SHAIN MANUFACTURING CO., THE
2520 Westlake No.
Seattle, Wash.
Owner and Manager: M. G. Shain.
Purchasing Agent: Stanley Young.
Superintendent: Al Johnson.
Superintendent Machinery Installation: Ray Miller.
Carpenter Shop Foreman: Emerald Baunsgard.
Paint Shop Foreman: F. J. Selber.

SOULÉ STEEL COMPANY
1750 Army St.
San Francisco 24, Calif.
President: Edw. L. Soulé.
Vice Pres.: E. B. McClure, N. E. Dawson.
Manager: Edw. L. Soulé.
Naval Architect: W. C. Nickum & Son.
Chief Engineer: Frank Kullmer.
Purchasing Agent: S. P. Selig.

SOULÉ STEEL COMPANY
6200 Wilmington Avenue
Los Angeles 1, California
Vice President: E. B. McClure.
Chief Engineer: V. E. Simhauser.
Superintendent: A. O. Aaland.
Purchasing Agent: R. L. Cole.
Chief Accountant: G. A. Smith.

SOUTH COAST COMPANY
Newport Beach, Calif.
President: Hubbard C. Howe.
Vice Presidents: Dr. Walton Hubbard and Walter Franz.
General Supt.: Howard Platt.
Purch. Agent: Spaulding Eastman.

STANDARD SHIPBUILDING CORP.
Los Angeles Harbor
P. O. Box 271
San Pedro, California
President: J. A. Cosmas.
Vice President: J. M. Carras.
Vice Pres. and Dir.: G. Logothetis.
Industrial Manager: D. S. Charles.
Secy. & Treas.: D. N. Moraitis.
Chief Engineer: W. E. Smith.
Purchasing Agent: C. A. Graf.

STEEL CONSTRUCTION CO.
Ft. of S. W. Curry St.
Portland, Ore.
President and Mgr.: F. E. Owen.
Treasurer: E. J. Secord.
Comptroller: A. N. Haradon.
Naval Architect: Phillip Mitchell.
Chief Engineer: Frank A. Tabor.
Purchasing Agent: E. J. Secord.
Superintendent: Ray Lewis.

STEPHENS BROS. INCORPORATED
345 N. Yosemite St.
Stockton, Calif.
President: R. R. Stephens.
Vice President: Richard T. Stephens.
Manager: Theodore Stephens.
Naval Architect: Richard T. Stephens.
Supt. of Construction: Kenneth J. Short.
Purchasing Agt.: John E. Gersbacher.

WILLIAM F. STONE AND SON
2517 Blanding Ave.
Alameda, Calif.

TODD SHIPYARD CORP.
Seattle Division
1801-16th Ave., S. W.
Seattle 4, Wash.
Vice President: R. J. Lamont.
Gen. Manager: J. D. Haynes.
Purchasing Agent: J. S. Robinson.

TODD PACIFIC SHIPYARDS, INC.
Tacoma Division—Tacoma, Wash.
Foot of Alexander Ave.
Pres. & Gen. Mgr.: R. J. Lamont.
Chief Engineer: James F. Goodrich.
Purchasing Agt.: Howard J. Flanders.

TODD PACIFIC SHIPYARDS, INC.
Seattle Division—Seattle, Wash.
2400-11th St., S. W.
President: R. J. Lamont.
Vice Pres. & Gen. Mgr.: E. B. Colton.
Secretary: R. L. Dalton.
Chief Engineer: F. G. Greaves.
Purchasing Agent: C. E. Bothwell.

TREGONING BOAT COMPANY
6505 Seaview Ave.
Seattle, Washington
President & Mgr.: James J. Tregoning.

UNITED CONCRETE PIPE CORP.
Long Beach, Calif.
President: B. J. Ukropina.
Vice Pres: Steve Kral, T. P. Polish.
Administrative Mgr.: Cecil W. Drake.
Chief Engineer: Harold Pope.

UNITED ENGINEERING COMPANY
500 Beale Street
San Francisco 5, Calif.
President: R. E. Christy.
Exec. Vice President: J. P. Thompson.
Vice President & Works Manager: George Sutherland.
Treasurer: R. P. Hasenauer.
Sec. & Asst. Treasurer: G. A. Wilson.

UNITED STATES NAVY YARDS

MARE ISLAND NAVAL SHIPYARD
Commander: G. C. Klein, Rear Adm.
Admin. Officer: R. L. Boller, Capt.
Asst. Ind. Mgr., Ferry Bldg.: H. F. Pfingstag, Capt.
Design Supt.: P. B. Moore, Cdr.
Fiscal Officer: W. H. Bicknell, Capt.
Ind. Relations: Ray L. Wilbur, Jr., Lt. Cdr.
Management Planning & Review: J. L. Bird, Capt.
Ordnance Supt.: G. S. Patrick, Capt.
Planning Officer: A. O. Gieselmann, Capt.
Planning & Estimating Supt.: W. B. Holden, Capt.
Production Officer: C. D. Wheelock, Capt.
Public Works Officer: C. R. Johnson, Capt.
Repair Supt.: H. Burris, Capt.
Shop Supt.: W. C. Sprenger, Capt.
Supply Officer: J. H. Hepliby, Capt.
Asst. Supply Officer: H. P. Kohlhas, Capt.
Asst. Repair Supt., Hull: W. E. Howard, Capt.
Electronics Officer: A. L. Becker, Capt.

PUGET SOUND NAVAL SHIPYARD
Commandant: Rear Admiral Ralph W. Christie, U.S.N.
Commander: Commodore W. M. Thompson, U.S.N.
Administrative Officer: Captain W. B. Coleman, U.S.N.
Production Officer: Captain Paul B. Nibecker, U.S.N.
Planning Officer: Captain H. E. Haven, U.S.N.
Public Works Officer: Captain Edmund B. Keating, U.S.N.
Supply Officer: Captain Howard M. Shaffer, U.S.N.

TERMINAL ISLAND NAVAL SHIPYARD
San Pedro, California
Commander: Commodore G. T. Paine, U.S.N.
Administrative Officer: Capt. J. McD. Smith, U.S.N.
Planning Officer: Capt. J. E. Hamilton, U.S.N.
Production Officer: Capt. R. K. Wells, U.S.N.
Supply Officer: Capt. G. W. Davis (SC) U.S.N. (Ret.)
Medical Officer.: Capt. R. R. Myers, U.S.N.R.
Asst. Industrial Manager: Capt. R. C. Bell, U.S.N.
Public Works Officer: Capt. H. E. Wilson, U.S.N.
Electronics Officer: Comdr. E. B. Robinson, U.S.N. (Ret.)
Industrial Relations Officer: Comdr. W. A. Andrews, U.S.N.R.

U. S. NAVAL DRYDOCK (12 N.D.)
Hunters Point
Comdr: J. W. Fowler, Commodore.
Admin. Officer: John Meyer, Capt.
Design Superintendent: A. M. Chambliss, Lt. Cdr.
Hull & Rep. Supt.: W. T. Jones, Capt.
Machinery & Asst. Repair Supt.: W. S. MacLeod, Cdr.
Ordnance Supt.: C. E. Bpiner, Capt.
Planning Officer: J. A. Sweeton, Capt.
Production Officer: E. P. Kranzfelder, Capt.
Public Wks. Officer: W. T. Eckberg, Capt.
Shop Supt. Production: L. C. Chamberlin, Capt.
Submarine Admin.: C. C. Burlingame, Capt.
Supply Officer: H. A. Phares, Capt.

VICTORY SHIPBUILDING CORPORATION
615 Coast Highway
Newport Beach, Calif.
President: Ray V. Marshall.
Vice President: A. M. Shaw.
Purchasing Agent: Frank S. Wade.

WASHINGTON BOAT WORKS
Seattle, Washington
Manager: P. G. Knox.
Sales Manager: Thos. E. Farrell.

WEST COAST SHIPBUILDING AND DRYDOCK COMPANY
P. O. Box 751, Berth 55
San Pedro, California
Partner: O. F. Collinge.
Partner: James P. Fitzpatrick.
Partner and General Manager: Frank Cavanaugh.
Sales Eng.: Stewart S. Small.
Comptroller: C. B. Dykes.
General Supt.: C. A. Swain.

WESTERN BOAT BUILDING CO.
2505 East 11th St.
Tacoma, Wash.
Partners: M. A. Petrich, H. M. Petrich, Martin Petrich, Jr., Allen Petrich.
Naval Architect: James Petrich.

WESTERN PIPE & STEEL COMPANY OF CALIFORNIA
See: CONSOLIDATED STEEL CORP.

WILLAMETTE IRON & STEEL CORP.
3050 N. W. Front St.
Portland, Ore.

President: Austin F. Flegel, Jr.
Vice Pres. and Gen. Manager: W. A. Kettlewell.
Secretary: H. A. Hamlin.
Treasurer: H. H. Hunt.
Naval Architect: J. E. Carson.
Chief Engineer: J. R. Daley.
Purchasing Agent: C. L. Brainerd.

WILMINGTON BOAT WORKS, INC.
P. O. Box 756
Wilmington, California

President: Robert E. Carlson.
Vice President: William L. Horton.
Sec'y-Treas.: Evelyn E. Marrs.
Naval Architect & Associate: Hugh M. Angelman.
Machine Shop Supt.: W. E. Greene.
Yard Superintendent: Arthur Gundy.
Paint Foreman: H. J. Allred.
Purchasing Agent: Kenneth Johnson.
Brokerage & Insurance: George Michaud & Associates.

WILMINGTON IRON WORKS
432 West "C" St.
Wilmington, Calif.

Pres.: Walter C. Richards.
Chief Engineer: Samuel E. Hood.
Purchasing Agent: Peg Andrae.

WINSLOW MARINE RAILWAY & SHIP-BUILDING CO., INC., THE
Winslow, Wash.

Exec. Vice Pres.: James F. Griffiths.
Vice President: H. A. Ayers.
Vice Pres. and Mgr.: C. M. Sigle.
Works Manager: A. H. Lindgren.
Chief Engineer: R. B. Stevenson.
Purchasing Agent: Louis Zetin.

Keep Posted

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Specialists in Marine Paints

With the return of our merchant ships to their peacetime operators, the matter of economical repair, maintenance and conversion is one of considerable importance to the operating staffs. The wise selection of the proper quality of paint for use on every part of the ship, will eventually result in considerable savings in lay-up time for cleaning and painting.

What might be termed one of the most vexatious problems of the shipmaster is that of keeping the submerged portion of the ship's hull free from all types of marine growths. All sorts of barnacles and other forms of marine matter continue to foul the vessel's bottom, so that even the most active commercial vessels appear to suffer a 5 to 10 per cent loss in operating efficiency after nine months out of dry dock.

For well over a period of forty years the chemists and manufacturing staff of the American Marine Paint Company have studied the many problems involved in this marine field and are able to offer a line of marine paints which will guarantee satisfaction under the most trying sea-going conditions.

The company's Germicide Composition bottom paint is recognized as one of the leading standard brands throughout the United States and is manufactured to suit all conditions. The tropical anti-fouling composition is compounded to combat the trying conditions found in tropical waters. They also manufacture a supertropical antifouling composition which is especially suitable for the sides of the hull where grass as well as other marine growth is prevalent.

Yachtsmen have found their Triple "C" Cape Cod Copper Compound to be an outstanding bottom paint over many years.

Founded in 1903 by J. M. Botts for the purpose of specializing in the manufacture of marine paints the company's plant is situated at Bryant Street, San Francisco.

The officers of the company are John Parker, president, and Fred W. Blanch, vice president in charge of sales.

New Flame-Proofing Finish for Fabrics

One of America's wartime secrets, a revolutionary fabric flame-proofing finish for textiles known as Ban-Flame, was revealed by the Joseph Bancroft & Sons Company, Wilmington, Delaware.

When applied to textiles this remarkable finish confines the action of fire to the area contacted, prevents spreading of the flame and frees the fabric from any afterglow. Ban-Flame treated fabrics do not burn, they only char, and then only at the point of contact with an open flame.

Soon to be made available for civilian use through its own mills, as well as others licensed by Bancroft, this process is a solution to the fabric and textile fire hazard in the marine and industrial world.

On commercial vessels, pleasure craft, automobiles and airplanes, it meets the need for a combined flame-proof and mildew-proof finish for upholstery fabrics, folding furniture, curtains, draperies and materials which are exposed to water and dampness, for Ban-Flame has excellent mildew-proof qualities.

This new process is to be moderately-priced to manufacturers, making it possible to provide the public with combined flame-proof, mildew-proof fabrics without appreciable increase in cost.

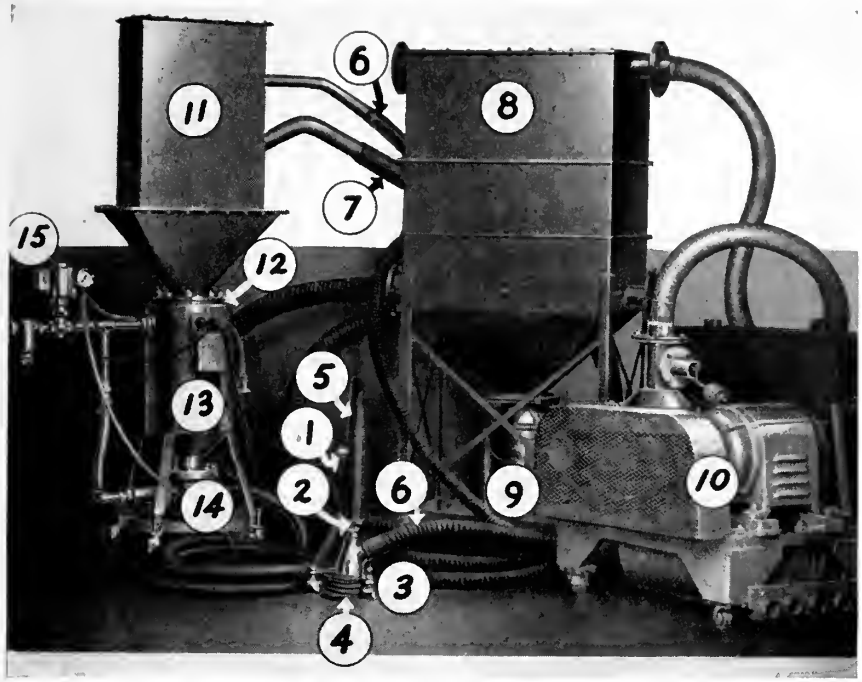
Packaged Line of Conveyors

A unique feature in the marketing of conveyors is the completely packaged line of gravity roller conveyors by Lyon Metal Products, Inc., of Aurora, Illinois.

These conveyors have great industrial use in handling and transportation of cartons, bales, packages, boxes, crates and other types of merchandise. They are available in these sizes:

Three straight sections all 10 feet long and in three widths, 12″, 18″ and 24″; three 90-degree curved sections, 12″, 18″, and 24″ wide; two trestles 18″ and 24″ wide. Each item is a complete unit, packaged and priced, simplifying selling, ordering and stocking.

The transportation on Lyon conveyors is by gravity, no power unit being needed.



1. Push button remote control switch. 2. Tungsten carbide nozzle. 3. Cast aluminum Vacu-Blaster gun. 4. Bristle brush in flexible retainer. 5. Blast hose with built-in electrical conductors. 6. Abrasive and debris vacuum return hose from gun to cleaner. 7. Dust and fines conveying hose from reclaimer to collector. 8. Dust and fines collector. 9. Dust and fines disposal bucket. 10. Vacuum pump unit with relief valve, motor, mufflers and cantroller. 11. Reclaimer and storage tank (250 lbs. grit capacity). 12. Automatic recharging valve. 13. Pressure abrasive feed tank. 14. Automatic feeding and flushing valve. 15. Magnetic operating valve and strainer.

The Vacu-Blaster

This equipment is being successfully used at the present time to remove paint, scale and rust from the decks and other steel surfaces of many ships in the San Francisco Bay Area.

It consists of a specially designed blasting gun, abrasive reclaimer, dust collector, abrasive storage tank, and vacuum pump unit. The gun consists of a blasting nozzle enclosed by a cone, which is surrounded by a pick-up cone, and further enclosed at the point of surface contact by a brush in a flexible retainer. The brush on the gun is held in contact with the surface to be cleaned, and the air stream from the vacuum return line effects a positive pickup of all dirt, dust and abrasive.

The Vacu-Blaster gun is operated with one hand, and is equipped with a push-button which controls the entire cycle of operation. While the surface to be cleaned is bombarded by steel grit from the blasting nozzle, the resultant refuse and spent grit are automatically picked up and returned to the abrasive reclaimer for separation—all in one continuous operation.

The Vacu-Blaster will thoroughly clean steel and many other surfaces without scattering any refuse or abrasive. It eliminates the need for protective clothing or artifically ventilated blast cleaning rooms; also effects a complete reclamation of re-usable abrasive.

The immediate application of paint to the cleaned surfaces, while blasting is going on on adjacent areas, is permissible.

The appliance is distributed by the Vacu-Blast Company of 272 Fremont Street, San Francisco 5.

Cummins Adds 200 and 275-HP. Diesels to Line

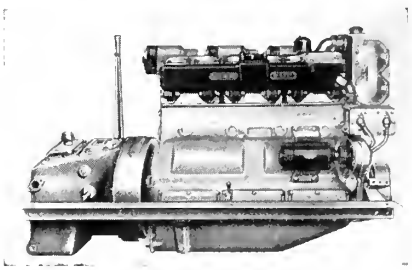
The Cummins Engine Company, Inc., of Columbus, Indiana, has announced the addition of two engines to its extensive line of marine diesels. The new high speed diesels are the Model NHM-600, with a maximum rating of 200 hp at 2100 rpm, and the supercharged Model NHMS-600, rated 275 hp (maximum) at 2100 rpm.

It is not strictly correct to term these two models of Cummins dependable diesels as "new" engines. Both were developed from the long proved and familiar Series H and supercharged HS, six cylinder diesels. The NHM-600 and NHMS-600 are merely higher horsepower, higher speed versions of the HM-600 and HMS-600 models. The increased capacities of the newly developed diesels were obtained by these three major innovations in the established Cummins design:

(1) By increasing the maximum operating speed from 1800 rpm (Models HM and HMS) to 2100 rpm (Models NHM and NHMS).

(2) By increasing size of the bore from 4⅞" to 5⅛", with corresponding increase in piston displacement from 672 to 743 cubic inches.

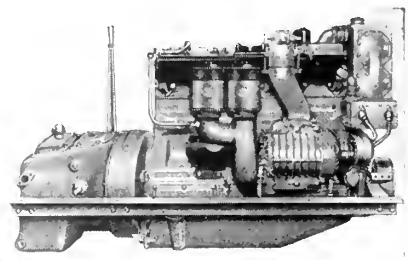
(3) The increased air supply needed to assure efficient combustion of the additional fuel required to produce increased horsepower is obtained by the use of dual intake valves. Dual exhaust valves permit the rapid exhausting of gases from the combustion chamber.



The generator side of the NHM-600 with standard equipment. The six-cylinder Model NHM produces 200 hp at 2100 rpm maximum, has 5⅛" bore and 6" stroke, 743 cubic inch displacement, dual intake and exhaust valves.

•

The supercharger side of the trim, lawweight supercharged Model NHMS - 600 Cummins marine diesel. Specificatians are: six cylinders, maximum rating 275 hp at 2100 rpm, 5⅛" bore and 6" stroke, 743 cubic inch displacement, dual intake and exhaust valves.



The photo shows G-40 Cherry Rivet Gun being used to install self-plugging Cherry Rivets in sheet metal. Note that the gun can be held and operated with one hand. It is well balanced for easy use in any position.

Cherry Blind Rivets

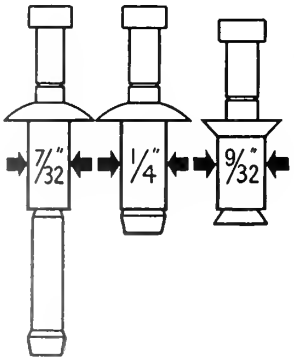
One of the wartime production techniques that has been immediately adopted by peacetime industries is blind riveting.

The practicability of using blind rivets in blind and difficult applications has been proved by their extensive use in military and commercial aircraft production, maintenance and repair. However, the conversion of this fastening technique to other industries has created new demands in blind rivet design and function.

To meet the need for larger diameter blind rivets, three new diameters, 7/32", 1/4" and 9/32" are now being manufactured by the Cherry Rivet Company of Los Angeles. These rivets are available in the three standard Cherry Rivet types, self-plugging, regular hollow and pull-through hollow; in modified brazier and 100° countersunk heads; in A17ST or 56S aluminum alloy, and in steel.

To install these larger rivets, a pneumatic-hydraulic Cherry Rivet gun, the G-40, is now being manufactured. It operates on from 75 to 90 pounds air line pressure, is 13 inches high and weighs seven pounds. The gun is well-balanced for easy one-hand use in any position.

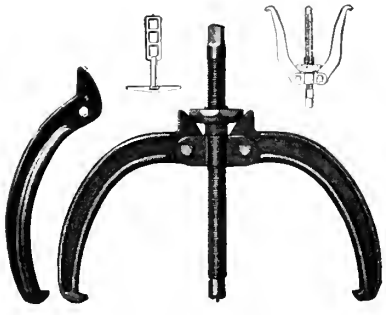
To meet the demand for larger blind fasteners, Cherry Blind Rivets are now manufactured in 7/32", 1/4" and 9/32" diameters, in addition to the 1/8", 5/32" and 3/16" diameters. All Cherry Rivets are available in the three standard types, self-plugging, regular hollow and pull-through hollow; in modified brazier or 100° countersunk heads; in a wide range of grip lengths and in several alloys. Special heads, grip lengths and alloys are made to order.



A Patented Puller for Propellers, Wheels, Pulleys and Gears

The Klay Puller, which is manufactured by The Scott & Ewing Company, Findley, Ohio, is an exclusive design in which the pulling and gripping actions are independent of each other. This puller is claimed to develop greater pulling power plus a safer and more positive grip on the object being pulled.

Not only does the Klay lock-nut principle securely lock the hooks to the gear or wheel so that they will not slip off, but the grip is equally applied on all sides. Thus the total force developed by Klay pulling screw is directed toward removing the wheel instead of part of it being diverted into gripping power.



In addition to regular straight and curved hooks, many types of special hooks are available and interchangeable for specific applications, including expansion hooks which work just the opposite from regular hooks. Klay Pullers are made in two and three-hook types for pulling anything from a 5/8" gear up to a 40" wheel or hub.

New Magnetic Contactor Announced by Westinghouse

For machine tool control, marine and mine application, and similar severe-duty applications where space is limited, a new type M d.c. single pole magnetic contactor is announced by the Westinghouse Electric Corporation.

Small, compact design of the new contactor saves panel space, and unit construction speeds assembly and assures accurate alignment of all parts. Rear or front-connected units are available. Contactor is entirely assembled on a formed frame which also serves as a path for the magnetic flux.

The small frame contactors in this line are limited to applications in which the coil voltage and the voltage of the circuit being interrupted do not exceed 250 volts. The deep frame contactors, which provide greater winding space for the operating coil, are suitable for voltage up to 600 volts.

Operating coils are rated for continuous duty and will operate the contactors at 80 per cent to 110 per cent of their rated voltage. The contacts are insulated for a maximum potential difference of 600 volts among parts.

New Roustabout Crane

The Hughes-Keenan Company, Mansfield, Ohio, has recently announced a powerful new roustabout crane, Model MC-8, which handles loads to 10 tons. It is a mobile full-swing boom crane, tractor mounted, that is easily driven where needed.

Booms of standard lengths from 15 to 30 feet are furnished; MC-8 is especially adapted to use of long booms, will handle loads of nearly 2 tons at a 30-foot radius, 10 tons at 9 feet. Ball bearing boom turntable and all gears and clutches run in oil, fully enclosed. Boom swing and hoist and load hoist are all independent actions, with separate controls and automatic brakes.

It is ruggedly built, designed for efficient operation, ideal for loading, unloading, moving or stacking heavy objects, especially outside the range of big overhead cranes, or where none are available.

SHORESIDE PERSONALITIES

New Officers of Transpacific Conference

ROY V. CROWDER is secretary of the Transpacific Conference in San Francisco, succeeding J. E. Wilson, who has been in the position for more than 24 years. Mr. Wilson will continue on in an advisory capacity. Crowder is the second ranking steamship man to be selected for a key post in Pacific Ocean shipping conference circles within the past month.

Only recently the Pacific Westbound Conference drafted HARRY HORNUNG, who had just returned from 39 months in the Southwest Pacific, with the rank of Colonel, when he was named secretary-manager of this body. Before the war he was freight traffic manager for N. Y. K.

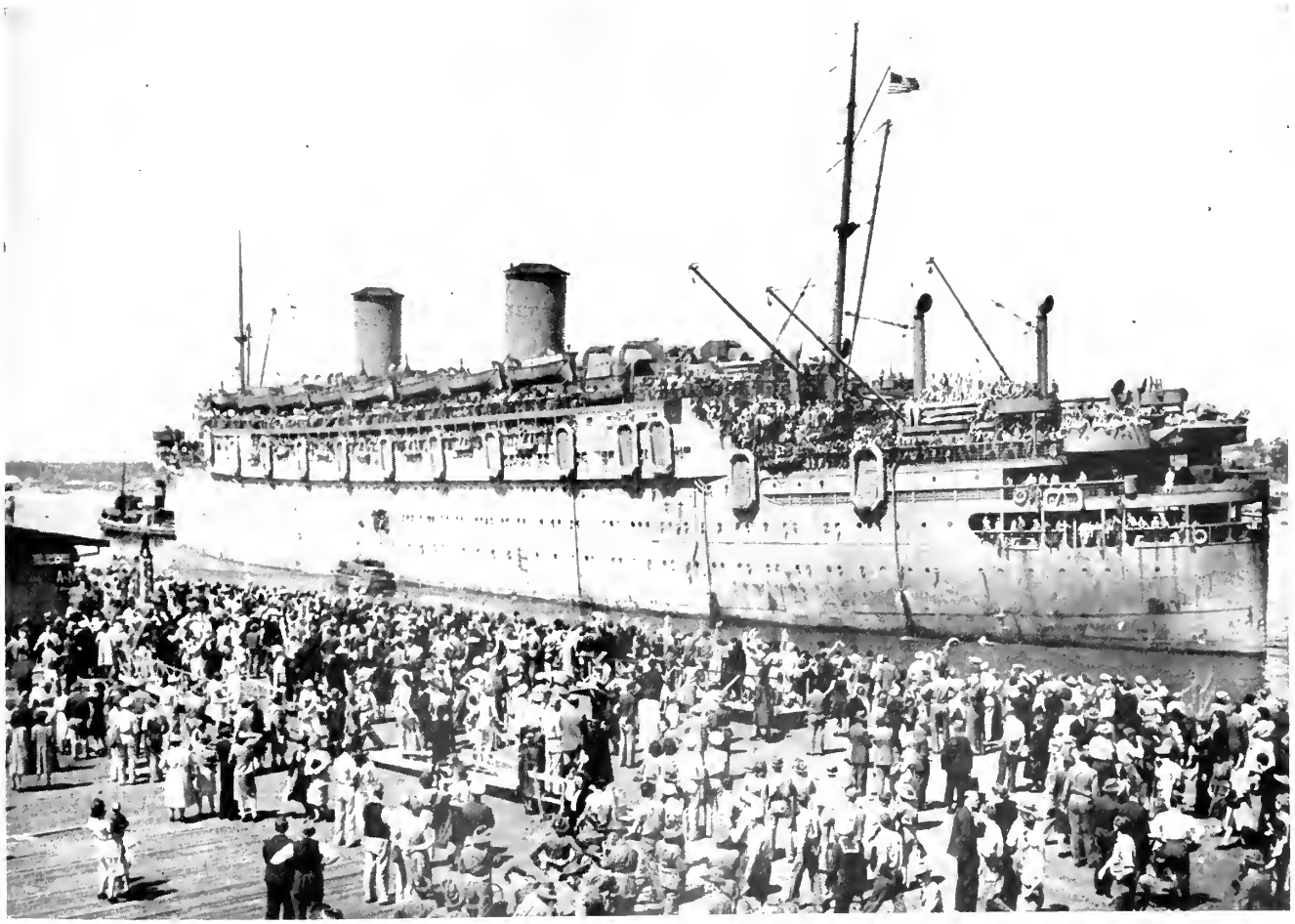
Crowder is remembered as passenger traffic manager for the Grace Line in New York and later in San Francisco. He was also one-time head of the passenger department of the Los Angeles Steamship Company, and was credited with much of the development and success of both their coastwise service with the Yale and Harvard, and the company's entry into the Los Angeles-Hawaiian passenger service with the liners City of Honolulu, City of Los Angeles, and the Calawaii.

Moved

Calmar Steamship in San Francisco shifted its pier offices from Pier 90 to Pier 48. This latter headquarters was recently turned back by the government.

Ever Hear of Merrill's Marauders?

In an address before San Francisco's Commonwealth Club, February 15, General Merrill stated that the Matson liner Lurline was selected to bring specially trained soldiers from the United States, pick up volunteer veterans from General MacArthur's forces in the South Pacific, and deliver them to India for the start of the ever-to-be-remembered raids of the Marauders behind the Jap lines in Burma. The Lurline (below) is about to be restored to Matson management for reconversion.



AGED LINER FINDS ... IN FAST G-E

(Right) G-E service engineer is shown grinding a set of collector rings for use in a 5400 kw marine generator. After being dressed down to close tolerances, the rings are shrunk on a mica sleeve, molded in one piece to cover the collector shell completely. Leads are silver-soldered to the rings. Exacting standards in work of this type are maintained by skilled G-E marine specialists.

(Left) George Barr, trained in marine engineering on the banks of the famous River Clyde in Scotland, is superintendent of General Electric's marine service in San Francisco. He joined G.E. in 1909 to work on turbines and has been closely associated with them ever since. During the last war, he supervised installation of main propulsion machinery in 46 destroyers. Since that time, he has played a large part in the development of geared-turbine and turbine-electric drives for every type of naval and commercial vessel. "Mr. Turbine," as he might well be called, has just hung up a record of 320 ships equipped with G-E turbine drives in the San Francisco area. Now it's his job to "keep 'em sailing."

FOUNTAIN OF YOUTH

KEEP 'EM SAILING SERVICE

REBUILT FROM SCRATCH IN 2 MONTHS, HER 27-YEAR-OLD TURBINES DUPLICATE THEIR TRIAL-RUN PERFORMANCE

A famous liner has served her time. Twenty-seven years of strenuous globe-trotting had left its mark—particularly on the ship's propulsion machinery. The two old turbines were so badly worn they gulped steam at an appalling rate and gave little in return. Leaking steam made the engine room unbearable. An important wartime mission demanded that they be rebuilt.

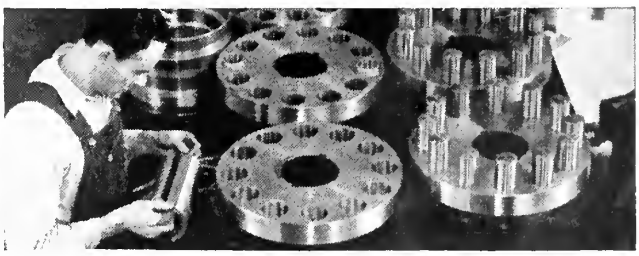
In a little over two months, this veteran liner was back at sea, her two rebuilt turbines turning up the same speed they made on their trial runs 27 years before!

A big job

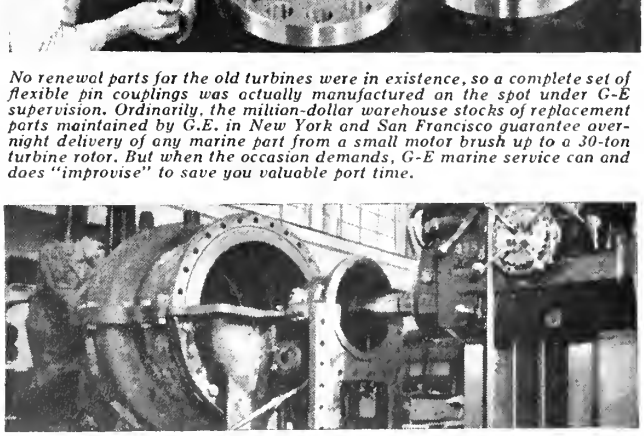
The turbines were so completely run down that only the casings, diaphragms, and rotors could be salvaged. For the rest, scores of renewal parts were needed; yet none was available. It was a big repair job—one which demonstrated dramatically the versatility of G-E keep 'em sailing service.

Working night and day, the General Engineering and Dry Dock Company, with the co-operation of G-E turbine engineers, literally manufactured the needed parts. Worn castings and shafts were metal sprayed and refinished. Turbine rotors were re-bucketed and re-balanced. Finally the reassembled turbines were tested; they developed their full normal rating *and they operated at their original efficiency!*

Another war story? Of course. But we think it makes a point which is just as vital to your peacetime operations. It is another fine example of the *flexibility* of G-E keep 'em sailing service—of G-E's ability to co-operate in speeding repairs *outside* its own service shops—of *expertness* in working on other than G-E equipment. We hope you'll call on this service freely to help cut port time and boost the earning power of *your* ships. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



No renewal parts for the old turbines were in existence, so a complete set of flexible pin couplings was actually manufactured on the spot under G-E supervision. Ordinarily, the million-dollar warehouse stocks of replacement parts maintained by G.E. in New York and San Francisco guarantee overnight delivery of any marine part from a small motor brush up to a 30-ton turbine rotor. But when the occasion demands, G-E marine service can and does "improvise" to save you valuable port time.



Producing a new turbine casing might take 6 months. This line couldn't wait that long, so the old casing was rebuilt from the ground up. Here it is being completely re-machined. Metal spraying, an up-to-date repair technique, is often used on jobs like this to salvage old equipment. The record shows that whenever the G-E marine organization was asked to rebuild a turbine, or to supervise such work, the resulting horsepower output equalled the manufacturer's original rating.

GENERAL ELECTRIC

200-50-9800

SHORESIDE PERSONALITIES

Moore Dry Dock Appoints Sandner

The Moore Dry Dock Company announces the appointment on February 1, 1946, of Victor R. Sandner as manager of their structural steel division. Sandner has been with the company since 1929, and previous to that time spent thirteen years on structural engineering work for engineers and architects in the bay area.

During World War II he was in charge of the structural steel department's operations on many important private and war contracts. The company is now furnishing, fabricating and erecting steel on numerous buildings and projects in connection with reconversion and plant expansion in the Western States.

American-Hawaiian-Luckenbach Joint Service

The American-Hawaiian Steamship Company and the Luckenbach Steamship Company, Inc., advise that in order to offer the most satisfactory service to shippers and consignees under reduced schedules, as recently advocated by the War Shipping Administration, they will, effective immediately, operate a joint service between Boston, Philadelphia and New York and Pacific Coast Ports with sailings, both eastbound and westbound, every five days. Luckenbach will continue to operate their independent service between the Pacific Coast and the Gulf, and American-Hawaiian will likewise continue their South Atlantic service on an independent basis.

Maritime Commission Construction Office Moves

The United States Maritime Commission announced that the office of the Director of Construction will be returned to Washington from New Orleans February 1. The construction headquarters have been in New Orleans since September 1, 1945. L. R. Sanford will continue as Director of Construction.

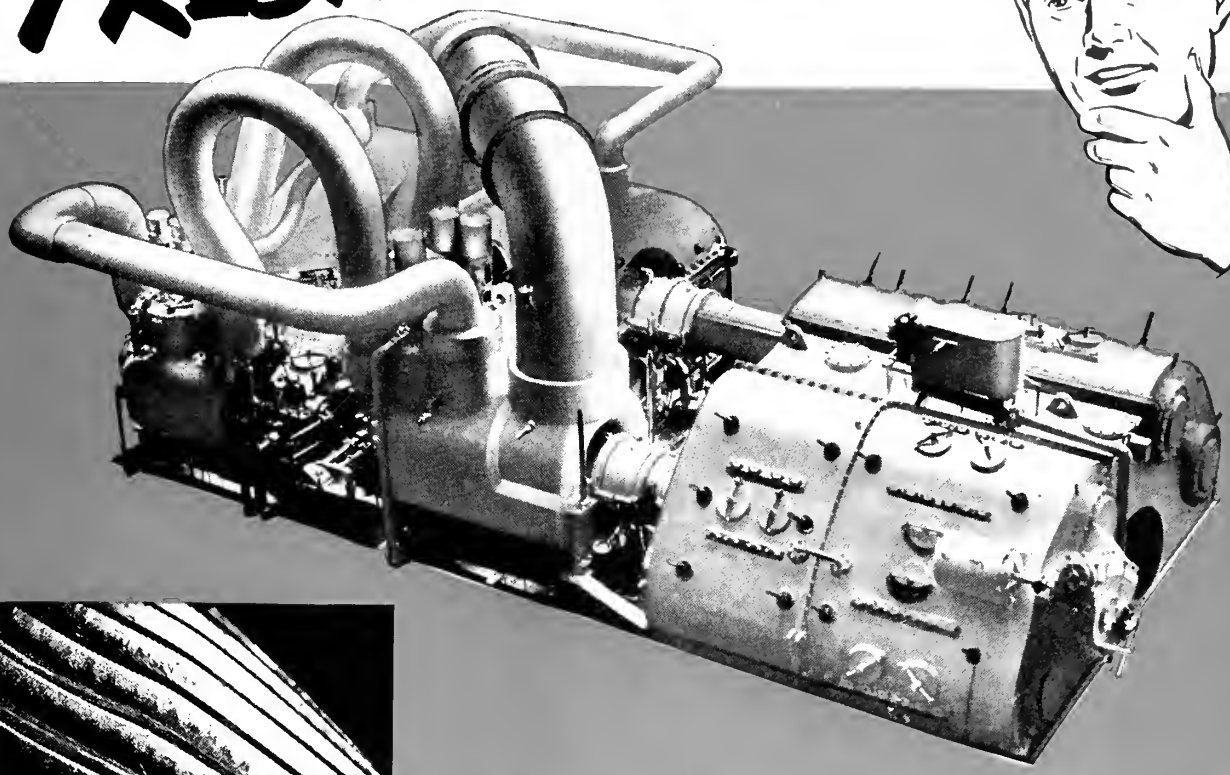
KEEP POSTED

Revolutionary Features in New Wire Rope Clamp

Cabl-ox, a new wire clamp, has been developed by the Nunn Manufacturing Company of Evanston, Ill., as the answer to the old problem of securing wire rope in its many applications.

This new product is the first step in reconversion by the Nunn organization. The Cabl-ox clamp, which has been tested by leading industrial laboratories, incorporates a new and exclusive wedging action in its component parts. This is the feature of the product which makes it possible to hold loads in excess of the tensile strength of the rope used. The unit is alloy steel, cadmium plated for weather protection, streamlined for neat appearance and freedom from obstruction. It is easily assembled or disassembled by unskilled labor. It is made in all standard sizes from 1/16" to 3/4".

TIME TO TAKE A FRESH START?



DON'T "INFECT" NEW TURBINE OIL BY PUTTING IT IN A DIRTY SYSTEM!

Upper photo—Because of improper cleaning methods, the oil in this system broke down completely after only six months of operation. Note severe wear on the gears caused by abrasive contaminants.

Lower photo—When Shell Marine Turbo Oil is used . . . following Shell Turbine Cleaning Procedure . . . gears remain clean and peak efficiency results.

SEND FOR THIS BOOKLET NOW!

Every turbine owner and operator should have a copy. It contains full details on the Shell Marine Turbo Cleaner and Shell Cleaning Procedure, and shows you how to get peak efficiency, lower operating costs.

SHELL CLEANING PROCEDURE

makes it easy . . . makes it sure!

A small amount of sludge and dirty oil acts on clean, new oil like a rampaging disease—can shorten its life 50% to 75%. Chemists call it the autocatalytic effect—sludge, metal particles and rust acting as catalysts to hasten the oxidation of new oil.

Before you add that next batch of make-up oil to your system, be sure to get details about Shell's Marine Turbo Cleaner and the Shell Cleaning Procedure. *You may decide to take a fresh start.*

Remember, too, this procedure should be followed before putting the first charge of lubricating oil in *new equipment.* As insurance, it's cheap enough to know that your turbine is free of slushing compound, run-in oil, and metal chips.

Call or write for your copy of the Turbine Cleaning Manual. Shell Oil Company, Incorporated, 50 West 50th St., New York 20, N. Y., or 100 Bush St., San Francisco 6, Calif.

SHELL

SHELL MARINE TURBO OIL

SPERRY GYROSCOPE COMPANY has published two beautifully bound publications, one on Electro-Mechanical Steering Systems, No. 19-10, the other on Gyro-Pilots, No. 19-15. Each is a complete treatise on its subject with photographs and outline drawings illustrating the text.

BAKER ARTICULATED FORK TRUCK is a four-page leaflet showing specifications and work possibilities of this handy truck. This leaflet is published by Baker Industrial Truck Division, of The Baker-Raulang Co., Cleveland, Ohio.

BETHLEHEM STEEL COMPANY has printed a beautifully illustrated booklet, No. 189, on the steel facilities on the Pacific Coast. The story of steel—through the operation of three steelmaking plants, three structural steel fabricating works and four mill depots in the four areas of the Pacific Coast by Bethlehem makes this booklet most interesting.

OAKITE-VAPOR HEAVY DUTY CLEANING UNIT is the title of a six-page brochure explaining the essential features of Oakite's new quality-engineered, multiple-duty steam cleaning unit for modern industrial plants.

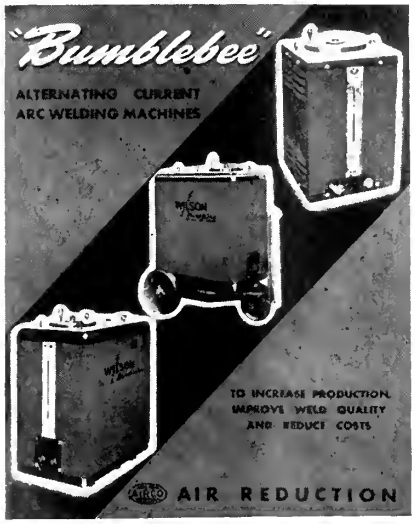
JESSOP STAINLESS STEELS, title of a specifications bulletin recently issued by Jessop Steel Company of Washington, Pa. It lists bars, hot rolled, cold drawn, centerless ground; billets, sheets, castings, circles, special shapes, plates, rings, flanged and dished head and other designs of steel.

PIONEERS IN INDUSTRY is the story of Fairbanks, Morse & Co. 1830-1945, told and illustrated in a beautiful book of 160 pages with elaborate four color treatment. From weighing devices through gasoline engines, windmills, pumps and gears to the most up-to-date diesel engines and airplane engines, this firm for 115 years has kept pace with the best practice and ethics in American industry. Today the company is on a very solid foundation of experience in its technical staff, integrity in its business dealings, and public confidence in its products. Our congratulations to the pioneers.

EVERLASTING VALVE COMPANY'S new 16-page bulletin No. E-150, explains the latest developments in lever-operated gate valves for industrial and other applications.

NEW A.C. ARC WELDING MACHINE BOOKLET: The new and improved Wilson "Bumblebee" alternating current transformer arc welding machines are fully described in a 16-page illustrated booklet, recently issued by Air Reduction, New York City. Engineering data and complete specifications are supplied and precisely labeled drawings and numerous photographs supplement the text.

The booklet describes the machines of 300 and 500 ampere standard and all-weather designs, and also the new 200-ampere "Bumblebee," which has been designed to meet the demands of a small arc welder, comparable in performance with the big "Bumblebees."



A SALUTE TO THE TUGS OF WAR has been made by Cleveland Diesel Engine Division of General Motors Corporation in a beautiful booklet called, "War Tugs Tell Tales of the Sea." The booklet contains a portion of the war records of several tugs powered by the company's diesel engines, and the facts presented are of vital importance to every shipbuilder, naval architect and vessel operator.

CELLULAR RUBBER: This four-page pamphlet, 845-21, published by Sponge Rubber Products Company of Shelton, Connecticut, describes various forms in which sponge rubber, bonded fiber and other sub-density materials are manufactured. Illustrated in the pamphlet are 98 molded, die cut and fabricated shapes of flexible, elastic, compressible products used for cushioning, shock absorption, vibration dampening, sealing, insulating and gasketing.

THE WATERTOWN BOOK OF PLASTICS is a new booklet issued by The Watertown Manufacturing Company of Watertown, Connecticut, that describes the company's complete service in plastics, including the development of Neillite, a phenolic-formaldehyde molding material. The booklet concisely explains the various thermosetting and thermoplastic materials that the company molds, and includes the new materials Saran, heat resistant Lucite, Cerex, Nylon and Polythylene. The booklet contains diagrams, graphs, illustrative photographs of custom molds in the commercial market, and a plastics properties chart.

SPRAY NOZZLES is the title of a sixteen page bulletin which sets forth and illustrates the Yarnell-Waring nozzles for water cooling, air conditioning and for general industrial uses in the catalogue issued by the Yarnall-Waring Company of Philadelphia, Pa.

HOW TO PUT OUT A MOTOR VEHICLE FIRE is the title of a cleverly illustrated, 24-page booklet and guide (which booklet should be tucked away in the glove compartment or similar handy location in all vehicles), issued by The General Detroit Corporation of Detroit, Mich.

is your boiler-water treatment COMPLETE?

HERE'S WHAT *COMPLETE* TREATMENT *MUST* INCLUDE

No. 3 in a series of advertisements on the requirements for the COMPLETE conditioning of boiling water.

1. Sound Chemical Treatment

(discussed in the February issue)

2. A Good Organic Coagulant

3. Simple But Scientific Control

(to be discussed in the April issue)

4. Competent Service & Instruction

(to be discussed in the May issue)

THE PRIMARY FUNCTIONS OF A GOOD ORGANIC COAGULANT ARE:

- **Maintain sludge in a "fluid" state to prevent adherence to heating surfaces.**
- **Eliminate carry-over by coagulation of suspended matter.**
- **Avoid costly blow-down through rapid settling of suspended matter and quick elimination by a short blow.**

BUT **— the finest coagulant is only ONE of the four requirements for COMPLETE boiler-water treatment.**

If you want to know how a real organic coagulant works hand in hand with chemical treatment, talk it over with the DREW Man—there's no obligation!

E. F. DREW & CO., INC.

15 East 26th Street, New York 10, N. Y.

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COMPLETE AMEROID SERVICE is available in these principal seoports in the United States and Canada:

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AMEROID

THE COMPLETE BOILER-WATER TREATMENT

MAIL THIS COUPON TODAY!

E. F. Drew & Co., Inc.
15 E. 26th St., New York 10, N. Y.
I am interested in further information about COMPLETE Boiler-Water Treatment.

NAME_____

FIRM_____

ADDRESS_____

52

Hot Off the Press

NEW BULLETIN ON PORTABLE VACUUM CLEANERS: This 10-page bulletin is extensively illustrated with explanatory photographs showing a line of Exidust portable vacuum cleaners suited to the needs of almost every type of industrial plant, institution, transportation facility, and public or commercial building. The bulletin is issued by Allen Billmyre Company.

PUBLICATION NO. 3250 on High Pressure Condensate Return System is being distributed by The Cochrane Corporation in Philadelphia. Benefits derived from the use of this system, as described in the booklet, include the establishment of higher heat transfer rates, definite uniformity, and more heat from the same pressure of steam with less fuel costs and increased boiler capacity.

PLANE PORTRAITS, a 28-page booklet, illustrated in color, and published by Turco Products, Inc., Los Angeles, contains a series of articles published by the Editors of Air Tech magazine as a service to the Aviation Industry, and in recognition of the growing importance of chemistry in the care and maintenance of aircraft. The chemical processes and materials described are now available to help in solving production and maintenance problems in every industry. In addition to the technical data, Plane Portraits also contains 8" x 11" photographs, in color, of popular planes.

TAYLOR ISSUES REFRIGERATION CATALOG: With the great strides that have been made in refrigeration during the past few years has come an increasing need for proper and complete instrumentation. The Taylor Instrument Companies of Rochester, New York, has just published a 36-page catalog, No. 300, dealing exclusively with the application of control instruments to the refrigeration field. The catalog is divided conveniently into two sections, one covering applications—the other, instruments.

CLEMSON BROS. OFFERS HANDBOOK ON HACK SAW CARE: Selection of the proper blades for cutting various metals, causes and cures of common blade difficulties, and hints on "how and how not to do it," are featured in a new 30-page illustrated booklet offered by Clemson Bros., Inc., of Middletown, New York, manufacturers of Star hack saw blades. The booklet includes data on both hand and power blades, and recommendations apply to the blades of all manufacturers, except where the text states otherwise.

CROCKER-WHEELER BULLETIN DESCRIBES SEALED-POWER MOTORS: A four-page bulletin recently issued by the C-W Division of Joshua Hendy Iron Works, Ampere, N. J., describes the company's Sealedpower motor. An exclusive design, this motor was developed for use in industrial locations, in places where there is excessive moisture, and for all applications where the conventional alternating current, totally enclosed, fan-cooled motor has been used in the past. Also included in the bulletin is a cutaway view and pictures of six typical applications. Laboratory tests, made before the motor was placed on the market in 1941, are illustrated and described.

POPE & TALBOT, INC., have recently put out a brochure featuring the advantages of the San Francisco Bay Area, to acquaint business executives, manufacturers and shippers throughout the nation with the pertinent facts and high lights of the San Francisco Bay Area as a potential market for their products. This brochure on the Bay Area is one of a series on Pacific Coast Ports. Other brochures cover the Puget Sound, Columbia Empire and Southern California.

"WORTHINGTON VERTICAL TURBINE PUMPS and Their Typical Applications," is a bulletin No. H-450-B33 recently published by Worthington Pump and Machinery Corporation. The bulletin illustrates a few of the many services to which Worthington vertical turbine pumps may be applied. These pumps, originally designed and used for pumping from bored or drilled wells have, within recent years, been applied to a very wide variety of services in almost every industry.

"THE GAS TURBINE POWER PLANT NOW A REALITY," is the title of a concise treatise with clear cutaway drawings and photographs of the gas turbine, issued by the Elliott Company, Jeannette, Pa., where the organization has designed and built for the U. S. Navy the power gas turbine. Although still in its infancy, the gas turbine will become a popular power plant of the future in varied fields. This booklet introduces its readers to the mysteries of the Elliott power plant.

"THE ATOM OF BERYLLIUM" is an attractive two-color leaflet recently published by The Brush Beryllium Company, Cleveland, to give comprehensive information on the advantages and applications of beryllium, metal alloys and compounds. Of simple atomic structure, beryllium is the only light metal with a high melting point, and provides superior advantages for X-ray transmission and sound velocity.

YOURS FOR THE ASKING!

The manufacturers named in this HOT OFF THE PRESS department will gladly furnish, without obligation to you, copies of the trade literature reviewed in these pages. For quick service, please use this coupon.

PACIFIC MARINE REVIEW
500 Sansome Street - - - San Francisco

Send me this Trade Literature as mentioned in your..... edition:

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(Identify by name of manufacturer)

NAME .....

BUSINESS .....

ADDRESS .....

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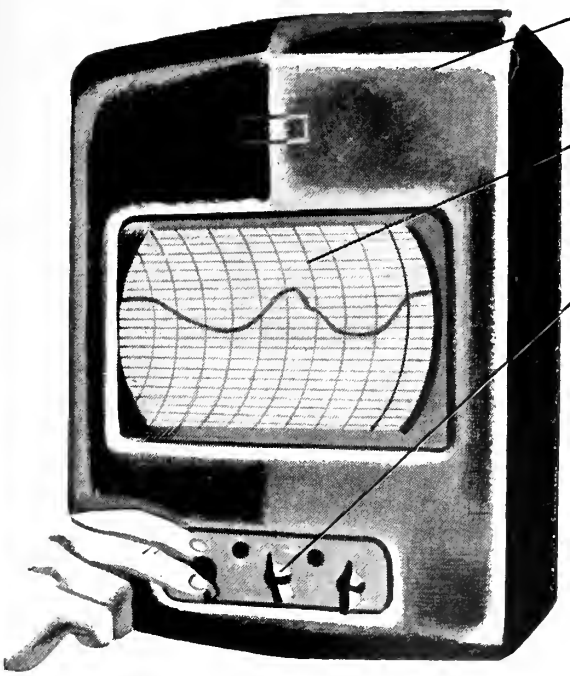
for bigger catches

and

easier navigation

—fishermen everywhere acclaim the

NEW BENDIX-MARINE SUPERSONIC DEPTH-SOUNDER



compact, rugged, splash-proof

large horizontal unobstructed viewing window

low operating cost

The valuable contribution of the fishing industry to the welfare of the nation was never more apparent than during the past five years. Its reward has been substantial too, for today a greatly increased demand for fish and fish products exists everywhere.

Bendix-Marine* is proud to have an important part in supplying this vital commodity—for through the use of the Bendix-Marine Supersonic Depth-Sounder the taking of fish is now surer, quicker, safer than ever before. Everywhere fishermen are saying it is by far the most important addition to fishing equipment to come out of the war.

No other Depth-Sounder has all these features:

Lightweight • Portable • Lower First Cost • Easier Installation • No Relays Required • No Keying Adjustments • No Demagnetizing of Projectors • Uses Dry Recording Paper • Large Unobstructed Viewing Window • Horizontal Graphic Chart • Good Bottom Coverage at All Depths • Works on All Available Voltages • Graphic Recorder in One Compact Unit • Component Parts Are Accessible for Maintenance, Quickly and Simply Replaced.

INSTRUMENTS Bendix-Marine CONTROLS

MARINE DIVISION, BENDIX AVIATION CORPORATION
NORWOOD, MASSACHUSETTS

PRODUCT OF Bendix AVIATION CORPORATION

*TRADEMARK

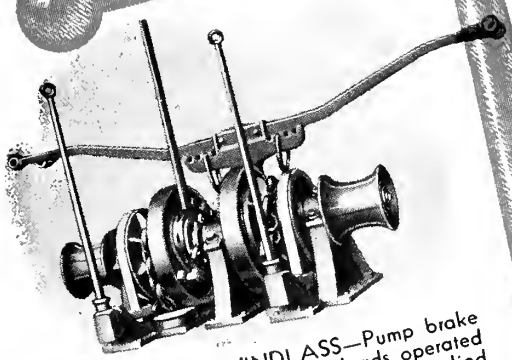
TYPE AND TONNAGE OF MERCHANT VESSELS COMPLETED BY AMERICAN SHIPYARDS FOR THE MARITIME COMMISSION AND PRIVATE INTERESTS—1939 THROUGH 1945—SELF-PROPELLED, STEEL, 2,000 GROSS TONS AND OVER

Type	Number	Gross Tons	Deadweight Tons	Total Horsepower	Horsepower Turbine	Horsepower Turbo-Electric	Horsepower Reciprocating	Horsepower Diesel
Liberty—Cargo—EC2-S-C1	2,580	18,544,475	27,417,605	6,450,000	—	—	6,450,000	—
Liberty-Aircraft Transpt.-ZEC2-S-C5	36	258,381	347,904	90,000	—	—	90,000	—
Liberty-Collier-EC2-S-AW1	24	159,432	264,455	60,000	—	—	60,000	—
Liberty—Tank Carrier—ZEC2-S-C2	8	57,408	79,140	20,000	—	—	20,000	
British Emergency Cargo Ship	60	430,440	633,600	150,000	—	—	150,000	—
C1-M-AV1 and C1-M-AV8 Cargo	209	795,867	1,053,498	355,300	—	—	—	355,300
C1-ME-AV6 Cargo	1	3,805	5,010	2,200	—	—	—	*2,200
N3-S-A1 & N3-S-A2 Coastal Cargo	95	174,316	265,879	123,500	—	—	123,500	—
R1-M-AV3 Refrigerated Cargo	17	64,618	72,879	28,900	—	—	—	28,900
C1-A Cargo, Diesel Drive	46	246,377	334,382	190,900	—	—	—	190,900
C1-A Cargo, Turbine Drive	19	97,197	140,209	83,600	83,600	—	—	—
C1-B Cargo, Diesel Drive	10	67,664	90,410	41,350	—	—	—	41,350
C1-B Cargo, Turbine Drive	85	571,808	765,823	374,000	374,000	—	—	—
C1-MT-BU1 Lumber—Cargo	1	3,133	3,757	2,400	—	—	—	2,400
C2 Cargo, Diesel Drive	22	150,176	198,606	146,528	—	—	—	146,528
C2 Cargo, Turbine Drive	234	1,736,021	2,233,315	1,544,400	1,544,400	—	—	—
C2 Cargo-Refrig.-R2-S-BV1	6	37,062	42,221	39,600	39,600	—	—	—
C3 Cargo, Diesel Drive	4	31,544	47,900	35,600	—	—	—	35,600
C3 Cargo/Transport, Turbine Drive	119	963,396	1,434,427	1,112,650	1,112,650	—	—	—
C4 Cargo	6	65,329	90,614	59,400	59,400	—	—	—
C4 Transport	59	689,839	409,659	584,100	584,100	—	—	—
Cargo, Waterman Type	27	166,455	290,831	178,200	178,200	—	—	—
Cargo, Export Type	25	173,443	216,686	220,000	220,000	—	—	—
Cargo, Seas Shipping Co. Type	6	42,606	60,237	42,000	42,000	—	—	—
Cargo-Refrig.-United Fruit Co.	5	35,370	31,860	66,000	66,000	—	—	—
Cargo, Private Interests	7	53,474	82,230	61,600	61,600	—	—	—
Cargo, Coastal, Private Interests	1	2,323	4,000	1,300	—	—	—	1,300
Bulk Cargo C5-S-AX1-Bethlehem Steel Corp.	1	8,561	24,251	13,000	13,000	—	—	—
Ore Carriers, Great Lakes	21	194,588	334,180	62,000	22,000	—	40,000	—
Cargo, Victory Type, VC2-S-AP2	272	2,068,933	2,898,833	1,795,200	1,795,200	—	—	—
Cargo, Victory Type, VC2-S-AP3	141	1,072,716	1,504,140	1,318,350	1,318,350	—	—	—
Cargo, Victory Type, VC2-M-AP4	1	7,599	10,206	5,850	—	—	—	5,850
Cargo-Transport, Victory, VC2-S-AP5	117	906,750	569,205	1,093,950	1,093,950	—	—	—
Passenger—S. S. America	1	26,454	14,331	37,400	37,400	—	—	—
Passenger—Cargo—Panama R. R. Co.	3	30,063	20,436	30,000	30,000	—	—	—
Passenger—Cargo—Mississippi Ship. Co.	6	47,859	48,427	51,600	51,600	—	—	—
Passenger—Cargo—C2-S1-A1	3	22,461	19,500	28,050	28,050	—	—	—
Passenger-Cargo, C3, Diesel Drive	4	37,040	39,788	35,000	—	—	—	35,000
Passenger-Cargo, C3, Turbine Drive	14	148,643	121,151	130,900	130,900	—	—	—
Transport—C1-S-AY1	13	92,040	33,066	57,200	57,200	—	—	—
Transport—P1-S2-L2	2	17,400	4,298	17,600	17,600	—	—	—
Transport—C3-S1-A3	2	19,771	14,400	18,700	18,700	—	—	—
Transport—P2, Turbine Drive	11	195,979	108,742	205,700	205,700	—	—	—
Transport—P2, Turbo-Elec. Drive	8	131,236	79,168	164,000	—	164,000	—	—
Transport—S4-SE2-BD1—Twin Screw	32	192,000	96,000	211,200	—	211,200	—	—
Transport-Cargo—S4-SE2-BE1—Tw. Screw	32	193,888	88,800	211,200	—	211,200	—	—
Tanker, Twin Screw—T3-S2-A1 and A-3	30	354,871	548,703	456,000	456,000	—	—	—
Tanker, T2-SE-A1	481	4,958,037	7,950,101	3,482,440	—	3,482,440	—	—
Tanker, T2-SE-A and T2-SE-A3	44	464,782	721,927	440,000	—	440,000	—	—
Tanker, T3-S-A1	21	210,457	342,779	161,700	161,700	—	—	—
Tanker, Socony-Vacuum Type	11	110,987	176,578	136,000	136,000	—	—	—
Tanker, T3-S-BF1	3	33,048	54,960	28,050	28,050	—	—	—
Tanker, T3-S-BZ1	4	56,792	92,332	53,400	53,400	—	—	—
Tanker, T3-M-AZ1	1	11,401	17,575	7,500	—	—	—	7,500
Tanker, Liberty Type—Z-ET1-S-C3	62	447,790	655,112	155,000	—	—	155,000	—
Tanker, Coastal, T1-M-BT1 and T1-M-BT2	24	76,860	96,070	33,600	—	—	—	33,600
Tanker, Private Interests	65	622,755	992,798	438,990	438,990	—	—	—
Tanker, Private Interests	11	112,268	180,679	66,800	—	—	—	66,800
Tanker, Private Interests	7	75,165	123,249	42,210	—	42,210	—	—
Tanker, Private Interests, Shallow Draft	10	34,010	59,262	20,000	—	—	20,000	—
Tanker, Private Interests, Coastal	1	2,345	3,450	1,440	—	—	—	1,440
TOTALS	5,171	38,607,508	54,661,634	23,073,558	10,459,340	4,551,050	7,108,500	954,868

Includes 95N3-S-A1 and N3-S-A2 coastal cargo ships under 2,000 gross tons each.
*Diesel-Electric.

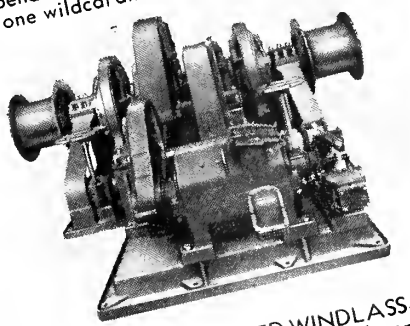
Compiled by American Bureau of Shipping.

Æ Improves Windlass Manufacture for 1946

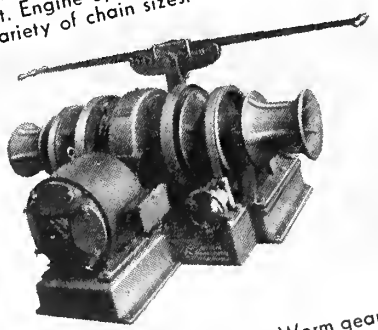


HAND POWER WINDLASS—Pump brake levers adjustable for power. Heads operated independently of wildcats. Can be supplied with one wildcat and one or two heads.

STEAM SPUR GEARED WINDLASS—Compound geared. Protected gearing and crankshaft. Engine cylinders close-centered. Built in a variety of chain sizes.



ELECTRIC SPUR GEARED WINDLASS—Water-tight variable speed motor and controller, protected gearing and brake. Warping heads on main or intermediate shaft.



ELECTRIC WINDLASS—Worm geared. Hand operation provided. Water-tight motor, variable speed controller, protective panel, resistors. Protected gearing. Also gasoline or Diesel drive.

Ask about quiet, compact electric types for passenger and passenger-cargo service

All of the familiar windlasses have been carefully developed over many years of experience. Only the best materials and expert craftsmen are used. Performance is dependable, long life is assured. You'll want all the information you can get on Æ windlasses—send for it.

When it's (Æ) . . it's A-1

GYPSIES • WINCHES • CAPSTANS • WINDLASSES • STEERING GEARS • TOWING MACHINES • MISCELLANEOUS AUXILIARIES

Other Æ Products: Æ-Lo-Hed Hoists, Hele-Shaw Fluid Power, Taylor and Perfect Spread Stokers.

AMERICAN ENGINEERING COMPANY

2450 ARAMINGO AVENUE • PHILADELPHIA 25, PA.

Pacific Coast Representative: Haugh & Egbert, Inc., Robert Dollar Building, San Francisco, Cal.
Gulf Coast Representative: Sintes Sales Engineers, 332 So. Diamond Street, New Orleans 13, La.

Shoreside Personalities

Executive Director of Pacific American Steamship Ass'n.

Albert W. Gatov, well-known West Coast shipping executive currently with the War Shipping Administration at San Francisco, has been appointed executive director of the Pacific American Steamship Association, succeeding Lewis A. Lapham, who is returning to the American-Hawaiian Steamship Company.

This action was announced by E. Russell Lutz, president of the Association. Lapham's resignation and Gatov's succession become effective March 1.

Albert W. Gatov, executive director, Pacific American Steamship Ass'n.

The new director is 38 years old. Born in Southern California, he has been in the shipping business all his life, first with the Pacific Steamship Company, later as operating manager for the Interocean Steamship Corporation at Los Angeles.

Gatov was commissioned in the Army in January, 1942, and was stationed for the following two years at Fort Mason, San Francisco. In May, 1944, Gatov then a major, was sent to Basra, in the Persian Gulf Command, in charge of a transportation unit handling Russian Lend-Lease. He returned to California in July, 1945, and was released from service two months later.

In November, 1945, Gatov joined the San Francisco office of the WSA as assistant chief of traffic and allocations, the position he leaves for his new duties with Pacific American.

The association is comprised of sixteen major West Coast shipping companies and represents them in their collective dealings with various administrative branches, including the Maritime Commission, War Shipping Administration, Army and Navy.

W. L. Slattery Moves Up

William L. Slattery has been appointed a special assistant to the U. S. Maritime Commission. Since 1942 he has served as the Commission's general auditor of construction.

Pacific Coastwise Service Resumed

By David Gregory

Manager of Operations and Traffic
Olympic Steamship Co.

With the resumption of Pacific coastwise water service, the vessels and operations of Burns Steamship Company, James Griffiths & Sons, Inc., and Olympic Steamship Co., Inc., will be pooled to form an integrated service for the purpose of furnishing the shippers and consignees with a reliable and frequent service between the California ports of San Francisco and Los Angeles, (Long Beach) and Puget Sound ports of Seattle and Tacoma.

This service provides for weekly sailings commencing with the northbound departure of the MS Coastal Rambler from Los Angeles (Long Beach), Saturday, February 16; from San Francisco, Wednesday, February 20; and southbound from Seattle, Thursday, February 28. Following at weekly intervals and on the same weekday the MS Coastal Buccaneer and the MS Coastal Courser.

The method of integration which has been approved by the operators calls for all vessels departing from Los Angeles Harbor northbound to be berthed by the Burns Steamship Company. Olympic Steamship Co., Inc., will berth all vessels northbound from San Francisco. All vessels sailing southbound from Seattle and Tacoma for California ports will be berthed by James Griffiths & Sons,

David Gregory

Inc. In Seattle, Olympic Steamship Co., Inc., will serve as sub-agents for Burns Steamship Company. At the California ports, James Griffiths & Sons, Inc., has appointed Olympic as their sub-agents in San Francisco and Burns Steamship Company as their sub-agents in Los Angeles. Sub-agents for Olympic at Los Angeles will be Burns Steamship Company.

The vessels which have been assigned for this service by the WSA are modern CI-M-AV1 type vessels of approximately 5000 tons d. w. They are 339 feet long, diesel-powered, and capable of cruising at twelve knots. These motorships are considered ideal for the Coastwise general merchandise trade. Forward of the house there are three cargo compartments. Each compartment is equipped with 'tween decks. The 'tween decks will assure proper stowage with a minimum possibility of damage. The three forward holds are equipped with five sets of handling gear which will permit rapid loading and discharging. Each vessel is also equipped with a deep tank which may be utilized for freighting liquid cargoes in bulk.

An unusual feature of these vessels —something unique in the Coastwise service—is the 10,000 cubic feet of refrigerator space. This space is made up of three compartments. Any temperature from zero degrees on up may be maintained. Each compartment is independently controlled so as to permit a varied range of commodities to be shipped in accordance with the temperature requirements.

"Able-bodied"—

ABLE-BODIED implies more than a stout constitution. It means, to men at sea, the ability to perform many tasks proficiently. Seagoing men who earn that special rating are versatile.

Marine boilers, too, have to earn their rating the same way—through proved seaworthiness plus versatility.

That's why the B&W Single-Pass, Header-type Boiler is such a popular choice for Victory ships, C-1, C-2, C-3, C-4 and many other types of cargo vessels; for fast tankers, and ore carriers. B&W Boilers of the same design are also hard-working crew members on tugs and river craft.

This versatility is the result of years of cooperation between B&W marine engineers and shipbuilders and operators.

Together with long-lasting dependability and high operating efficiency, this proved adaptability to widely-varied marine services has earned for all types of B&W Marine Boilers the rating: "able-bodied".

BABCOCK & WILCOX

THE BABCOCK & WILCOX COMPANY
85 LIBERTY STREET, NEW YORK 6, N.Y.

On the Pacific Coast: C. C. MOORE & CO., 450 Mission Street, San Francisco, Calif.

Richard G. Coffin, manager of marine sales department, Socony-Vacuum Oil Co., Inc.

Coffin Moves Up At Socony

Richard G. Coffin, newly appointed marine sales manager of Socony-Vacuum Oil Company, Inc., has been associated with the company since January 1, 1926. He was first employed as a service station attendant by the White Star Refining Company in Detroit, and when White Star became a division of Socony-Vacuum, Mr. Coffin was made district sales manager in charge of Western Michigan and Northern Indiana.

In 1940 he was transferred to New York to be assistant to the general manager of the marine sales department, and successively became assistant manager of marine sales, domestic manager and, on January 1, 1946, manager.

Pacific Coast Manager

The appointment of Harvey A. Craig as Pacific Coast manager, Republic Steel Corporation, has been announced by J. M. Schlendorf, vice president in charge of sales.

In this new post, created to bring under one head the many sales problems peculiar to the Coast, Mr. Craig will supervise the territory served by all three Coast sales offices. He will, however, retain his position as manager of the Los Angeles office. No change is being made in the personnel of the other offices. W. L. Thomas is district sales manager of the San Francisco office and C. V. Gardner is district sales manager of the Seattle office.

Mr. Craig joined the organization in 1943 as manager of the Los Angeles sales office. For many years he was vice president of Rheem Manufacturing Company, Richmond, California.

USMS Discharge Button

The United States Maritime Service is now issuing a discharge lapel button, similar in significance to the emblem issued to former members of the Armed Forces.

Resembling closely the one worn by Army, Navy and Marine veterans, the gold-plated pin shows an eagle with his talons entwined about an anchor, with a laurel wreath encompassing the central figure.

Applications for the emblems may be secured at Maritime Service and War Shipping Administration offices.

New President of American Mail Line

A. R. Lintner, who was formerly vice president and general manager of the company, is now president and general manager of American Mail Line. Lawrence Calvert, president of American Mail since its organization in April, 1940, has resigned because of pressure of other business.

Lintner is a former Pacific Coast director of the War Shipping Administration, and previously was Pacific Northwest manager of WSA. He was Seattle district director of the United States Shipping Board during the First World War. He came to Seattle in 1917 from New York City, where he was with the Navy's construction department. After a year with Seattle Construction & Dry Dock Company, he joined the steel-ship division of the Fleet Corporation of the Shipping Board.

Lintner spent six years in the Orient representing the States Steamship Company.

Standard of California New V. P.

Election of C. E. Finney, Jr., as a vice president of Standard of California is announced by R. G. Follis, president of Standard.

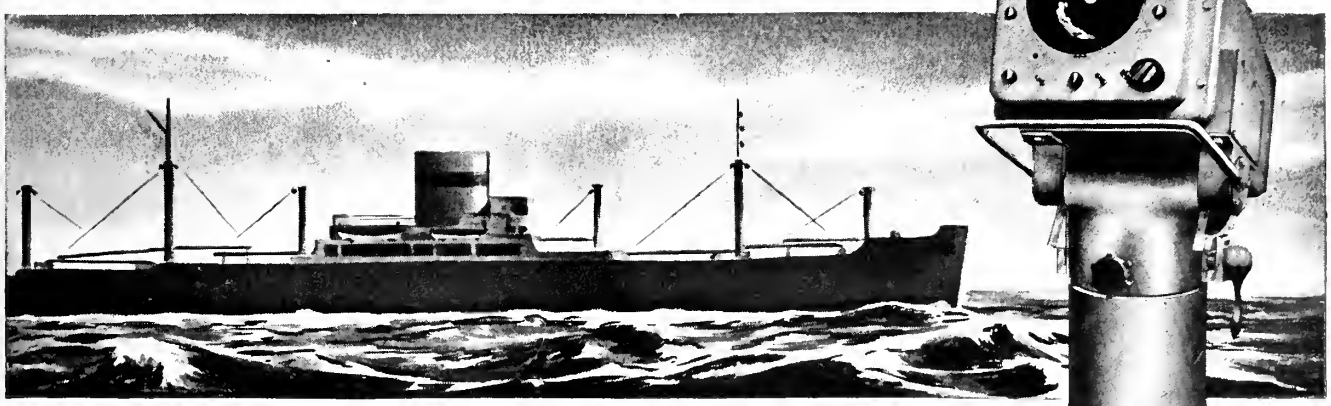
Finney has been assistant vice president for manufacturing for the last year. He will be concerned with industrial relations matters in his new position.

A graduate of Cornell University, Finney joined Standard of California in 1919 at the company's refinery in Richmond, Calif., and soon rose to pressure still foreman. In 1931 he became manager of the El Paso refinery of Standard of Texas, a subsidary, and a year and a half later was made manager of the Richmond refinery. Three years ago Finney became general manager of Standard of California's manufacturing department.

Two other new appointments in Standard of California's Manufacturing Department are G. H. Langsdorf as manager, Technical Services, and O. N. Miller, assistant to G. A. Davidson, vice president in charge of manufacturing. Miller formerly was superintendent of the cracking division at El Segundo refinery.

PROVED

on America's Fighting Ships



READY

for America's Merchant Ships

The INDICATOR can be mounted on the bridge—on deck, bulkhead, or overhead. Note that the head is rotatable vertically and horizontally through 45°... *adjustable* for greatest comfort and convenience!

RAYTHEON RADAR... *The "Mariners Pathfinder"* ... is ready for action! The design is frozen. Production is getting underway. Raytheon will soon begin equipping America's merchant fleet.

The same basic gear that served the Navy as the SG or SO radar has been re-designed in commercial form for the maritime industry. The same proved performance can be counted on! The same skill and experience in manufacturing Navy equipment will go into every set.

Here are some of the highlights of the new gear: range, 50 miles, or down to 100 yards ... true or relative bearings ... easy, convenient controls, *all* on the bridge indicator ... quick access to all components for maintenance and inspection.

This is the radar you will want—the radar that you *know* is "right" from the start. Remember—Raytheon is *the name that means most* in surface-search radar. Write or wire to Marine Department, 107 Foundry Avenue, Waltham 54, Mass.

RAYTHEON MANUFACTURING COMPANY
Waltham 54, Massachusetts

RAYTHEON

Excellence in Electronics

Personnel Changes at Yarnall-Waring Co.

Yarnall-Waring Company, Philadelphia, announces the following personnel changes: **Joseph Kildare** has been appointed sales manager at home office; **Frank W. Miller** has been made works manager, and **J. Frank Long** has been transferred to Chicago district office as sales engineer.

Charles H. Grosjean, sales engineer in New York office, is now in charge of the Detroit sales office, replacing **C. N. Maxfield,** who has been appointed California district manager, with new sales offices in San Francisco and Los Angeles.

Two men have been added to Yarway sales staff; **Jackson Kemper,** New York office, and **Jack Schuyler,** Los Angeles office. Both of these sales engineers have had long experience in selling and servicing steam plant equipment.

Paul H. Bordwell, vice president in charge of Orient, for APL.

APL's New Oriental Vice President

Oscar G. Steen, vice president in charge of the Orient for the American President Lines, has resigned his position effective March 1, next, it was announced by Dr. Henry F. Grady, president.

Mr. Steen, a veteran of 33 years service with the American President Lines and predecessor companies, is leaving the steamship business to head up a company in Shanghai which will have the distributorship for Dodge trucks and automobiles.

Upon acceptance "with deep regret" of Mr. Steen's resignation, the President Lines' board of directors promptly elected **Paul H. Bordwell,** Mr. Steen's long-time assistant in the Orient, as his successor with the title Vice President in Charge of the Orient.

Mr. Bordwell is a native of Alameda, California, and like Mr. Steen is a veteran of more than 30 years service with the company in the Far East. He is widely and favorably known to the shipping industry on both sides of the Pacific.

In October, 1941, just two months before Pearl Harbor, Mr. Bordwell came to America on home leave. Unable to return to the Orient, he served as an executive assistant in the San Francisco home office, and lately he has been engaged in reorganizing the Oriental staff for resumption of company services in the Far East.

No "Blank Cartridges" in Admiral Vickery's Belt

Vice Admiral Howard L. Vickery received the welding industry's highest award, the James Turner Morehead Medal, at a dinner in New York January 28, attended by most of the heads of the Maritime shipyards in the country. This medal was presented to Admiral Vickery, former vice chairman of the U. S. Maritime Commission, for his outstanding services in building America's bridge of welded ships. Vice Admiral Emory S. Land, his former chief, also paid tribute to Admiral Vickery for his leadership in adapting the use of oxy-acetylene welding and cutting processes to quantity production of America's wartime merchant fleet.

Charles DeWolf Gibson, vice president of the Air Reduction Company and former president of the International Acetylene Association, presided, and in introducing Admiral Vickery said of him, "He never fired a blank cartridge in his life."

In the photograph left to right are: Mr. Gibson, Admiral Howard L. Vickery, G. L. Carter, I. A. A. president, and Admiral Emory S. Land.

Marine Exchanges Issues New List of Buyers

The Marine Exchange of San Francisco has prepared for its members a list of purchasers of material, equipment and services for steamship companies and shipyards of the San Francisco Bay Area.

The list, newly revised, indicates those in charge of operating, repair and subsistence matters.

Congress Committee Approves Kings Point Academy Expansion

The U. S. Merchant Marine Cadet Corps was created prior to the war under provisions of the Merchant Marine Act, 1936, as amended, and the site at Kings Point acquired for the construction of a permanent Merchant Marine Academy.

From 1938 to December 1, 1945, 7291 officers were graduated from the Cadet Corps for service with the U. S. Navy or attached to merchant vessels.

The members of a Congressional Board of visitors has reported to Congress that they were impressed with the splendid establishment at Kings Point, the highly efficient educational program and the fine type of young men participating. They further pointed out that the security and position of the United States in the field of international commerce and status as a sea power is largely dependent upon the character and education of officer personnel.

Recognizing the necessity for an expansion of facilities if the ultimate aims and objectives for which the Academy was created are to be realized, the Board recommended that adequate funds for a chapel, library, and development of athletic and recreational facilities be made available.

In accordance with recommendations of the Board, the course of study at the Academy has been extended to four years and measures are being taken to have the Academy placed upon an accredited basis permitting the award of a B. S. degree in Marine Transportation.

P. H. Lair, well-known engineer named New York sales manager by The Dampney Company of America.

P. H. Lair Named New York Sales Manager

The Dampney Company of America, Boston, announces the appointment of P. H. Lair, well-known Eastern industrial engineer and research consultant, as manager of its New York sales office, 114 Liberty Street, N. Y., where he will offer consultation and service in the field of protective coatings. Mr. Lair's experience fits him particularly for this position. For the past five years, he has been engaged in industrial and mechanical engineering for one of the larger Eastern engineering firms where he handled the design for several steam generating plants and steam distribution systems utilizing pressures as high as 1350 psi with 900F. total temperature.

Left to right: Jack Ellsworth, Jack Green, and Tom Pike, recent Tube Turns appointments.

Tube Turns Detroit Office and Head Office Appointments

Tube Turns, Inc., Louisville, Ky., has opened an office in Detroit, at 713 Ford Bldg., in charge of **Jack Ellsworth,** it is announced by John G. Seiler, the firm's vice president and general sales manager. Ellsworth will represent Tube Turns' forging and welding fittings divisions, and his territory will include Michigan, Northeastern Ohio, North Illinois, and Indiana, except Whiting and East Chicago. Before assuming his new post, he was assistant district manager of the Midwest territory, with headquarters in Chicago.

Mr. Seiler also made the following appointments: **Jack Green** is now sales manager of the welding fittings division. A native of Louisville, he attended the University of Kentucky and was the American Radiator and Standard Sanitary Corporation's branch manager in Mansfield and Akron, Ohio, before his affiliation with Tube Turns in February, 1941. He was stationed in Chicago, as district manager, before becoming the division's assistant sales manager in June, 1943.

Succeeding Jack Green as assistant sales manager of the welding fittings division is **Tom Pike.** He is a specialist in refinery and oil well equipment. Determined to learn the petroleum industry literally from the ground up, his first job was as a "roughneck" in the Huntington Beach oil field in California, his native state. Later he became an engineer-salesman for W. R. Guiberson Company before taking over Tube Turns' Los Angeles office, in January, 1940. He subsequently became district manager in charge of the West Coast territory.

Matson Line—New Southern California Headquarters

The Matson Navigation Company has moved from the Roosevelt Building in Los Angeles to the Pacific Mutual Building.

Ralph J. Chandler, vice president of Matson, is in Room 1235, 523 West Sixth Street; **Charles S. Booth,** assistant general freight agent, of Matson, is located at 550 South Grand Avenue; and Paul N. Carter, freight agent, Matson, is located at 550 South Grand Avenue.

The new passenger office is to be located at 533 West Sixth Street, Los Angeles, and an announcement of the opening will be made later, following completion of alterations.

Rear Admiral Friedell Retires from Service

Rear Admiral W. L. Friedell, Commandant of the 11th Naval District and former Mare Island Navy Yard Commandant, is retiring from service. He is being succeeded by Vice Admiral Jesse B. Oldendorf, commander of the battleships of a task force in World War II.

Matson's Director of Industrial Relations

Appointment of Alfred B. Tichenor as director of Industrial Relations of Matson Navigation Company and United Engineering Company was announced jointly by Frazer A. Bailey, Matson president, and W. P. Roth, chairman of the board, United Engineering Company.

Prior to his joining Matson, Mr. Tichenor was associated with Industrial Relations Counselors, Inc., of New York.

Kinney Names Manager of P. C. Branch

Roy A. Woltman has been appointed manager of the Pacific Coast branch for Kinney Manufacturing Company of Boston, Mass., and will also continue in charge of the company's office at Los Angeles.

Woltman succeeds Dean J. Hill, who died January 16 after 39 years with the Kinney Company. Mr. Hill opened the company's Los Angeles branch in 1922, and was appointed Pacific Coast manager in 1932, which position he held until his death.

Merchandising Manager Of Jorgensen Steel

Alexander H. Gaal has been appointed merchandising manager of the Earle M. Jorgensen Co., steel distributors, with warehouses in Los Angeles, Oakland and Houston.

Alexander H. Gaal, merchandising manager, Earle M. Jorgensen Co.

A discharged Army Major, he has been stationed for over three years in the Steel Division of the War Production Board, Washington, D. C. During 1943 he accompanied Sir John Duncanson, Steel Controller for Great Britain, on an extensive steel survey throughout the British Empire at which time the CMP plan was installed in Australia, New Zealand, India and Union of South Africa.

SALES REPRESENTATIVE WANTED: Thirty-four year old manufacturer of marine and industrial equipment wants to secure services of established individual or firm as sales agent for Pacific Coast. Profitable line for anyone familiar with marine trade. Please write to Box 346B, Pacific Marine Review, 500 Sansome Street, San Francisco 11, California.

Prior to his service in the Army he was with Republic Steel Corporation, general sales, Cleveland, Ohio, and also represented them in Los Angeles for several years. Mr. Gaal is a graduate of Mercersburg Academy, Ohio State University, and Harvard Graduate Business School.

United States
Treasury Department

January 25, 1946

Dear Mr. Editor:

On behalf of the Treasury's War Finance Committee of Northern California, let me take this opportunity of thanking you for your very splendid cooperation during the seven war loan drives and the final Victory Loan campaign.

We are thoroughly cognizant of the patriotic and unselfish efforts which you made during these drives, all of them so very vital to the successful termination of World War II and the preparation for a post-war world at peace.

You can rightfully take credit for a substantial contribution to the winning of the war, and for your service the War Finance Committee again extends its full measure of gratitude.

Sincerely yours,
EUGENE B. BLOCK,
Chairman, Press Division, United States Treasury Department.

Colonel Leon J. Lancaster, newly-appointed APL's general agent for the Northwest, with headquarters in Seattle.

APL Personnel Appointments

In preparation for his company's early resumption of full-scale commercial operations, Dr. Henry F. Grady, president of the American President Lines, announced a number of key personnel appointments in this company's worldwide shipping organizations. The appointees, still on terminal leave, are all former APL staff members who have been with the Armed Forces or on loan to the Government in civilian capacity. They are:

Colonel Leon J. Lancaster, general agent, Seattle, Washington; Colonel John T. Danaher, general passenger agent, New York City; Lt. Colonel James H. Whitman, general agent for the Mediterranean, with headquarters at Genoa; Commander Harold S. Campbell, general agent, Honolulu, T. H.; and Jay J. Murphy, returning from WSA assignment in Pacific, general agent, Boston, Mass.

Whitman, Campbell and Murphy are all products of the company's own Training System, having joined the organization as trainees on leaving college. They advanced through various departments and climaxed their training by serving as pursers on several President Line vessels.

Dr. Grady also announced the elevation of E. V. Nevin, chief auditor, to the position of executive assistant, on the San Francisco headquarters staff.

Jay J. Murphy, general agent, Boston, Mass.

Harold S. Campbell, general agent at Honolulu, T. H.

(Continued from Page 252)

National Marine Exposition

Partial List of Exhibitors

Aerial Products, Inc.
AGWI Lines
Alcoa Steamship Corp
All-Bilt Uniform Company
American Chain & Ladder Co., Inc.
American Export Lines
American Metal Moulding Co.
Anderson & MacKenzie
Appel & Company
Arnot & Company
Atlantic-Pacific Mfg.
Auth Electrical Specialties Co.
H. Barrow Co., Inc.
Bath Iron Works
Bendix Aviation Corp.
Bludworth Marine
A. N. Brabrook
Cargocaire Engineering Corp.
Carswell Marine Associates
Columbia Bronze Corp.
Condenser Service & Eng. Co., Inc.
C-O-Two Fire Equipment Co.
P. J. Delahanty Mfg. Co.
DeLaval Steam & Turbine Co.
Dunlop Tire & Rubber Corp.
Eagle-Picher Co.
Electric Tachometer Corp.
Federal Shipbuilding & Dry Dock Co.
"Flexitallic" Gasket Co.
General Electric Co.
Gibbs & Cox, Inc.
Grace Lines
Gulf Oil Corp.
Harnischfeger Corp.
Hooper Valve Div., Warwick Machine Co.
International Mutoscope Corp.
International Nickel Co.
International Paint Co., Inc.
Johns-Manville Corp.
Kearfott Engineering Co.
Walter Kidde & Co.
The Log
M. Low
Lukens Steel Co.
Mackay Radio & Telegraph Co.
Marine Catalog & Buyers' Guide
Marine Engineering & Shipping Review
Marine News

Marine Progress
Martin-Parry Corp.
Metal Lumber Company
Metropolitan Refractories Co.
Motorship
National Bed Spring Co.
New England Trawler Equipment Co.
New York State Maritime Academy
Oakite Products, Inc.
Oldman Fairlead Company
Owens-Corning Fiberglas Corp.
Pacific Marine Review
Paulson-Webber Cordage Co.
Pitometer Log Corp.
Plymouth Cordage Co.
The Propeller Club of the United States
Radiomarine Corp. of America
Raytheon Manufacturing Co.
John R. Robinson
Roebling's Sons Co.
Roth Brothers Chronometer Co.
Russell & Stoll
Sandusky Foundry & Machine Co
Seamen's Church Institute
Selby-Battersby & Co.
George C. Sharp
Sharples Corp.
Sims Valve Co.
Sinclair Refining Co.
Snap-on Tools Corp.
Socony-Vacuum Oil Co.
Sperry Gyroscope Co., Inc.
Star Metal Mfg. Co.
Submarine Signal Co.
The Texas Company
John C. Thompson, Inc.
Arthur Tickle Engineering Works, Inc.
Tinnerman Products, Inc.
Todd Shipyards Corp.
Tollefsen Bros.
Uehling Instrument Co.
United Dairy Equipment Co.
United Fruit Company
United States Lines
United States Merchant Marine Academy
United States Steel Corp.
Van Karner Chemical Arms Corp.
Walton Marine Contracting Corp.
Welin Davit & Boat Co.
Westinghouse Electric Corp.
E. J. Willis Company
Thos. C. Wilson, Inc.
C. A .Woolsey Paint & Color Co., Inc.
Worthington Pump & Machy. Corp.
Young Windows of America
Zalud Marine Corp.

SHORESIDE PERSONALITIES

Commodore Norman B. Hall, USCG. Commodore Halert C. Shepheard (at right), USCGR.

Reassignment of Two USCG Commodores

Coast Guard Headquarters, Washington, D. C., announces the reassignment of Commodore Halert C. Shepheard as chief of the Merchant Vessel Inspection Division, Coast Guard Headquarters, Washington, D. C. Commodore Shepheard relieves Commodore Norman B. Hall, who returns to his regular Coast Guard duties.

During World War II, Commodore Shepheard was assigned duties where his years of merchant marine experience would be of greatest benefit to the maritime industry and the nation. Soon after the duties of the Bureau of Marine Inspection and Navigation were transferred to the Coast Guard in 1942, he was commissioned Captain in the Coast Guard Reserve, and became chief of the Merchant Marine Inspection Division, Coast Guard Headquarters, Washington, D. C. In June, 1944, he was temporarily detached from Headquarters for duty in the European war zone, where he served with the Commander, U. S. Naval Forces in Europe, and with the Supreme Commander, Allied Expeditionary Force. Detached early in 1945 he was promoted to Commodore, and continued on special assignments for the Commandant on merchant marine affairs, such assignments taking him to Copenhagen in November, where he was assigned as an adviser to the U. S. Delegate to the Maritime Preparatory Technical Conference of the International Labor Organization.

Coast Guard Headquarters announces the reassignment of Commodore Norman B. Hall, USCG, to his regular peacetime duties of Inspector-in-Chief of the U. S. Coast Guard, where he will have supervision of inspection of personnel, materiel, operations and financial transactions of the Coast Guard, to insure the efficiency and adequacy of Service functions. He will relinquish his present duties as chief of the Merchant Vessel Inspection Division to Commodore H. E. Shepheard, USC GR.

During World War II, Commodore Hall organized and had jurisdiction of the Coast Guard's wartime Port Security Division. While Chief of the Port Security Division he also acted as Coast Guard liaison representative to cooperate with the Facility Security Division, Office of the Petroleum Coordinator for war. For his outstanding work as Chief of the Port Security Division, Commodore Hall was awarded the Legion of Merit.

In July, 1945, he was appointed Chief of the Merchant Vessel Inspection Division of the Coast Guard, a position which he has held until the present date.

SHORESIDE PERSONALITIES

COLONEL WARREN D. LAMPORT, former director of operations at Vancouver, Wash., has taken over the duties of general manager of the Seattle port, succeeding the late Colonel W. C. Bickford.

Colonel Lamport was a one-time member of the Board of Harbor Commissioners of Long Beach, and president of the California Association of Port Authorities as well as a director of the California Association of Port Authorities.

In the appointment of Colonel Lamport, E. H. Savage, president of the Seattle Commission, announced that George Treadwell, who has rendered such outstanding service over the years, is now chief engineer, having been promoted from first assistant. Mr. Treadwell is well known and highly regarded among his colleagues on the Pacific Coast.

EDWARD "ED" PELTRET, well known as marine editor of the San Francisco Chronicle as well as a magazine writer until he resigned in 1938, has returned as shipping editor of the Call-Bulletin. During the war, he served as purser on vessels operating to Alaska out of Seattle.

SHORESIDE PERSONALITIES

R. W. HURLBUT, sales manager of Maritime Laboratories of Compton, Calif., manufacturers of Lectrolox and a complete line of marine paints, announces the recent appointments of the following distributors: for Alaska and Washington, Bryant's Marina, Inc., 117 East North Lake Street, Seattle; for Oregon, Steckmest & Co., Inc., 355 W. First Avenue, Portland.

The California distributors are: the Johnson Specialty Co., 27 Pine Street, San Francisco, for the northern part of the state; and for Southern California, the same company, located at 808 E. Anaheim, Wilmington; also at 2019 Main Street, San Diego. The Davis Service Co., of 621 Mission Street, San Francisco, represents the company in the Hawaiian Islands with offices at 313 Alexander & Baldwin Bldg., Honolulu and in the Philippines at the Philipinos Bldg., 21 Plaza Moraga, Manila.

THE DISTINGUISHED SERVICE MEDAL, highest award in the Merchant Marine, has been awarded Captain Hugh Parks Brown, Jr., resident of San Francisco and one of the youngest skippers in the service. This award by the War Shipping Administration was given to Captain Brown for his action while master of the SS City of Alma, in risking his life to save several members of his crew when his ship was torpedoed by a Nazi submarine.

OBIT: W. L. "Leslie" Comyn, 65, colorful personality in Pacific Coast shipping for more than 35 years and remembered as the leading figure in the building of the concrete steamer Faith, built and launched in the first World War near Redwood City, passed away in Seattle early in February, after a brief illness.

Mr. Comyn, while operating the firm of Comyn, MacCall & Company, had a number of sailing ships operating in the South Seas copra trade to San Francisco for many years. He has been engaged in the stevedoring and general steamship business in Puget Sound since leaving San Francisco shipping activities in 1939.

THE MARITIME COMMISSION has before it for study a reported proposed increase from $2500 to $5000 for admission of steamship lines into the Pacific Coast-European Conference, as submitted by that body.

It was reported that the Commission, which has jurisdiction over steamship combinations established under the Shipping Act of 1916, will fully investigate reasons for the submitted fee increase before any authority before such a scale is granted.

Member lines of the Conference include Blue Star Line, Donaldson Line, East Asiatic Company, Fred Olsen Line, Fruit Express Line, Furness Line, Isthmian Steamship Company, Knutsen Line, Lauritzen Line, Mosvold Line, Holland-American Line, Johnson Line, Royal Mail Lines and Interocean Line (Westfal Larsen & Company).

COMMANDER RALPH M. SHEAF, who was in charge of and directed the building of the U. S. Maritime Commission Training Station at Coyote Point, San Mateo County, is now attached to Kings Point Academy, New York, under Rear Admiral Giles Stedman.

Commander Sheaf is well known in the San Francisco Bay area. Hundreds of youths were trained under his supervision and are now officers in the merchant marine.

J. J. LOWE BACK WITH AMERICAN MFG. CO. — After four years of active duty with the Navy in European and Pacific areas, James J. Lowe, former Lieutenant, USNR, has rejoined the sales staff of American Manufacturing Company, Brooklyn, New York, cordage mill. In addition to field sales work, Mr. Lowe will direct the company's advertising activities.

GE's Federal & Marine Section Expands

Announcement has just been made by General Electric Company's San Francisco office of the appointment of **Hughes W. Ogilvie** as sales engineer in the Federal & Marine Section. He will make his headquarters in San Francisco, assisting **G. L. Crow** and **C. M. LeCount.**

Hughes W. Ogilvie, sales engineer in San Francisco for G. E.'s Federal & Marine Section.

A native of Memphis, Tennessee, Ogilvie graduated from Leland Stanford University in 1941. He joined General Electric in 1942 at Schenectady, N. Y. headquarters, taking the G E test course for engineers. He transferred to the San Francisco office the following year, where he has been field engineer on marine installations until his present promotion.

Changes at Walworth

John M. Olmsted, for many years a vice president in charge of sales on the Pacific Coast for the Walworth Company, manufacturers of valves and pipe fittings, retired on December 31, according to a statement issued by W. B. Holton, Jr., president of the company. "J. M. O.," as Olmsted is familiarly known to his many friends, had his headquarters in Los Angeles and supervised the sales activities of the Walworth Company's West Coast offices, in Seattle, San Francisco and Los Angeles.

Effective on January 1, 1946, Fred J. Chittenden, for 17 years manager of the Walworth Company's San Francisco offices, became manager of West Coast sales, continuing his headquarters in San Francisco.

Appointment

STEWART S. CORT has been appointed manager of the sheet and plate sales division of Bethlehem's Pacific Coast Steel Corporation. Cort, who has been for the past year in the same division of the home office plant in Bethlehem, Pa., is the first manager Bethlehem has appointed to this phase of the steel business on the West Coast. This is an excellent indication that the company looks forward to an extended market in this business in the West.

Accident Prevention Contest for Stevedoring and Terminal Companies

In the Accident Prevention contest of the Waterfront Employers' Association of the Pacific Coast, in which trophies and awards are being offered for safety records established by member organizations, the Pacific Marine Review is the donor for the Columbia River District, onshore group. In all there will be 14 trophies, awarded annually, and 60 certificates. Eighteen donor companies are participating.

The plan of the contest is based on safety statistics for the members in each regional group. The winners of the awards announced for February, 1946, together with the regional group listing, are as follows:

Columbia River District Onshore, winner, Portland Stevedoring Company; Columbia River District Offshore, winner, Portland Stevedoring Company; Columbia River District Terminal, winner, Interstate Terminals, Inc.; San Francisco Bay District Onshore, winner, San Francisco Stevedoring Co.; San Francisco Bay District Offshore, winner, Jones Stevedoring Company; San Francisco Bay District Terminal, winner, Howard Terminals; Southern California District Onshore, winner, Crescent Wharf & Warehouse Co.; Southern California District Offshore, winner, Matson Navigation Company; Puget Sound District Onshore, winner, Alaska Steamship Company; Puget Sound District Offshore, winner, Rothschild-International Stev. Co.; Puget Sound Terminal, winner, Baker Dock Company; Coastwise Onshore, winner, San Francisco Stevedoring Co. (S. F.); Coastwise Offshore, winner, Matson Navigation Co. (L. A.); Coastwise Terminal, winner, Baker Dock Company (Tacoma).

The first award was made February 15 and future awards will follow on about the same date each year until 1949.

Consultant Opens Office

G. Chauncey Parsons, former chief engineer and general manager of Durkee Marine Products Corporation, West Coast Division, is opening his own office in San Pedro, as consultant on general and marine engineering problems. He plans to be available to do some design work on yacht and commercial boats. He is the originator and patentee of the "Parsons Method" of building smooth, small, steel-hulled vessels. At the present time, there are three licensees building boats by this patented method, Central Boat Works and South Coast Company, at Newport Beach, California, and Harbor Steel Fabricators, at San Pedro, California.

Mr. Parsons will also manufacture and market certain marine specialties under the trade name "Parsons Products."

APRIL · 1946

Pacific MARINE REVIEW

Lessons in Crystal Gazing

With "V-J" Day well past, we have been besieged with the question "When are we going to get Manila rope?" *

If we were expert crystal gazers perhaps we could supply the answer. But our crystal shows only a big question mark where the subject of Manila fiber supply is concerned.

We do know that every day brings nearer the time when you WILL once more have Manila rope and you may be assured that our organization is doing everything to hasten this time. No matter when that time comes, you'll be glad that you waited for the Extra Superior trademark. It is your assurance of a rope made with the FINEST Manila fiber—a rope that stands up under the hardest condition.

Samething to look forward to—this famous rope trademark.

TUBBS
EXTRA SUPERIOR MANILA
CORDAGE COMPANY

* Even though new government regulations permit the making and use of Manila rope (3¾" circ. and larger), fiber supply is far insufficient to fill the demand.

TUBBS CORDAGE COMPAN

SAN FRANCISCO SEAT
LOS ANGELES • CHICAGO • PORTLAND • NEW YO

Pacific Marine Review

OFFICIAL ORGAN
Pacific American
Steamship Association

•

Shipowners Association
of the Pacific Coast

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EQUAL emphasis upon all five vital qualities makes Columbian Tape-Marked Pure Manila Rope a *balanced* rope! In a good rope none of these qualities should predominate, for the accenting of one quality is at the cost of the others.

STRENGTH . . . The test for breaking strain alone does not make quality! The minimum point established by the United States Bureau of Standards is one which Columbian Manila Rope has considered a minimum for years. Our standards were so high we had to make no change to meet government requirements. But strength alone is not enough. COLUMBIAN *Balanced* Manila ROPE has equal emphasis on all five!

COLUMBIAN ROPE COMPANY
400-90 Genesee St., Auburn, *"The Cordage City,"* N. Y.

Columbian TAPE MARKED PURE MANILA ROPE

Pacific MARINE REVIEW

MARITIME INDUSTRY NEEDS PUBLIC RELATIONS

In this crucial period our industry has many **musts.** Having gone all-out for war as few other industries did, and having been stymied at every approach toward reconversion, it needs to consolidate its thinking and its acting, so that necessarily divergent elements do not conflict at so many points.

Every branch of the industry has a big stake in the welfare of the whole. While we waited for a ship sales bill there could be very little in the way of plans for ship conversion or ship construction or ship operation; and now there is a further wait for the setting of the "pre-war" and "wartime" costs. Some companies have been so situated as to permit of some progress; some have not.

The point is that a strong industry needs to have all its units functioning. A weakness in one unit affects all. A united advance in the entire maritime industry is a **must.**

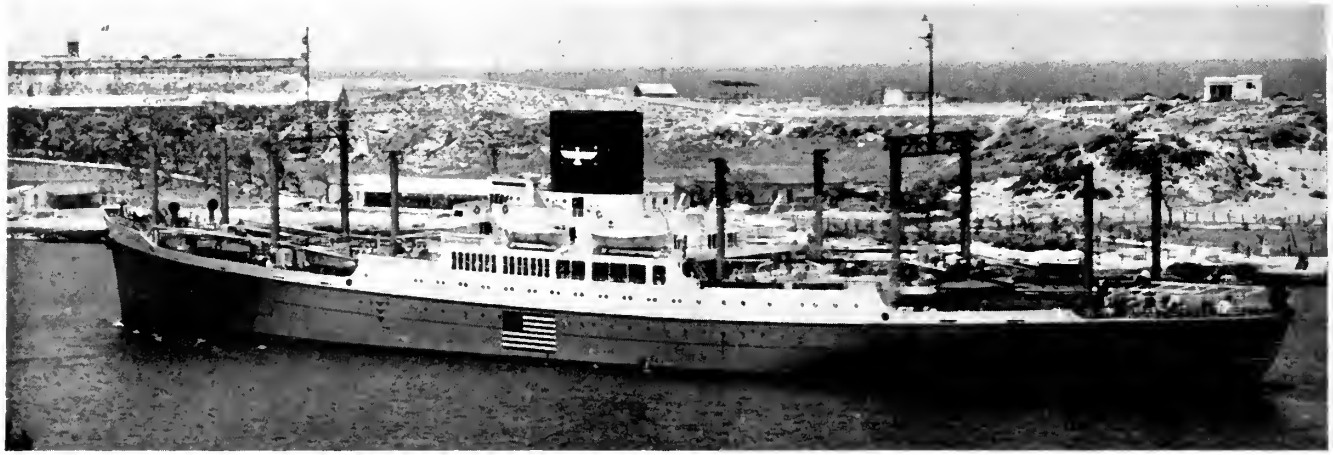
We propose to analyze the various needs of the industry in a series of short articles or editorials. Included will be such subjects as port costs, rail and water rates, air-water combinations, canal tolls, world trade, coastwise and intercoastal difficulties, and others on which there should be a common basis for opinion and action. But first, public relations.

In every human relationship there is some common ground for a mutuality of interest, and that interest can be broadened. Shipping people have—must have—a relationship with the public, with the government, with labor, and with each other. All are interested—vitally interested—in the success of the industry as a whole. But too frequently some spark of irritation or jealousy flames into animosity and the vital objective is lost to view. Or some inadroit spokesman may be regarded as representative of the industry when he is thinking only of his own interests. Or we may stoop to the folly of adopting the expressions of critics, like "subsidy" when we might say "parity payments for labor"; or "embargo foreign trade" when our imports are even more vital than our exports.

We know that we have an industry that is important to the welfare of the country. But in the public mind the industry is something less than vital. Can't we get the story over? In time of hazard, the shipyards and the operating skills of the steamship companies have the admiration of all, but as with the Army and Navy or the Doctor or Policeman, when the danger is overcome they are crowded out of the public mind by more timely problems.

There are many points of peacetime interest between us and the public generally. For instance, what would the 15,000,000 people who are concerned with the cotton industry do if the half of their production which is exported were to be left unshipped? Or the farm and rural communities if the fourth of their crops now exported were to find no market? Or the factories of the country which now need some five billion dollars worth of imports to keep them employing millions of workers? Or even the taxicabs of a city like San Francisco which take $900,000 a year from water front and tourist traffic? We could go on and mention here the dollar interest of almost every element in the population. Let us tell all these people of **their** stake in shipping so their **hearts** will be with us.

The National Federation of American Shipping, the Propeller Clubs, the American Merchant Marine Institute, the local clubs and societies, and the maritime press are earnestly struggling with the public relations problem and are all seeking the same result. The best we can put into the job of helping them is the least we should offer.



The President Polk in Havana Harbor before the war.

S. S. President Polk

First Big Conversion Job on Pacific Liners

Having served as an Army transport through the late war with efficiency and honor the S. S. President Polk is now being restored to her original state as a round-the-world passenger and cargo liner for the American President lines. This job, after competitive bidding, was awarded to a Pacific Coast shipyard. It is expected that a sister ship the President Monroe will be similarly restored in the near future.

After the reconversion work is finished these vessels will appear within and without substantially as shown in the illustrations herewith. They are C-3's fitted with first-class passenger accommodations for 97 persons and will be used in the trans-pacific service.

These vessels have very sea-kindly hulls with a large cubic and dead-weight capacity for cargo and are equipped with every modern fitting and device to maintain comfortable conditions in the staterooms and public rooms for the passengers and to insure an abundance of wholesome and delicious food in the dining saloon.

Principal characteristics of the ship are shown in the line box herewith. It will be noted that these vessels have a good turn of speed and ample oil tankage capacity for great cruising radius. The space amidships occupied by the propulsion machinery is very short leaving ample opportunity fore and aft for large cargo holds.

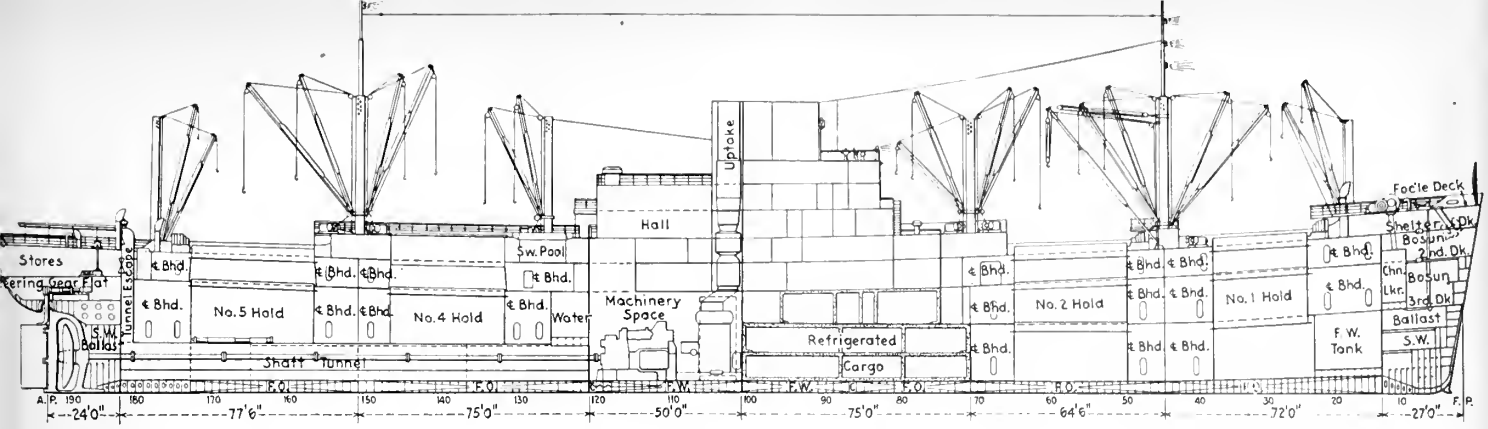
As originally built she was delivered late in 1941 to the American President Lines by the Newport News Shipbuilding and Dry Dock Company.

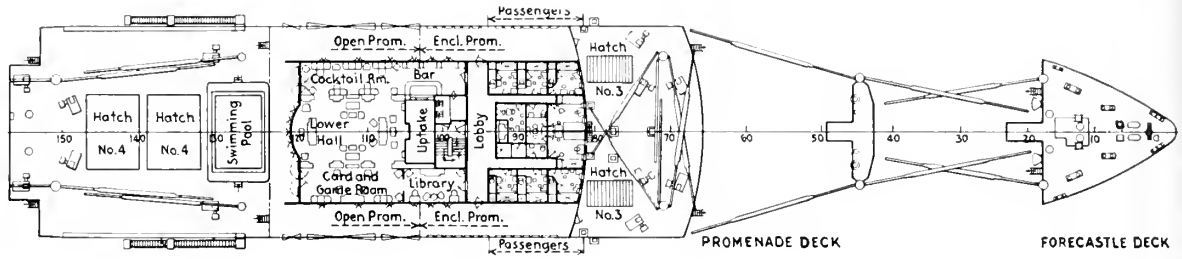
Propulsion Machinery

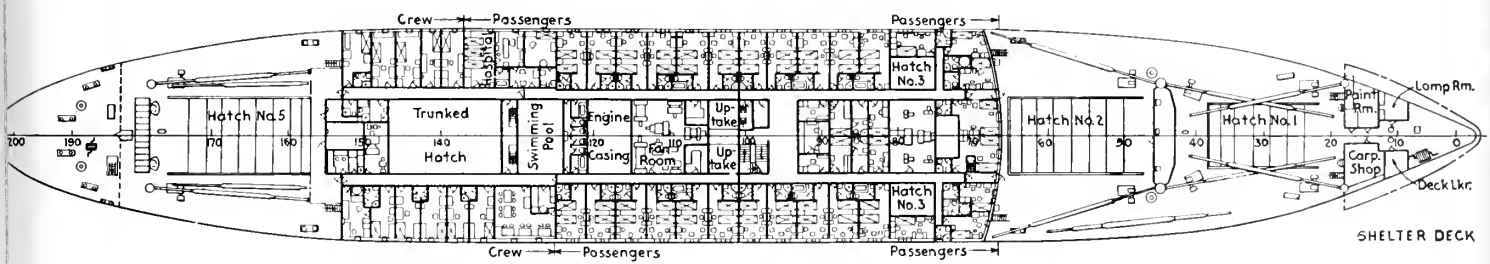
Propulsion machinery is of the steam turbine geared transmission type using steam at 440 psi and 740° F. total pressure and rated 8500 shp with 28½ inches vacuum on the condenser and with the propeller turning 85 rpm. Two sectional header type Babcock and Wilcox marine water tube boilers, designed for a pressure of 500 psi are installed, each of which supplies 37,500 lbs. per hour of 450 psi steam at 750° F. Each boiler is capable of 50 per cent evaporative overload. Each boiler is fitted with 5 B and W wide range type oil burners served by Quimby screw type pumps and by Griscom-Russell oil heaters. Oil is delivered to the burners at 300 psi and 230° F. Two Sturtevant force draft blowers driven by Westinghouse motors deliver air to the burners through the air pre-heater and the space between the inner and outer boiler casings. Bailey automatic combustion control takes care of the fuel-air ratio and the feed water adjustment. Diamond soot blowers keep the heating surfaces of the boilers clean. A Hays Corporation flue-gas analysis outfit checks combustion and a Hancock injector introduces make-up feed.

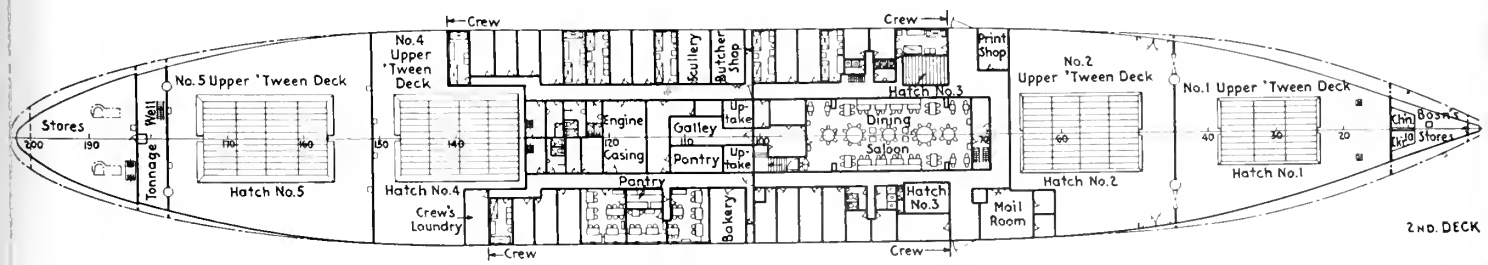
These boilers are mounted just forward of and in the same compartment with the main turbine—and a very short main steam pipe connects the boiler drum outlets with the turbine throttle. The entire propulsion machinery occupies only 50 feet in length in the mid-body of the ship for 8500 shp with 25 per cent overload capacity and for all auxiliaries with no crowding.

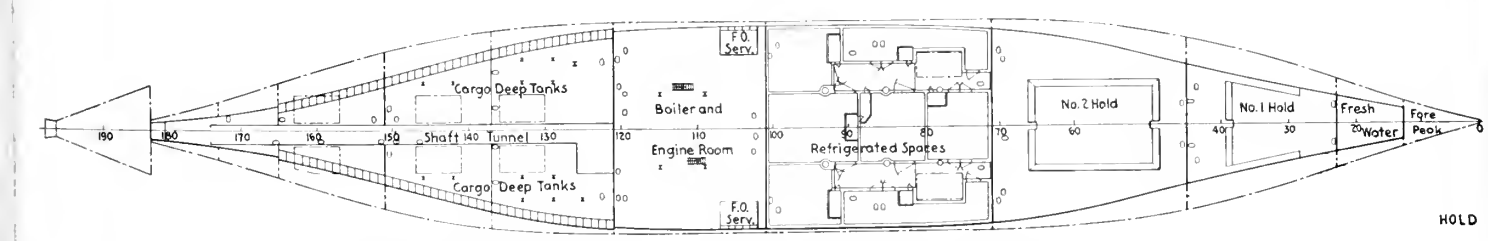
Newport News designed and built the turbines of their own impulse-reaction type. The turbine is of the











INBOARD PROFILE AND GENERAL ARRANGEMENT PLANS OF THE PRESIDENT POLK

Pacific Marine Review, April, 1946

cross compound type with high pressure rotor running 4504 rpm and low pressure rotor at 2289 rpm and with the shafts of the rotors connected through flexible pinions to the shafts of the high speed pinions of a Westinghouse double reduction gear set which drives the propeller line shafting at 85 rpm through a six shoe segmented type Howarth Pivoted thrust bearing.

The turbine water rate does not exceed 6.97 lbs. shp and the combined fuel consumption does not exceed 0.6 lbs. shp. Mounted on top of a Newport News two pass type condenser the low pressure turbine unit exhausts directly into 7800 sq. ft. of cooling tube surface in a space served by a C. H. Wheeler twin two stage type air ejector with inter and after and gland leak-off condensers which maintain a vacuum of 28½ inches when served with 250 psi steam. Cooling water is circulated by a De Laval horizontal centrifugal pump, of 13,000 gpm capacity at 10 psi, driven by a 100 hp Westinghouse motor.

From the hot well at the bottom of the condenser the condensate follows the now standard American path back to the boiler. Two Worthington vertical centrifugal pumps, with a capacity for 140 gpm at 180 feet head and driven by a 15 hp Westinghouse motor, discharge the condensate through the inter and after and gland leak-off condensers of the air ejector; the Davis drain cooler; the first stage Davis feed water heater, and to the Cochrane deaerating heater. This latter heater is located at shelter deck level 36 feet above engine room floor and provides a positive suction head for the feed pumps. Feed pumps are in duplicate —Warren horizontal centrifugals driven by Terry turbines—and taking suction from the deaerating heater deliver hot feed water through the Davis third stage heater to the boilers. The feed heaters are served by bled steam from the turbines—first stage at 7.1 psi deaerating, second stage at 25 psi, and third stage at 100 psi, all absolute. Feed goes into boilers at approximbately 318° F.

The propeller is a right-hand four blade solid cast Cramp brass manganese bronze wheel with a diameter of 21 feet 8 inches. It weighs 21 tons and has an expanding pitch measure of 21 feet 8 inches at 0.7 of the radius. At normal horsepower in calm seas this plant drives the hull easily at 18 knots. At 19.5 knots there is no sense of vibration on deck and no machinery noise. Three De Laval Westinghouse geared turbo-electric generators each of 300 k. w. capacity furnish electric energy for the auxiliary power, cooking, and lighting loads. The total connected electric load for these three classes approximates 2500 hp. Carrier refrigerating and air conditioning units take care of the refer cargo ship's stores, and complete temperature and humidity control for the dining room and certain other compartments.

Principal Dimensions

Length over-all	492 feet
Length between perpendiculars	465 feet
Beam, molded	69 feet 6 inches
Draft, full load, molded	26 feet 6 inches
Depth, molded to shelter deck	42 feet 6 inches
Shaft horsepower	8500
Speed	16½ knots
Gross tonnage	8500 tons
Deadweight tonnage	9400 tons
Fuel capacity	1455 tons
Displacement	16,190 tons
Bale capacity	568,050 cubic feet
Passengers	97
Crew	135

Passenger Accommodations

The work now in progress will be largely concerned with restoration of the public spaces on this vessel. These comprise sleeping, dining, and recreational facilities for 96 passengers. Sleeping accommodations are: six single and two three-person rooms on promenade deck; and six rooms for two persons, and twenty-four rooms for three persons on the shelter deck. All three-person rooms have two single beds and a pullman berth. All rooms have private toilet and lavatory and a tub or shower bath. All furnishings and fittings are up to first-class hotel standards.

The public rooms on the promenade deck are closely grouped and amply spacious for the passenger complement. They are surrounded by a fine broad promenade deck which is enclosed with Kearfott Full-vu windows. At the after end of the group of public rooms is a sports deck and built-in open swimming pool. Immediately forward of this area is the main lounge two decks high and finished at its after end with full height windows shielded by Venetian blinds. These windows afford an interesting view of the sports deck and pool and beautiful vistas of the sea.

Forward of this lounge are: a card room; a veranda cafe and bar; a library and writing room; and a lobby with gift shop and other conveniences. All of these rooms are decorated in a simple modern motif. Architecturally they stress the functional. All ventilating ducts are carefully worked into a harmonious scheme of line and color treatment. Furniture upholstering, deck coverings and drapes blend beautifully with each other and with the motif so that the impression is smart comfort.

Ventilation, air conditioning, and sanitary arrangements on these ships functioned more perfectly than on most of the large passenger liners on which we have traveled.

The dining room on the second deck depends entirely on electric light and mechanical ventilation and air conditioning. It is a rather narrow room. The interior decorators have so skillfully treated this unpromising interior that a diner has almost a perfect illusion of eating in the open air under tropic foliage. Air conditioning of this room and the pantries and galley adjoining is so perfect that there is a complete absence of objectionable cooking and food odors.

If the reconversion program succeeds in restoring completely the charm and comfort of these passenger accommodations we will soon have again running out of the Golden Gate a pair of transpacific passenger and cargo liners, equal in every comfort to any vessels on such service under any flag.

Merchant Ship Sales Act of 1946

By A. J. Dickie

The long eagerly-awaited Ship Sales Bill has now passed through the Congressional mill, has been signed by the President and so has become a law substantially as follows:

Section I—Name

The name of this act shall be Merchant Ship Sales Act of 1946.

Section II—Policy

(a) This measure declares its policy to be the maintenance of "an efficient and adequate American-owned merchant marine": (1) sufficient to carry American domestic waterborne commerce and a substantial portion of American export and import foreign commerce and to provide American shipping service on all essential trade routes for such commerce (2) capable of serving as a naval and military auxiliary in time of national emergency (3) owned and operated under the American flag by citizens of the United States; (4) composed of the best equipped, safest and most suitable types of vessels, built in the United States, and manned with a trained and efficient citizen personnel; and supplemented by efficient citizen-owned facilities for shipbuilding and ship repair, marine insurance and other auxiliary services.

Section III—Definitions

(a) **Commission** means the U. S. Maritime Commission.

(b) **War-built vessel** is defined as an ocean-going vessel of 1500 gross tons or more, owned by the United States, suitable for commercial use, which (1) was constructed or contracted for by or for the account of the United States from January, 1941, to September 2, 1945; or (2) was constructed from September 3, 1939, to September 2, 1945, and was acquired by the United States during that period.

(c) **Pre-war domestic cost** (p.d.c.) is the amount determined by the Commission (and published in the Federal Register) to be the cost of such a vessel built in the United States under conditions obtaining on or about January, 1, 1941, and in no case greater than 80 per cent of the domestic war cost of vessels of the same type.

(d) **Statutory Sales Price** (s.s.p.) is 50 per cent of pre-war domestic cost for freighters, 87½ per cent of p.d.c. for tankers, in each case subject to following adjustments:

(1) Cost of putting vessel in class to be subtracted;

(2) Cost of adding desirable standard vessel features to be subtracted;

(3) Cost of desirable features not in standard vessel to be added;

(4) Depreciation at 5 per cent per annum from date of original delivery to date of sale plus an additional 3 per cent per annum on cargo vessels or 4 per cent per annum on tankers for periods of war service.

In no case shall these adjustments reduce the s.s.p. below 35 per cent domestic war cost for standard cargo vessels, 31.5 per cent d.w.c. for Liberty type vessels, or 50 per cent d.w.c. for tankers.

(e) **Domestic War Cost** (d.w.c.) means the average war cost of the type taken without national defense features during the six months' war construction period most representative for that type.

Section IV—Sales to Citizens

(a) Any citizen may make application to purchase any war-built vessel under jurisdiction of the Commission and the Commission must sell if it finds that the applicant has the "ability, experience, and financial resources" necessary to "operate and maintain the vessel."

(b) At time of sale citizen must pay 25 per cent of s.s.p., paying the balance in not more than 20 annual installments at 3½ per cent interest per annum.

Section V—Charter to Citizens

(a) Any citizen may apply to the Commission to charter "a war-built dry cargo vessel for bareboat use." The Commission shall not approve unless in its judgment such charter would be consistent with the policies of this act, and no charter shall be made until 60 days after publication of the applicable p.d.c. in the Federal Register.

(b) Charter hire shall be fixed by the Commission and shall not be less than 15 per cent of the statutory price per annum except on an affirmative vote of at least 4 Commissioners.

(c) The provisions of Sections 708, 709, 710, 712 and 713, of the Merchant Marine Act of 1936, as amended, shall be applicable to all charters made under this section.

Section VI—Sale to Non-Citizens

(a) Commission is authorized to sell vessels to non-citizen applicants with following restrictions:

(1) Applicant must have necessary ability, experience and financial resources and sale must be consistent with policies of this act and with Section 9 of Shipping Act of 1916;

(2) Vessel must be unnecessary to defense of United States;

(3) Vessel must be unessential to the American Merchant Marine; and

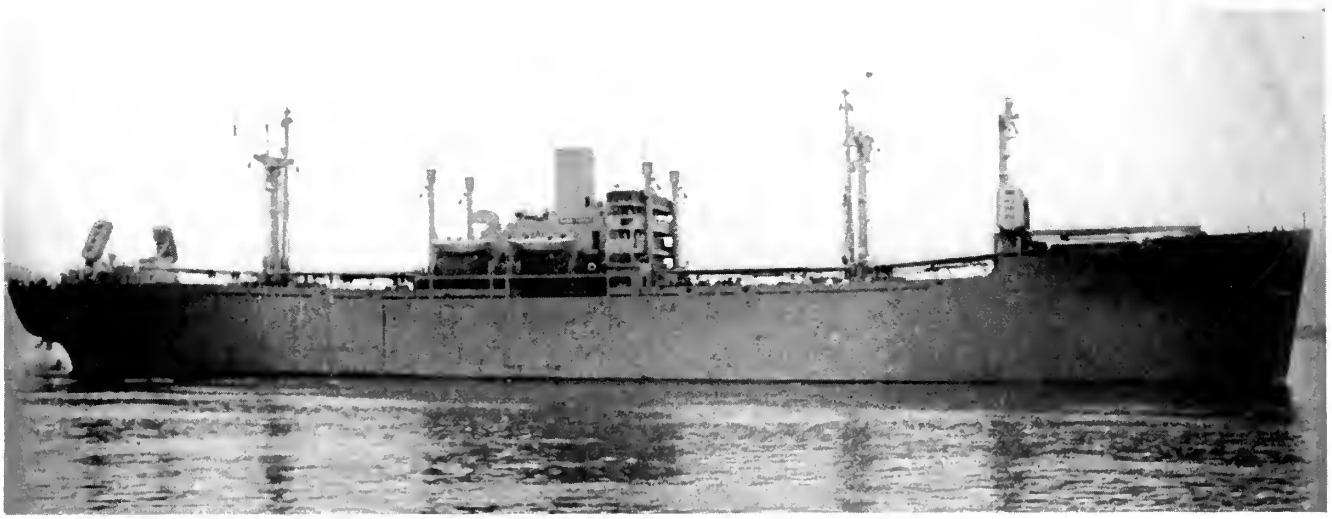
(4) Sales must not be made until a reasonable period of time after publication of p.d.c. in Federal Register—this period for "C" type vessels and tankers to be not less than 90 days—the vessel for such period having been available for sale or charter to citizens.

(b) The preferred mortgage securing the balance of unpaid price in cases where vessel is being transferred to foreign register shall contain clauses insuring it as preferred over any other liens or encumbrances under the laws of such registry.

Section VII—Order of Preference

(a) The Commission shall give preference to: citizen applicants over non-citizen applicants; citizen applicants to purchase over citizen applicants to charter and citizens of the Philippines over other non-citizen applicants. In each case the Commission shall consider the war loss in tonnage of the applicant and shall give preference to former owners of the vessel.

(b) After cessation of hostilities,



The Victory type. Estimated statutory sales price $917,979.50. Charter rate per annum $137,696.93. Charter rate per month $11,474.00.

operation of commercial vessels by the United States either for its own account or through operating agents shall, except as to services specifically authorized by law, be continued "only to the extent necessary to effect orderly transfer of vessels to private operation."

Section VIII Exchange of Vessels

Authorizes the Commission to acquire vessels in exchange for an allowance of credit on the sales of its own vessels or of any vessels built in the United States after January 1, 1937, and acquired by exchange. Many restrictive clauses qualify this authorization. Principal of these are as follows:

The vessels to be exchanged: must be one owned by a citizen and not acquired by purchase under this act; or must be one built in the United States and owned by a foreign corporation, controlling interest in which is owned by a United States citizen, and which agrees to operate purchased vessel; and shall be documented in the United States.

The trade-in allowance: shall not be applied on the cash payment required; shall be the fair and reasonable value of the vessel as determined by the standards of Executive Order 9387 (8-F.R. 14105) as of the date of offer; shall not be greater than one-third of the s.s.p. (unadjusted) of the vessel to be purchased, or the liability of the United States under charter for restorations of such vessel, whichever is higher; and, on vessels acquired from the United States, shall not be greater than price paid for the vessel plus depreciated value of subsequent improvements.

The application for such a trade-in must be in the nature of a firm offer binding for 90 days.

Section IX—Adjustment of Prior Sales

Any citizen of the United States who: owns a vessel acquired from the Commission prior to the enactment of this act and delivered by its builder after December 31, 1940; is party to a contract with Commission to purchase a vessel not yet delivered; or owns or has contracted for the construction of a vessel on which a construction differential subsidy was paid or agreed to be paid; shall be entitled to an adjustment in the price of such a vessel by treating the vessel as if it were being sold to the applicant on the date of the enactment of this act.

This adjustment is qualified by subadjustments of mortgage payments, interest payments, Federal tax payments and agreements to limit charter hire and liability of the United States on vessels operated by U. S. under charter.

Section X Limitation of Eligibility

No person is eligible to purchase or charter or receive adjustment on sales price without entering with the Commission into a binding agreement that the liability of United States for any vessel, owned by the applicant and under charter to the United States, shall be limited to "just compensation" as of the date of loss.

Section XI—Reserve Fleet

Directs Commission to place in National Defense Reserve such vessels as: Commission, Secretary of War, and Secretary of Navy jointly shall deem necessary; and all vessels owned by the Commission after December 31, 1947, for the sale of which no contract has been made up to that time except those deemed of insufficient value for commercial and defense purposes.

Vessels placed in reserve shall not be used for commercial purposes except during periods of emergency under Section 902 of Merchant Marine Act of 1936 as amended. Any war-built vessel may be made available to any State maintaining a marine school according to Act of July 29, 1941 (Public Law 191, Seventy-Seventh Congress 55 Stat. 607).

Section XII—General Provisions

(a) Authorizes Commission to reconvert or restore any vessel authorized to be sold or chartered.

(b) Exempts contracts of the Commission from provisions of Section 202 of the War Mobilization and Reconversion Act of 1944.

(c) Permits vessels sold to citizens under this Act to engage in Coastwise Trades of the United States even though they had been engaged in foreign flag service during World War II.

(d) Impounds all moneys (received by Commission under this

Act) in the Treasury under Miscellaneous receipts. Specifically applies to the provisions of this Act all the provisions of Sections 201 (d), 204 (b), 207, 209 (a), and 905 (c) of the Merchant Marine Act of 1936 as amended.

Section XIII—Reports

Commission on July 1, 1946, and every three months thereafter must make reports to Congress on all activities and transactions under this Act.

Comment

This Act is somewhat complicated. An apparently sincere effort to help establish a privately owned American Merchant Marine by selling the war built tonnage to American citizens at very reasonable prices has bogged down into a mass of "complex and cumbersome" rules in regard to fixing prices and charter hire.

Pre-war domestic cost of building a similar ship is the basis of price computation. This, however, is qualified by an artificial floor. This cost cannot be less than 80 per cent of the domestic war cost of a similar ship. However, the pre-war domestic cost as thus established will be used as the base.

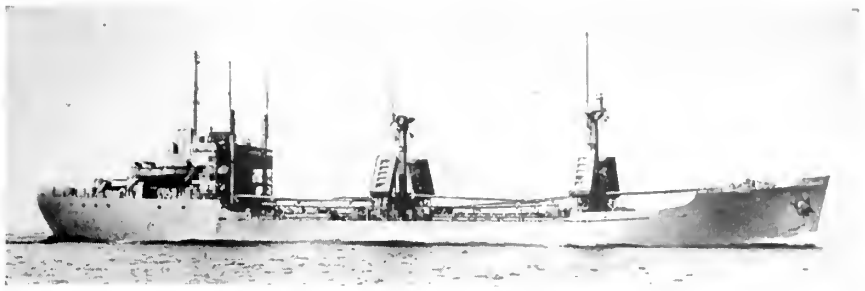
Next we have a Statutory Sales Price which is 87.5 per cent of p.d.c. for tankers and 50 per cent of p.d.c. for cargo carriers. This s.s.p. can be further reduced by depreciation, expense for putting in class, and expense for adding desirable standard equipment originally but not now in the vessel. However, this reduction process can go no lower than a fixed percentage of the domestic war cost—31½ per cent for Liberty ships; 35 per cent for standard cargo types; and 50 per cent for tankers.

Such criteria for basic prices require a survey of each vessel before an accurate selling price for that vessel can be established. This means long delays and on top of these delays there is imposed a 60-day wait after publication of the price before the vessel can be chartered and a 90-day wait before the vessel can be sold to a non-citizen buyer. These delays may make it impossible to take advantage of a very good ship sales market.

A rough idea of the statutory sales prices is given by the table herewith which sets forth the estimate of the War Shipping Administration establishing interim charter hire rates for the various types.

Section 709, Merchant Marine Act 1936 provides that if any charter operator makes in the operation of a vessel more than 10 per cent net per annum on his invested capital one-half of the excess over 10 per cent net shall be paid to the Commission as additional Charter hire. Definitions of the terms "net voyage profit," "fair and reasonable overhead expenses," and "capital necessarily employed" are in the charter form together with formulae for determining the quantities involved.

As we read this Act of 1946 we are impressed with the tremendous effort that is made to prevent any loss to the United States through irregularities in such sales as may be made. We still believe that if Congress had in 1945 accepted from the Navy and the Maritime Commission the schedule of the ships thought to be essential for future emergencies and had then authorized the Commission to sell the balance of the fleet on the world's markets at world market prices we would by this time have sold a few hundred vessels and would have plenty of all types left to furnish a more than adequate American privately owned merchant marine in addition to the laid-up fleet. We would by that method have sold on a higher market, have realized a better price, and have had far less selling cost than will be entailed by sales under the present Ship Sales Act of 1946.



C1-M type. Estimated statutory sales price $640,000. Charter rate per annum $96,000. Charter rate per month $8,000.

Type Vessel	Deadweight Tonnage	Estimated Statutory Sales Price (Mean)	Charter Rate Per Annum 15% of Sales Price*	Charter Rate Per Month*
EC2-S-C1	10,800	$ 582,833.00	$ 87,424.95	$ 7,285.41
		Ceiling		
C1-M-AV1	5,100	640,000.00	96,000.00	8,000.00
C1-A	7,400	932,757.50	139,913.63	11,659.47
C1-B	9,100	932,757.50	139,913.63	11,659.47
C2-S-B1	9,200	991,347.00	148,702.05	12,391.84
C2-S-AJ1	10,800	991,347.00	148,702.05	12,391.84
C3	12,300	1,154,000.00	173,100.00	14,425.00
VC2-S-AP2	10,800	917,979.50	137,696.93	11,474.00
VC2-S-AP3	10,800	1,026,347.00	153,952.05	12,829.34

* With additional charter hire payable in accordance with the provisions of Sec. 709, Merchant Marine Act, 1936.

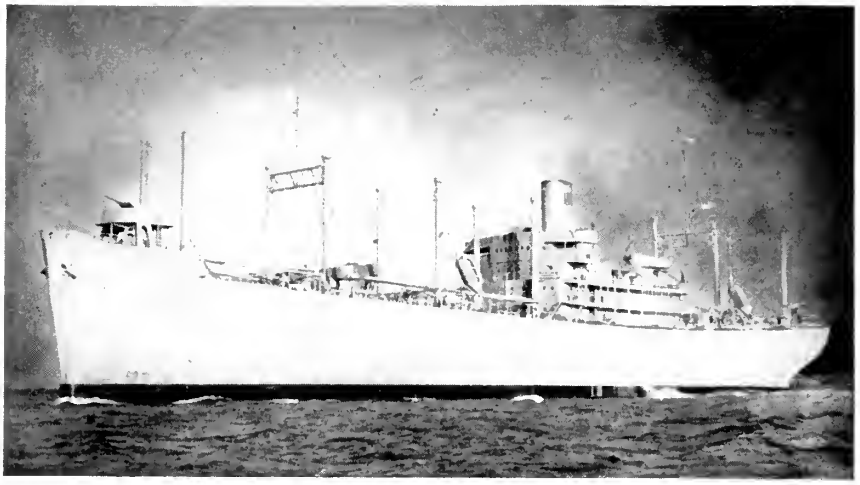
C2 type. Estimated statutory sales price $991,347. Charter rate per annum $148,702.05. Charter rate per month $12,391.84.

Policy Governing Interim Chartering of Ships by War Shipping Administration

I. General Statement of Purpose And Intention

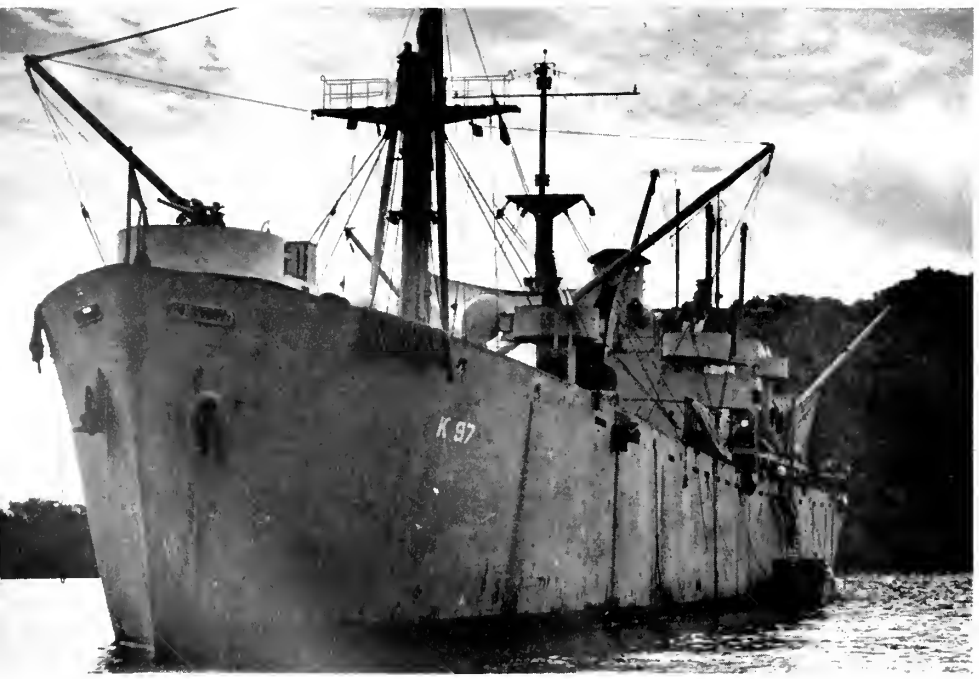
With the termination of the UMA agreement on March 2, 1946, the WSA proposes to derequisition vessels chartered to the WSA as rapidly as possible so as to achieve prompt resumption of private shipping by operators owning their own vessels. It is obvious that the tonnage requirement necessary for transportation of foreign commerce of the United States will far exceed the privately owned tonnage to be derequisitioned The UNRRA requirements and national import programs will create an emergent demand for tonnage during at least the calendar year 1946 and well into 1947. During this period it is felt necessary to curtail WSA operation through agents to the greatest extent possible, in order that dual operation (government and private) with its attendant disadvantages may be avoided.

The policy of the Ship Sales Bill is to encourage the ownership and operation of the merchant fleet of the United States by citizens thereof and the retirement of the Government from ship operation through the sale or charter of war-built tonnage. The pending bill provides that no charters shall be made under the Act until sixty days after the publication by the Maritime Commission of the statutory sales prices. However, as the Report of the Joint Conferees states: "The bill would not affect the existing authority of the War Shipping Administration and the Maritime Commission to charter vessels to citizens of the United States, which may be necessary for limited periods to speed up the resumption of private steamship operation." It is proposed, therefore, that with the termination of UMA, WSA will undertake a program of interim bareboat chartering under the authority of P.L. 101, 77th Congress, authorizing the charter of vessels "necessary for transportation of foreign commerce of the United States or of commodities essential to the national defense, upon such terms and conditions, for such period or periods, and subject to such restrictions as the commission (now WSA) may deem necessary or desirable for the protection of the public interest, and at such rate of hire as it may deem to be fair and reasonable." It is intended that this program shall remain in effect only for such period as may be required for the chartering provisions of the Ship Sales to become fully operative. The provisions of the interim charters therefore will be patterned generally after the provisions of the Ship Sales Bill.



C3 type. Estimated statutory sales price $1,154,000. Charter rate per annum $173,100. Charter rate per month $14,425.

The Liberty type. Special conditions apply to Libertys.



Following the termination of the UMA agreement on March 2, 1946, the War Shipping Administration will undertake to assure that adequate U. S. flag tonnage is available to transport this nation's fair share of its foreign commerce. It will also contribute tonnage to a pool to be formed for the common task of relief and rehabilitation including the shipping requirements of UNRRA for cargo moving from the United States and Canada. These requirements will be centrally programmed in Washington and so far as possible cargo to move on United States flag ships will be allocated to privately owned or chartered shipping. Any deficiencies resulting will be met by government owned tonnage.

The WSA does not expect to exercise any direct control over privately owned tonnage except to see that it is employed in a manner not inconsistent with the overall programs and the welfare of the Ameri-

can Merchant Marine in general. The cost of moving cargoes for relief and rehabilitation will however continue to be of direct concern to this Government and freight rates for such cargoes therefore must conform with Conference or WSA approved rates. At the same time WSA recognizes fully that participation by private capital is dependent upon adequate and compensatory rates.

The WSA hopes that a large share of this Government's obligation for the transportation of relief and rehabilitation cargoes will be met by privately owned or chartered tonnage.

II. Basic Policy Regarding Chartering

Charters will be made to:

(a) Operators of liner or berth services who will be expected to bring their fleets up to the standards required for peacetime operation pending acquisition of new tonnage and/or redelivery of their owned vessels.

(b) Liner or berth operators to provide additional tonnage necessitated as a result of the war or in the relief and rehabilitation program, to handle the additional cargo moving on berth vessels.

(c) Experienced operators other than those engaged in berth services for the transportation of commodities which move under contract and in full-cargo lots.

(d) Other operators who qualify and commit themselves to purchase ships under the Merchant Ship Sales Act of 1946.

(e) Operators for employment in cross trades (that is between foreign ports where such operation is in the interest of the over-all Government program and does not conflict with a United States flag berth service.

III. Form of Charter

A draft of proposed "WARSHIP-DEMISEOUT" as an interim charter, the provisions of which are patterned generally after those of the Ship Sales Act, has already been released. Comment on the provisions of this charter is unnecessary for the purpose of this statement, except to state that the trading limits will be in conformity with the basic policy set out in paragraph "II" herein and that WSA must exercise reasonable control over the routing and cargo carried by the ships it charters.

The preceding table sets forth proposed basic charter rates for standard vessels based on the pending Ship Sales Bill.

IV. General

In the allocation of cargo to be carried by U. S. flag vessels, first preference will be given by WSA to the owners and second preference to charterers of the U. S. flag vessels.

Except in very unusual cases, no charters will be made under the authority of P.L. 101 (77th Congress) after the effective date for chartering under the Ship Sales Act. Furthermore, it is intended that these interim charters shall be supplanted by Ship Sales Act charters at the earliest practicable date.

Development of Small-Boat Harbors

A series of small harbors all along California's coastline, providing anchorage for light-draft vessels, long has been a dream of California fishing fleets, yachtsmen and power boat enthusiasts. Now the project has begun to "jell" through start of an organized campaign to make the dream a reality.

Yachtsmen, fishermen and power boat owners have started the ball rolling at a series of meetings already held, and being scheduled. The small craft owners have requested the California State Chamber of Commerce to coordinate this campaign, and sparkplug the initiation of necessary Federal legislation for surveys and appropriations.

Already, the State Chamber, through its natural resources committee, its travel and recreation committee, and its North Coast, Central Coast and Southern California councils, has swung into action. All sections of the California coastline were represented at a big meeting in Newport Harbor, arranged by the State Chamber—and steps for new small harbor projects are under way in Sonoma and San Luis Obispo counties.

Frank M. Shay, San Jose, chairman of the State Chamber's Central Coast Council, has written California congressmen requesting introduction of legislation authorizing an Army Engineer's study of harbors for light-draft vessels in Northern California, similar to existing authority in Southern California.

"Use of these light-draft vessel harbors would serve two principal purposes," Shay points out. "They would provide refuge and landing facilities for the commercial fishing industry. Also, they would provide for recreation. Commercial fishing fleets landed a billion and a quarter pounds of fish in California ports last year. More anchorage and refuges would result in increased catches. Such harbors could also be used by small craft owners for recreational purposes."

Authorization for Army Engineer survey of the Northern California coastline is asked because a similar survey already has been authorized for Southern California. Study is now being made by the Southern California district, U. S. Engineers. This study extends from south of Point Pinos, Monterey County, to the Mexican line.

The Newport Harbor meeting showed small craft owners what can be done in light-draft harbor development. Two northern counties already are doing something about it.

San Luis Obispo County's chambers of commerce, supervisors, planning engineers, commercial fishermen, public representatives and others are working on formation of a San Luis Obispo County harbor district for development of Morro Bay, with freeway and altered streets to give maximum accessibility. The plan contemplates seeking some of the state-held beach park acreage for the development.

Sonoma County's Board of Supervisors was represented at the Newport Harbor meeting. Immediately afterward, the supervisors voted to start proceedings for county acquisition of private acreage on the west shore of Bodega Bay for harbor and recreational uses.

Harbors that can be fitted into the program include Crescent City Harbor, Humboldt Harbor, Noyo, Albion, Point Arena, Bodega Bay, Richardson's Bay, Petaluma River, Napa River, Tomales Bay, Bolinas, Richmond, Martinez, Oakland Outer Harbor, Half Moon Bay, Santa Cruz, Moss Landing, Monterey, Big Sur, Morro Bay, Avila, Goleta, Santa Barbara, Ventura, Oxnard, Port Hueneme, Santa Monica Harbor, Playa del Rey, Redondo, Arroyo de la Cruz, Cambria Pines and Mission Bay.

Re-establishment of International Ice Patrol In North Atlantic Ocean

Admiral J. F. Farley, Commandant of the United States Coast Guard, has just announced the re-establishment of the International Ice Patrol in the North Atlantic Ocean. The President had previously directed that the Coast Guard resume the conduct of the international service of ice observation and ice patrol as the need of protection against icebergs became paramount with the end of hostilities and the resumption of peacetime commercial traffic over the North Atlantic steamship lanes.

The International Ice Patrol was terminated on December 22, 1941, by reason of war conditions and disruption of normal maritime commerce, but a careful estimate of North Atlantic ice conditions was maintained throughout the war. Information concerning the northern areas invaded by pack ice and icebergs was vital for the regulation of patrol craft and the routing of war ships and convoys. The ice conditions in Denmark Strait, for example, directly affected the movement of enemy submarines and surface raiders. This isolated passage between Iceland and

NO FUZZY LAMBSKIN

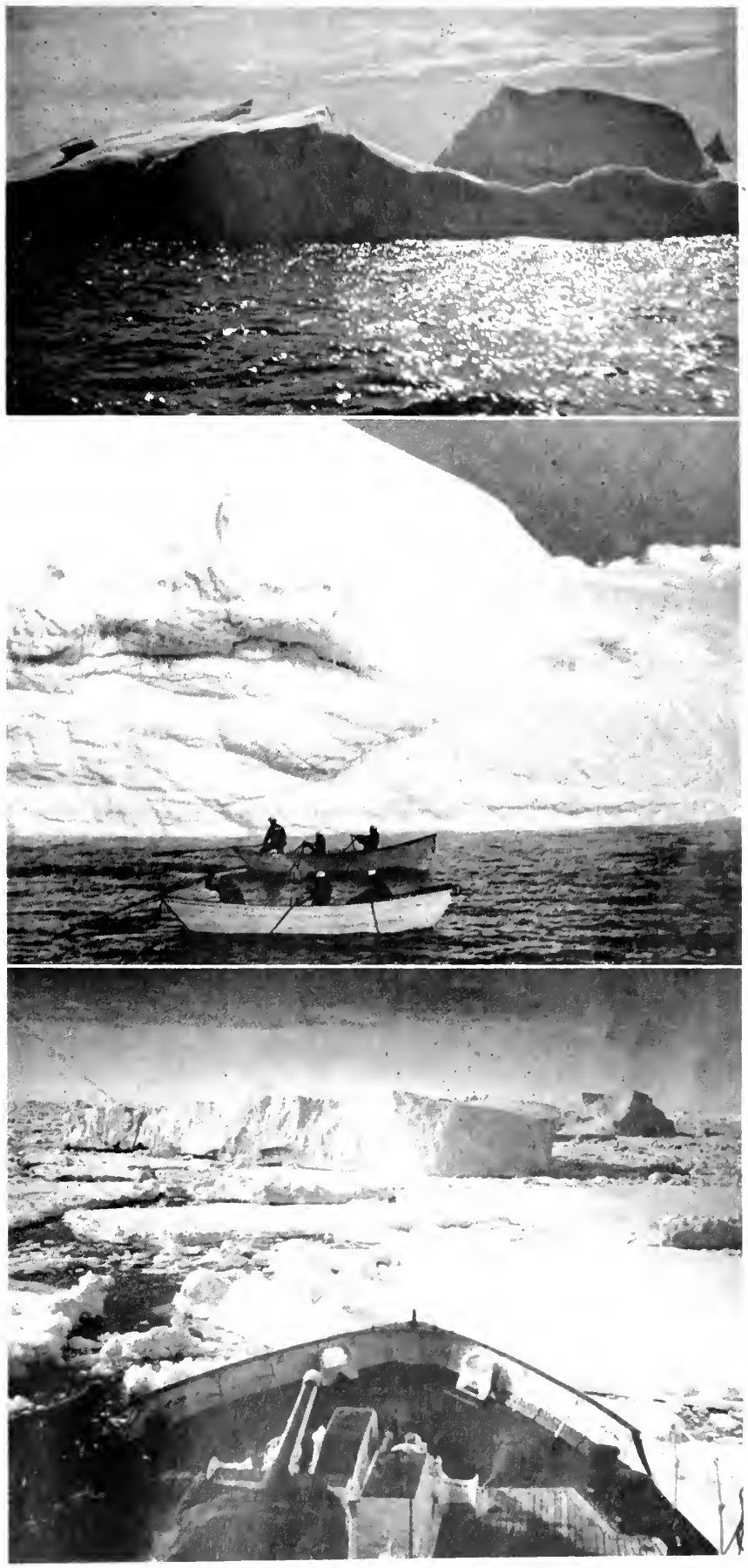
The fuzzy, fleecy look of this berg is strictly a floating wolf in sheep's clothing. Spring brings down whole packs of these bergs, seemingly intent on destruction of helpless merchant vessels, but the U. S. Coast Guard has the answer. Now equipped with radar and Loran, ships and planes of the Coast Guard's international ice patrol locate such floating menaces and radia their position and direction of drift twice daily to shore stations and merchant shipping. This patrol took up its war-suspended duties by presidential order this March.

Greenland possessed too many hazards in the form of field ice and icebergs for ordinary shipping, so became a frequent avenue for German ships entering or leaving the North Atlantic. The presence of pack ice and bergs prevented any general practical mine blockade. It was in the Denmark Strait that the German battleship Bismarck sank the British battleship Hood and later suffered a similar fate in an attempted escape towards Europe.

The iceberg menace is one of nature's elements which man in all his ingenuity and resourcefulness cannot control, regulate or entirely avoid. Breaking off from the massive Greenland glaciers, these icebergs, frequently as long as a block and a half as high, above the water, are carried along by the ocean currents. Some of them reach the Labrador current, and then they start their march toward the heavily-traveled North Atlantic steamship lanes. It is beyond human power to hold them back, to destroy them, or to divert them from their course.

The Coast Guard will inaugurate the ice patrol about March, when the presence of ice generally commences to threaten steamship traffic, in the North Atlantic. The patrol area covers a region of about the size of the State of Pennsylvania, in the general region of the Grand Banks of Newfoundland. During the ice season, which usually extends from April to July, this region is blanketed in fog during a large part of the time, accentuated by the confluence of the Gulf Stream and Labrador current. And through it passes the world's heaviest traffic.

Aviation, Radar, and Loran will be employed for the first time to insure greater certainty of detection and location. Radar and Loran, however,



Top: BEAUTY PACKED IN ICE. Smashing destruction wears a translucent white mask, but mariners know the menacing truth, so Coast Guardsmen man planes and ships equipped with radar and Loran, and cruise into the icy North Atlantic. Foreknowledge of the location and drift of such glacial offspring is obtained by the Coast Guard in its annual springtime ice patrol, which has been resumed by presidential order this year.

Center: A RACE WITH DEATH. Coast Guardsmen on the international ice patrol take to their "keels" in a race with death and time. Experiments in the use of explosives to destroy icebergs have proved the impossibility of such destruction, however, so radio-location and warning are the means adopted by Coast Guard planes and cutters for efficient protection of North Atlantic shipping.

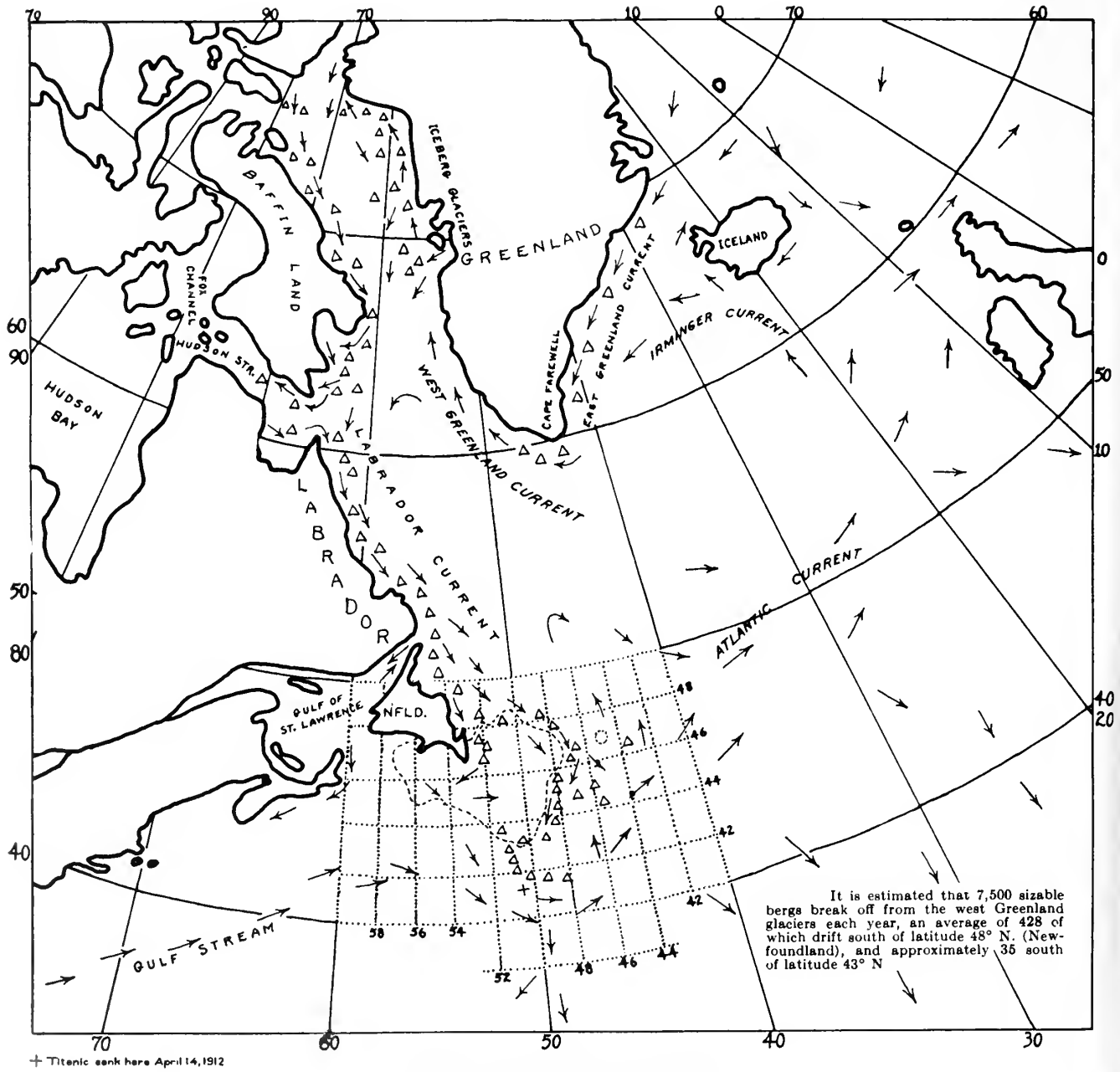
Bottom: SPRING PLOWING. Something new in spring plowing takes place as this Coast Guard cutter heads into the crust of a North Atlantic ice pack. The spring thaw breaks such floating fields off from far northern glaciers; they drift into North Atlantic shipping lanes; and the Coast Guard cutters and planes go out again to begin their vigilant annual patrol, suspended during the war.

are supplemental and are not a conclusive answer for ice surveys. A vigilant patrol will therefore be necessary by cutters and aircraft. Planes and ships will be based at Argentia, Newfoundland, where the International Ice Patrol Commander and staff will make its headquarters.

Coast Guard-manned B-24's will make the aerial surveys, supplemented by additional Coast Guard aircraft when required. The Owasco* class cutters have been assigned for surface patrol. These vessels are especially designed for Coast Guard duty and service conditions, such as rescue at sea, ice breaking, weather patrols and rough weather duties have determined the scantlings and arrangement of structure as well as the mechanical and electrical requirements and equipment. This class of vessel is single screw, turbine-electric, capable of developing 4000 shp. These vessels are 254 feet in length, have a 43′ beam and a cruising radius of 14,800 nautical miles at 11 knots or 5,750 nautical miles at 18.4 knots. They carry a complement of 15 officers and 108 men. Both planes and ships will be equipped with Radar and Loran. It is contemplated that one cutter will be on patrol and one vessel will be on standby status in the vicinity of Argentia.

Information concerning ice, growlers, and icebergs will be collected by the patrol vessels, from aerial surveys, and from sightings reported by ships and planes operating in or crossing the area subject to ice hazards. Whenever practical, commercial ships will be requested to report by dispatch every four hours when in the ice area their position, course, and speed, and a brief description of

* Described in detail in recent issues of Pacific Marine Review.



DRIFT OF ICEBERGS FROM THEIR SOURCE INTO THE NORTH ATLANTIC

ice sighted. This information will be summarized each day in radio dispatches which are broadcast twice daily.

An idea of the importance which mariners in the vicinity of the Grand Banks place on the receipt of ice information is indicated by the cessation of practically all commercial radio transmission during the periods the ice information is being broadcast by the Ice Patrol Commander.

In past years, during periods of poor visibility, when it was not possible to conduct efficient patrols, the ice positions given were estimated and based on sightings that might be several days old but the introduction of radar during this year's patrol will assist in locating bergs even during low visibility.

However, current models of radar gear of proper characteristics and operating at peak performances should easily pick up large ice-bergs but small bergs or growlers capable of doing extensive damage to vessels in even moderate seas and with moderate wind conditions are liable to remain undetected. It is therefore unsafe to rely on radar to indicate small bergs or growlers that may be large enough to sink a vessel. Ships should, therefore, make a practice of keeping clear of areas infested by growlers and heavy pack ice even though scattered. The most certain method of avoiding damage to a vessel is to be able to see ice and keep clear of it.

The introduction of Loran into the ice patrol service this year offers a much better opportunity to check the exact locations of bergs and ice after they are sighted. In the past, patrol vessels have been fogbound for days. Their position had to be determined by dead reckoning and radio direction finder bearings. With the advent of Loran, the patrol vessel's position can be plotted within approximately one mile so fog will no longer interfere with this phase of operations. Loran will also afford a more efficient means of tracking bergs in their early movements.

Besides the regular work of locating the ice and warning passing vessels of the danger limits, the officers of the patrol vessels are directed to make a study of the ice situation, particularly with regard to the currents in the vicinity of the Grand Banks, the physical properties of the ice, its drift, erosion and melting; temperatures of sea water and atmosphere in the vicinity of the ice; habits of birds, and seals with regard to ice; and, in short, to gather all sorts of information that might help the navigator in those regions.

The Coast Guard's many years of experience in administering the International Ice Patrol in the North Atlantic and in conducting operations in Alaskan waters and other areas where heavy ice conditions prevail was put to good use during the war. At the outset of the war, Coast Guard cutters, with their Coast Guard officers and men, were organized into a patrol for the naval defense of Greenland under the operational control of the Commander in Chief, U. S. Atlantic Fleet. This force was later expanded, augmented by the establishment of an operating base, radio stations, aids to navigation, aviation landing fields, and other facilities in Greenland. The Greenland Patrol provided escort vessels for shipping between Greenland and the United States and Canadian ports, carried out anti-submarine activities in these waters, and cooperated closely with the Army in the establishment of bases in arctic and sub-arctic territory. A special duty assigned to this force was that of protecting the cryolite mines in Greenland and of convoying and protecting merchant vessels carrying cryolite to United States ports.

The Coast Guard takes particular pride in its record of service since undertaking this duty; not a single life has been lost by reason of collision of a vessel with an iceberg in the area under surveillance. This record of efficient performance of duty in connection with the Ice Patrol is in keeping with the tradition of the Coast Guard dating back over 150 years, and which the Coast Guard strives zealously to maintain with an unfaltering resolve that the duty shall be carried on in a manner to merit the esteem and respect of the maritime nations of the world.

Briefly stated, the duties of the Coast Guard in conducting the ice patrol in the vicinity of the Grand Banks, consist in finding and keeping in touch day by day with icebergs and field ice, determining their set and drift, reporting their presence and location to the Hydrographic Office of the Navy, and broadcasting the information by radio for the protection of shipping. The cutters, while on this work, also perform such incidental service, not to interfere, however, with the paramount duty of the patrol, as rendering assistance to vessels in distress, giving medical aid to crews of passing vessels, removing obstructions to navigation, and extending such other assistance to the mariner as may be practicable, and conducting scientific observations and experiments for the aid and furtherance of oceanographic knowledge.

This will be a year of new ideas and innovations for combating the ice menace. Changes from the old system of patrol are in order as the result of introducing wartime equipment to peacetime usage in safeguarding merchant shipping.

United Nations Ships May Use WSA Food Stores

Permission has been granted by the War Shipping Administration for vessels of Greece, Netherlands, Norway, Sweden, United Kingdom, and tankers of Panama to stock food stores from WSA sources. Exemption from a previous order limiting supplies to U. S. ships was made possible by an agreement reached by the Department of Agriculture and the War Shipping Administration.

The agreement followed an appeal by Ministries of Shipping of the six nations to the acting war shipping administrator for exemption and stating that it would be impossible for their vessels to obtain adequate quantities of food either in their home countries or through civilian channels in the United States.

The exemption provides that the foreign flag vessels must comply with all other food control regulations and bulletins issued by the Food Control Division of WSA.

Other countries may be included in the exemption agreement if they make application to WSA including proof of inability to obtain food stores in their home countries and other qualifications.

All privately owned ocean-going American flag vessels engaged in foreign commerce and coastwise vessels previously covered are included as authorized purchases of Government controlled foodstuffs from approved ship supplies.

Merchant Ships In Atomic Test

The effect an atomic bomb will have on cargo ships and transports is an important part of the coming world-celebrated experiment to take place in mid-Pacific this summer. One-fourth of the targets will be merchant-ship types.

Besides the 25 targets, 21 other merchant-ship types will participate as survey and supply ships. Among the latter is the Navy transport W H A R T O N, once the liner SOUTHERN CROSS, which carried thousands of tourists to South America. Already on the scene at Bikini Atoll, in the Marshalls, is the BOWDITCH, a survey vessel formerly the well-known SANTA INEZ, of Latin American passenger ship fame. The transport GEORGE CLYMER, once the liner AFRICAN PLANET, will also participate in the supply fleet.

Among the other supply ships heading for the tiny atoll in the wake of some thirty-five warships, from battleships to submarines, are six Victory ships, six C-2 cargo ships, three C-3 transports and three seaplane tenders.

The first ship to arrive at Bikini Atoll was a merchant ship, the SYLVANIA, an attack cargo ship. She reached the scene of the bomb test early in March with a load of buoys and chains for marking areas.

The last ship to arrive will also be a merchant-type vessel, scheduled to be late in reaching the scene for a specific purpose. She is to be the BURLESON, a two-funneled transport playing the part of a modern "Noah's Ark". On board will be over 4,000 animals, to be distributed among the target ships to test the bomb's effect on animal life.

In order to reduce expected seasickness among these doomed creatures, the BURLESON will be held in San Francisco until April 15 when she will begin her high-speed run to the Marshalls. She will carry 200 goats, 200 pigs, some sheep and 3,700 rats.

First to arrive of the $100,000,000 worth of merchant-type ships to be used as targets will be the FILLMORE. She and her 24 sister-ships are two-stack transports and attack cargo vessels, each of over 425 feet in length. They were designed and built by the Maritime Commission. All but two of this fleet were known as Navy BD1's unique in that they were launched complete with superstructure, masts, funnels and boat davits all in place. The other two vessels are combat cargo ships.

During the war, these combat transports and cargo ships formed the core of our amphibious forces in many landing operations. Working close inshore, they discharged cargo and troops on beachheads, at the same time providing considerable fire-power to cover the operations.

Lists of the target and supply ships participating in the test, as furnished by the American Merchant Marine Institute, follows:

Target Ships

NAME	NUMBER	TYPE
Artemas	AKA 21	BE1
Athene	AKA 22	BE1
Gilliam	APA 57	BD1
Appling	APA 58	BD1
Banner	APA 60	BD1
Barrow	APA 61	BD1
Bladen	APA 63	BD1
Bracken	APA 64	BD1
Briscoe	APA 65	BD1
Brule	APA 66	BD1
Burleson	APA 67	BD1
Butte	APA 68	BD1
Carlisle	APA 69	BD1
Cartarette	APA 70	BD1
Catron	APA 71	BD1
Cleburne	APA 73	BD1
Courtland	APA 75	BD1
Crittenden	APA 77	BD1
Dawson	APA 79	BD1
Fallon	APA 81	BD1
Fergus	APA 82	BD1
Fillmore	APA 83	BD1
Gasconade	APA 84	BD1
Geneva	APA 85	BD1
Niagara	APA 86	BD1

Support Group

NAME	NUMBER	TYPE
Mount McKinley	AGC 7	C2-S-AJ1
Appalachian	AGC 1	C2-S-B1
Blue Ridge	AGC 2	C2-S-B1
Panamint	AGC 13	C2-S-AJ1
George Clymer	APA 27	Passenger C3 Ex African Planet
Rockbridge	APA 228	Victory
Rockingham	APA 229	Victory
Rockwell	APA 230	Victory
Saint Croix	APA 231	Victory
Cavalier	APA 37	C3-S-A2
Henrico	APA 45	C3-S-A2 Ex Sea Darter
Bottineau	APA 235	Victory
Bexar	APA 237	Victory
Rolette	AKA 99	C2-S-B1
Ottawa	AKA 101	C2-S-AJ3
Albermarle	AV 5	Seaplane tender
Kenneth Whiting	AV 14	Seaplane tender
Cumberland Sound	AV 17	Seaplane tender
Wharton	AP 7	Ex Southern Cross

Others

NAME	NUMBER	TYPE
Sylvania	AKA 44	BE1
Bowditch	AGS 4	Ex Santa Inez

Swedish Merchant Fleet 1,600,000 Tons

During 1945 Sweden's merchant marine increased by 41,000 gross tons to 1,598,000 tons, as compared with a net increase of 135,000 tons the year before. Most of the vessels added to the fleet were motor-driven. The steam tonnage, on the other hand, showed a further decrease. The number of ships at the end of 1945 was 2,069, or 23 less than in 1944.

The war losses of Swedish merchant shipping were about 600,000 gross tons. Most of these losses, however, have been compensated by new construction at Swedish yards, and the country's commercial tonnage is now about the same as before the war. Swedish shipyards are also engaged in a large building program for Norway.

At the end of 1945, the make-up of the Swedish merchant fleet was as follows:

	Gross tons
679 steamers	548,558
580 motor vessels	969,483
808 auxiliary vessels	79,676
2 sailing ships	90

Ship Warrants Act Still in Effect

Controls exercised over shipping by merchant ship warrants are still in effect despite termination of the United Maritime Authority agreement as of March 2, 1946.

Public Law 173, Seventy-seventh Congress, commonly known as the Ship Warrants Act, as extended by Public Law 610, provides for the exercise of certain controls over shipping for six months after the termination of World War II shall have been proclaimed, or until such earlier time as the Congress or the President may designate.

Accordingly, until further notice, vessels are required, under the rules and regulations issued pursuant to the Public Laws involved, to hold valid United States merchant ship warrants to be entitled to priority in the use of shore facilities in United States ports.

Seagoing Hopper Dredges

USEO Hull Design No. 248

A shipbuilding project now rapidly nearing completion and one that is different in character from any of the war-time construction to which we have become accustomed, is the construction of four 3000 cubic yard capacity seagoing hopper dredges.

These vessels are to be added to the constantly growing fleet of dredges now being operated by the U. S. Engineers in the development and improvement of harbors where deep water dredging is necessary.

The general design plans prepared by the U. S. Engineers Office, Philadelphia, Pa., reflect the summation of the latest ideas gained from past performance of dredges under their operation and include a great variety of specialized equipment.

Complete detailed working drawings for hull, machinery and electrical work, together with requisitions in detail covering all materials required have recently been prepared by Joslyn & Ryan, Marine Engineers and Naval Architects of San Francisco.

These dredges to be named Comber, Gerig, Langfitt and Biddle are now under construction in the yards of the Ingalls Shipbuilding Corporation, Pascagoula, Miss., under the supervision of USEO inspectors at their yard.

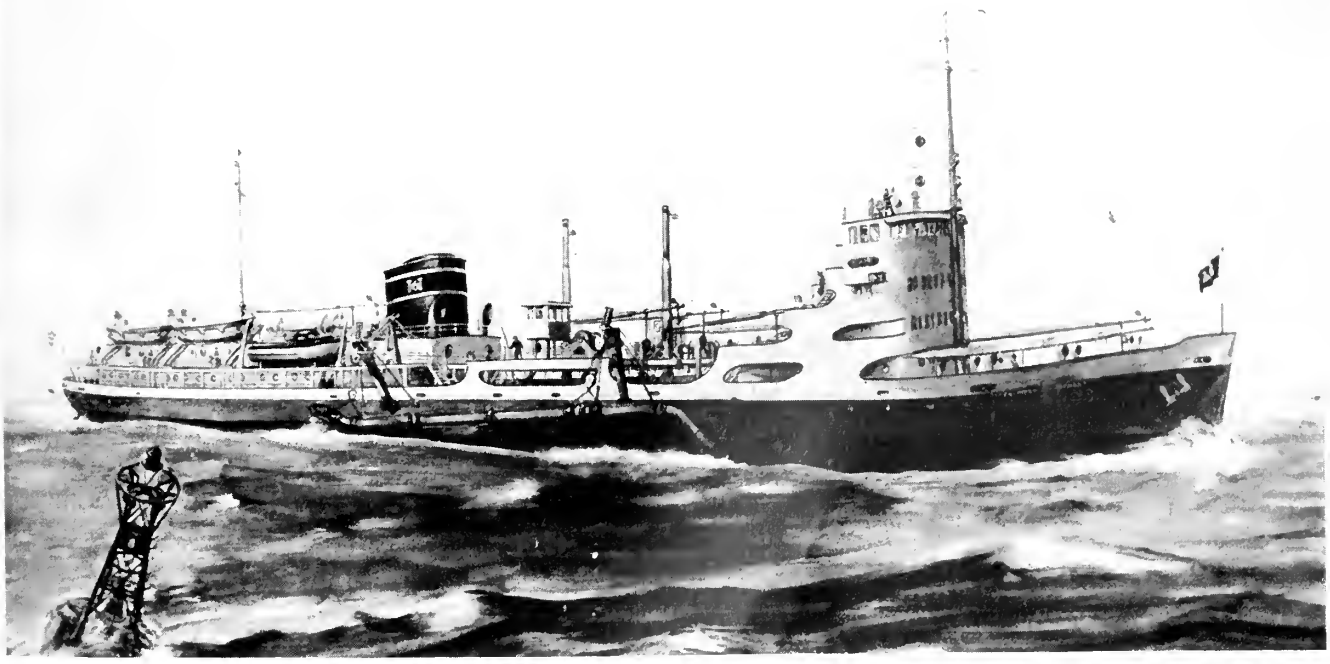
Hopper section, where the muck is loaded from suction pipes for transportation and dumping at sea, is located forward of the boiler room. This hopper section is divided into six main hoppers, extending 91 feet fore and aft and 20 feet port and starboard of center line. Each of the six hoppers is subdivided by transverse sloping bulkheads into 2 smaller hoppers which convey the muck to 6′-0″ x 6′-9″ cast iron doors in the bottom of the hull, which open to the sea. There are twelve such doors, hydraulically operated from walkways at the bridge deck level.

Pump room for dredging operations is located forward of the hopper section and contains two enormous 30″ diameter intake centrifugal pumps port and starboard. Through a trunnion in the shell abreast of the pump room each pump, port and starboard, is connected to the long drag pipe suction line with its draghead chewer at extreme end.

Drag pipes are raised and lowered by cable through huge blocks attached to large davits, which also control lateral position of drag pipes.

Since these dredges were designed to go anywhere for dredging purposes the quarters and accommoda-

The seagoing hopper dredge.



tions for crew and ship's stores are quite extensive and much more complete than on the ordinary work boat. Provision has been made for a complement of 93 persons, which includes not only the usual crew for the operation of the ship but also those handling the dredging operations as well.

Arrangement of accommodations and equipment is designed to adequately supply all the needs of this large crew on long voyages so that these vessels are modern hotels afloat combined with a complete hopper dredge system.

General arrangement plans herewith indicate: the relative location of the propulsion and dredge operating power producing and power applying units; the arrangement and location of the accommodations; the location of emergency and life saving equipment; and the arrangement and location of the waste material carrying hoppers.

A table herewith records the principal characteristics.

Propulsion Machinery

Propulsion machinery employs the turbo-electric system. Two single pass, sinuous header cross drum type water tube boilers, supplied by Combustion Engineering Co., deliver steam at 450 psi. 750° F. temperature to two Westinghouse Electric Corporation turbo-generator sets which in turn generates electric energy to four propulsion motors, each of which is directly connected through 14¾ inch diameter steel shafting to a solid four bladed manganese bronze propeller furnished by Baldwin Locomotive Works.

Boilers

Each boiler under normal power operation produces 38,000 pounds of superheated steam and 3500 pounds of desuperheated steam per hour and must be capable of operating continuously at 25 per cent over this normal rating. These ratings are based on: feed water supply at 300° F; fuel oil of 18,500 Btu per pound; fire room temperature not exceeding 100° F; stack temperature at air preheater outlet 320° F; and boiler efficiency not less than 87.5 per cent. Each boiler has 6900 sq. ft. of heating surface exclusive of water walls, and is designed for a maximum pressure of 500 psi. At the desuperheater outlet the steam condition is 435 psi and 50° superheat.

The boilers are fitted with: Todd wide range burners of the mechanical atomizing type; combustion air preheaters; Diamond, automatic, valve-in-head, soot blowers; automatic feed water regulators; and Hagan automatic combustion control.

General Characteristics

Length Over-all	351′	8¾″	
Length, Between Perpendiculars	340′	0	″
Breadth, Molded	60′	0	″
Depth, Molded Amidships	30′	0	″
Design Draft, in Service Condition	22′	2	″
Sheer For'd, Molded	6′	9	″
Sheer Aft, Molded	3′	11	″
Camber Upper Deck		15	″
Frame Spacing	24″ and 26		″
Dead Rise		4	″
Propulsion S.H.P.	6000		
Hopper Capacity	3000 cu. yds.		

Twin Screw Propulsion
Twin Rudders, providing greater maneuverability at low speeds. Engine and Boiler Rooms located aft.

Two Buffalo Forge forced draft blowers of axial flow design are installed in the boiler room, each blower being capable of furnishing air to both boilers. These blowers take air from the annular space between the stack and the outer casing and deliver it through manually controlled louver dampers at the blower outlets, automatically controlled dampers at the boiler inlets, and the air preheaters to the boiler furnace fronts.

The steam and feedwater circuit from and to these boilers is of the closed de-aerating type which has become practically standard in American marine engineering design. Superheated steam for each boiler goes directly to its main turbo generating unit, through the turbine, into the condenser, through the condensate pump into the de-aerating second stage heater, through the feed pump and into the third stage heater and so back into the boiler. Condensate from the auxiliary condensers also comes into the de-aerating heater.

In normal operation the main feed pumps discharge into a common header from which the feed goes to the boiler through the 3rd stage heater or is by-passed directly to the boilers. Thus either feed pump can supply either or both boilers. Connections are so arranged that either feed pump can be overhauled while the other is still serving the boilers.

The main feed pumps and motors were furnished by Aldrich Pump Co., the 1st and 3rd stage heaters by the Davis Engineering Co., Cochrane Corporation furnished the de-aerating 2nd stage heater, and the standby steam drive feed pumps were furnished by Worthington.

Main Turbo-Generator Sets

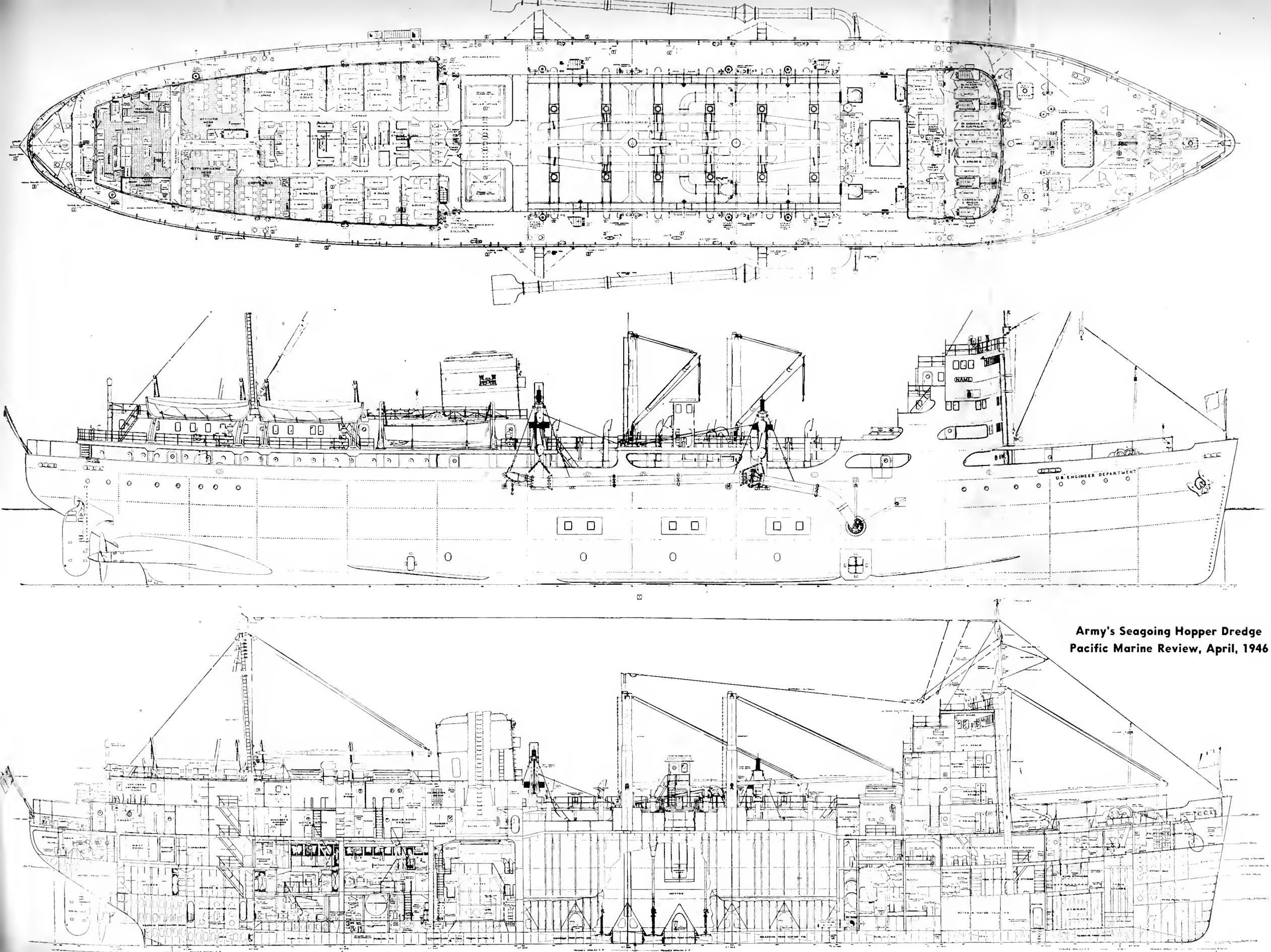
In the engine room just a few feet aft of the boilers are the turbines each having ample capacity to develop on its propulsion motor 3000 shp, plus excitation, all electrical losses, and a 300 kw auxiliary load. These turbines are the standard Westinghouse marine type operating normally at about 6000 rpm and driving through single reduction gears a shaft on which 3 generators are mounted in line. Three extraction connections are provided on each turbine to take off steam for feed water and other heating purposes at 11.8 psi, 30.5 psi, and 83 psi absolute.

The three generators driven by this turbine are: a main propulsion generator; a dredge pump generator; and an auxiliary generator. Electrical characteristics are: for the propulsion generator 600 to 720 volts, 2450 kw direct current; for the dredge pump generator 600 volts d. c. 925 kw; and for the auxiliary generator 240-120 volt three wire d. c. 300 kw. Each generator has a two hour rating of 125 per cent of normal.

The propulsive motors as will be noted on the inboard profile are installed directly below the propulsive generators and are each rated 3000 shp at 100 to 120 rpm. This speed range is obtained by variation of the propulsion generator field voltage within the range of 600-720 volts. Each motor is fitted at the commutator end with a tachometer generator which is wired to an indicator in the pilot house. These indicators accurately show the speed of the propulsion motors over a range from 0 to 125 rpm ahead or astern. On the range between 0 rpm and 100 rpm the propeller speed is under the control of either the bridge or the engine room. Above 100 rpm a constant power of 3000 shp is maintained on each wheel by an automatic regulating unit consisting of one motor and two rotary exciters operating on the fields of the propulsion generators. Each propulsion generator armature is permanently connected with the armature of its respective propulsion motor.

Dredging Equipment

Each of the two dredge pump mo-



Army's Seagoing Hopper Dredge
Pacific Marine Review, April, 1946

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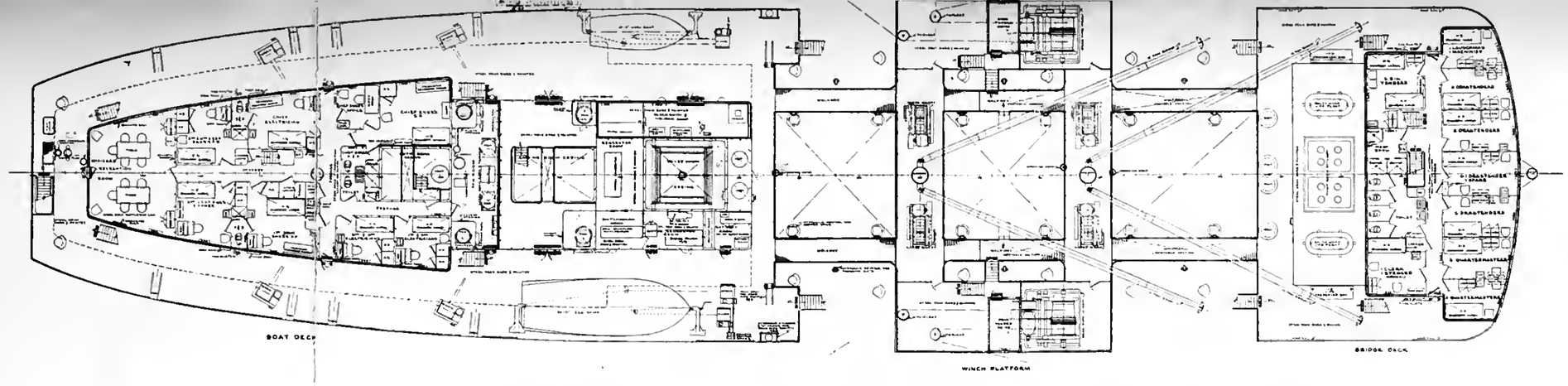
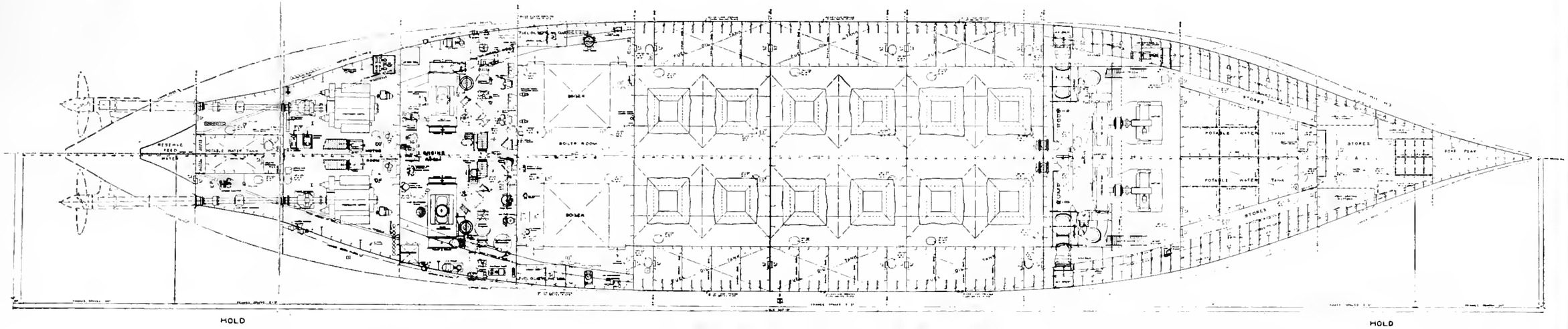
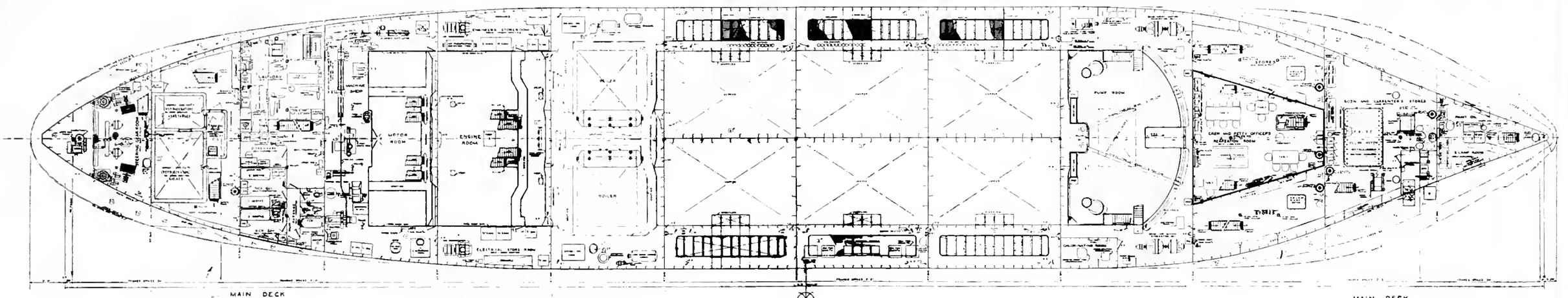
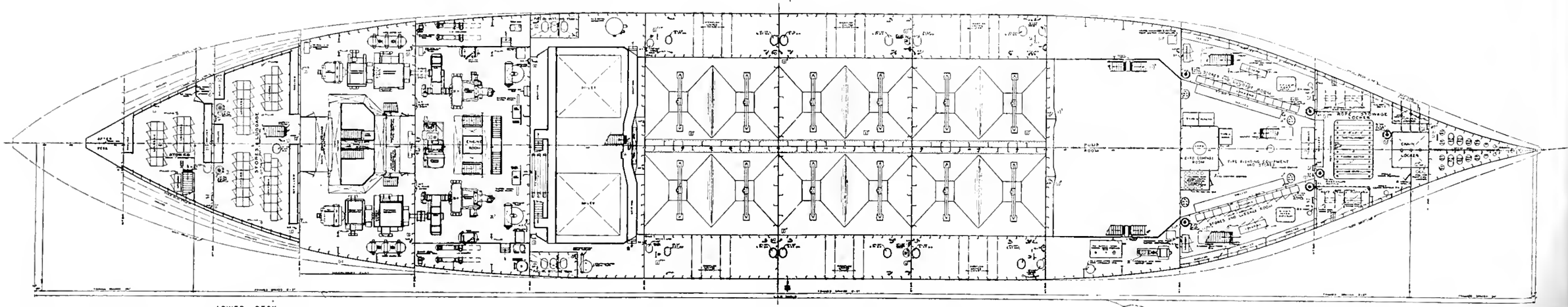
Pacific Marine Review, April, 1946









tors is directly connected to its respective dredge pump and is rated 1150 shp at 180-205 rpm, 600 volts d. c. The speed range is controlled through variation of the field voltage of dredge generator. A waterproof drum controller with 20 points of control, located in the drag-tender's house, is used to cut resistors in or out to weaken or strengthen the field of either the motor or its generator. Armatures of motor and its respective generator are permanently connected.

Centrifugal volute type single impeller pumps of 30 inch diameter suction inlet are used for the suction dredging opertion. These are built to special material specifications by the Elliott Machinery Corporation which firm furnished also: the suction and discharge piping; the drag pipe winches and davits; the hopper distribution system; and the unwatering and jetting pump. Discharge piping from these pumps is 28 inches inside diameter. The elbows and fittings on both suction and discharge piping are of cast alloy steel and very massive. Mounted on each of the pumps is a Schutte-Koerting primer of the steam jet exhauster type of a capacity for exhausting the suction line and the dredge pump in 1¼ minutes when operated with steam at 150 psi. Similar priming arrangement is provided for the hopper unwatering and jetting pump.

Outboard suction pipes are supported at their inboard ends by trunnions. From the trunnion an elbow leads into a long bend and a straight section ending in the ball joint followed by a long straight section ending in the drag head. This assembly is of sufficient length so that at a 45° angle it could be used on bottoms 55 feet or more below the surface of the sea. In operation each of these outboard suction pipes is supported by wire rope falls from two davits, one supporting the ball joint and the other supporting the drag head. These davits are served by a winch with two drums driven by a 125 shp, 230 volt, shunt wound d. c. motor rated at 690 rpm. In order to get the delicate control required for this operation each winch motor is provided with a motor generator set consisting of a 150 shp 240 volt d. c. motor driving a 113 kw 240 volt d. c. generator and rated at 1200 rpm. Each winch motor when working in either direction is controlled by varying the field of the generator of its respective motor generator set. This is accomplished by means of a pilot exciter energizing each generator field and so designed that its output can be controlled by a self-contained auxiliary circuit. Each auxiliary circuit is controlled by a rheostat mounted in a pedestal control stand in its respective drag-tender's house. Thus by a very simple manual movement the winch is under perfect electrical control. The two drums on the winch are so proportioned and geared that they automatically take care of the relative positions of ball joint and drag head without putting any undue strain on the pipe.

Deck Machinery

A motor drive spur gear windlass with two winch heads and suitable for 2 3/16 inch stud link anchor chain is located on the upper deck forward. The Westinghouse motor is rated 50 hp at 230 volts d. c. The windlass is by the McKiernan Terry Corp., and it is capable of hoisting two 7070 lbs. bower anchors and two 20 fathom lengths of 2 3/16" anchor chain at a speed of four fathoms per minue. Anchor chain is cast steel by the National Malleable & Steel Castings Co.

A vertical single barrel motor drive capstan capable of producing a pull of 11,000 lbs., with a line speed of 40 ft. per minute and of working a load at crawling speed without unsnubbing, is installed on the upper deck aft.

Six double reduction spur-geared electric drive American Hoist and Derrick Co. cargo winches are installed as follows: one on upper deck forward; four on boat deck winch platform; one on upper boat deck house top. The upper deck forward is capable of 5000 lb. line pull at 100 ft. p. m. and of 6000 lbs. at reduced speed. All the other winches have a line pull capacity of 10,000 lbs. at 100 ft. p. m., and 12,000 lbs. at reduced speed.

These vessels are equipped with two large rudders hung as shown on the outboard profile. These rudders are operated by an American Engineering Co. hydro electric steering gear. The rudders are spaced 8 ft. 6 in. outboard of center line port and starboard. The gear is capable of moving both rudders simultaneously through an arc of 70° in 30 seconds at a vessel speed of 15½ knots (light condition). Control from the pilot house and the after boat deck-house top is by Sperry electric telemotor. A Sperry rudder angle indicator is installed in the pilot house.

Emergency Equipment

Six boats are carried, four Welin lifeboats on Welin McLaughlin gravity type davits, and a sea skiff and a work boat on Welin boom mechanical type davits. Welin boat winches are installed for handling all boats. The sea skiff is an elaborately fitted cabined cruiser with 165 shp diesel engine drive. Each lifeboat has a 52 person capacity.

For fighting fire there is installed a fire main fed by powerful motor drive pumps and having hose connections to cover all parts of the vessel. There are in addition a number of remotely controlled and a number of manually operated carbon dioxide systems. Remote control systems cover: paint, oil and lamp room; hold spaces; under boiler room floor; and engineers' paint and oil room.

Manually operated systems cover: gyrocompass compartment; pump room at lower deck level; boiler room; propulsion motor room; engine room; and each of the crew's spaces.

Navigating Equipment

Three Navy standard magnetic compasses, an electric deep sea sounding machine, a taffrail log, and a Clinometer were furnished by the Kelvin and W. O. White Co.

An electrical draft indicating system was furnished by the Pitometer Log Corporation. The engine room telegraphs were provided by Bendix Aviation Corporation, who also installed the rudder angle indicators. Guided Radio Corporation sound detecting and talking system is installed. A sound powered selective ringing telephone system connects the pilot house with all essential points in the vessel.

A complete Sperry gyrocompass installation assures correct bearings and includes: one master gyrocompass, Mark XIV model, in a gyrocompass room located on lower deck level directly below the bridge; one bearing repeater atop pilot house; one repeater in pilot house; one repeater in radio direction finder; and one repeater at emergency steering station. A Bludworth marine model radio direction finder is installed in the chart room.

Complete radio telegraph apparatus for transmitting and receiving is installed in the radio room and a complete ship to ship and ship to shore radio telephone service with

remote controls for transmitting and receiving calls in the pilot house. A recording echo sounding device is located in the chart room.

Machine Shop

On the main deck as shown in the general arrangement plans is an elaborately fitted-out machine shop with the following machine tools:

A Le Blond gap lathe 18″ - 38″ swing, 10 feet 2″ bed, motor drive:

A Le Blond screw cutting lathe 12″ size, motor drive;

A Stauss & Haas shaper, 20″ rapid traverse, motor drive;

A Stauss & Haas pipe and bolt threading machine 1″ to 6″ pipe motor drive;

A Moore Handley sensitive drilling machine, motor drive;

A Moore Handley hack saw, 9″ x 9″ motor drive;

A Stauss & Haas radial drill press motor drive;

A Hisey Wolf grinder motor drive;

A blacksmith forge;

A Westinghouse arc welding set;

A machine shop vise;

An Acetylene welding outfit;

An anvil;

Chain trolleys and rails;

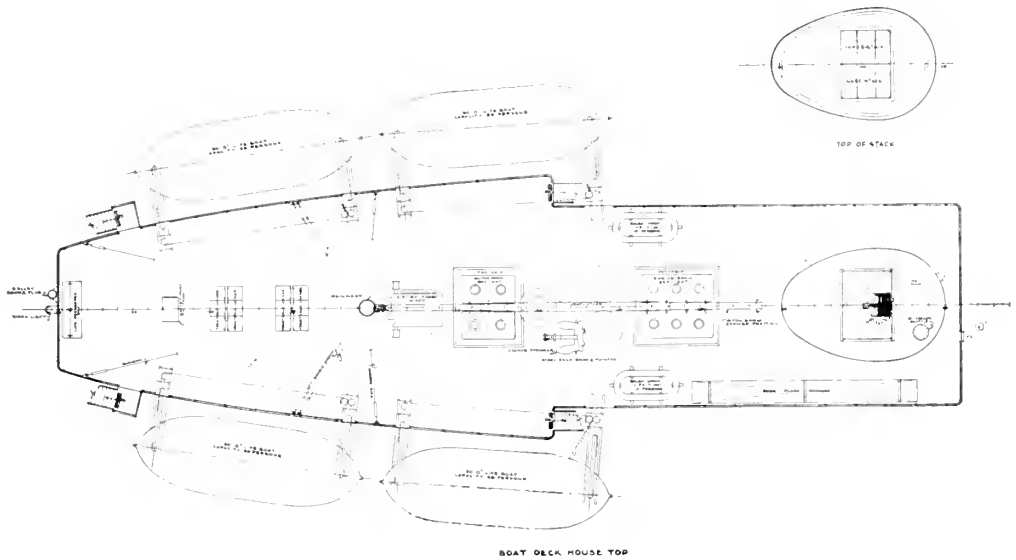
And a fine assortment of hand tools and portable electric tools.

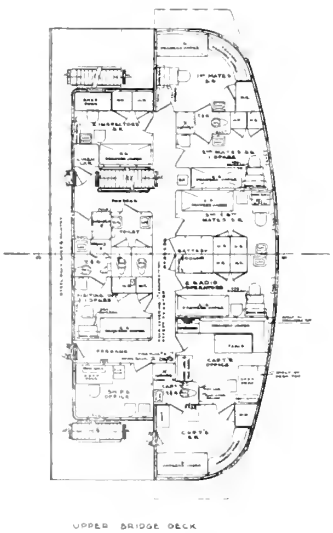
Accommodations

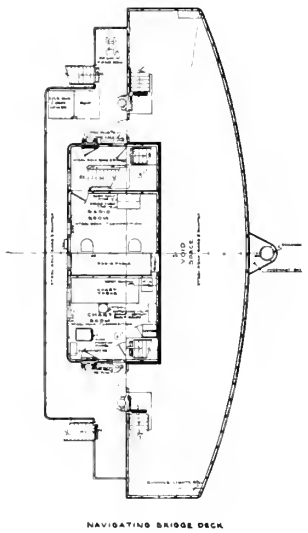
Captain and deck officers are quartered on the upper bridge deck, and directly below these quarters on the upper deck level are the ship's crew. In the boat deck house aft are the staterooms of the engineers, and electricians. Directly below these on the upper deck are: the oilers, wipers, waiters, and cooks; the galley and three mess rooms—officers', petty officers' and crew's. Ample provision is made for showers and toilets, not more than 4 persons are assigned to any space. More than customary ventilation and fenestration are provided. Cold storage chambers are provided for ship's culinary stores with refrigeration machinery furnished by York.

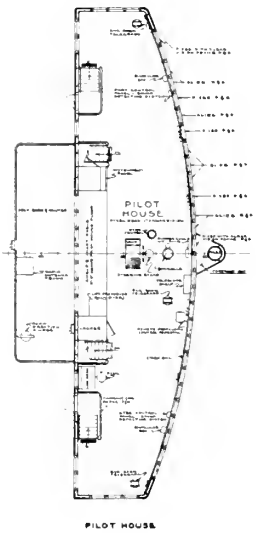
Plumbing fixtures and fittings are largely by Crane.

It will be noted from the foregoing description and the plans herewith that these four seagoing hopper dredges are independent units capable of taking care of their crews, their transportation to the job, and extensive dredging operations anywhere in the world that is accessible to vessels of their draft. They are in fact the most complete and elaborate dredges yet built by the U. S. Engineers Office.

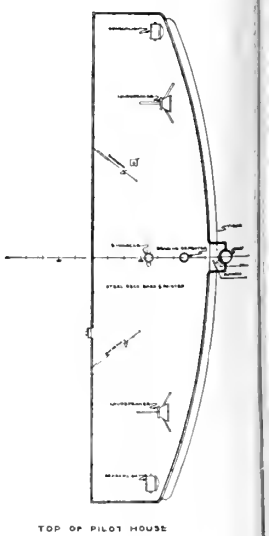



UPPER BRIDGE DECK


NAVIGATING BRIDGE DECK



PILOT HOUSE


TOP OF PILOT HOUSE

Design for Welding And Welding Controls

By R. F. Grambow

A Naval Architect's prime concern regarding welding is the assurance that the completed hull structure conformed to his specification and that each joint was performing its calculated stress without failure and with the proper factor of safety. In order to achieve this end he must first design the hull in such a manner as to facilitate assembly, to eliminate the necessity of excessive field plate edge preparation, to eliminate potential notch conditions, to eliminate inaccessible welds and to minimize overhead welding, to eliminate doubler plates, etc.

With this accomplished, the next step is to establish rigid welding control in order to insure that the design is adhered to and that the prescribed welding procedures and sequences are followed. The final assurance of the success of this control then rests in the proper inspection of the completed weld.

Design

At Marinship our first step was to carefully scrutinize the contract plans with the thought in mind of standardizing weld bevels, eliminating staggered butts, eliminating notch conditions in the main strength members (especially the sheer strake), removal of all attachments or miscellaneous foundations and outfitting items from the sheer strake, and in general simplifying awkward and troublesome welding details. In cooperation with the Welding Division, the Engineering Department developed approximately 30 typical standard welding details which were chosen to include every possible type of weld on the hull. By following this system it was not necessary to detail the welds on any of the structural plans; instead, a particular joint would be identified by the number of the standard weld bevel which would apply. To facilitate operations in the shops, and to eliminate the necessity for constant reference to the design drawings, a cutting sketch was made for all flat rectangular plates and straight shapes. This cutting sketch indicated cutting dimensions, bevels, excess stock and piece mark. In cases where the plates or shapes had shape, templates were provided bearing this same type of information. Following this same practice of giving selective information to the shops, individual shop assembly drawings were developed After the completion of such plans they were turned over to the Welding Division to determine a sequence of welding. It was after this step that actual work on the steel began. A weld layout group would then actually mark this combined information on the steel for the guidance of burners and welders. In this manner a relatively rigid control was attained. No burning or welding could be done until the weld layout man, who came under the supervision of the welding engineer, had transferred the engineering information and the welding sequence from the plans to the steel.

Welder Classification

These precautions although rather far reaching were of little value without proper classification of the welder himself. We all realize that although a welder may complete a very satisfactory job on a down hand butt weld, he may fail on an overhead butt or a vertical weld. In view of this factor Marinship took special precautions to go further into welder classifications than required by the American Bureau of Shipping and the United States Coast Guard and actually classified each welder for a specific type of job.

Regardless of the ambitious control program that was attempted, we realized that because of lack of sufficient and proper supervision because of the intense pressure of the wartime program, we still could not be sure of the finished product. Frequent visits to the yard uncovered many deviations and variations from our planned way of doing things. We realized that the final analysis rested in proper and adequate welding inspection. This inspection fell into three categories: visual, physical and radiographic.

Inspection

At the beginning of our program we relied chiefly on the first two of these. Visual inspection covered such things as under-cutting, over-welding, pitting, unsatisfactory reinforcement, saddle welds, etc. Physical inspection included test coupons, tre-

Marinship Technique

R. F. Grambow of Marinship Corporation, Sausalito, California, presented a paper entitled, "Creation of a Shipyard for Welded Construction" at the February 15 meeting of the New York Section of the Society of Naval Architects and Marine Engineers. After describing the organizational techniques of Marinship and the physical equipment of the yard, this paper describes the design features and the control and inspection of welds which resulted in the practical elimination of structural failures in Marinship built vessels. This article is that portion of the author's paper which deals with welding design and welding controls.

panning, and in some cases, chipping. The men on the ways were naturally seeking some way of eliminating trepanning and in this respect they had the full sympathy of both the welding engineer and the Engineering Department. It was felt that plug-cutting was unsatisfactory and, in fact, bad practice. Welding the hole, we felt, did nothing but set up further stresses in a structure already stressed some incalculable amount. We realize that although the plug was a true sample for one particular spot, the weld one foot away could be entirely different in nature; further, if the plug did indicate an unsatisfactory weld, we had no way of knowing the extent of the unsatisfactory weld without cutting further plugs, or chipping. In such cases we would set out on a chipping expedition, chipping until we came to sound weld and in many cases then chipping further to make certain that sound weld continued, all of which was a costly operation and in many cases an unnecessary one.

We felt that radiography might be the answer and we embarked upon a program of experimentation. To this end the services of the Industrial X-Ray Engineers were obtained. This organization had successfully applied radiography in other west coast yards and we considered ourselves fortunate to find them available. We believed that if we could see through the metal there was not any necessity of cutting plugs.

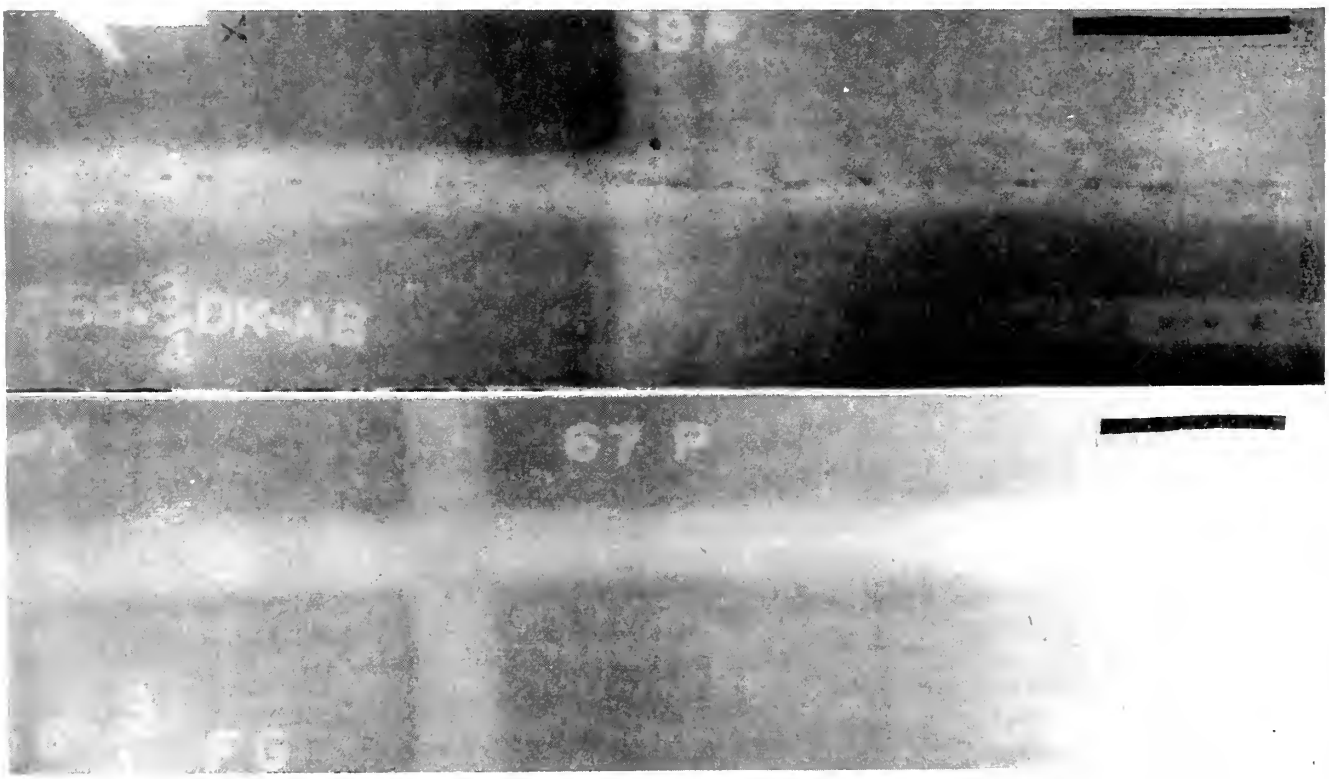
The first question that arose upon deciding to apply radiography to structural welds was, "How much of the hull shall we attempt to investigate?" Our answer was to go far enough to know what quality of welding we were getting and far enough to be certain that the design requirements of the main strength members were being met. In close cooperation with the United States Maritime Commission, the American Bureau of Shipping and the United States Coast Guard, the Marinship Welding Division and the Engineering Department agreed upon which portions of the structure were to be included in the so-called vital area. This area centered around the midship half length, where stresses were known to be a maximum, but also included certain welds at the forward and after portions of the vessel. Within this zone a basic group of approximately 50 butt-welds were chosen to be radiographed.

Both X-rays and Gamma-rays were used. Gammagraphs were preferred because of the relatively simple and compact equipment, the absence of the need for elaborate preparations, and the overall speed of operation. X-ray was comparatively bulky (crane facilities were required for handling it), it was often difficult to support the tube head properly, and the overall operation required more man-hours than radium. In either case similar safety precautionary measures were necessary. The Industrial X-Ray Engineers followed their established rules for the safe handling of their equipment and the shipyard provided guards to divert the workers from the area being inspected.

Each negative was marked to indicate the frame, plate and strake so that it could be readily correlated with the shell extension or deck plating plan. A lead arrow was placed alongside the weld to indicate the forward end. A 9 hole penetrameter of the stop type, graduated in .010", was used. The penetrameter was

Fig. 1 top: This radiograph reveals a deck butt having lack of penetration and slag throughout the length of the film. In addition, a lack of penetration is revealed in the Unionmelt seam going forward of the butt. The location of the lack of penetration in respect to the cover passes of the weld reveals faulty back chipping as the cause of the lack of penetration. The decreasing density of the vertical pockets in the Unionmelt indicate improper "run-out" pads and also that good metal will be reached approximately 6" forward of the butt.

Fig. 2, bottom: Radiograph reveals faultless welding of both the Unionmelt seam and butt. Identification on film shows the radiograph to have been taken on Hull No. 67 port side at Frame 56-3 4 at junction of "F" and "G" Strake.



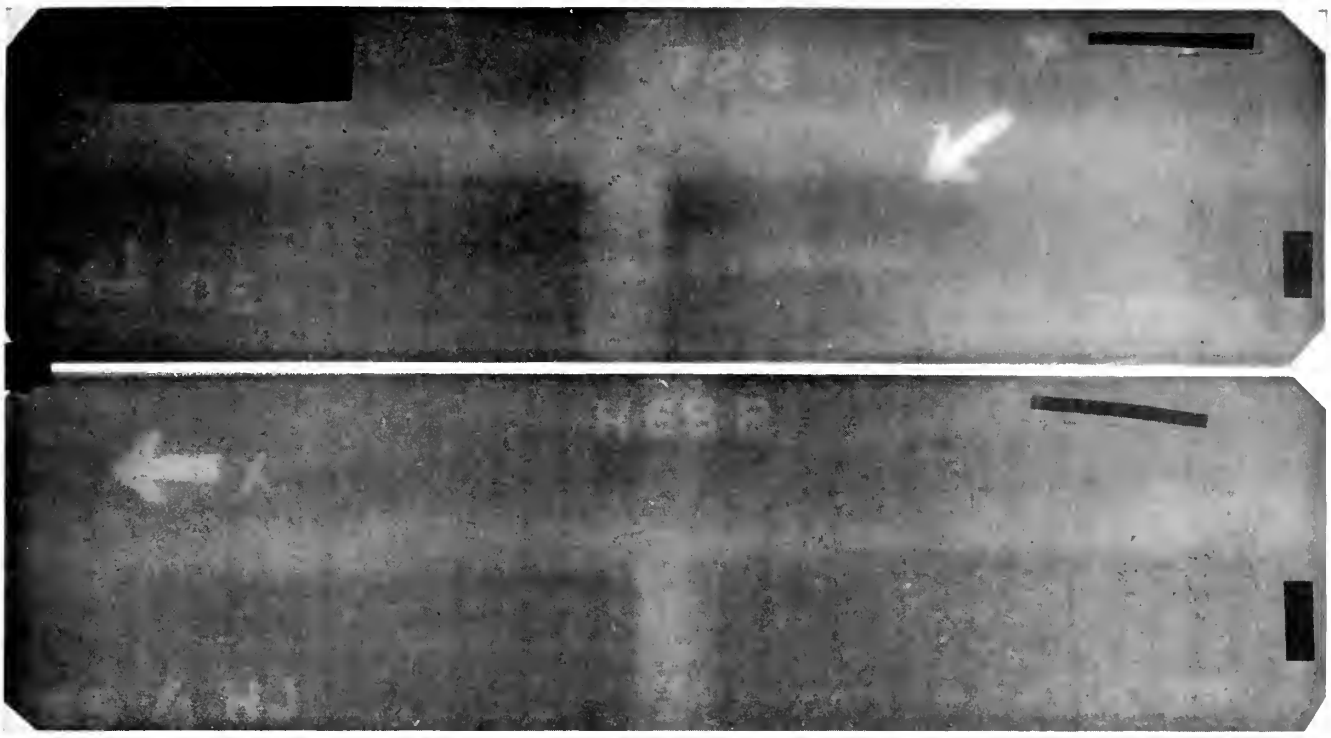


Fig. 3, top: A slight lack of penetration near the top of the "V" of the butt is noted near the intersection. The seam aft of the butt shows gas pockets which are local in character and the film is classified "SUBSTANDARD."

Fig. 4, bottom: Reveals good welding except for minor slag pockets. Note that the .010 layer of the nine hole penetrameter is revealed.

placed on the radium side of the weld. With the use of fine grain films a perception of less than 2% of the thickness of the material was obtained.

In order for radiography to be at all useful it was realized that some set of standards must first be established and agreed upon by all agencies involved. Based upon the experience of the Industrial X-Ray Engineers, in combination with specific known conditions at Marinship, we adopted four classifications of welds.

1. FAULTLESS—a weld showing no inclusions, under-cutting, cracks or defects of any kind with adequate but not excessive reinforcement. (See Fig. 1.)
2. SATISFACTORY—a weld which did not reveal evidence of cracks of any length, and which was free of linear defects of more than 1", slag inclusions, even though they were fairly dense (but were surrounded by several inches of good material), were allowed in this classification. Under-cutting and other surface flaws did not affect this classification but were noted. In some cases it was necessary to check the welding procedure in order to properly identify markings that appeared to be defects. (See Fig. 2.)
3. SUB-STANDARD — defects in excess of those coming in the "Satisfactory" classification but not of serious enough nature to be classed as "Unsatisfactory." However, if the defect occurred in an area where maximum joint efficiency was a requisite, this class of weld was called to the attention of the welding engineer and the inspection agencies to determine if repair of the weld was warranted. (See Fig. 3.)
4. UNSATISFACTORY — radiographs showing linear defects of over 4" on the film, especially these which extended through the end of the film. A chain of slag inclusions, porosity, or pipes were considered the same as linear defects. Cracks of any kind required repair. However, care had to be exercised in differentiating between lack of fusion and an actual crack. (See Fig. 4.)

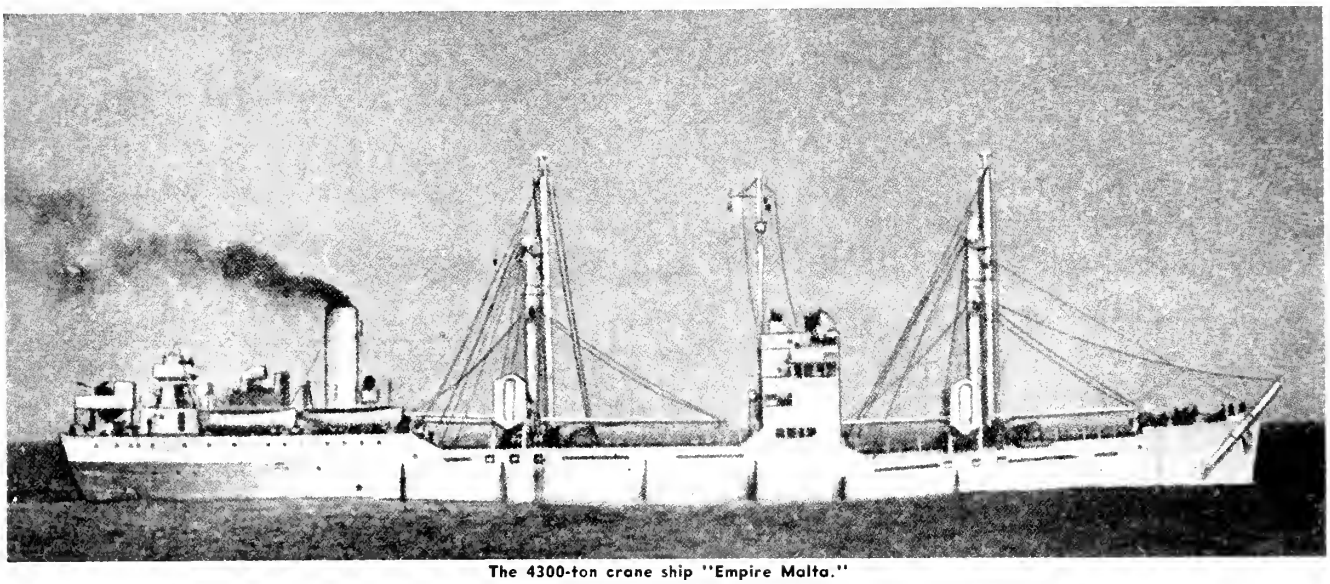
It should be noted that "Sub-Standard" or "Unsatisfactory" welding was submitted to the welding engineer for two main purposes:

1. So that he could review the function of the particular weld as defined by the original engineering design and then determine if the joint as evaluated by the radiograph was acceptable or if it required repair, bearing in mind that in many cases the "cure" of the defect might result in a condition worse than the defect itself.
2. So that the "Sub-Standard" and "Unsatisfactory" work could be discussed directly with the welding supervisors who were responsible for the quality of the joint, and who could in turn contact the welder who actually did the work.

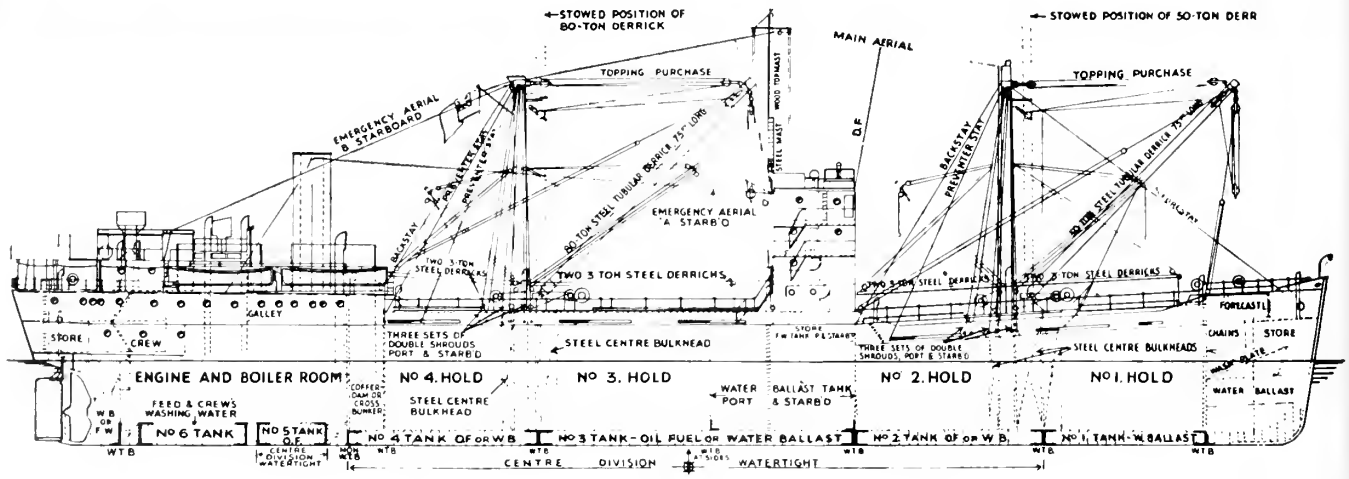
There is one very necessary link that must be present in order to derive the maximum control offered by radiography. Some means must be provided so that the welder who made any particular weld can be identified. This was accomplished at Marinship by a very simple card system which allowed us to know **who** and **what** on each hull. Each hull erection section was represented by a master card bearing the same identifying number as the section itself. Each of these master cards was supplemented by a secondary set of detailed cards which enumerated the various shipfitting and welding oper-

(Continued on page 368)

A Multi-Purpose British Steamer



The 4300-ton crane ship "Empire Malta."



Built by Wm. Gray & Co., Ltd., West Hartlepool, for the Ministry of War Transport in 1944, the Empire Malta was the prototype of a special series of multi-purpose ships designed by the Merchant Shipbuilding Department at the Admiralty to serve, according to requirements, as crane ships for lifting cargo weights up to 80 tons, as cased-oil carriers, as colliers, or as general purpose cargo vessels, or for carrying heavy vehicles.

Of the well deck type with poop (82 ft.), raised quarterdeck (197 ft.) and forecastle (29 ft.), the Empire Malta has the following main particulars:

Length, b.p.	312 ft.
Breadth moulded	46 ft. 4 in.
Depth mld. to upper deck	24 ft. 9 in.
Depth mld. to raised quarter deck	29 ft. 7 in.
Gross tonnage	3,539
Net tonnage	2,265
Deadweight tonnage	4,310
Draught	20 ft. 10 in.

She has four cargo holds served by large hatchways—one 40 ft. 6 in. long by 26 ft. wide—the total grain capacity being 250,700 cu. ft., and bale, 240,000 cu. ft. No. 1 hold is 40 ft. 6 in. long, No. 2 hold 47 ft. 3 in., No. 3 hold 78 ft. 9 in., and No. 4 hold 38 ft. 3 in. The hatchways are of the following dimensions:

No. 1 hatch....24′ 9″ long by 20′ wide
No. 2 hatch....24′ 9″ long by 26′ wide
No. 3 hatch....40′ 6″ long by 26′ wide
No. 4 hatch....22′ 6″ long by 26′ wide

The transverse bulkheads separating No. 3 hold are fitted with portable sections port and starboard, giving clear access to No. 2 hold and No. 4 hold respectively, the openings in each case being 14 ft. wide and 20 ft. high above the tank top, or 14 ft. high above ballast. These openings enable the vessel to carry in three holds large vehicles, tanks or locomotives which, owing to their size, could only be loaded through the one hatchway. In addition to the total water ballast capacity of 1,327 tons provided in the forepeak, double bottom tanks and side tanks in way of No. 3 hold, 100 tons of permanent ballast are arranged amidships to assist in limiting the angle of heel when heavy lifts are being made.

Cargo-Handling Gear

The cargo-handling gear is grouped round the foremast and the mainmast respectively (there being also a light wireless mast immediately abaft the bridgehouse). The forward cargo-handling gear consists of four 3-ton derricks, one 50-ton tubular steel derrick, 75 ft. long, two 7 in. by 10 in. steam winches and two 8 in. by 12 in. steam winches geared to large barrels for lifting heavy loads. There is a similar arrangement at the mainmast, which suports the 80-ton derrick, also 75 ft. long. When either of the heavy derricks is in use, two of the 3-ton derricks serving the same hold (No. 1 hold and No. 3 hold, respectively) are unshipped. The topping purchase for the 50-ton derrick runs through a 16 in. quad iron block at the masthead and another on the derrick, and the two main cargo purchase blocks are also of 16 in. quad type. The purchase arrangements for the 80-ton derrick are similar, except that 18 in. blocks are used. No departures from accepted practice were made in the cargo leads and runs so that normal crews would have no difficulty in working the heavy-lift gear.

The officers' and engineers' cabin and saloon accommodation in the Empire Malta, which was intended for continuous service in the tropics, is arranged in the bridgehouse. The crew and defense personnel are housed aft, 10 defense personnel on the poop deck and the native crew—comprising 23 for deck duties and 14 engineroom—on the raised quarterdeck.

The machinery of the Empire Malta was supplied by the Central Marine Engine Works of the builders and consists of a set of triple expansion engines with cylinders 20, 31 and 55 in. diameter by 39 in. stroke, steam being supplied by two oil-fired boilers, 14 ft. by 11 ft. 9 in., working at 200 lb. pressure and fitted with forced draught and superheat. The service speed is 11¼ knots on 15¼ tons of oil fuel per day.

The ILO's Maritime Work

By J. L. Mowat

Acting Chief of the Maritime Service of the International Labor Office

Following the recent meeting in Copenhagen, the representative of the American shipping industry very strongly urged that the Seattle meeting be taken very seriously and attended with adequate preparation.—Ed.

In the more than twenty-six years of its existence, the International Labor Organization has done much to raise the international standards of employment of seamen throughout the world. That is part of its job, which is in general to help to maintain peace by guaranteeing fair conditions of employment for all workers and thereby reducing international competition based on unfair working conditions. Now that the war is over, the Organization is again getting down to the task of making further improvements. At a conference to be held in Seattle, Wash., beginning June 6, it hopes to set up a number of new international rules to get better conditions on board ship and to promote the well-being of seamen in a variety of ways.

How the ILO Works

Under the ILO's machinery international standards for conditions of work in various occupations are formulated by the International Labor Conference—a kind of world parliament for discussing labor and social questions. In normal times general sessions of the Conference are held every year. In addition, from time to time there are special maritime Conferences which bring together as delegates experts on the shipping industry and on life at sea. Each Conference has before it reports prepared by the International Labor Office, which is constantly collecting and distributing information on all aspects of labor problems. In its work in connection with seamen, the Office is advised and guided by the Joint Maritime Commission—a standing committee of nine representatives

of shipowners and nine representatives of seamen chosen from different maritime countries.

When the Conference meets, whether to discuss general or maritime questions, every country which is a member of the Organization—and there are more than 50 of them—is invited to send four delegates, two representing the Government, one representing organized employers and one representing organized workers. There is complete freedom of speech and voting for each of these groups of delegates, for the Organization is an entirely democratic institution. A few months before a Maritime Conference, there is usually a preparatory meeting on the same lines as the Conference but on a smaller scale, such a preparatory conference was held in November at Copenhagen. At these meetings experts from the chief maritime countries give their views on what improvements in standards are possible internationally at any given time.

What Is a Convention?

When the Conference decides on its international standards, they are put in writing in what is known as a Convention, which is a kind of international treaty. The Convention is then sent to Governments, which are obliged to submit it, within a definite time limit, to their parliament or congress or whatever body draws up the laws of the country. A decision is then taken by each country as to whether it will ratify the Convention—that is, whether it accepts the proposed treaty. If it does, it must see that its laws are brought into complete agreement with the standards set by the Convention. Machinery exists for making certain that countries carry out their obligations under any Convention they ratify.

The Conference decisions can also take the form of recommendations or resolutions, which are less formal and do not carry with them the same strict obligations for Governments. These forms of Conference action have, however, proved useful in the past in bringing before the world ideas and suggestions for improving working conditions, and in that way they have encouraged social progress.

Past Achievements

What has the ILO done so far for seamen? It has collected and published a lot of information on conditions of employment, such as wages, hours, insurance, and welfare in ports, in every country—information which is not usually available in collected form and which it is difficult for any one country or trade union to obtain for itself. This information is always at the disposal of Governments, shipowners' associations and seamen's unions.

In the second place, the Conventions so far adopted by the ILO cover a wide field of subjects which affect the daily life of seamen. They deal with such questions as hours of work, manning, facilities for finding employment, seamen's articles, the employment of young persons, officers' competency certificates, annual holidays with pay, sickness and unemployment insurance, shipowners' liability, and the repatriation of seamen. Together, these Conventions make up what has been called an International Seamen's Code. There are still gaps in the Code, however, and it will be for the Seattle Conference to fill some of them. There are already 15 Conventions on maritime employment and dock work, and on the average each of them has been accepted and applied by 17 States, including practically all the important shipping countries.

To quote only one example, the Convention on unemployment indemnity in case of shipwreck, which was passed in 1920 and has been accepted by nearly all the important maritime countries, provides for the payment of at least two months' wages to seamen when they lose their jobs because their ship is lost. This was agreed to at a time when no country had any laws granting such compensation—a striking instance of how the ILO can do good work for seamen and get the backing of maritime countries for its efforts.

Present Activities

The Conference in Copenhagen in November was organized by the ILO in preparation for the Seattle session. It brought together representatives of Governments, shipowners and seamen from 20 leading maritime countries for a preliminary consideration of a wide range of questions: wages, hours and manning on board ship; social security and pensions for seamen; crew accommodation; food standards and certificates for ships' cooks; certificates for able seamen; medical examination to protect seamen's health; holidays with pay; continuous employment; and the recognition of seamen's unions and the right of collective bargaining between shipowners' and seamen's organizations. The questions of wages, hours and manning were also considered but on this problem it proved difficult to reach satisfactory results, because the views of the shipowners and the seamen differed so widely. However, the discussion cleared the air, and it may be hoped that it will prove possible to find a firmer basis for an accord. On all the other questions substantial agreement was reached, and there is every reason to believe that Conventions which many countries can ratify will be adopted at the Seattle session.

Difficulties

No international agreement is easy of achievement. What are the difficulties in reaching agreement on ILO Conventions? The main one is that many delegates—whether Government, shipowners or seamen—want the standards laid down in a Convention to be exactly the same as—or better than—those in their own country. But such an attitude is contrary to the whole idea of the ILO which is to set up **international minimum** standards. Now, a minimum standard which can be accepted by most of the maritime countries is bound to fall considerably short of what exists in the most advanced countries. But does that make it useless? A delegate from a country with high standards in wages, accommodation, etc., may say: "What use is this Convention to me? You suggest a minimum wage of $60, $64 or perhaps $72 a month for an able seaman, but our seamen get more than that under their collective agreements. You say the minimum floor space for a man to sleep in should be 30 square feet in ships of 3,000 tons or over. But in the last ship I sailed in we had about 40 square feet. What interest can we have in these proposals or in making them into an International Convention?"

This is an old argument. An answer was recently given to it in a report on the Copenhagen Conference published in a French magazine produced by former members of the Resistance Movement in that country. It said: "The international measures proposed at Copenhagen will not bring many advantages to French seamen, whose conditions are in general more favorable than those in other counttries. But the proposals

are of interest to French seamen because they help to consolidate what we have already got. From the point of view of world social progress they will bring about a definite and often considerable improvement in the standard of living of seamen, particularly in the countries where conditions are very bad."

The value of international agreements was also emphasized by Admiral Land in 1944, when he said: "Can there be agreement among the maritime nations as to size, location and character of crews' quarters? If our standards in this respect are maintained and are so much higher than others, we are placed at a decided disadvantage in original cost and maintenance. If our standards are correct, how can we bring the other maritime nations into line? What part will the seamen's unions take in establishing uniformity? . . . The days when the dregs of the beach manned the ships are past, and we must have labor laws to meet present day conditions at sea. In so far as possible, there should be uniformity among the maritime nations in this regard."

An International Labor Convention is not intended to lay down exactly the highest standards that already exist in one or two countries. If it did, only very few countries would agree to it, and that would be of little value. The idea is to set up an international minimum, which may fall short of the standard of the best countries but is well ahead of the standard in the more backward countries. When the pressure of the unions or of public opinion, based on the ILO Convention, induces a majority of the maritime countries to accept that Convention, it means that the standards in the less advanced countries have to be brought up at least to the international minimum, and in many cases countries are willing to go a step or two further. From a humanitarian point of view this benefits the seamen in these countries, but it also benefits those in the more advanced countries because it means that the less advanced countries are no longer able to offer as severe competition in world shipping. Take again, for instance, the suggestion of $60, $64 or $72 a month as a minimum wage for an A.B. It may not help the seamen in the advanced countries directly, but what of the countries which, according to official figures collected by the ILO, are paying their seamen $44 a month? Isn't it worth while trying to bring them up to a higher international minimum?

It may be said from the seamen's side: "Yes, but if you fix a low international standard, then the shipowners of the advanced countries will try to deprive their seamen of their better conditions and pull them back to that lower minimum." This fear is groundless. In the first place, each Convention says that it is a minimum, and every country that accepts it solemnly promises that nothing in the Convention will be allowed to affect any higher standards that exist in any country. But there is a second and stronger argument against this fear of losing high standards. How were they obtained? Because collective bargaining was carried on in a reasonable spirit, and because the unions were strong enough to win concessions from the owners. If that is so, aren't these unions still strong enough to hold what they have won? Of course they are!

If, therefore, nothing can be lost through ILO Conventions and something can be gained by improved conditions in other countries, it obviously pays the workers in the advanced countries to back the Conventions even when they don't contain exactly what they would like to put into them. This is a point that people find difficult to grasp when they suddenly go to international meetings after fighting in their own collective negotiations for much higher standards. But it is the only sound basis for international progress in working conditions.

It is the hope of the ILO that the important questions on the agenda of the Seattle Conference will be tackled in this spirit with a view to improving the conditions of seamen everywhere and preventing unfair competition on the basis of inferior labor standards.

Competition for Freight Cargo

The Airlines Set a Fast Pace

Divested of all military trappings which it had used during service with the Air Transport Command, the first C-54 to be converted at the Martin plant into an air cargo carrier was delivered recently to American Air Lines. Above is the interior of the ship, complete with the necessary tie-downs, cargo lashes and other fittings. The ship stopped off at the new Newark, N. J., Airport and was viewed by thousands. A Martin passenger ramp was taken to Newark for the show and used by the sightseeing throng.

Flexibility in Small Shipyards

Commercial Iron Works, of Portland, Ore., will deliver to the U. S. Navy in April the aircraft carrier Rabaul. This is the last of the Navy ships under contract between the U. S. Navy and Commercial Iron Works and the last Navy ship to be constructed in the Port of Portland under World War II contracts.

The Rabaul will be the 200th ship delivered to the Navy by Commercial Iron Works and joins the ranks of other quality ships turned out in quantity by this company before, during and after the war. It's an impressive list — 200 ships; sixteen different types:

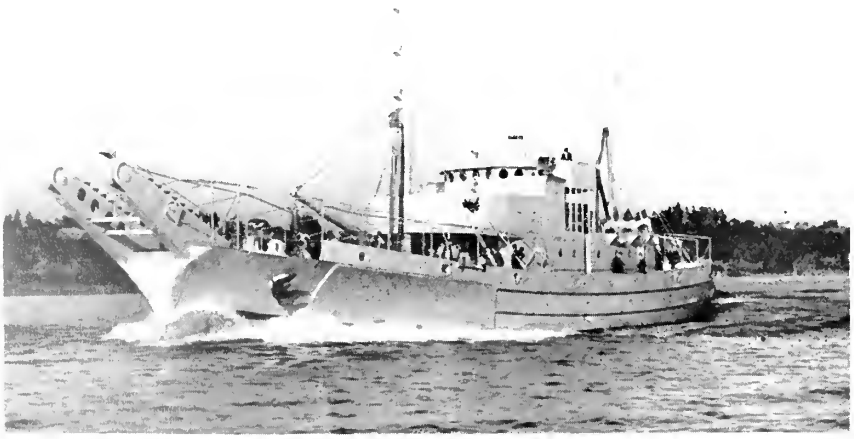
4 Net Tenders (YN)
7 Minesweepers (AM)
4 Fleet Tugs (AT)
41 Subchasers (PC)
2 Gun Boats (PGM)
6 Net Layers (AN)
56 Landing Craft, Infantry, Large [LCI(L)]
52 Landing Craft, Support, Large [LCS(L)]
12 Harbor Tugs (YTB)
4 Aircraft Carriers, Escort [AVG 6 class (CVE)]
3 Aircraft Carriers, Escort [CVE 105 class (CVE)]
3 Navy Attack Transports (APA)
1 Navy Troop Transport (AP)
2 Ammunition Tenders (AK)
2 Sludge Barges (YSR)
1 Oil Barge (YOS)

The smaller ships were built by Commercial Iron Works from the keel up, both on its ways and on the marine railway. The larger ships came as hulls for completion or as cargo ships for conversion; the conversions, in most cases, meaning practically a complete reconstruction job. On one job, the APA's, the yard acted as design agent in the conversion of cargo ships to attack transports.

Commercial Iron Works' ways can accommodate ships up to 250′ in length. The largest ships constructed there during the war were the AT class of Navy Fleet Tugs, 205′ x 38′ 6″ x 22′ 3″. The smaller ships, the YTB's, 100′ x 25′ x 13′ 6″, were built two to a way. When the company received its contract for building landing craft, the requirements of the war called for speed in production which brought into use the marine railway.

Above: An LCS-28 on trial run in the Willamette River.

Below: The USS "Catalpa." This was the first ship built under Navy contract in the Portland area since World War I. She was commissioned June 20, 1941.



Two Every Sunday

A design was worked out whereby four landing craft could be built on one special transfer track by extending the shunt cars to accommodate the extra length. Two ships were launched simultaneously every Sunday for the life of the contract. The ships were built stern to stern and, when launched, a sponsor would be at each end of the railway's cradle to strike the ships at the same time, the ships moving slowly down the incline to the water. It took about 30 minutes, the usual launching taking seconds. While these ships were being built on the railway, two ways were also devoted to landing craft, the other two ways being used on other ships under contract. The remaining transfer tracks were reserved for drydocking and were in constant use, ships coming from as far as Astoria for bottom work, installation of underwater gear, etc.

During the year 1944, Commercial Iron Works produced 112 ships, and reached a peak of 11 in one month, which was made possible through the added use of the marine railway for ship construction. If the Navy had never used the railway for repair it had still served a useful purpose and had been worth, many times over, the million and a half spent on it. These landing craft were used at Leyte, Saipan, Okinawa and other important landings leading to victory.

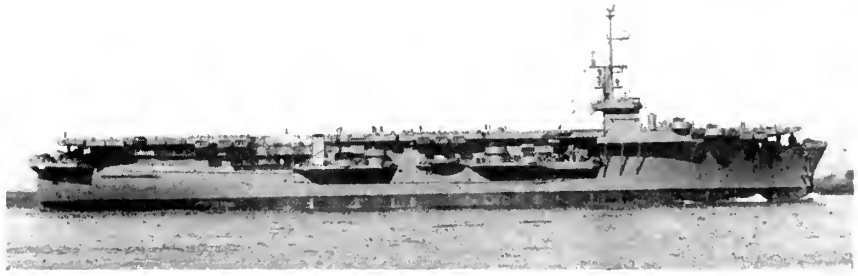
Since the end of the war, ships by

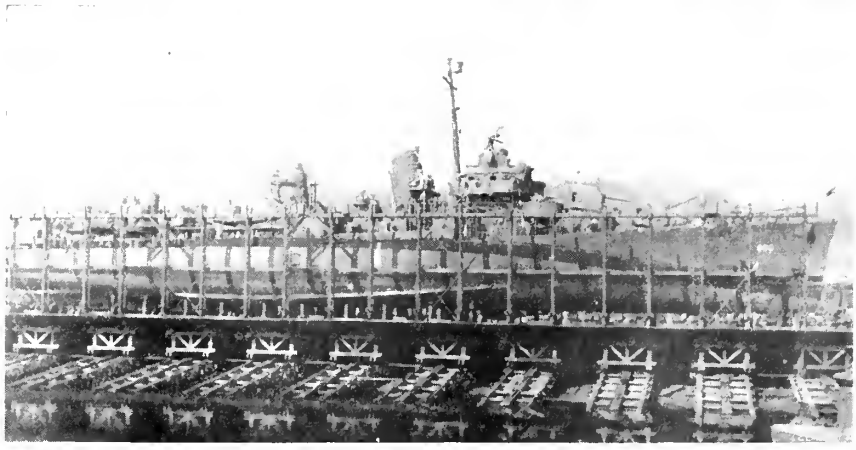
the hundred have been coming into the port of Portland for voyage repairs and for repairs and overhaul prior to storage at Tongue Point and Portland. Practically all of the small ships are handled on the marine railway at Commercial Iron Works. The largest ships handled were an LST and a Fletcher class destroyer.

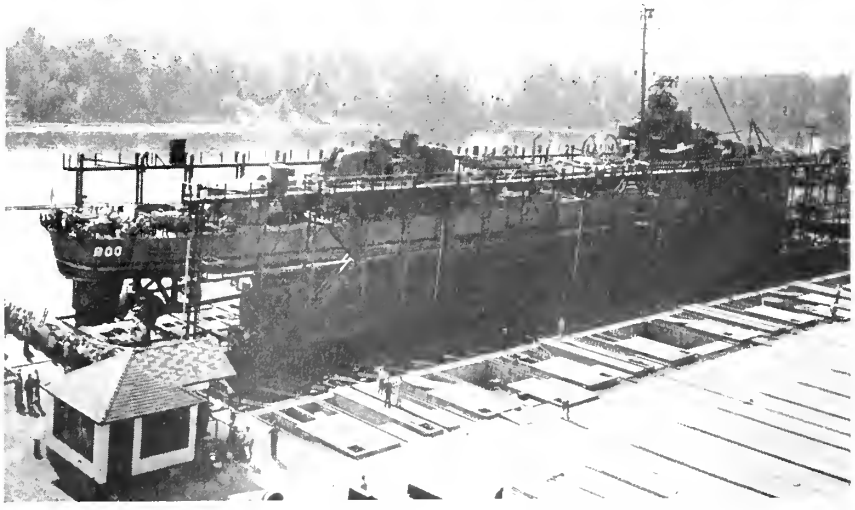
The marine railway at this yard is something entirely different from the usual drydock. It was built on the sidehaul pattern to avoid difficulty in the handling of ships due to the rise and fall of the river. To lift a ship, keel blocks are prepared following the keel design of the ship. The cradle is then dropped into the river and the ship enters the cradle from the south end away from the outfitting dock. As the cradle starts up the incline, the blocks are pulled tight against the sides of the ship by means of hand winches on the catwalk of the cradle, assuring a firm setting. The time involved in a lift is as minutes compared to any other method of drydocking. As many as seven ships have been lifted, shunted, work accomplished and returned to the water in one day. These, of course, would be small ships, as a Fletcher class destroyer is left in the cradle for work while smaller ships can be shunted to transfer tracks.

The marine railway gives the port of Portland a special advantage in drydocking facilities for peace time. Small ships can be drydocked without the necessity of tieing up the port of Portland and Swan Island drydocks from large ships. The peace time use of Commercial Iron Works sludge barges, which clean ship's tanks by the "Wheeler Vacuum Process" is great. It allows tank cleaning without dirtying the ship to go on while handling cargo and can be done without delaying ships' schedules.

Commercial Iron Works, with the possible exception of the steel foundry, is a self-contained organization, and is a good example of flexibility in small yards.







Top: An LCI on trial run. This ship is the side ramp type, which was later changed to a bow opening ramp type.

Second from top: The USS "Salerno Bay" on trial run in the Columbia river.

Last two pictures: Two views of vessels being raised up the incline railway. Ross Island in the background.

Todd Handled 20,000 Ships

Rapid conversion of scores of peacetime vessels to war purposes, a program as critical in the first months after Pearl Harbor as repair and new construction, was a major project in the Atlantic, Gulf and Pacific Coast yards of Todd Shipyards Corporation, according to records revealed by the company.

The 127 ships converted by Todd yards totalled more than 1,330,000 deadweight tons. During the wartime period, Todd handled for repair and conversion more than 20,000 ships of some 108,000,000 tons. In addition Todd building yards completed 1,000 ships, a total of 6,000,000 tons, including airplane carriers, destroyers, submarine and destroyer tenders, Liberty ships and large landing craft.

As in war, Todd is in the forefront in the reconversion of ships to peacetime uses. The transport Argentina, first ship to be converted to carry G.I. brides and babies, was drydocked, redesigned and equipped at Todd Brooklyn, and she was followed immediately into dry dock by the Saturnia—which Todd previously had converted into the hospital ship Frances Y. Slanger.

The war stories of some of the famous ships handled by Todd yards are now recounted. Among the first ships which the company's yards sent into the Allied shipping pool after this country entered the war were the former French luxury liner Ile de France; the Furness-Bermuda liner Queen of Bermuda; the George Washington, 38-year-old former German liner, which was reclaimed from the scrap heap to become a first class troop transport under the hands of Todd workers; the United States liner America, which became the transport West Point, and the United States liner Manhattan, converted into the transport Wakefield.

The George Washington, of 23,788 gross tons, built in Stettin, Germany, in 1908, did transport duty in World War I after being seized by the Allies. She was converted back to passenger service after the end of that war, but after a few voyages was laid up.

When transports were desperately needed in the early part of World War II, the George Washington was hurriedly equipped as a troopship and pressed into service. However, with her existing boilers and coal-burning equipment, she was too slow even for sluggishly moving convoys.

The job of converting the vessel, whose hull, propulsion machinery and general design was pronounced worthy of the cost of conversion, was turned over to the Brooklyn division of Todd Shipyards Corporation on June 15, 1942. There the ship was changed from a coal to an oil-burner, the Scotch-type boilers were replaced by new water-tube boilers and numerous other auxiliary engine room units were installed.

The existing inadequate troop and crew berthing, messing, galley, sanitary, heating and ventilating systems were removed and replaced with modern equipment, and armament was placed aboard.

From a top speed of eleven knots, developed on trials after she was resurrected from the ship graveyard in the Patuxent River, off Solomon's Island, Md., the George Washington, after conversion to oil fuel at Todd's, achieved a loaded speed of 19 knots and a cruising radius of 15,000 miles—her oil capacity equalling that of a medium tanker. Accommodations were installed for 6,500 men, 480 officers and a crew of 240. The vessel was turned over to the Army transport service in mid-April, 1943. The job could have been completed in January of that year had the necessary materials been available.

Another notable conversion job accomplished by Todd, the Ile de France, was completed in 120 calendar days—from August 20, 1943, to December 18, 1943, eleven days fewer than the minimum estimated time. The vessel was equipped to carry 8,352 men, 1,354 officers and a crew of 626. This was more than double the troop-carrying capacity she had while operating as a hastily adapted troopship manned by an East Indian crew.

The Ile de France project necessitated the removal of inadequate trooping and crew facilities. These accommodations were completely redesigned and replaced with up-to-date equipment, including berthing, messing, kitchen and sanitary facilities. Many changes were made in the compartmentation of the vessel, and boilers, propelling units and all engine and boiler room auxiliaries were completely overhauled, as well as most of the deck machinery. Lighting and power wiring, to a considerable extent, were renewed throughout the vessel, as were interior communications. Life-saving equipment, including boats and handling gear, was completely overhauled and augmented.

In the spring of 1942, Todd was called upon to convert into a combat troopship the large, luxurious passenger liner Queen of Bermuda, well-known to thousands of pre-war travelers.

The Queen of Bermuda was a double problem for Todd shipworkers. Not only was the ship to be converted throughout, but she had been badly damaged from stern post to the forward part of her engine room. The ship's entire bottom had to be removed and reconstructed. All four propeller shafts were realigned, the drive motors were checked for alignment and all of the vessel's machinery and boilers were opened up and overhauled.

Then the Queen of Bermuda, which served as a commerce raider in the first years of the European war, virtually was rebuilt inside. Her handsome wood-paneling and wooden bulkheads were ripped out. Passenger salons, lounges, smoking rooms and "night club" were dismantled and partitions taken down. In their places were constructed troop berthing quarters, new ventilating systems, galleys, mess rooms and sanitary equipment. The job, begun April 4, 1942, was completed July 31, 1942.

One of the fastest and most extensive conversions ever performed on a big liner was accomplished at Todd Brooklyn division in changing into a permanent troop transport the West Point—formerly the America,

largest and fastest passenger liner ever built in the United States.

After our entry into the war, the 26,000-ton liner was hastily adapted for troop carrying, by means of the installation of additional bunks and temporary mess tables. However, as soon as practicable, the West Point was scheduled for complete overhauling, reconditioning and conversion as a permanent troopship, and she entered the Brooklyn yard on September 24, 1942.

The liner's fine wood stairs and paneling were removed and steel companion-ways and bulkheads substituted. Her turbine drive machinery was thoroughly overhauled. Hundreds more bunks were added and her spacious cabins and public rooms were transformed for the grim business of war. New ventilating systems, galleys, mess-halls and sanitary systems were installed.

Exactly thirty-one days after the work was begun, the West Point was ready to carry American fighting men overseas.

Other vessels serviced and repaired by Todd during the war include the Queen Mary and Queen Elizabeth; the diplomatic exchange ship Gripsholm, now scheduled to revert to the Swedish-American Line; the Washington (transport Mount Vernon), and the former Swedish-American liner Kungsholm, now the transport John Ericsson.

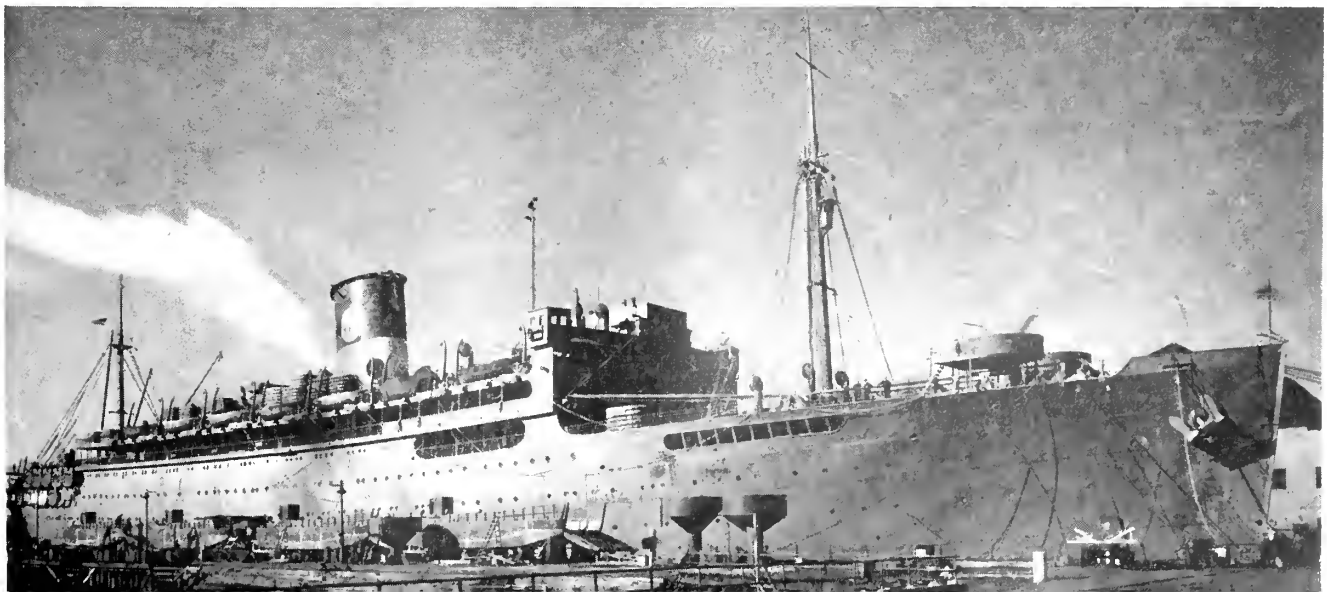
Another huge emergency conversion undertaking by Todd was the redesigning of 41 Victory ships into troop transports—22 of these vessels were converted in the Brooklyn yard and 19 in the Hoboken division. These 4,555-ton ships were enabled to accommodate 1,350 troops and 150 officers. Knockdown bunks were installed in the cargo spaces and the ships equipped and remodeled to carry cargo on the outbound trip and then, by setting up the demountable bunks, take troops on the trip back to the United States.

Todd also converted from C-4 hulls three of the Navy's newest hospital ships, the Haven, Benevolence and Sanctuary. Many types of ships for war service were converted in Todd yards, including attack transports, attack cargo ships, submarine tenders, auxiliary command headquarters ships, electronic repair ships, Army repair ships, aircraft transports, patrol frigates, store ships and others.

Of the total tonnage converted in Todd yards, the Brooklyn division handled 503,000 deadweight tons; Hoboken, 484,000; Galveston, 135,000; Todd-Johnson in New Orleans, 113,000, and Seattle, 95,000.

The Shipment of War Brides Presents Problems

G.I. brides and children will travel to the United States aboard the Army transport Argentina, which was converted at Todd Shipyards Corporation's Brooklyn Division to carry 550 war brides and babies. The Argentina was the first United States flag ship to be converted from troopship to bring Ameican soldiers' brides and children from overseas.



Industry's Stake In Our Merchant Marine

What is our policy on the new war-swollen fleet—shall we keep it, sell it, or junk it? Can we compete with low-cost foreign steamships? Here are advantages and handicaps to industry in "Shipping American."

The authoritative publication, "Modern Industry," recently published an excellent summarization of industry's stake in the American Merchant Marine, which the National Federation of American Shipping is anxious to have read by all who are interested in the future of the maritime industry. We publish it herewith through the courtesy of "Modern Industry."

The U. S. now has the largest merchant marine in the history of the world.

Will we keep it?

Should we keep it?

Is it important to industry?

These questions will be answered in the coming months and years by decisions of the Congress, Administration officials, shipowners, and the public.

England is working assiduously to regain supremacy of the seas. Norway, Greece, and other traditional maritime nations are planning comebacks. Russia, China, Brazil seek a slice of the world's shipping business. Even Switzerland has a merchant marine.

But today we have no definitely accepted, consistently followed maritime policy.

Our shipping men think our goal should be to carry about half our import and export trade in American bottoms. Our State Department and some top officials in other government agencies are against this. They believe foreign ships should carry our trade so foreign countries can earn more dollars to buy American goods.

The Navy wants to retain a big merchant fleet, both active and reserve, and a virile shipbuilding industry as a national defense measure.

The average citizen likes to see the Stars and Stripes flying from ships in every port, but wonders if it isn't an expensive luxury.

While industry wants to ship as cheaply as possible, it also wants efficient, dependable service that will open foreign markets and sources of raw materials.

In 1936 the Congress declared for a merchant marine sufficient to carry a substantial portion of our foreign trade and to provide service on all essential routes. For whatever it's worth, this is still our official policy.

Plenty of Cargo, but—

Our imports and exports are due for a big expansion in the next few years. This expansion probably will come whether the trade is carried in U. S. or foreign vessels.

Most foreigners make it almost a religion to ship and travel in vessels flying their flags. Americans have never done this.

Our 1936 Merchant Marine Act states that we should have a merchant fleet capable of carrying a "substantial portion" of our international commerce. Not since the Civil War have we carried as much as 50% of our foreign trade in our own ships.

In World War I and II we spent billions and sweat blood to build cargo fleets and transports. But between wars our ships rotted at anchor and our shipyards were virtually idle.

Obviously, a large merchant marine is a strong bulwark of national defense, worth considerable expense for this reason alone.

There are real advantages beyond pride and patriotism, however, in having American ships carry the goods of American manufacturers. Every ship line has agents here and abroad soliciting freight, drumming up trade, promoting imports and exports, encouraging passenger travel, finding new markets, assisting shippers in countless ways.

These representatives of American ship lines naturally will promote American trade.

American ships can give more direct and dependable service than foreign ships. For many years the only way American shippers could reach the East Coast of South America was in foreign ships via the European ports. This caused delays which severely handicapped them in competition with European firms. Even on the heavily traveled ship lanes, foreign vessels arrange schedules to suit the convenience of their own nationals

American ships employ American seamen, buy American supplies, seek repair in American ports. A single line, with four passenger and a dozen cargo ships, spent $30 million in a normal pre-war year for wages, supplies, maintenance, and repair.

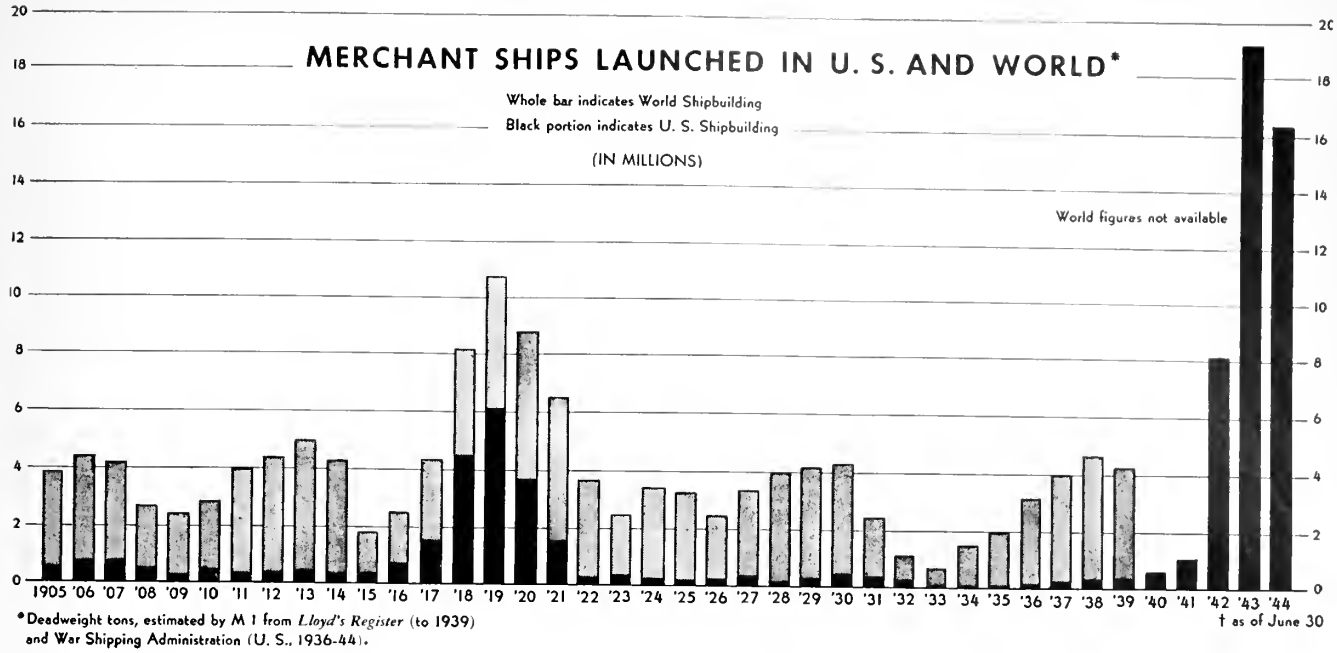
These ships buy virtually every type of American product, from light bulbs and bed sheets to cables and pumps. American shipyards, too, are big customers of American industry when they have ships to build and repair.

If it's a big merchant marine we want, why worry? We've got it. We have lots of ships, more than 5,000 of them, aggregating some 60 million deadweight (cargo capacity) tons—bigger than the pre-war fleets of Norway, Germany, and Japan combined. Two thirds of the world's merchant tonnage is American-owned.

World is Hungry for Ships

All other nations, with the possible exception of England, now have a shipping shortage.

But it takes more than ships to make a shipping line. It also requires



cargo and the ability to compete with other carriers.

Cargo to keep most of the world's shipping busy for a couple of years should be ample. But there is also plenty of competition, and more to come.

We had a big fleet after World War I; most of it, though, didn't stay on the seas long. Operating costs of U. S. lines have always been much higher than foreign lines because of our higher wage standards. Before the war wages of American seamen were 50% to 100% higher than foreign, and the spread is greater now. The same is true in ship repair yards.

This means that much of our shipping will have to have an operating subsidy—really a parity payment to American workers—if it is to stay in business.

Furthermore, much of our war-built shipping is not well suited to commercial use. Half our 5,000 new ships are Liberties, too slow to be economical on the average run. Most of our others were built for general cargo or war.

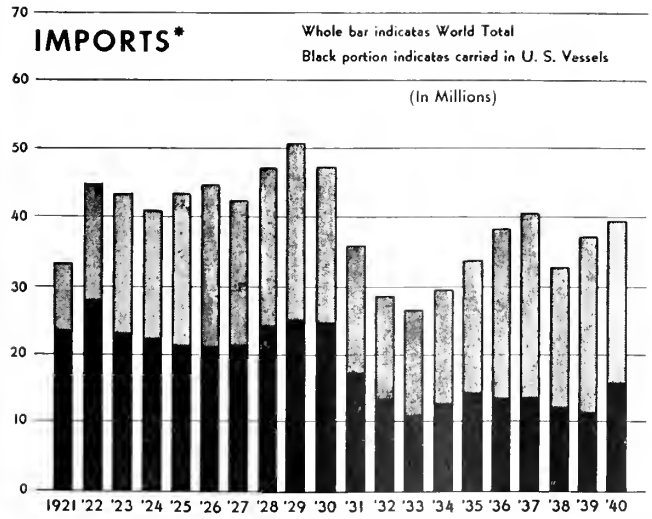
The most economical ship is one designed for certain cargo such as cattle, ore, fruit, or meat; with speed, size, and draft suitable to the oceans and harbors it is to ply; and equipped with the right type of hatches and booms. Foreign countries, while anxious to acquire some of our surplus ships, are all building or planning specialized, efficient ships.

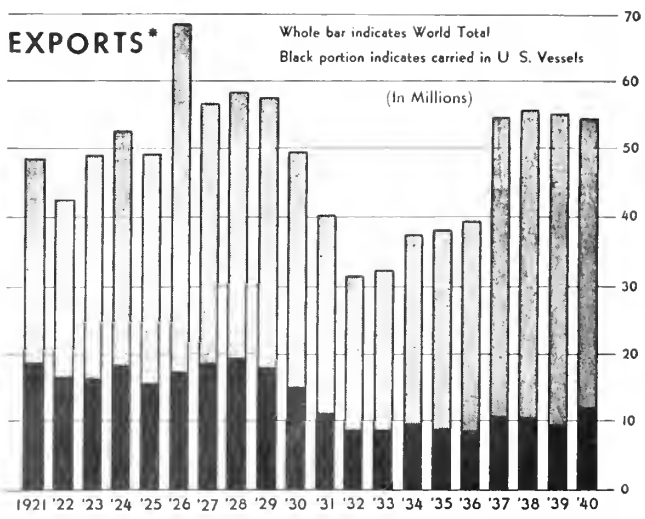
This competitive edge, plus lower foreign construction and operating wages, plus the obsession of foreigners to ship in their own vessels, adds up to stiff competition for American shipping lines a year or two from now, even though immediate prospects are fairly bright.

We can do several things to meet this rivalry. Of first importance are subsidies authorized by the 1936 Act to offset wage differential.

Subsidies vs. Freedom

Most American passenger and



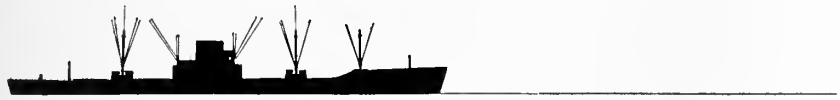


*In cargo tons of 2,240 lbs.—excluding cargoes carried by ships of less than 100 tons gross capacity.

S. S. *America*, passenger liner now Navy transport, has cruising radius of 12,100 miles; deadweight tonnage, 14,361. Propulsion, turbine.

Combination passenger and cargo type (C3 P & C). Length, 491 ft.; cruising radius, 20,300; deadweight tonnage, 9,937. Propulsion, turbine.

Combination passenger and cargo type for South American trade. Length 492 ft.; cruising radius, 18,600 miles; deadweight tonnage, 9,000.



Combination passenger and cargo type for routes between New York and South and East Africa. Length, 479 ft.; deadweight tonnage, 10,048.

Fast freight steamer for New York-Mediterranean and Indian trade. Length, 473 ft.; cruising radius, 15,600 miles; deadweight tonnage, 9,514.

Victory type for general cargo. Length, 455 ft.; cruising radius, 20,500 miles; deadweight tonnage, 10,850. Propulsion, turbine.

Liberty type (EC2-S-C1) for general cargoes. Length, 441 ft.; cruising radius, 9,000 miles. Propulsion, steam-reciprocating.

General cargo ship (C1-A). Length, 412 ft.; cruising radius, 18,900 miles; deadweight tonnage, 7,416. Propulsion, turbine or Diesel.

General cargo ship. Length, 459 ft.; cruising radius, 16,200 miles; deadweight tonnage, 8,514. Propulsion, turbine.

Tanker type (T2-SE-A1). Length, 523 ft.; estimated cruising radius, 12,600 miles; deadweight tonnage, 16,765. Propulsion, turbo-electric.

Transport type (P2-SE2-R1). Length, 608 ft.; deadweight tonnage, 12,063; shaft horsepower, 18,000. Propulsion, turbo-electric.

Far North Atlantic route (New York to Western Europe); accommodate about 1,200 passengers. Length, 745 ft.; cruising radius, 8,000 miles.

For service from New York to east coast of South America, which would reduce run between New York to Rio from 11 to 7-1/2 days. Length, 699 ft.

For New York to Mediterranean run provides for large cargo capacity, high speed, moderate size (650 ft.). Cruising radius, 12,500 miles.

For transpacific run out of San Francisco to China and Philippines provides tankage for the round trip of 14,500 miles. Length, 895 ft.

For San Froncisco to Australia run. Already operating for armed forces, would be reconverted, modernized. Calls for 4,000 tons of cargo.

many freight lines took these subsidies, which before the war amounted to about 50% of operating costs. With the subsidies go many restrictions. The vessels must maintain certain operating standards, keep to specified routes, maintain a definite sailing schedule whether or not they have full cargoes, submit their accounts for audit, and pay excess profits to the Maritime Commission.

On the basis of 1938 operations (the first full peacetime year of the subsidies) over a 10-year period this recapture provision, it was estimated, would pay back to the Government about two-thirds of the subsidy payments. This would suggest that American operators can compete, except perhaps in the luxury-passenger trade, if the Government takes part of the financial risk in building up new shipping routes and services.

Many American ship operators never applied for a subsidy, preferring freedom of operation to the rules and restrictions which accompany government aid.

Labor Costs Soared

On the other hand, labor costs have gone way up during the war. Seamen's wages, which averaged 50% above foreign before the war, have risen 77% since 1941; and maritime unions are talking about another 30% raise and a 40-hour work week.

Dockside costs are up 40% since 1941, and longshoremen's unions have imposed restrictions on man-hour output.

Repair, conversion, and maintenance costs are far above foreign shipyard charges. Ship operating subsidies may have to be far higher than before the war if our merchant marine is to remain large and vigorous.

Aside from its direct construction subsidy, the Maritime Commission has various trade-in, charter, and conversion provisions under which old vessels and war-built ships can be modernized and adapted to special services.

This program will give much work to many American shipyards. It will also give the right kinds of ships to meet foreign competition at investment costs not far out of line with anticipated foreign construction costs.

Domestic trade—coastwise, intercoastal, and with U. S. territories—has always been restricted to vessels of American registry, so no foreign competition exists here.

Before the war this trade occupied about 70% of U. S. shipping—some eight million deadweight tons of the 11 million tons of oceangoing vessels under the American flag.

Except for the territorial trade and coastwise tankers and colliers, this business has disappeared almost entirely. Ships taken by the Government for other service have been lost, converted, or worn out; hence substantial new investment is required for vessels adapted to this type of trade.

Railroads and trucks are now handling the freight. Coastal ship lines, which weren't very prosperous before the war, will have to institute major economies to lure that business back. Since 1940 the Interstate Commerce Commission has had jurisdiction over coastwise and intercoastal rates and routes.

ICC Rules the Roost

The ICC is under instructions from the Congress to maintain competition between all forms of transportation. It remains to be seen whether it will approve rates which will enable ship lines to attract business and make a profit.

Meanwhile the Maritime Commission, under temporary authority from the ICC, is resuming some intercoastal shipping services, employing private operators as its agents.

Early indications are that war-built ships are inefficient in this service. New or converted vessels might keep out of the red if their capital cost is not too high.

Under these conditions our war-built merchant fleet may be a white elephant. What to do with these ships poses tough problems.

The Government could sell them cheap to induce extensive use. But American lines would then be saddled with obsolete vessels, our shipyards would be idle, and foreigners would build for themselves efficient ships which would soon capture world trade.

This is exactly what happened after World War I, when we sold our "Hog Islanders" for whatever they would bring, which wasn't very much.

Higher Prices, Fewer Sales

Or the Government could put high prices on its ships to recover as much war cost as possible. If this happens, relatively few of our 5,000 ships would be sold, since operators would prefer to have new vessels built for more efficiency.

The new legislation provides that certain ships selected by the Navy and Maritime Commission are to be laid up "in sanctuary" and maintained as a reserve fleet for future emergency. To keep this fleet from hanging over the market as a threat to prices, no vessel can be taken out of sanctuary either for sale of charter without approval by the Congress. All surplus ships unsold or unchartered after two years are to be added to the sanctuary or scrapped.

The cost of maintaining these reserve ships in idleness will be considerable; and it is questionable how long the taxpayers will stand for it. Our whole merchant marine and surpus-ship program probably will be re-examined within a few years.

Many economists, including several in the Administration, think a big merchant marine either for use or as a defense reserve is a waste of money, a threat to other nations, an obstacle to international trade, and a continuance of an archaic kind of nationalism.

If foreign nations, with their lower construction and operating costs, they argue, are permitted to carry the world's trade all will benefit, trade will expand, and the ship-owning nations will be able to earn foreign exchange to buy more goods in the U. S. and elsewhere.

Good Balance for Foreigners

Answering this are figures showing how, in the 20 years between World War I and II, foreign countries derived a net favorable balance of about $40 million a year from goods and passengers in the U. S. seaborne trades—an amount equal to only 1% of the average value of our exports in the same period.

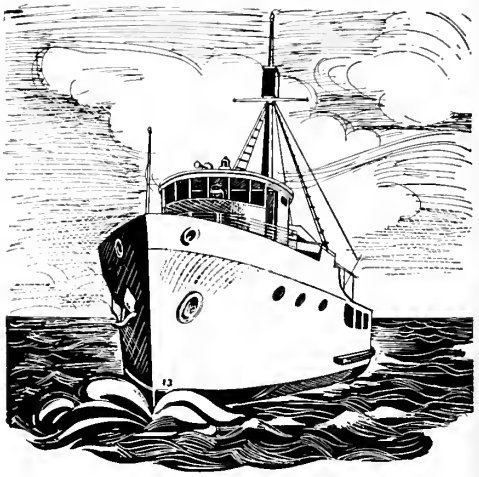
Even so, American shipowners argue there is no more reason for sacrificing our merchant marine to help foreigners get dollar exchange than to surrender an export industry for this purpose.

Last fall British shipyards had under construction 209 postwar-design merchant ships totaling 1,732,380 gross tons, and they plan a ship a day during 1946.

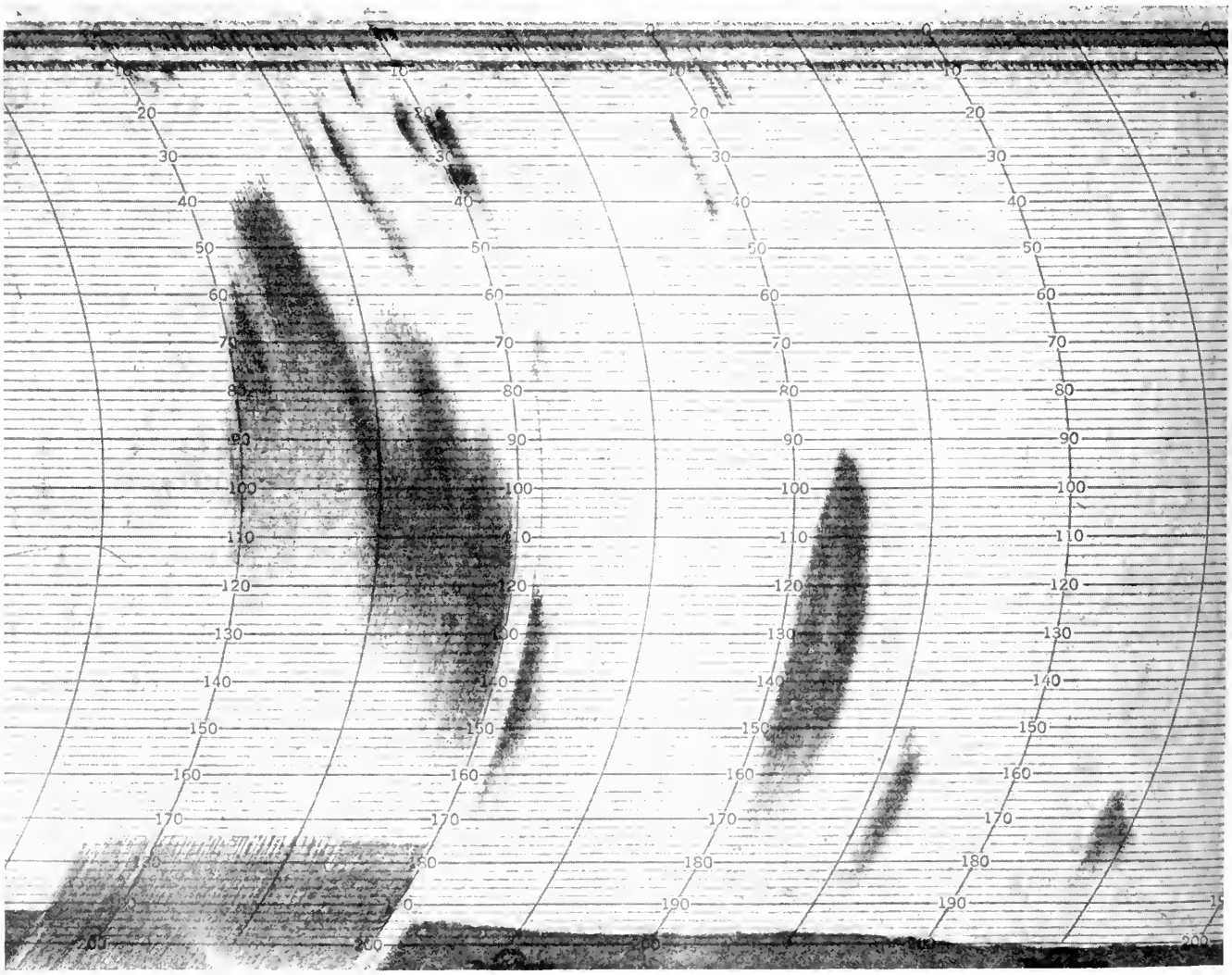
The Swedes, with expanded shipyard capacity, have orders for two or three years ahead. Danes, Norwegians, French, and Dutch are planning to rehabilitate their yards rapidly. They will build fast, specially adapted vessels, more economical to operate than our war-built ships,

(Continued on page 368)

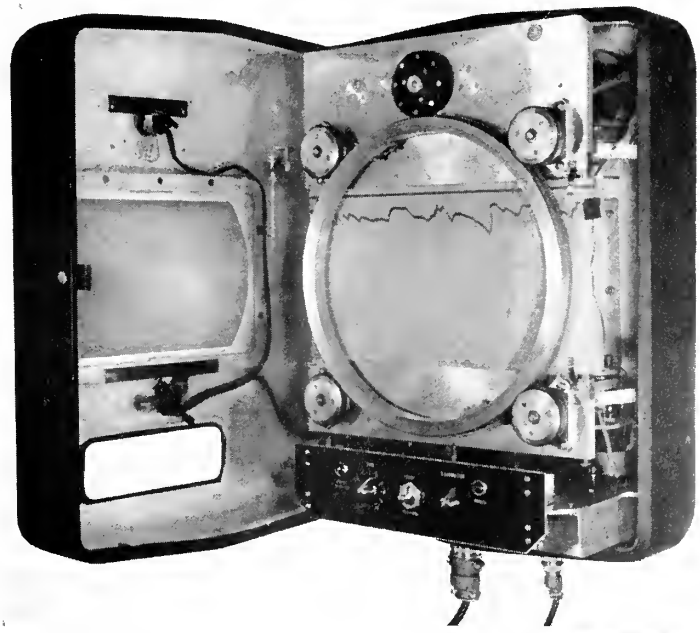
Coast COMMERCIAL CRAFT



Depth Recorder On Fishing Craft



In our October issue we published an article on the Bendix Electric Depth Recorder. Herewith are pictures taken at the time of a trial run of a fishing boat in Los Angeles Harbor recently.



Above: Bendix-Marine recording depth finder. Left, signaling device; right, recording mechanism.

Left: Depth recorder with cover opened, showing paper operating mechanism.

Below: Bendix depth finder recorder opened to show details.

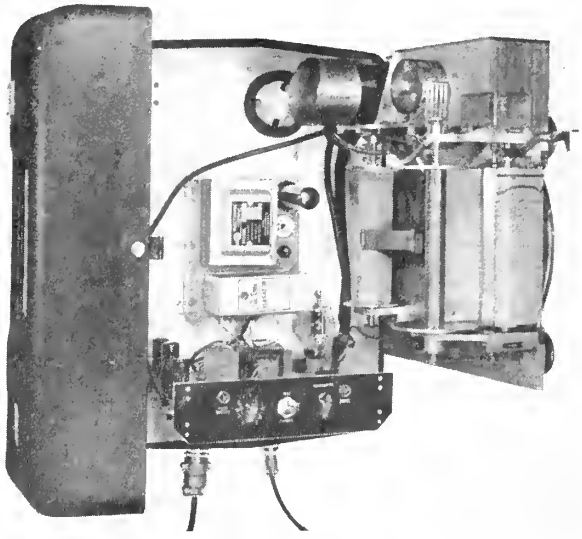


Chart on facing page. This is a remarkable showing of schools of herring recorded on the Bendix chart. The figures down the face of the chart show the depth of the sea in feet, and the distance between the radial lines represents about one minute of time with the boat traveling at a speed of two knots.

Bendix Depth Recorder On Test Run

Left to right: Don Morse, West Coast Representative, Scintilla Division, Bendix; Myron Henry, Paul W. Hiller Co.; E. O. Cooper, Service Manager, Bendix West Coast; William Horton, Wilmington Boat Works; Jack Elliot.

Left to right: R. P. Geddes, Jr., Bendix West Coost Marine Division; Sol Levine, Project Engineer, Marine Division, Bendix Aviation Corp.; William R. Ryan, Chief Engineer, Marine Division, Bendix Aviation Corp.; Walter Rhea, Bendix West Coast Marine Division.

Group watching the recorder in action.

Canal Barge Company's new Diesel towboat Codrington, built by Nashville Bridge Company and powered by General Motors.

Oil Barge Transportation on Ohio and Mississippi Rivers

Towboat "Codrington" Inaugurates New Service

FOR ABOUT FOUR years all classes of shipbuilding and shipping have been so controlled by the Government that new privately constructed and owned vessels of substantial size have been almost as "rare as hen's teeth." Consequently, it is of considerable interest to record the completion and shakedown runs of one of the first pre-war river transportation fleet developments. This consists of the new Diesel towboat "CODRINGTON" and integrated units or barges built under contract by the Nashville Bridge Company, Nashville, Tennessee, for the Cleveland Diesel Engine Division of the General Motors Corporation and acquired by the Canal Barge Company, New Orleans, La., for its oil-carrying service.

Although the trials of this fine modern craft were only run in January, she already is engaged in her regular duties on the Ohio and Mississippi Rivers where she has inaugurated a barge transportation movement on a route which is approximately a thousand miles each way.

Following preliminary builder's tests, the acceptance trials took place on January 10, and consisted of a 40 mile run down the Cumberland River pushing two 20,000 bbl. capacity steel oil barges to a point where the company officials were put ashore. The test took place without a hitch, and everyone aboard appeared to be fully satisfied with the performance. The towboat then proceeded on her way to her operating base to take aboard a load of crude oil for her maiden voyage to a distant refinery.

While transportation of petroleum by water is age old, there was comparatively little carrying of crude oil and refined products on the Mississippi River and its tributary waters prior to the early 1930's. With the development of proration legislation for oilfields, which limited well output; with the decline and fluctuation of prices, and with the imposition of heavy taxes and other restrictive petroleum laws, the cost of oil transportation became a serious problem to oil companies because of its effect on net profits. Naturally towboat reliability, economy and efficiency became very important factors in the transportation of oil by barge. The selection of types of towboat power, as well as the selection of particular makes of machinery were and are very important because of their direct bearing on efficient service and their relation to the commercial success of overall operating plans. The Canal Barge Company was one of the pioneers in the adoption of new methods and techniques for river towing, and also one of the first

to engage in hauling gasoline and other light oils on a contract transportation basis in the lower Mississippi territory.

Between 1930 and 1941 the U. S. Engineers embarked on a broad program of inland waterway improvement. Many existing rivers were improved and new canals opened to aid navigation and to assist in greater use of inland water transportation. Then followed the construction by the oil industry of necessary bulk terminals at strategic points capable of handling large quantities of crude and refined petroleum. As terminals were constructed for handling petroleum products along the inland waterways, facilities for the transportation thereof grew steadily. Formerly the method of towing barges owned by the oil companies was neither satisfactory nor very economical, especially as most of the motive power was steam. Barges would be dropped at terminals along the routes and then unloaded by whatever pumping facilities were available. Having no power of their own, the barges would remain there idle until another tug came along to tow them back to the starting points.

To overcome this situation, the Canal Barge Company undertook to organize and develop integrated transportation units consisting of specially built barges, specially developed tugs and towboats and likewise specially developed pumping facilities. The first step involved the design, development and construction of a barge that was specially suited for this type of operation and which would secure maximum efficiency not only through the speed with which it could be moved but also through the speed with which it could be unloaded so as to make it available for further operations.

This new barge embodied several innovations. It was a welded shell barge, whereas most barges then in use were either wooden or riveted steel. The bottoms were not flat but of a sort of V type with a six inch dead rise, which tended to deflect submerged logs and similar debris instead of permitting it to pass under the tow until it fouled the towboat propeller. This new type of bottom also made possible an internal construction that provided a well towards which the liquid contents of the barge gravitated so as to make possible a much more rapid and complete "stripping" or unloading of the barge. Thus the speed of movement, with the same power and fuel consumption, was increased.

In 1938 the General Motors Corporation collaborated with the Canal Barge Company, and designed a Diesel driven towboat which formed the prototype of the new vessel "CODRINGTON." Completed in 1939, she was named the "BULL CALF," and—it is interesting to mention—this vessel contained the first Air-Flex clutch-coupling and the experience and knowledge gained from her formed the basis for the Diesel engine plant of the war built LST's. The "BULL CALF" was smaller and had less power than the "CODRINGTON," being 88 ft. long and powered with a 750 HP G. M. Diesel engine, and her service performance has more than justified the larger and more powerful vessel being built along similar lines but capable of a much greater tonnage haul.

From the standpoint of river hauling the "CODRINGTON" is noteworthy. She is a fine example of postwar shipbuilding, and her power plant is a modern engineering achievement. Everything has been done to improve efficiency in conjunction with an increase in overall simplicity. It is only necessary to watch the captain handle the combined steering engine and propeller controls in the pilot house, and to note the instant response of the ship, in order to realize how much has been accomplished over the old steam stern wheeler. The total tow length, including the tug, is 591 ft., yet steering in the narrow river seems to be accomplished with the greatest of ease.

Named after George W. Codrington, Vice President, General Motors Corporation, who was responsible for the manufacture of the Diesel engines, this towboat is 110 ft. long, moulded, and 111 ft. 3 in. overall, with 26 ft. moulded beam; 26 ft. 9 in. maximum breadth, and 9 ft. 4 in. depth amidship. The sheer forward is 2 ft. 2 in. and aft it is 9 in. The hull and superstructure of the towboat is of all welded construction, and the steel fabricating workman-

The CODRINGTON pushing two 20,000-bbl. capacity steel barges during her acceptance trials on the Cumberland River.

ship and outfitting are of A-1 quality. Length of the two barges closely coupled together is 480 ft. To prevent up-and-down rubbing and wear where the two barges are connected, two 6½ in. pins fit into sockets, while heavy rubbing plates take the side thrust.

Propelling plant of the "CODRINGTON" consists of a 16-cylinder, Model 16-278A, General Motors Marine Diesel Engine of the two-cycle type rated to deliver 1,235 b. hp at 700 rpm, and this unit is coupled to an Air-Flex clutch and reversing mechanism and a reduction gear. This reversing unit has two constricting type air-operated clutches which provide flexible and resilient connection between the engine fly-wheel and the driving drums mounted at the forward, or engine end, of the gear unit. The rubber clutch glands are selectively inflated to obtain desired rotation of the propeller shaft. Under the arrangement of the air control it is impossible to inflate both clutches simultaneously. Reversing is accomplished through bevel pinions, and as astern and ahead reduction ratios are identical, full power and torque are available in both directions.

The main G. M. Diesel engine of the "CODRINGTON" is of V-design with port scavenging-air inlets and valve-in-the-head exhaust outlets. Scavenging is carried out by means of a blower mounted at the forward end of the engine which draws its air supply through a silencer and delivers it under low pressure to the combustion chambers. The blower consists of a pair of triple helical-lobed rotors in a closely fitting housing, but without actual metal-to-metal contact, and the design allows a continuous and uniform displacement of air. From the space between the inner and outer wall of the blower housing, the air passes into the air box around the cylinder liners, and into the cylinders when the pistons uncover the ports.

The crankcase is a one-piece fusion welded alloy steel structure of

Top: Part of the spacious accommodations provided for the officers on the CODRINGTON.

Center: One of the two-berth cabins.

Bottom: Pilot house. All instruments, gages and levers are mounted in a single unit for the convenience of the pilot.

great strength and stiffness, with the advantage of light weight. It is so designed that combustion loads are transmitted as straight tension from the upper deck plate of each cylinder bank through inclined side plates to the forged foot frames on which the main bearing supports are bolted. Steel plate stiffeners between the main frame members rigidly brace the frame structure.

The engine base also is of welded steel and firmly carries the crankcase, reverse reduction gear and Air-Flex clutch. The crankcase is a one-piece steel forging, drilled for lubricating oil passages, and statically and dynamically balanced. Pistons are of close grained alloy cast iron. The cylinder blocks are fitted with replaceable liners having integral water jackets. They also are made of cast iron and their bores are accurately honed to a mirror finish. The cooling spaces extend to below the scavenging air intake ports.

Supply of fuel is by a transfer pump on the engine which delivers the oil to the unit fuel-injection system, but the fuel passes through strainers arranged between the pump and the injector to ensure that no foreign matter reaches the spray nozzles. These strainers are easily cleaned or renewed. Surplus fuel is by-passed to ensure that any reverse flow of oil cannot carry dirt back into the injector when the engine is stopped.

The overall length of the engine is 16 ft. 9 in. from the aft coupling to the forward end, while the complete length of the entire power and reverse units is 25 ft. 9 in. The overall height from the crankshaft center is just over 6 ft., and the overall width is 5 ft. 9 in., making a very compact installation. Cooling is by means of a closed fresh water system.

The size of the propeller of the towboat is limited by her draft and by the size of the tunnel in which it turns. It is a three-bladed wheel of 82 in. diameter. At full speed the main engine rotates at 700 rpm and the propeller at 304 rpm. To increase the effective thrust and with a view to reducing any tendency for the tunnel and propeller to become clogged with driftwood, a special semi-nozzle has been installed in the after end of the tunnel. The latter is in the shape of a Venturi throat, being narrow at the after end. Rubber bearings carry the propeller shaft.

The entire engine room and its machinery has been white enamelled, which makes the compartment very bright. It is in charge of chief engineer Walter E. Andrews, with Leonard McDougal as second engineer and Tom Smith as third engineer. A clarifier takes care of cleaning the lubricating oil for the main engines, and the fuel oil for these engines is also filtered. For auxiliary power and electric light, there are two three-cylinder Model 3-71 General Motors Diesels, which drive 30-kw. direct current generators. The lubricating oil, as well as the fuel oil, for these auxiliary engines is filtered.

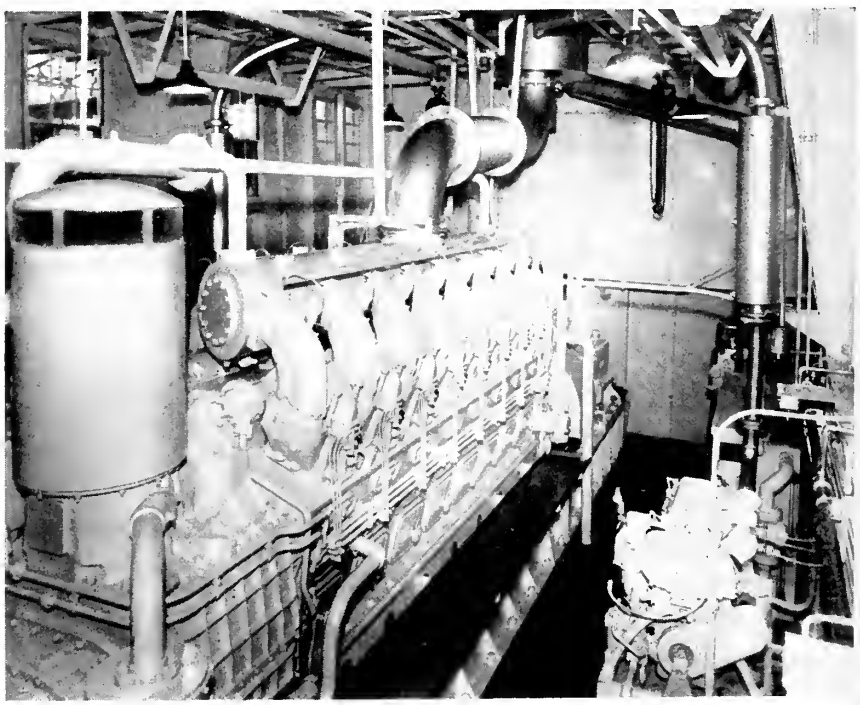
To heat the ship there is an oil-fired boiler which supplies hot water to the various radiators in the officers' and crews' quarters. Forward of the engine room there is a workshop equipped with sufficient tools to carry out minor repairs. In this space are located two air compressors, belt driven by the motors, and equipped with magnetic control. These units provide air for starting the Diesels and maneuvering them, as well as for the Air-Flex clutch and for the operation of the pilot house control gear and the rudder engine. There also is installed a bilge pump driven by a 15 hp electric motor.

In addition to the fuel tanks on the towboat, each of the barges carries a fuel-oil tank on deck, thus considerably increasing the cruising range without increasing the draft of the "CODRINGTON." Flexible piping is connected whenever the towboat's fuel tanks require replenishing. Also on the deck of each barge is a cargo-pumping unit consisting of a gasoline engine and deep-well pump. These units can be used for discharging cargo independently of shore equipment at any unloading point.

The pilot house control gear of the "CODRINGTON" was designed by Harry Dyer, President of the Nashville Bridge Company, and was manufactured and assembled at the shipyard. It is actuated by a 9 hp air motor, and, together with the various indicating instruments, is arranged in a single-unit stand or console, with the instruments and gauges mounted flush in its sloping top. All levers, including the twin rudder arms, are conveniently arranged in front of the pilot.

The forward part of the upper structure of the towboat below the pilot house houses the officers' accommodation and has a lounge or spare room. Aft of the lounge are two cabins with toilets and shower for the captain and pilot respectively.

The CODRINGTON'S main power plant—a 16-cylinder Model 16-278A General Motors Diesel, with clutch-reverse-reduction gear unit, is shown at the left. Auxiliary power is provided by the 3-cylinder Model 3-71 General Motors Diesel generator set in the right foreground.



These are spacious and well-furnished.

The engineers' and mates' quarters below those of the captain and pilot are also modern, insulated and heated. There are two two-berthed cabins with shower and toilet between them. Right aft is the combination galley and mess room. Food service is given directly from the hot tables, oil-fired range, etc., to a lunch counter, which facilitates service by the cook. Forward of the galley are the quarters for the cook and deck hands. On the deck above the galley is a riveted steel rowboat equipped to take an outboard motor, and handled by a derrick.

During the trial runs Captain R. R. Thorpe was at the controls. Present at the trial runs were the following representatives of the Cleveland Diesel Engine Division, General Motors Corporation; George W. Codrington, General Manager; Thomas E. Hughes, Sales Manager; Knut O. Keel, Chief Engineer; Benjamin H. Gommel, Commercial Sales Manager; John Kitco, Engineer; Theodore L. Meckbach, Manager, New York Office; Charles G. Gustavson, Engineer, New York Office; Dan Smith, Resident Engineer at Nashville and Trial Enginer; and C. L. Barnard, Manager, New Orleans Office. Also present were: Harry Dyer, President, Nashville Bridge Company; Harry B. Jordan, German Jordan and Joseph M. Jones, executives of the Canal Barge Company; Clark Berry, purchasing agent, Canal Barge Company; and R. B. Cook, consultating naval architect and member of Tams, Inc., New York.

Distinctive New Outboards

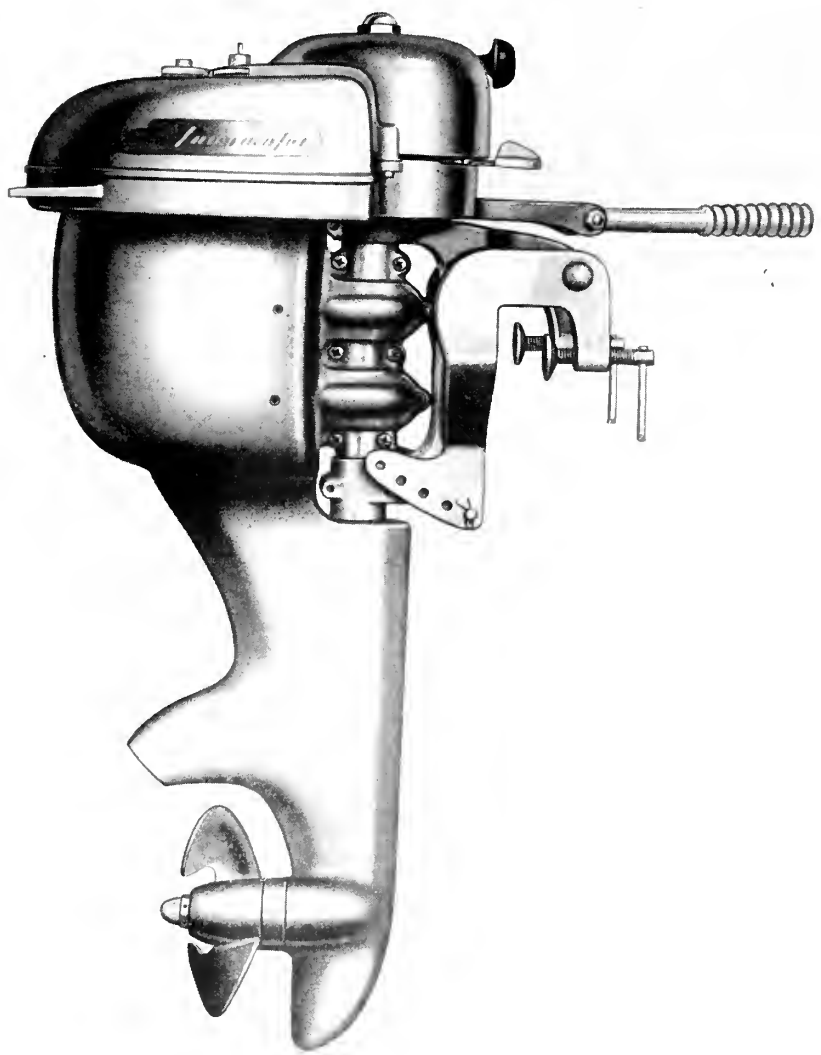
Timed with the New Year comes the announcement by Metal Products Corporation, Milwaukee, of its distinctive new line of outboards with marked advancements in design, construction and performance. With outboard motor users and dealers alike, the new outboards are sure to excite exceptional interest—as will the news that the line of three popular models, with piston displacements of 4.6, 9.2 and 15.9 cubic inches, in 2½, 5 and 10 horsepower, will be in quantity production and ready for deliveries to dealers by spring.

The officers of the corporation for years have been known in dealer circles and in the fields of motorboating and outboard racing. Its president and treasurer is George L. Kuehn, former motorboat racing champion with a long record of Wisconsin State, Central Divisional and National Championships. Louis Kuehn, his father and vice president of the corporation, is well known to hardware and building material dealers and jobbers from coast to coast, and long has been regarded as one of the nation's most esteemed industrial leaders through his long and successful record as founder and president of the Milwaukee Corrugating Company, later known as the Milcor Steel Company. Serving as vice president and chief engineer is Leo T. Kincannon, who ever since 1925 has been designing and testing engines, tools and machinery. His work on outboards has earned nationwide recognition, as he designed two previously successful, nationally known outboards. The secretary of the company is Edward H. Engelhorn, who has a long record of achievement with outstanding builders of engines. His 15 years of experience has established him as a leading figure in the manufacture of all types of outboard motors as well as in the field of racing outboards.

Features of the Metal Products Line

Outstanding among the features of

Outboard motor. Piston displacement 15.9 cubic inches.



Louis Kuehn, vice president, Metal Products Corp.

George L. Kuehn, president and treasurer, Metal Products Corp.

the new outboards is that they are 15% to 20% lighter and smaller than pre-war models of like horsepower. This is made possible by simplicity and a distinctively different type of design and construction—also the use of some of the new metals and alloys developed to meet wartime needs. The compactness of the trim, streamlined new models is immediately apparent. Not only does their smaller size and lighter weight make them easier to handle and carry, but hand grips are built in for extra convenience.

Quick, sure starting and smooth, even operation at all speeds, including trolling speed, are assured by a patented float-feed dual carburetion system with adjustments for high, intermediate and low speeds. Conveniently located controls provide remarkably easy, positive carburetor adjustments.

Shear-pin troubles have been eliminated through the utilization of a new patented propeller mechanism, which automatically disengages the propeller when it strikes an obstruction—and re-engages as soon as the propeller is again in the clear.

Another important design feature of the line, which sets a precedent in the outboard field, is that the new motors are entirely "outboard"—that is, no part of the motor extends inside the boat. This overcomes the problem of oil and gasoline dripping into the boat. The compact new outboards are set lower on the boat to provide better balance. Boats equipped with them are thus highly maneuverable—with full 180° steering. A special securing lock assures positive tilt-up position whenever desired. This does not depend on friction to maintain proper angle, but has a locking-pin which prevents the motor from slipping back to the normal operating position.

Edward H. Engelhorn (left), secretary, and Leo T. Kincannon, vice president and chief engineer, shown with new outboard.

Another outstanding design and construction innovation, the two-piece over-all motor housing, makes possible the removable cylinder sleeves and bearings. In case proper lubrication is neglected, thus causing damage to any bearings or cylinder sleeves, new ones can be inserted quickly, easily and economically. These new outboards have lightweight aluminum alloy pistons and connecting rods, hardened steel gears, hardened and ground bearing surfaces, counterbalanced crankshaft, automatic oiling, rotary neoprene water pump of a patented design, a collector-ring-equipped magneto that assures positive firing and eliminates broken and leaky wires resulting from constant flexing. Other distinctive advancements include the large capacity, die cast, streamlined gas tank, weedless type propeller, and underwater exhaust. All these combine to give the new outboards plenty of selling features to please any dealer—and provide dependable performance, maneuverability, and ease of handling and operation that is a pleasure to the most discriminating boat owner and user.

Pacific MARINE REVIEW

Washington Digest

Navigation and Inspection Law Waiver

The House has, without a record vote, passed the bill (H.R. 5716), to amend the Second War Powers Act, 1942, as amended, so as to continue certain features of the statute in effect until March 31, 1947. The bill had been favorably reported (H. Rept. 1714) to the House from the House Judiciary Committee by Representative Hobbs, Alabama.

Among the features of the Act which will be continued in force are emergency powers of the Interstate Commerce Commission over motor and water carriers, and provisions for the waiver of navigation and inspection laws.

The navigation and inspection law waiver is contained in Section 501 of the statute, which reads as follows:

"SEC. 501. The head of each department or agency responsible for the administration of the navigation and vessel inspection laws is directed to waive compliance with such laws upon the request of the Secretary of the Navy or the Secretary of War to the extent deemed necessary in the conduct of the war by the officer making the request. The head of such department or agency is authorized to waive compliance with such laws to such extent and in such manner and upon such terms as he may prescribe either upon his own initiative or upon the written recommendation of the head of any other Government agency whenever he deems that such action is necessary in the conduct of the war."

The bill now goes to the Senate for consideration.

Tonnage Allocated by WSA for Pacific Coast-Puerto Rico Service

Allocation of merchant ship tonnage to move cargo from Pacific Coast ports direct to Puerto Rico has been approved on a test basis, the War Shipping Administration has announced. Pope & Talbot, Inc., has been designated as berth agent to handle the direct shipment of cargo.

Prior to the war, intercoastal cargoes destined for Puerto Rico were carried on regular eastbound voyages by American-Hawaiian Steamship Company and Pope & Talbot, Inc. Since resumption of intercoastal operation, many ships have been operating eastbound at full capacity and the handling of Puerto Rico cargo on these voyages would conflict with this through traffic.

In approving the trial allocation of a monthly sailing to Puerto Rico, WSA approved allocation of other tonnage for future additional direct sailings to Pope & Talbot and American-Hawaiian Steamship Co., if the cargo conditions justify it.

Travel Groups Seek Removal of International Transport Barriers

Presentation of a united front to bring about greater freedom in international travel in the interest of world trade, peace and prosperity was the unanimous feeling of representatives of transportation and travel groups participating in a meeting at the Carlton Hotel. A committee of outstanding figures in the transportation world was formed to study the problem, outline a program for organization of the work for removal of unreasonable travel restrictions and to help promote world tourist and business travel. The committee is to report back to a second meeting of the group held March 27, 1946.

M. F. Redfern, secretary of the Air Transport Association of America, was appointed chairman of the committee and Almon Roth, president of National Federation of American Shipping, was named vice chairman. Other members are H. M. Paulsen, president, American Association of Travel Agents; Russell E. Singer, general manager, American Automobile association: Willard Givens, executive secretary, National Education Association, and Paul M. Hawkins, Washington representative, American Hotel Association.

The committee was instructed to survey any activities already in progress concerning revision of world travel barriers, including results of the survey in the March 27 report. Robert Ramspeck, executive vice president, Air Transport Association, was chairman of the meeting, and Col. Sidney Post Simpson, of New York Bar, was named counsel.

Modification of Transpacific Passenger Agreement Filed for M. C. Approval

Modification of the agreement of the Transpacific Passenger Conference (No. 131-201) so as to prohibit the appointment of freight brokers, forwarders or receivers of cargo, as agents, directly or indirectly, except as unanimously agreed upon by member companies, has been filed with the Maritime Commission for approval.

The modification was submitted and signed by the following conference members: American President Lines, Ltd; Canadian Australasian Line, Ltd.; Canadian Pacific Steamships, Ltd; Java Pacific Line (of the N. V. Stoomvaart Maatschappij "Nederland" and N. V. Rotterdamsche Lloyd); Silver Line, Ltd.; Klaveness Line; Matson Navigation Co.; Pacific Island Transport Line (A/S Thor Dahl); Prince Line, Ltd.; The Oceanic Steamship Co.; Trans-

atlantic Steamship Co., Ltd. (Rederiaktiebolaget Transatlantic), and Union Steam Ship Co. of New Zealand, Ltd.

Billing Procedure Is Outlined in WSA Accounting Instructions

Procedure to be followed by agents, general agents, and berth agents in billing for compensation pursuant to provisions of General Order No. 56 and preparing the statements required in connection with such billing has been outlined by the War Shipping Administration in Auditing and Accounting Instructions No. 51. Issued under date of March 1, 1946, over the signature of J. M. Quinn, comptroller, the instructions were made available March 14.

Government Set-Aside Food to Go to Ships of Approved Nations, WSA Says

Vessels of approved nations will be supplied food by Government-approved ship suppliers from Government set-aside orders the War Shipping Administration announces. Permission was granted for vessels of Greece, Netherlands, Norway, Sweden, United Kingdom, and tankers of Panama to stock food stores from WSA sources. Exemption from a previous order limiting supplies to U. S. ships was made possible by an agreement reached by the Department of Agriculture and the WSA.

The agreement followed an appeal by Ministries of Shipping of the six Nations to the Acting War Shipping Administrator for exemption and stating that it would be impossible for their vessels to obtain adequate quantities of food either in their home countries or through civilian channels in the United States. The exemption provides that foreign-flag vessels must comply with all other food control regulations and bulletins issued by the Food Control Division of WSA.

Other countries may be included in the exemption agreement if they make application to WSA including proof of inability to obtain food stores in their home countries and other qualifications.

All privately-owned ocean-going American flag vessels engaged in foreign commerce and coastwise vessels previously covered are included as authorized purchasers of Government controlled foodstuffs from approved ship suppliers.

Nielsen to Report to WSA On Foreign Seamen Wage Investigation

A comprehensive report based on intensive overseas studies of wages paid to seamen employed on foreign competing vessels will be presented to the War Shipping Administration shortly by Eric Nielsen, special assistant to the Deputy Administrator in charge of labor.

Mr. Nielsen has spent many weeks abroad, specifically to gather data on the subject of seamen wages for use at the forthcoming maritime conference to be held in Seattle the early part of June. However, it is also known that the Maritime Commission itself is interested in such a report for use in that agency, and for future reference as to adjustments of subsidies.

Friedlander Appointed as Consultant to Macauley

Appointment of Lt. Col. Joseph Friedlander in the capacity of consultant to Acting Chairman Edward Macauley, of the Maritime Commission, has been announced by Commission officials.

Col. Friedlander, who will assume his duties shortly, has been associated in the past with Dollar Steamship Lines, General Steamship Corporation, Swayne & Hoyt, American Trading Company, as well as having experience in tug and barge operations. During the course of the war he was employed by the Army Air Forces, handling overseas shipments for the Air Corps.

WSA States Bunker Fuel Shortage Is Delaying Relief Ships

Lack of bunker fuel oil has delayed the sailing of a number of critical vessels out-bound with vital cargoes of relief supplies, the War Shipping Administration states. Early March saw the complete depletion of all bunker fuel stocks in the Philadelphia area and the situation changed temporarily only because of the arrival of one tanker. At present New York is short of sufficient stocks, Norfolk is out, and additional ships will be delayed.

The shortage has hit the Gulf and Atlantic Coasts, WSA said, and although the situation on the Pacific Coast is not so critical, stocks of bunker fuel are far below normal levels.

There were ample tankers to meet transportation requirements and the shortage appeared to arise from heavy demand and a lack of production of bunker oil. No improvement is in sight unless positive corrective steps are taken, WSA said.

Two New Foreign Agreements Filed for Maritime Commission Approval

Establishment and maintenance of two additional joint steamship services are provided for in two conference agreements filed for approval of the Maritime Commission on March 5, 1946.

No. 7568—Between The Ocean Steam Ship Co. Ltd., The China Mutual Steam Navigation Co. Ltd., and the Nederlandsche Stoomvaart Maatschappij "Oceaan", provides for establishment of a joint service "in trades between United States ports on the one hand and foreign ports on the other". The exact trading area of this conference pact is not identified in the agreement, a situation, according to Maritime Commission of-

ficials, that may be questioned before approval of the agreement.

No. 7569—Between M/V Nonsuco, Inc. and S/S Vincente, Inc. (as one member or part only), covering establishment of a joint cargo service between United States ports and ports in the Far East including the ports of Japan, Korea, Formosa, Siberia, Manchuria, China, Indo-China and the Philippine Islands.

Both of the proposed agreements prohibit the pooling or other sharing of profits or losses as between the parties.

Over-Age Lakes Ships to Be Scrapped at Canadian Yard

Hulls of 29 over-age Great Lakes vessels, recently sold by the Maritime Commission to the By-Products Iron and Steel Corporation, Cleveland, Ohio, will be moved to Canada where they will be cut into scrap for remelting purposes, according to announcement by the Commission.

WSA Lists Passenger Fares Between U. S. and World-wide Areas

Passenger fares between United States ports and virtually all parts of the world for vessels operated for account of War Shipping Administration have been prescribed or reaffirmed by that agency in Rate Order No. 463, issued under date of March 7, 1946. The new Rate Order cancels the previously listed fares contained in Rate Order No. 222, which was issued late in 1943.

The new passenger fares are listed "in keeping with the gradual return to more normal standards of ocean passenger transportation," the Rate Order stated, but it was pointed out that as circumstances warrant the WSA hereafter will authorize special fares, etc., for application to vessels and lines operated for its account.

Fares Apply to or from All Ports

Between and	U. S. Pacific Coast Ports
Mexico—West Coast ports	$100.00
Guatemala, Salvador and Honduras—West Coast ports	120.00
Nicaragua and Costa Rica — West Coast ports	135.00
Panama and Panamal Canal Zone	150.00
Colombia—East Coast ports	175.00
Netherlands West Indies	190.00
Western Venezuela ports to and including Laguaira	190.00
Eastern Venezuela ports	200.00
Trinidad	200.00
Brazil—	
Natal and ports north therof	250.00
Ports south of Natal to and including Bahia	275.00
Ports south of Bahia to and including Santos	300.00
Ports south of Santos	325.00
Uruguay	350.00
Argentina—	
Mar del Plata and ports north thereof	350.00
Colombia	175.00
Ecuador	200.00
Peru—	
Callao and ports north thereof	225.00
Ports south of Callao	250.00
Chile—	
Antofagasta and ports north thereof	275.00
Ports south of Antofagasta to and including Valparaiso	300.00
Ports south of Valparaiso	325.00
India—	
Karachi to Madras, both included	450.00
Ports north and east of Madras	450.00
Ceylon	450.00
Burma	450.00
Persian Gulf ports	500.00
Gulf of Aden ports	500.00
Red Sea ports	500.00
Suez Canal ports	500.00
Hawaiian Islands	100.00
Tahiti	175.00
Samoa Islands	200.00
Fiji Islands	210.00
Gilbert and Marshall Islands	200.00
Mariana Islands	225.00
New Hebrides, Solomon Islands, New Caledonia and New Zealand	225.00
Admiralty Islands, New Britain and New Ireland	250.00
British New Guinea	275.00
Netherlands New Guinea	300.00
Australia—	
Queensland, New South Wales, Victoria and Tasmania	275.00
South Australia	300.00
Northern Territory	300.00
Western Australia	350.00
United Kingdom and Eire	325.00
Ports on the Baltic Sea, Gulf of Bothnia, Gulf of Finland and Gulf of Riga	350.00
German North Sea Ports, Norway, Denmark, and West Coast of Sweden	325.00
The Netherlands, Belgium and French Atlantic ports	325.00
Portugal and Spanish Atlantic Ports	325.00
Japanese Main Islands	225.00
Korea	225.00
Manchuria	250.00
China—	
Shanghai and ports north thereof	250.00
Ports south of Shanghai	275.00
Formosa	275.00
Philippine Islands	275.00
French Indo-China	300.00
Siam, Malay States, Sumatra and Java	325.00

Conditions Applicable to the Above Listed Fares:

Where accommodations of an emergency type are provided, such as "standee" or troop class berths, ordinary crew quarters, or when passengers are berthed in public room spaces, a discount of 33-1/3% may be granted, the resulting reduced fare if an uneven amount to be rounded off upward to the next unit of one dollar.

One child under 3 years of age in a family shall be free of charge, but any additional children under 3 years of age in the same family shall be charged quarter fares each. Children 3 years and under 12 years, half fare; 12 years and over, full fare.

United States and foreign government taxes, port dues, landing fees or other charges of every nature levied against passengers or passenger fares are not included in the above listed fares and shall be collected from or paid by passengers in addition to such fares.

All fares listed are on a "one-class" basis, with full public room promenade and other privileges, to the extent that vessel operating conditions permit and within the discretion of the Master of the vessel involved.

The assignment of accommodations, in view of the uniform fares herein provided, shall be made by vessel Agents at ports of embarkation, under direction and subject to the approval of the Representative of the War Shipping Administration for the area where practicable. Except where unusual circumstances prevent, preference in assignments shall be granted United States and foreign Diplomatic and Consular Officers, Military and Naval officers, and United States and foreign Government officials. On private civilian travel, preference shall be granted in relation to age, family considerations and other pertinent factors.

The fares are for through travel without change of vessel, and no forwarding, transshipment, or maintenance ashore shall be provided thereunder.

Through fares, between points or for routes not covered herein, and interport fares, will be quoted on application.

Orders Cancelled: Rate Order No. 222.

Admiralty Decisions

By Harold S. Dobbs
of the San Francisco Bar

Lighter Captain Not a Member of the Crew

In previous articles I have stressed the ambiguity that presently exists among the circuits in the matter of the classification of persons employed aboard barges and tugboats. In my last article I pointed out that in the **Dillon case,** 1945 A.M.C. 1486, Third Circuit, the court held that the libellant was a member of the crew and, therefore, not entitled to the benefits of the United States Compensation Act even though the employee's duties had no connection with the navigation of the vessel and the additional factor that the barge upon which he was employed had no motive power.

In the **Lindenberg case,** 1946 A. M.C. 46, Second Circuit, an appeal pressed the question of whether or not the district court was correct in affirming the Deputy Commissioner's decision that the claimant, a lighter captain, was not excluded from the coverage of the Longshoreman's and Harbor Workers' Compensation Act. It provides as an exception to Compensation coverage that masters and members of the crew of any vessel are expressly excluded.

The claimant in this case was a lighter captain by occupation and on June 6, 1944, the date of his injuries, was in the employ of the plaintiff as captain of its lighter Boonton which was afloat in the East River. The plaintiff's business is the lighterage of freight in and about New York Harbor by means of barges, lighters and gasoline hoisters, which are without power of self-propulsion and must be towed from place to place. The lighter Boonton, described also as a gasoline hoister, is a vessel of the barge type, 120 feet in length and 36½ feet in width, with a freight capacity of about 475 tons. It has a cabin 12 feet by 6, a mast and boom, and a gasoline engine used to load and unload drafts and to pump water from the hold. The claimant was employed at a daily wage for an eight hour day and at an hourly wage for overtime; he had no experience as a seaman and no master's or seaman's papers; was not furnished meals or quarters by his employer, and lived on shore, except on occasions when required to work overtime. His duties consisted of operating the engine to raise and lower drafts of freight, procuring bills of lading, checking each piece of freight as loaded and discharged, directing the stowing of the freight in order that it would be so placed as to facilitate its removal and to insure the vessel riding on an even keel, pumping out water from the hold, making minor repairs, throwing lines to the dock when tying up and affixing them to the lighter when casting off from the dock, tightening and loosening the lines from the lighter to the dock as occasion demanded, and watching the cargo when required overnight, for which extra duty he was paid overtime wages. At the time of his accident he was painting the cabin of the vessel and fell to the floor from a coal box on which he was standing. The Deputy Commissioner found the facts as stated above and they are amply supported by the testimony of the claimant, who was the only witness.

The appellant's objection is not to the foregoing findings but to the Commissioner's conclusion therefrom; namely, that the principal duties of the claimant were similar to those performed by longshoremen, checkers and talleymen in connection with the loading and discharging of cargo and were not principally in connection with the navigation of the vessel and that he was not a master or member of the crew of the lighter Boonton within the meaning of Section 3(a) (1) of the Act.

The contention is that **Norton** vs. **Warner Co.** (Rusin's Case) (321 U. S. 565, 1944 A.M.C. 337), requires the opposite conclusion. The court, however, did not agree. There the bargee was employed by the month and provided with quarters on board; he had no duties in connection with the handling of cargo and no shore duties; his duties in connection with navigation were more than pumping out and handling lines; they included responding to whistles from tugs and putting out navigation lights and signals. In the case at bar the claimant's primary duties had to do with the cargo and were such as longshoremen customarily perform. That he had the additional tasks of pumping the hold, handling the lines when docking or casting off, and making minor repairs, such as painting the cabin, is not enough to take him out of the class of harbor workers for whom the Act was intended to provide compensation. The court agreed with the Deputy Commissioner and the District Judge that the controlling authority is the **Bassett case,** 309 U. S. 251, 1940 A.M.C. 327.

As Chief Justice Hughes noted in the **Bassett case,** (309 U. S. at 259, 1940 A.M.C. 327), in construing the Longshoremen's and Harbor Workers' Compensation Act,

> "Little aid is to be found in considering the use of the term "crew" in other statutes having other purposes. Legislative intent may be defeated by giving an invariable definition to the same word in different statutes. Compare **United States** vs. **Monat,** 124 U. S. 303, with **United States** vs. **Hendee,** 124 U. S. 309 (the former that the paymaster's clerk was not an officer of the navy within the meaning of one statute and the latter holding he was an officer of the navy within the meaning of another statute). The case of **Long Island R. R. Co.** vs. **Lowe,** 1945 A. M. C. 143, 145 F. (2) 516 (2CCA) involved the question whether the employee's status as seaman or longshoreman should be determined by his duties on the day of the accident; it has nothing to do with the case at bar."

This case provides additional auth-

ority and proof that titles are unimportant and in each case one must carefully examine the duties of the particular employee and the circumstances under which they are carried out before coming to a conclusion that the employee is either a member of the crew and thereby excluded from the Act, or, on the other hand, is a longshoreman and harbor worker and entitled to the benefits of the Act.

Federal Employee May Sue Under "Suits In Admiralty" Act

The subject of this title has been a lively one in the Admiralty Courts during the last few years, due primarily to the fact that many federal employees have filed actions for damages as a result of personal injury under the Suits in Admiralty Act, even though in each case the employee was afforded protection under the United States Employees Compensation Act.

After a careful examination of the United States Employees Compensation Act, it will be discovered that it does not specifically provide that the relief set forth therein is exclusive.

The problem again arises in **Garland C. Marine** vs. **United States of America,** 1946, A.M.C. 53, United States District Court, where the libellant, employed as a customs inspector, filed a libel against the United States to recover for injuries sustained during the course of his official duties when he fell from an alleged defective ladder while leaving a merchant vessel owned by the United States. The vessel was berthed in Baltimore Harbor. Libel was filed under the Suits in Admiralty Act (Title 46 U.S.C. Sec. 742), which provides in effect that a libel in personam may be maintained against the United States where, if the vessel were privately owned and operated, suit could be maintained against the private owner. The United States excepted to the libel upon the ground that the libelant was an employee of the United States and therefore required to look for his sole remedy to the United States Compensation Act (5 U.S.C. Sec. 751-800). The court overruled the exceptions of the United States upon the ground that the compensation act does not expressly provide that the remedy set forth therein is exclusive of other remedies. The contention that the compensation act is the only remedy available to a libellant or plaintiff has been advanced in a number of cases where suits for personal injuries have been brought by a federal employee under other particular Acts of Congress. In such cases the sustainablity of the suit has depended almost uniformly upon the question of whether the particular Act afforded a basis for the suit. Otherwise stated the view was taken that the compensation act was not an exclusive remedy. But it has been frequently decided that if the plaintiff or libellant has accepted benefits under the compensation act, the suit for damages would thereby be barred.

In this case the suit is based upon the Suits in Admiralty Act. It contains no exception making the remedy unavailable to federal employees who otherwise come within its provisions. The respondent here contends that the exceptions should be implied because the libellant is a federal employee, and therefore the compensation act is the exclusive remedy. This contention is not sustainable from the decisions.

Brady vs. **Roosevelt S. S. Co.,** (317 U. S. 575, 1943 A.M.C. 1), while not strictly speaking a precise adjudication on the point, is, from the history of the litigation in the District Court and the Circuit Court of Appeals for the 2nd Circuit and the Supreme Court, so near to an expressed decision that it must be regarded as determinative here. In that case a United States Customs House Inspector was killed by a fall from a defective ladder used to board a vessel at a pier. At the time he was acting in the course of his official duties. The ship was owned by the United States Maritime Commission and was operated for it by the Roosevelt S. S. Company. His administratrix recovered a judgment against the latter in the District Court, which was reversed on appeal in the Second Circuit on the ground that the suit could only be maintained against the United States under the Suits in Admiralty Act. It will be noted that the facts in that case are almost identical with those in the instant case. In reversing the judgment of the Second Circuit the Supreme Court in an opinion by Justice Douglas said (317 U. S. page 577, 1943 A.M.C. page 3):

"And we may assume that petitioner could have sued either the United States or the Commission under the Suits in Admiralty Act. In any event, such a suit would be the exclusive remedy in Admiralty against either of them. **Eastern Transportation Co. vs. U. S.,** 272 U. S. 675, 1927 A.M.C. 174; **Emergency Fleet Corp.** vs. **Rosenberg Bros. & Co.,** 276 U. S. 202, 1928 A.M.C. 441. And it is likewise clear that the action in Admiralty afforded by Section 2 of the Suits in Admiralty Act is the available remedy against the United States or a corporation whose entire outstanding capital stock is owned by the United States or its representatives. **Johnson** vs. **Emergency Fleet Corp., supra.** The sole question here is whether the Suits in Admiralty Act makes private operators, such as respondent, non-suable for their torts."

And later in the opinion (317 U. S. page 581, 1943 A.M.C. p. 6) it was said:

> "Moreover, if, as apparently was the case here, the claimant was eligible to receive and did receive compensation under the United States Employees Compensation Act (39 Stat. 742, 5 U.S.C., sec. 751), he is barred from suing the United States for the tort. (**Dahn** v. **Davis,** 258 U. S. 421)."

Apart from the effect of the **Brady** case there seems to be no precise adjudication that a Government employee may maintain a suit under the Suits in Admiralty Act, but there are cases which either very clearly so imply or are closely analogous thereto. In the **George Washington,** (1929 A.M.C. 885, SDNY) it seems the maintainability of such a suit was virtually conceded although the libellant was barred by the prior acceptance of benefits under the compensation act. In **Matson Navigation Company** vs. **U. S.,** (284 U. S. 352 1932 A.M.C. 202), it was said in the opinion:

> "The language of such sec. 2 is general, embracing suits of maritime causes of action by owners, as well as by the third persons injured by the operation for the Government of merchant vessels."

In **Panama R. R.** vs. **Minnix,** (282 Fed. 47 5CCA), and **Panama R. R.** vs. **Strobel,** (282 Fed. 52 5CCA), it

(Continued on page 368)

Pioneer Dry Dock Company Changes Controls

General Engineering Looks Ahead

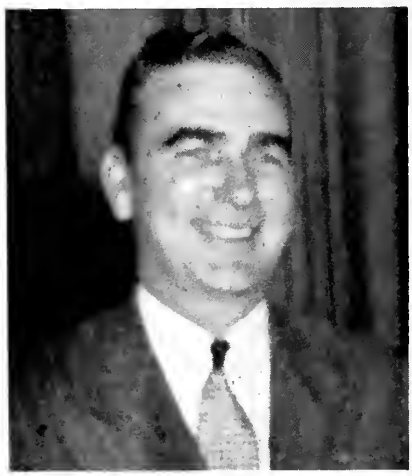
George A. Armes

In San Francisco announcement was made that the ownership of General Engineering and Dry Dock Corp. had been acquired by Godfrey K. Waters. Mr. Waters during recent years has been associated with the industry doing business with all of the major shipyards in the country.

The newly elected officers are W. L. Montgomery, President; Albert Wanner, Vice President; Frank H. Fox, Vice President and General Production Manager; and Peter P. Mesquita, Jr., Secretary - Treasurer. Mr. Waters, as Chairman of the Board, said that his interest in the future of the marine industry on the Pacific Coast prompted his decision to affiliate with the company and make his permanent residence in the Bay Area. The officers of the corporation have been with the firm for many years and no change will be effected in the directors of production.

For nearly twenty years prior to the recent war, General Engineering and Dry Dock Corp. engaged in the repair and construction of ships, barges, tugs and ferries in the San Francisco Bay Area. There will be no change in the policy of the firm and in the future they will continue to specialize in marine repair and conversion work. The men who directed their pre-war production activities, and who maintained an unusually high quality of work during the war, will continue to serve through the transition to peacetime operation.

W. L. Montgomery



Godfrey K. Waters

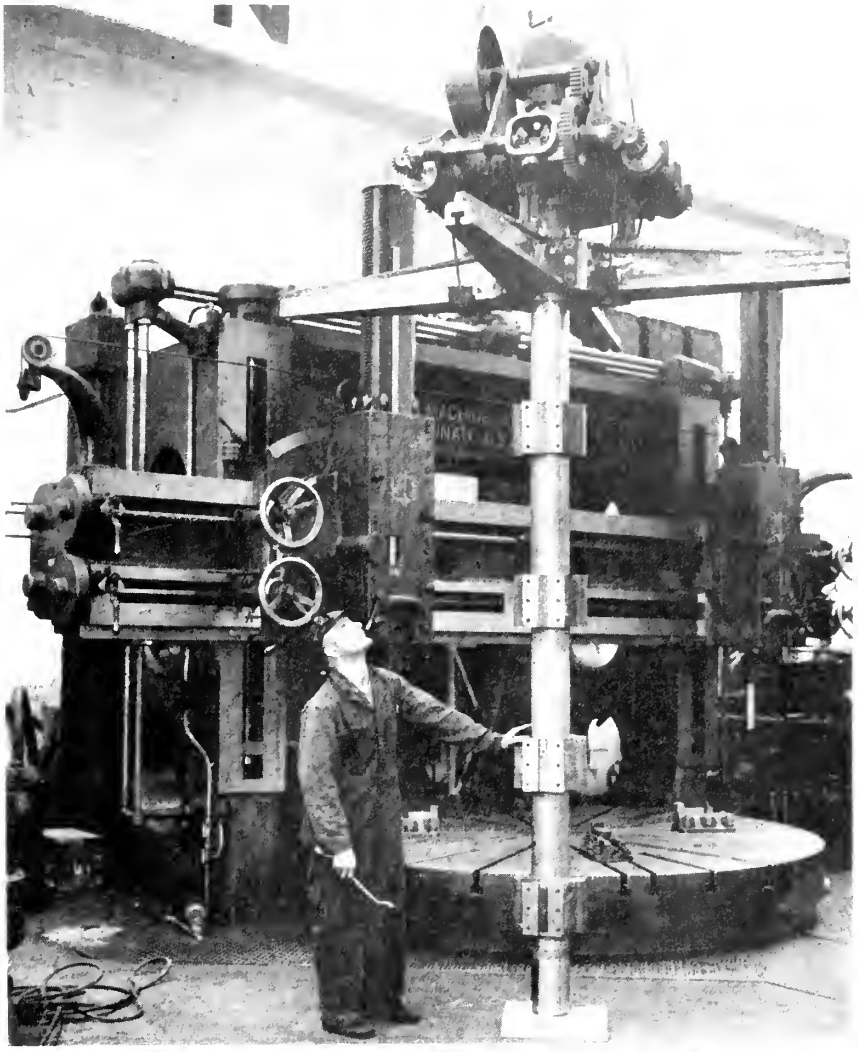
During the year following Pearl Harbor, GEDDCO increased its ship repair volume more than ten times, and for the past 2½ years has been delivering vessels—some of them requiring well over 100,000 man hours—at the rate of better than 17 a week. This work has been divided almost equally between the armed forces, government agencies, and commercial operators. For the Army and Navy up to June 30, 1945, they had repaired 1262 ships; for the W.S.A. and Maritime Commission, 1420; and for commercial operators, 1271 vessels.

Frank H. Fox, vice president and general production manager, has been

with the organization since its beginning in San Francisco and during the war received many official commendations for excellency of work and speed of production which came under his direction.

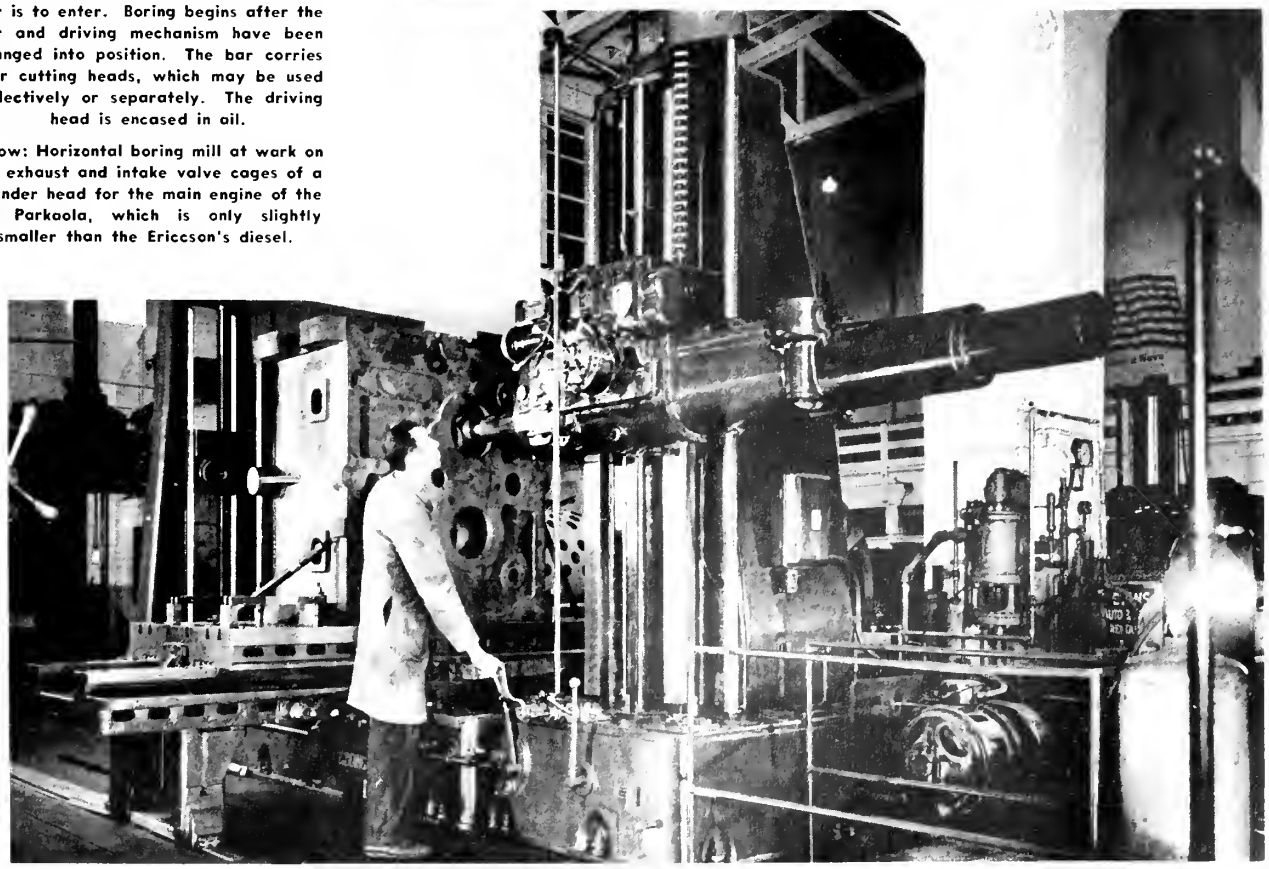
The Alameda yard of GEDDCO, located at the foot of Schiller Street, stretches for a half mile along the southern shore of the Estuary, opposite the Coast Guard base on Government Island. It is located at one of the widest points along the channel, providing ample room for launching vessels or maneuvering ships alongside the wharves, or into the dry dock or graving pits. All major shops are located near the wharves and docking facilities. It takes only a few minutes to move material from shop to ship, or for a man to walk from one end of the yard to the other.

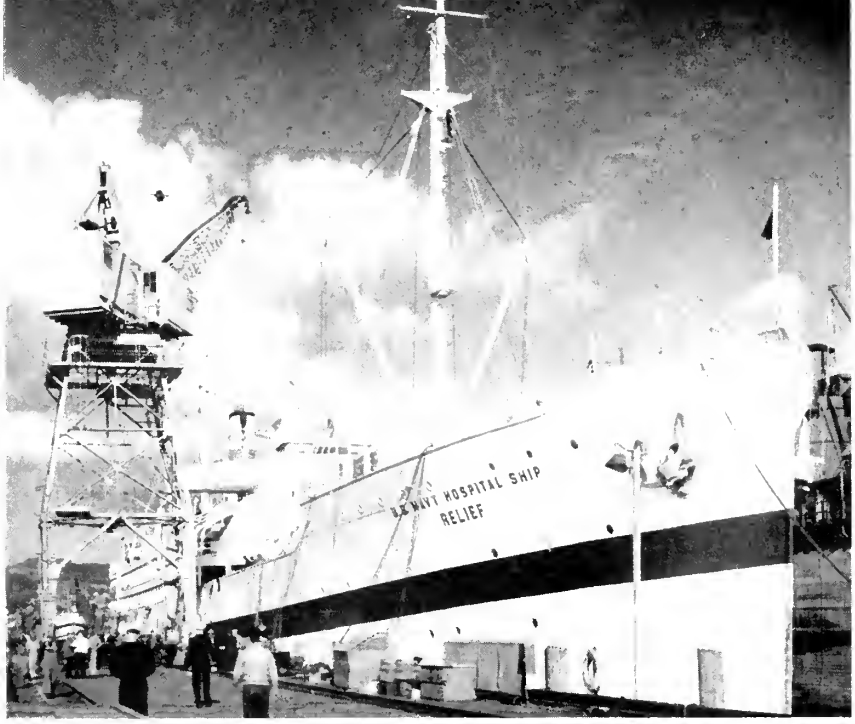
New construction work was concentrated in the western end of the



Above, right: Complete assembly of a special boring bar designed and constructed by GEDDCO for the U. S. Navy. Designed to bore the inside diameter of a submarine telescope mounting. A two-inch hole runs through the bar, with a cross-hair sight on either end. A sight is also placed across the work where the bor is to enter. Boring begins after the bar and driving mechanism have been changed into position. The bar corries four cutting heads, which may be used collectively or separately. The driving head is encased in oil.

Below: Horizontal boring mill at wark on the exhaust and intake valve cages of a cylinder head for the main engine of the MS Parkoola, which is only slightly smaller than the Ericcson's diesel.

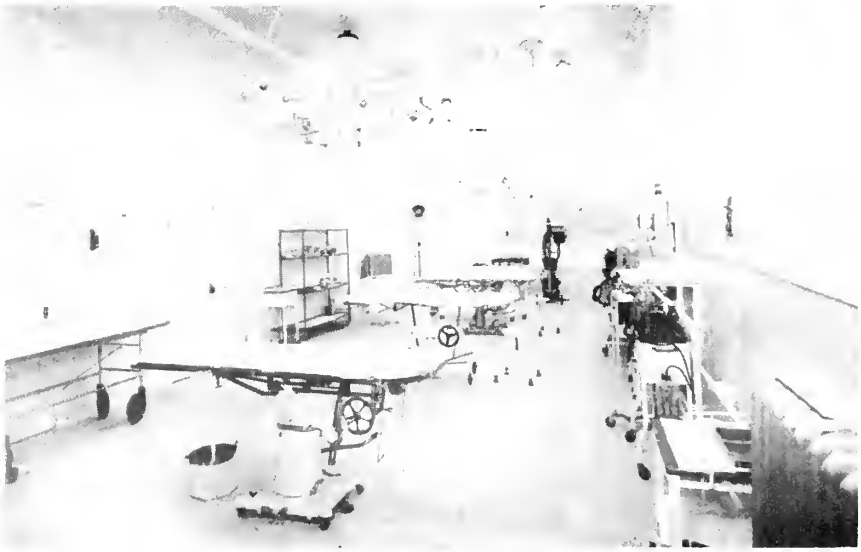




Frank H. Fox

yard, handy to the plate shop and the plate storage yard. The machine shop and rigging loft are close to the wharves and dry dock. The mill and joiner shop are immediately adjacent to the marine railways, and the administration building is located in the center of the yard. The warehouses are so placed that materials are right at hand as needed.

During the war the Alameda yard built the famous fleet minesweepers, and at the same time maintained a heavy schedule in repair and conversion work. A few of the more colorful conversion jobs included the

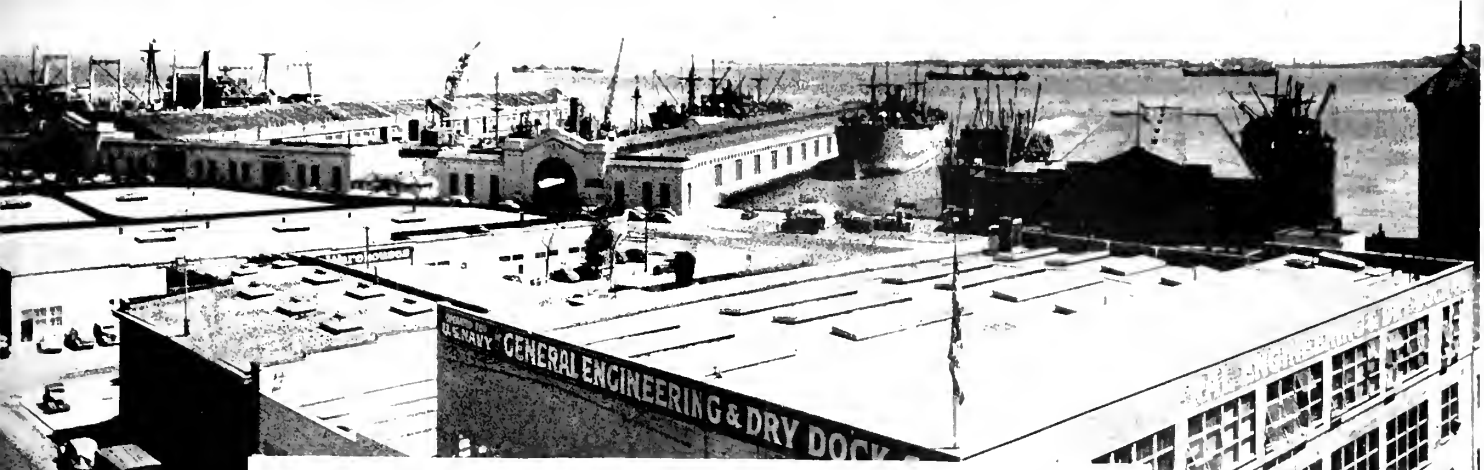


Top, left: The hospital ship Relief. One of the most memorable jobs turned out in the Alameda Yard was the up-dating of this, the Navy's oldest and for 20 years the country's only hospital ship.

Center, left: One of the eight wards on the Relief after the installation of modern facilities and air conditioning.

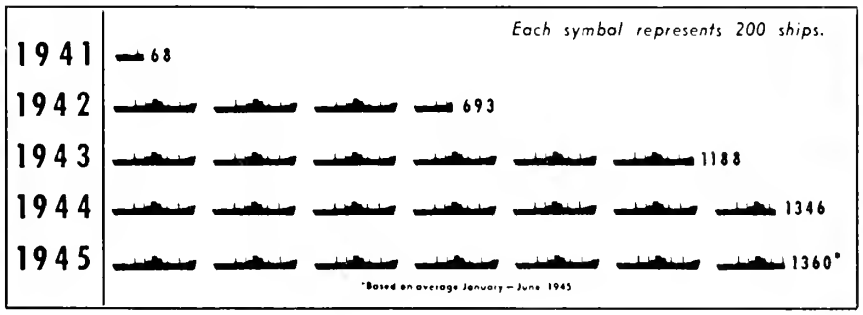
Bottom, left: Main operating room following modernization.

Peter P. Mesquita



Repairing 1300 Ships a Year

NUMBER OF VESSELS CONVERTED OR REPAIRED

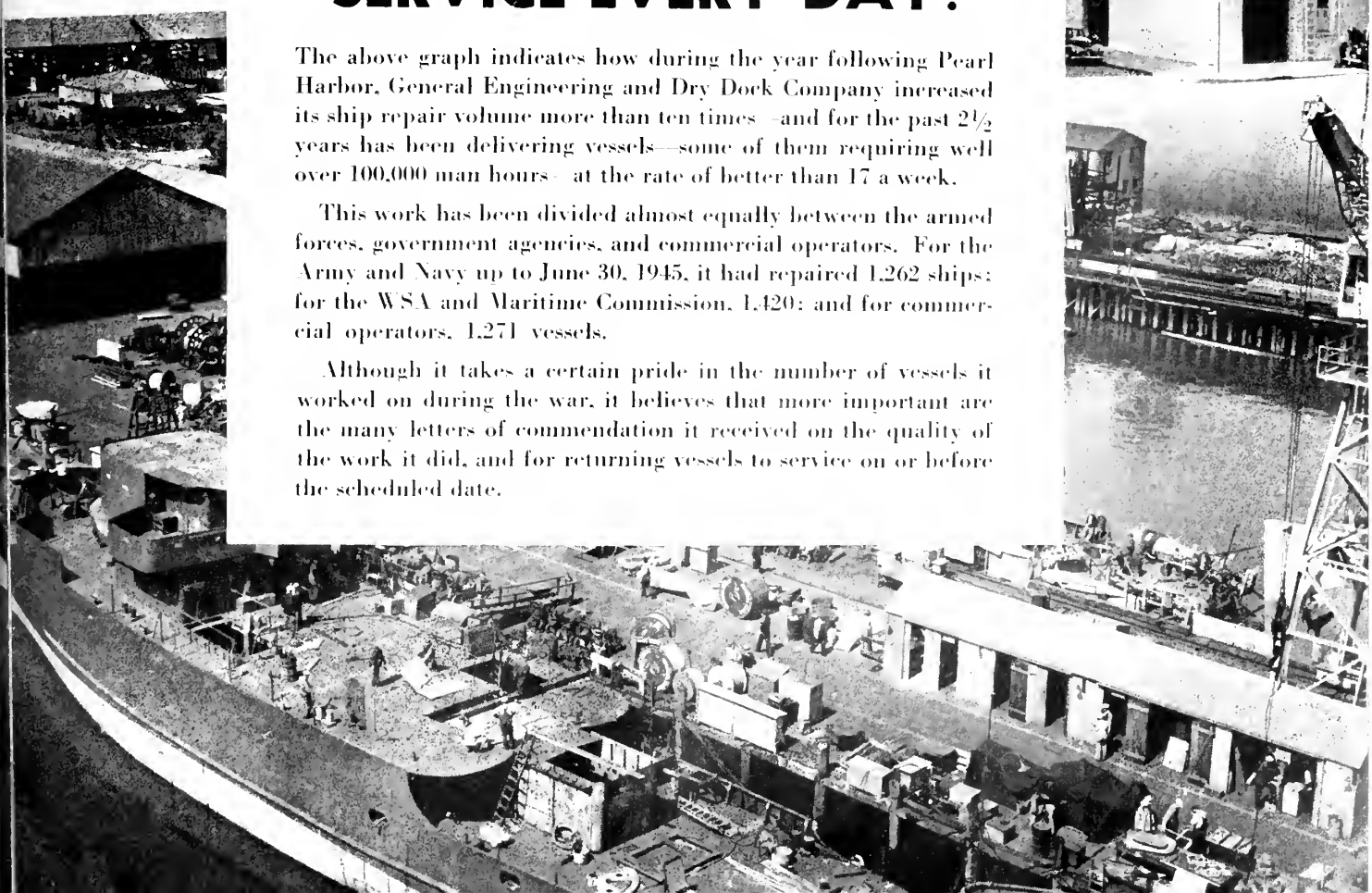


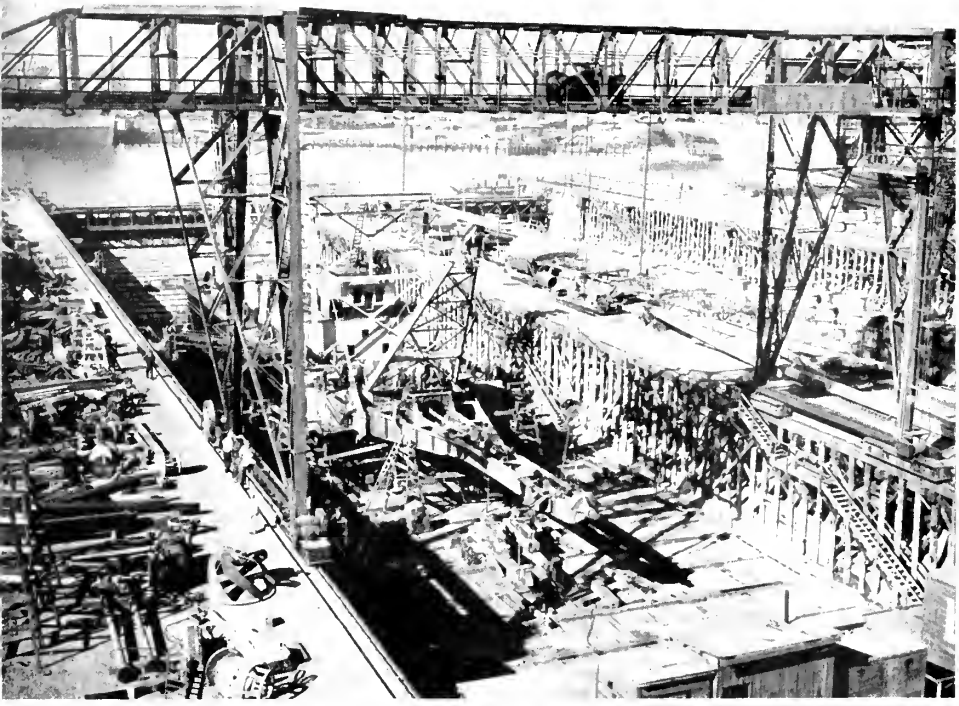
3.5 SHIPS RETURNED TO SERVICE EVERY DAY!

The above graph indicates how during the year following Pearl Harbor, General Engineering and Dry Dock Company increased its ship repair volume more than ten times—and for the past 2½ years has been delivering vessels—some of them requiring well over 100,000 man hours—at the rate of better than 17 a week.

This work has been divided almost equally between the armed forces, government agencies, and commercial operators. For the Army and Navy up to June 30, 1945, it had repaired 1,262 ships; for the WSA and Maritime Commission, 1,420; and for commercial operators, 1,271 vessels.

Although it takes a certain pride in the number of vessels it worked on during the war, it believes that more important are the many letters of commendation it received on the quality of the work it did, and for returning vessels to service on or before the scheduled date.





The dredge Golden Gate being completely reconditioned in one of three graving docks.

famed transport U.S.S. Henderson, which was converted into a Navy Hospital ship. Also the U.S.S. Pinkney which was the first of the A.P.H. Fleet to suffer from the use of the kamikaze plane.

GEDDCO shops in San Francisco are located adjacent to the waterfront adding much to their ability to render efficient service. Their main San Francisco offices are located at 1100 Sansome Street. This building includes Shop A. Shop A is devoted almost exclusively to marine repair work and includes a babbitting department, pipe shop, precision tool and die department. The babbitting department makes a specialty of cast

ing engine bearings, using the spin ning process. This department serve heavy machinery manufacturers i this area, as well as the marine in dustry.

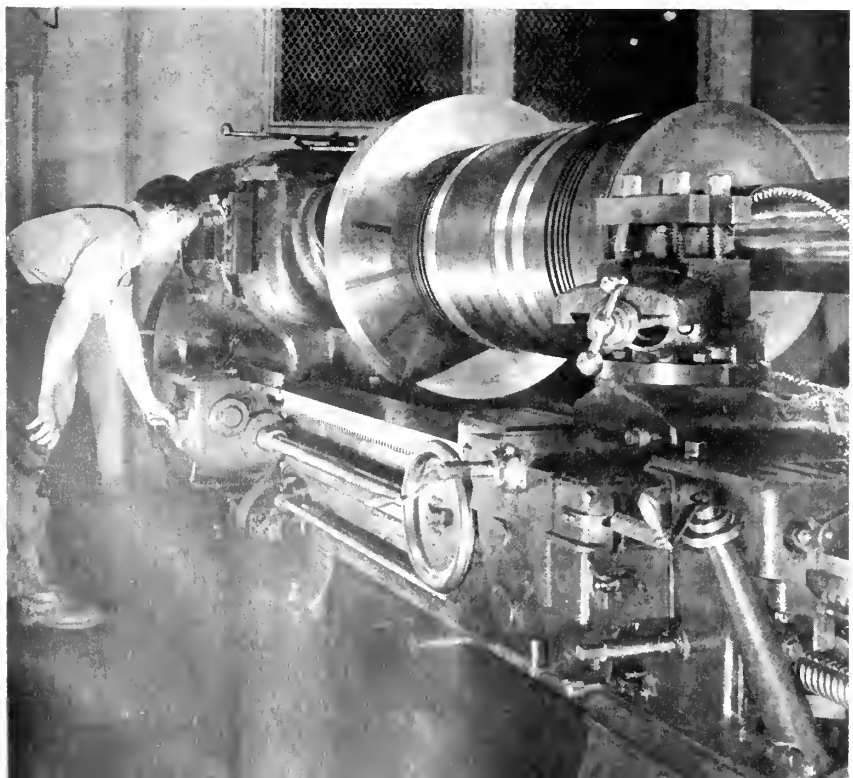
Shop B is located on Battery Stree and the buildings are adjacent t Shop A. These buildings include th blacksmith shop and a plate shop Machine Shop B is familiarly know as the "valve shop" since it has bee specializing in the repair and buildin of marine valves.

The newest GEDDCO plant wa completed early in 1943 and locate at Battery and Union Streets. Thes shops were outfitted with high spee machines needed for the repair o

A. P. Wanner

marine engines and auxiliary equip ment. These new buildings also in clude their carpenter shop, rigging loft and pattern shop. The machine shop has two overhead cranes, the largest of which has a capacity of 30 tons.

These facilities are near the com pany's waterfront facilities on Pier 25. Pier 25 is not just a center for despatching crews, but is a well equipped repair yard in itself. It contains a machine shop, sheetmetal and tin shop, plate shop, joiner shop, rigging loft, electrical drafting depart ment, welding, boiler repair, and



This water-cooled Niles lathe, shawn cutting a pistan rod fram a huge diesel engine assembly, has a 40-inch swing and can handle wark up to 21 feet between centers. This section of GEDDCO Shop C in San Francisco also is equipped with an American lathe with a 28-inch swing, 13 feet between centers.

electrical shops, and a large tool room. Gas and diesel engines from ships' boats are repaired in one section of the pier. As many as three ships can be handled at once at this 800-foot pier, which is located within two blocks of the San Francisco shops.

General Engineering's ability to repair vessels anywhere in the San Francisco Bay Area is one of the developments arising out of the necessity of recent years. Equipment and machinery fabricated in their shops is regularly moved by truck or barge, and installed aboard vessels at piers or anchorages.

The General Engineering and Dry Dock Corp. has recently published a beautiful 100-page illustrated book of their complete facilities. This book includes many pages in color and aerial views and may be obtained by directing requests to them at foot of Schiller Street, Alameda, California.

The Fond du Lac at Pier 25. Equipment and machinery fabricated in the San Francisco shops is regularly moved by truck or barge to variaus other jabs at piers or anchorages in the bay.

Left to right: Peter P. Mesquita, H. C. Hansan, W. L. Montgomery, Frank H. Fox, George A. Armes, James H. Young, Wallace J. LaFrenz, and A. P. Wanner.

Vice Admiral Vickery's Work is Over

On the 21st of March Vice Admiral Howard L. Vickery, U. S. Navy retired, died very suddenly at Palm Springs, California. He had just arrived at the desert resort, with his wife, to take a much needed rest when a heart attack struck him and he passed away while being examined by the doctor. Interment, Arlington National Cemetery.

Howard L. Vickery was born in Bellevue, Ohio, in 1892 and was graduated from the U. S. Naval Academy, Annapolis, in 1915. He specialized in ship design and construction and throughout his Navy career was mainly attached to the Bureau of Construction and Repair. In 1937 he was loaned by the U. S. Navy to the U. S. Maritime Commission to organize the technical division of the Commission. Admiral Land immediately made Vickery his assistant in charge of ship design and construction in the program to rehabilitate the American Merchant Marine.

As result of Vickery's ability to inspire confidence and to transmit energy the Maritime Commission Technical Division was ready when the call came for emergency tonnage for war purposes and they amazed the maritime world with the speed of ship production in American shipyards.

Admiral Vickery drove toward the set construction goals with such inspired energy and such constructively critical contact that the goals were far surpassed and records in construction seldom lasted more than 30 days.

The result was a total of merchant tonnage which far outstripped the destruction of tonnage by the enemy submarines and air bombing, and which gave the U. S. Army and Navy, and our allies overseas, the supplies and munitions necessary to win the war.

If any one man deserves special credit for that result Vice Admiral Vickery was that man.

He wore out his heart putting that result across and laid down his life shortly after it was accomplished. This sacrifice of life, and there were many others like it, was just as surely a life lost in the service of his country as was that of any soldier or sailor by enemy action.

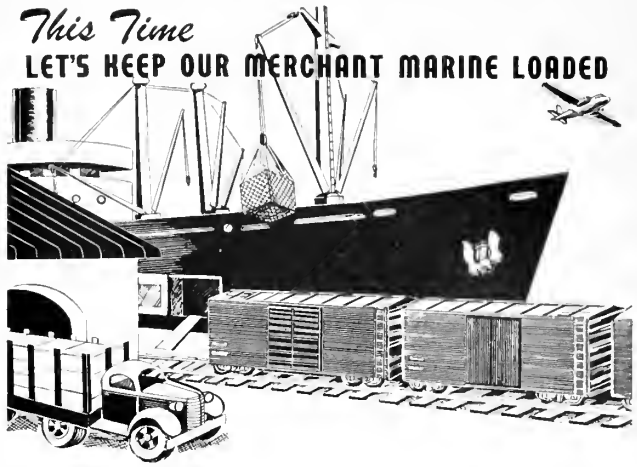
The accomplishments of Admiral Vickery won many national and international honors and decorations including: the U. S. Army Distinguished Service Medal; Knight Commander Military Division of the Order of the British Empire; Distinguished Service Certificate, American Legion; Officer Grand Dragon of Anam, French Indo-China; Victory Medal, World War I; and Morehead Medal, International Acetylene Association.

Among the qualities that were displayed in Admiral Vickery's contacts with shipbuilders were the rather rare abilities of prompt decision and of slashing through red tape. These two qualities were in no small measure responsible for the tremendous shipbuilding records made—records that put the citizens of United States under great obligation to this quiet forceful naval officer who got things done in a great hurry and done well.

Vice Admiral Vickery is survived by Mrs. Vickery and by two children, Lt. Comdr. Hugh B. Vickery, U.S.N., and Miss Barbara Willia Vickery.

Pacific WORLD TRADE
Reg. U. S. Pat. Off.

By T. Douglas MacMullen



Our Shipping Policy and Foreign Trade

By George R. Paschal

For many years, some foreign shipping interests have sought to talk the United States out of an adequate merchant marine on the ground that shipping is unimportant to us but crucial to other nations. The matter of our national defense and of shipping's vital role therein has been hurriedly passed over in such propaganda, since no one can dispute our need for vessels for defense purposes or contest the fact that twice in a generation we have come close to losing wars through lack of enough ships and the trained crews to man them.

Twice we have had to improvise vast shipbuilding programs in frantic haste with an accompanying waste of billions of dollars due to failure to maintain a proper merchant marine ready for any emergency. Twice we have seen our armies waiting uselessly at home for lack of vessels to move them, and have had two wars drag out for many unnecessary months—the last one at a cost of some $250,000,000 per day. Even a few days cut from the length of the war through our having had an adequate merchant marine would have meant a saving of many times as much as would have been spent in building or maintaining the proper tonnage.

In addition, three times within a generation we have seen foreign vessels withdrawn in good part from our trades to serve emergency needs at home.* As a result, our commerce has been disrupted and in some cases we have been forced to pay exorbitant rates to such foreign tonnage as remained. That disruption was far less in 1939 than in 1914. and the rates charged our shippers were far lower, solely because we had a merchant marine in 1939—inadequate though it was— as against an even weaker fleet with almost no ships in foreign trade prior to World War I.

But it is not the function or desire of foreign shipping interests to discuss America's maritime needs from an impartial standpoint. The usual presentation passes over the question of national defense with brief mention, and instead dwells at great length and with great inaccuracy on the alleged "fact" that earnings of foreign shipping pay for "an important part" of our exports. The "conclusion" is then drawn that if we should operate in post-war years a much larger merchant marine than the one found inadequate for our safety in 1941, it would be only at the cost of much of our exports and our prosperity, and of the prosperity or even stability of other maritime nations.

It is thus sought to "prove" that the reversion of our merchant marine to its state of pre-war inadequacy (which Admiral King has warned against) will really be to our own advantage, and will bring about true international cooperation. As we see it, this kind of cooperating means that we should be content to do the "cooing" while the foreigners do the "operating."

The Facts of the Case

In an effort to ascertain the facts regarding the effect of shipping on American export trade as affected by the international balance of payments, THE GRACE LOG examined the matter, and published (March 1944 issue) an analysis of the balance of payments statistics compiled by the Department of Commerce itself.** These statistics showed that

*During two wars, and the British coal strike in 1926.

In 1943 the Department of Commerce published a comprehensive report entitled **The United States in the World Economy which was designed to describe, factually, the relationship of the economy of the United States to that of other nations and the world at large. It was a distinct contribution to knowledge. Table I, among the accompanying exhibits, showed the balance of international payments of the United States. This revealed for each year from 1919 to 1938 inclusive the net balance resulting from the exchange of goods and services between the United States and the remainder of the world.

World Trade Makes Jobs!

during the twenty years of peace (1919-38) between the two world wars—when foreign shipping was predominant in our trade—the actual net foreign shipping earnings available for buying American exports amounted on the average to less than $35,000,000 annually, or less than one per cent of the average value of our exports in that period. (Naturally, since the one per cent figure is an average, the percentage in individual years was in some cases higher, in some lower.)

Our own computations for the sample year 1937 (a time of exceptionally large foreign ship earnings), also showed that if the United States then had operated a substantially larger merchant fleet—one assumed to carry even as much as sixty per cent of our foreign trade—this could have no appreciable adverse effect on our prosperity. If operation of such a fleet had equalized more or less the revenues derived by American and foreign shipping, and thereby had wiped out the net balance of foreign earnings, the theoretical loss of exports brought about by this would have been counterbalanced by a roughly equivalent increase in domestic employment and sales.

In addition, it has been pointed out by Admiral Land, as Chairman of the Maritime Commission, that if American foreign trade in the postwar years grows to the extent estimated by the Department of Commerce, the American merchant marine can be increased to a size adequate for our defense without reducing the gross dollar earnings of friendly foreign nations. American shipping can take the place in our trades of former Axis lines without hurting our Allies, and can also carry a substantial part of the prospective increase in our exports and imports. This carriage of new traffic need not interfere with the retention by Allied shipping of its pre-war trade.

Furthermore, far from attempting to drive friendly shipping from the seas, or to operate even a major part of our war-built fleet, Congress is favorably considering the sale of surplus ships to foreigners on the same financial terms as to Americans.

These facts, which have demolished the foreign "economic" case and the "American aggression" spectre, are well known to most foreign shipping interests but not to our own public in general, and hence the attacks continue. Some of the attacks, even on reasonable American shipping expansion, seem to be motivated by a desire to exclude the United States even from the carriage of our fair share of the prospective postwar increase in our foreign trade which the Department of Commerce now forecasts. Thus, we are told that we ought not to operate much more tonnage than we did in 1939, although our overseas trade is expected to double.

Department of Commerce Studies

For many years, no one effectively challenged and reduced to its proper proportions the foreign contention that shipping in foreign trade is unimportant to us, but is vitally necessary to other maritime nations. As a result some of our present-day economists and officials, not yet aware of the full facts of the case, have continued to debate whether we should, or should not, have a larger merchant fleet in foreign trade—this despite the fact that Congress itself long since has crossed that bridge after very full weighing of the pros and cons. The only result has been, not to reverse legislatively-declared American shipping policy, but rather to contribute to vacillation in its carrying out in peacetime.

Meanwhile, by its studies, the Department of Commerce has thrown light on the contention of foreign interests that their shipping earns much of Europe's daily bread. In addition to the facts brought out by the balance of payments statistics, cited above, it also has been shown (in a table published in the April 29, 1944 Foreign Commerce Weekly, and reproduced herewith) that the ratio between income from shipping and national income of the principal maritime countries has been extremely low for all except Norway, the only country where the figure exceeded 2.5 per cent. (Britain, in fact, derived only 1.3 per cent of its national income from shipping operations in the sample year 1937.) Figures for employment in shipping operations afloat have been proportionately even lower—with Norway the only nation to have over one per cent of its labor force so occupied.

These two Department of Commerce studies, and the implications which can fairly be drawn from them, have come as quite a blow to the foreign propagandists and have served as eye-openers to the public here. They seem to establish that shipping is a minor earning factor both at home and abroad, and that actual net earnings of foreign shipping do little to promote sales of American exports.

But, as cogently pointed out by the British shipping magazine Fairplay, the percentage which net shipping income bears to total national income (which we believe conclusive as to the argument that certain countries "live by their shipping earnings") does not necessarily have anything to do with the relation between such earnings and the imports of the nations concerned.

To examine this latter relation, we must determine, first, what percentage of the various countries' total imports is paid for by their net foreign exchange earnings from shipping; and second (which is much more relevant to the problem at hand), what percentage of their imports is paid for by net ship earnings in United States trade. Since we do not generally offer competition on routes aside from those to and from our country, expansion of our merchant marine can hardly affect foreign earnings obtained elsewhere.

The answer seems to be that for Norway, Greece and a few other countries, net foreign exchange earned from shipping is of real importance in the purchase of imports. For other nations, such as the United Kingdom, shipping earnings, while less important in percentage terms, are still to be reckoned with. The reckoning for most countries, however, is obscured by a tendency to confuse gross earnings, or some modification thereof, with net balance of payments figures.

But except in the case of Norway, which had about 40 per cent of its shipping in United States trades, only minor fractions of the various major foreign merchant marines serve our commerce. The British, for example, had about 10 per cent of their vessels so employed. Thus, for all but Norway, net earnings which might be affected by our competition cover only a small fraction of the foreign exchange needed by the respective countries. In fact, even a substantial reduction in net earnings accruing to foreign shipping in the United States trade would not have any material effect on the imports or prosperity of any foreign country except Norway—and her ships in our trades are mainly tankers, tramps, or special types, having

little prospective American competition.

Now, however, some of the staff of the Department of Commerce do not like the conclusions drawn logically—and, we believe, accurately—from its own figures; and seek to escape their implications. In the September 22, 1945 issue of Foreign Commerce Weekly published by the Department of Commerce, appears an article entitled "Shipping Policy and the Balance of Payments" by John H. Smith,—also the author of "World Income From Shipping" printed in the April 29, 1944 issue of the same publication. This most recent article seeks to demonstrate that shipping earnings are, after all, of large importance to certain foreign countries for the purchase of our goods, and that if we increase the American merchant marine in any notable degree it can be done only at the cost of a substantial fall in our exports. Yet the author cannot deny that the basic statistics—which have been presented in clear fashion in previous publications by the Department of Commerce—show that we can become a greater maritime nation without real economic disadvantage.

Analysis Based on Monopoly Assumption

The article in question attributes to unnamed persons the contention that if American vessels carried all of our goods this would reduce foreign purchases of our exports only one per cent. We know of no one who has suggested that American vessels should monopolize the carriage of our trade; or that "the net shipping balance would merely disappear (become zero) if the United States carried all its own trade." But on the basis of this peculiar assertion the Department of Commerce article builds up a towering structure of theory by assuming an American shipping monopoly of our trade. It attempts to show that if we had carried every pound of our imports and exports in the 1919-39 period, foreign earnings of dollar exchange would have been reduced enough to decrease our exports by 5.3 per cent. To support such a figure, the idea is then developed that the measure of the shipping earnings available to foreign nations for purchase of our exports is not that given in the Commerce Department's own balance of payments data—which lists what the foreigners actually earned from shipping as compared with our earnings, the difference then being the foreign balance to be spent for our goods. Instead, the article asserts that the measure of that figure should be actual net foreign shipping earnings in our trades plus "savings" equivalent to sums those shippers might have lost if we had monopolized all carriage! Finally, the article states that this over-all 5.3 per cent reduction in purchasing power would have fallen primarily on a few nations such as Norway, Netherlands and Greece; and then it seeks to demonstrate that these three countries in the past have depended on shipping earnings for the dollars to pay for about half of their imports from the United States.

In arriving at these "conclusions," and hence leaving the implication that the United States should not operate a larger merchant fleet in the post-war years, the author has employed statistics and techniques which we believe are open to serious question. The true facts seem to present a different picture and yield a contrary conclusion. Yet since the matters dealt with are complex and technical, some readers—unfamiliar with the whole problem and the data employed—may be misled (by the apparent authority of the mass of statistics presented) into accepting the author's premises and "figures" as valid, and his implied conclusions as a statement of sound policy.

To repeat, no responsible American officials or shipping men have proposed, or desire, that American ships monopolize carriage of our foreign trade. The highest figure which has been seriously advanced is that we should operate enough vessels, and of sufficiently high quality, to earn and merit the carriage, on the average, of about half of our foreign trade—more in some trades, less in others. *** Elementary reasoning would suggest, and careful analysis will substantiate, that if we had done this in the inter-war years, the balance of payments on shipping account (i. e., roughly "what we earn from foreigners" versus "what foreigners earn from us," but not the gross earnings of foreign ships) would have been reduced to somewhere near zero; and as a result the reduction in net foreign earnings would have been equivalent to about one per cent of the average value of our 1919-38 pre-war exports, and to no other figure.

Unreal Assumption

Yet by pyramiding, on top of actual net earnings, theoretical losses from a theoretical monopoly which never existed, and is not now and never has been advocated, Mr. Smith's article magnifies the importance of available foreign shipping earnings many fold. And worst of all, that study, even though it begins by treating the magnified total as a merely theoretical one, good only if a monopoly is sought, ends by accepting this inflated percentage as a measure of actual fact. And it is so quoted by Fairplay, an influential foreign shipping magazine.

The inflated figure, however, is not applicable. It is only a shadow produced by placing an untenable hypothesis between the light of reason and a blank piece of paper. Naturally, if American vessels carried all of our trade instead of the half the Maritime Commission proposes as a reasonable aspiration, then foreign countries would have to pay us for shipping services rendered them on our exports, and the balance of payments would be against foreign countries. But to imply that this theoretical figure has any bearing on shipping policy demonstrates a disappointing lack of logic on the author's part. The point of practical economic analysis is to find clues which can serve as guides in evaluating or proposing future policy. We determine what the actual situation has been. We calculate what the effect of a proposed change in policy would have been if it had been made under past conditions. Useful results can be obtained only if the hypothetical model conforms to realistic proposals in hand.

To summarize, if American shipping, in the years 1919-38, had carried roughly half of our foreign commerce and passenger trade, foreign countries (including the Axis) would have suffered a reduction in net dollar earnings equivalent in value on the average to about one per cent of our exports—this cannot be successfully disputed. That reduction would not have affected our domestic prosperity in any measurable degree—it would have been equivalent to less than seventy cents on every thousand dollars of United States annual national income. Fur-

***According to Maritime Commission estimates this would involve operation of about 15,000,000 deadweight tons (including coastal and intercoastal trades, etc.), in contrast to the some 60,000,000 we had at the wartime peak.

thermore it would have been compensated for by a roughly offsetting increase in domestic sales brought about by greater employment in American shipping and shipbuilding.

Effect of Reduction on Foreign Nations

As regards the effect of the reduction on foreign nations, it might have decreased principally the dollar earnings of the British, Norwegians, Germans and Japanese. The Japanese and Germans we can demiss. British earnings in our trade are, by Department of Commerce data, insignificant in comparison with British total balance of payment figures, and furthermore are derived mainly from passenger carriage—a field with only moderate prospective American competition. This leaves Norway as the only country in which a reduction in earnings in American trade might have had any material effect; and such a possible effect is minimized by the fact that Norwegian vessels are of types not likely to be in serious competion with American ships. Furthermore, on the average, Norway sells us more than she buys from us, and hence does not need ship earnings to buy U. S. goods.

In commenting on the most recent Department of Commerce article, we have refrained from discussing in detail the statistical computations given therein, the economic reasoning employed, or the trade data marshalled in support. But it must be said for the information of the reader that the "net earnings plus savings" argument, which the author presents, is an involved economic fallacy—a fallacy which becomes apparent when the same reasoning (used in the article in the case of shipping) is applied to the merchandise import and export balances. Thus, one can "prove" that the same trade is worth many billions to us and simultaneously to other nations, merely by reversing the monopoly assumption—in one case treating it so that we export without importing, and in the other, import without exporting—and by "computing" what we or they "earned or saved" in such cases.

Table A—National Income and Income from Shipping in Principal Countries, 1937

Reprinted from **Foreign Commerce Weekly,** April 29, 1944.
(In millions of national currencies)

Country and monetary unit	National income	Approximate income from shipping*	Ratio of income from shipping to total income
			Percent
United Kingdom .....pound....	5,200	70	1.3
Norway .....crown....	2,637	296	11.2
Japan .....yen....	20,476	146	.7
Germany .....reichsmark....	64,940	220	.3
United States .....dollar....	71,500	63	.09
Netherlands .....florin....	4,500	106	2.4
France .....franc....	212,000	967	.5
Sweden .....crown....	10,274	118	1.1
Denmark .....crown....	4,400	111	2.5

*Calculated at one-third of gross shipping receipts.

In addition, the statistics given in support of the allegedly typical earnings of Norwegian shipping in our trade are not typical, since they are based on the year 1940—a year in which rates were abnormal due to the war. In fact, the data given for these earnings actually are more than twice the level which normally had prevailed in previous years. Statistics to prove this point are easily obtainable and have been in Washington for years.

Furthermore, the statistics, which purport to show that Norway, Netherlands and Greece in pre-war years were dependent on dollars earned in our shipping trades, for half the sum needed to buy our goods, are misleading. The figures are of foreign rather than of American origin; and apparently list imports C. I. F., and exports F. O. B., instead of on a uniform basis. The result erroneously magnifies the surplus of imports from the United States.

Finally, the figures used ignore a true surplus of exports from Netherlands' colonies to the United States, which offsets the mother country's real import surplus. This is done simply by omitting all mention of these colonies in the tables and by failing to include their trade figures in the "Netherlands" heading. If correction is made for this, for the trade valuation error, and for certain minor corrections for goods in transit, etc., the supposed heavy unbalance against these countries in their trade with us is shown not to exist.

NATIONAL SHIPPING POLICY

Congress has enacted a national shipping policy which is often forgotten in discussion of details. It is clear and unmistakable. It is stated as follows:

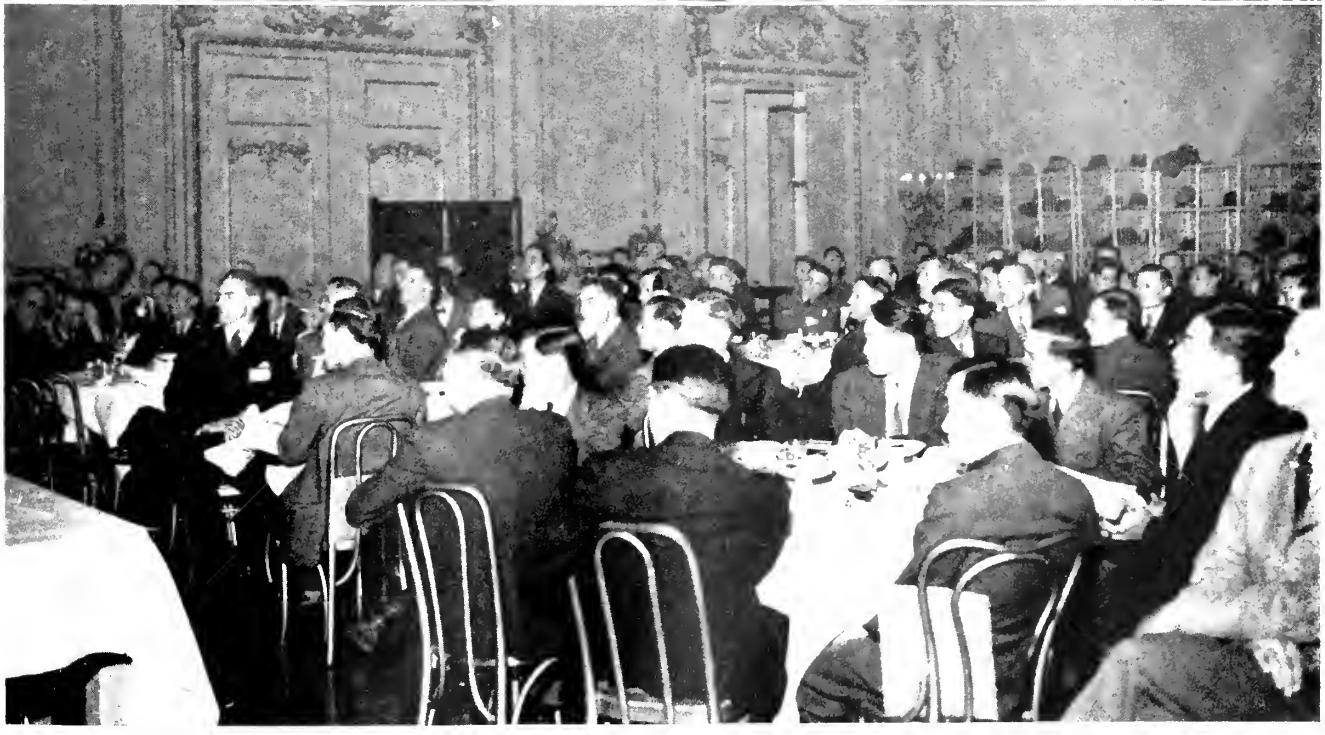
Merchant Marine Act, 1936

Title 1 — Declaration of Policy

Section 101. It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency, (c) owned and operated under the United States flag by citizens of the United States insofar as may be practicable, and (d) composed of the best-equipped, safest and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel. It is hereby declared to be the policy of the United States to foster the development and encourage the maintenance of such a merchant marine."

Technicians Depart for China

At a luncheon meeting of the San Francisco Foreign Trade Association were assembled 62 Chinese technicians, who have been, along with some 900 others, completing their technical training in industrial establishments throughout the United States. Left, at the head table, is Alvin E. Eichholz, manager of the Foreign Trade Department, San Francisco Chamber of Commerce. Third from left, and presiding, is Fred Galbreath, manager, Marine Office of America, and first vice president of the association. Far right, Lyford M. Morris, president Junior Foreign Trade Association. Lower picture: General view of members and guests.



Silk is Back

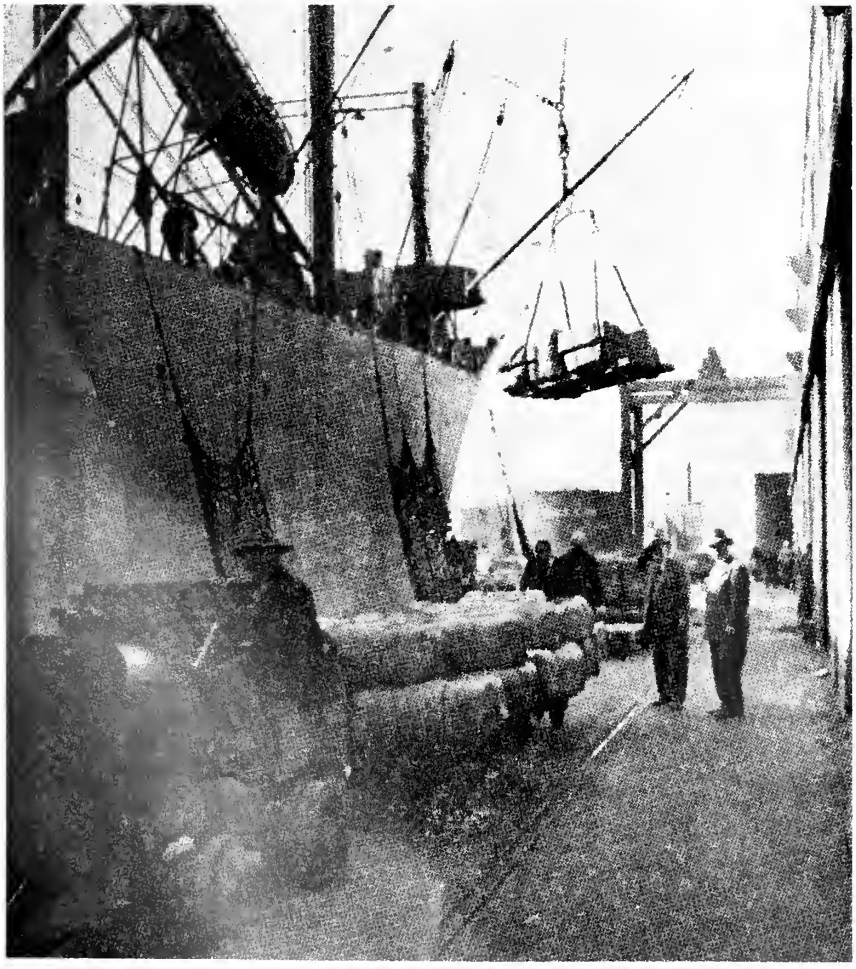
First Postwar Imports of China Goods

The first substantial commercial shipments of Chinese merchandise since the war have arrived in San Francisco on the S. S. "President Grant" of the American President Lines. Included in the cargo were 500 bales of long-awaited raw silk from China, shipped to this country from Shanghai by the Central Trust of China under the auspices of the University Trading Corporation in New York City, the Chinese government purchasing and sales agency here. Additional silk shipments are expected within the near future as sizable amounts are reported in Shanghai awaiting shipment.

Also on the "President Grant" were 575 drums of China wood oil consigned by the China Vegetable Oil Corporation to the Pacific Vegetable Oil Corporation of San Francisco. This company expects to receive shortly from Shanghai and Hongkong additional quanties of wood oil; also aniseed oil. Other commodities arriving on the steamer included 250 cases of bristles consigned to the Bank of China, cotton goods, silk piece goods, furs and skins, linen goods, porcelain ware, straw braid, feathers, curios, hemp hats, and miscellaneous Chinese merchandise.

This shipment marks an important step in the resumption of normal trade between China and the United States. As facilities in China are restored to normal operation, it is expected that the flow of Chinese exports to this country will increase steadily.

First raw silk to arrive from the Orient since before Pearl Harbor being unloaded from the S. S. President Grant at San Francisco January 6.



Large Imports from China Predicted

A substantial volume of exports from China to the United States during the next few years is indicated by estimates of the volume of Chinese commodities available for shipment abroad received by the China-America Council of Commerce and Industry from official Chinese sources. These figures, the first official estimates of post-war Chinese exports to be received in this country, show that after a transition period to allow for revival of production and transportation in the formerly occupied areas, China will be able to ship considerably larger quantities of her basic export commodities than before the outbreak of the Sino-Japanese war in 1937.

In the three years before the Sino-Japanese war, exports from China proper (not including Manchuria and Formosa) averaged $222,000,000. Judging by the latest estimates, it should be possible to exceed that total within a few years. In the first year after resumption of regular trade, however, shipments are expected to be considerably below the pre-war figure for most items. Among the major Chinese export commodities for which considerably increased shipments are predicted in the post-war years as compared with the pre-war period, 1935-1937, are tung oil, bristles, raw silk, wool, tea, egg products, tin and antimony. Large shipments are predicted also of other well-known Chinese staples, such as sausage casings, hides and skins, oil seeds, beans, feathers, medical substances, and tungsten ore. Certain manufactured products, which found

a large market abroad before the war, are also expected to figure prominently in the post-war export list. This applies particularly to such items as handkerchiefs, linens, embroideries, laces and hairnets.

A favorable market is predicted for wood oil, shipments of which from China proper averaged $21,000,000 a year in the pre-war period. The same is true of furs and skins, of which China exported more than $9,000,000 a year, and of wool, of which she shipped almost $6,000,000 annually. Before the war China exported raw silk to the value of over $12,000,000 annually. Despite the decreased consumption, due to competition from rayon and nylon, it is believed that this figure can be considerably exceeded because of weakened Japanese competition. Similarly, hog bristles, of which China formerly shipped around $7,000,000 a year, are expected to find a brisk demand notwithstanding the recent development of the synthetic variety.

Vegetable seeds and oils, including sesame seeds, tea oil, perilla oil, peanut oil and cotton seed oil, are expected to enjoy substantial sales in the U. S. and other countries. In the 1935-37 period, U. S. imports from China of these items exceeded $6,000,000 a year. During those years China shipped to this country each year handkerchiefs, embroideries, laces and trimmings and hairnets to the value of about $6,000,000, and American importers are again actively in the market for these materials. Exports of egg products from China before the war averaged $13,000,000 a year and they are again expected to have a large sale abroad. Certain minerals and ores, of which China is the major producer, particularly tin, antimony and tungsten ore, will again be available. The U. S. alone formerly took from China more than $5,000,000 a year of these three items.

Exports from Manchuria and Formosa

In addition to China proper, Manchuria and Formosa, now under Chinese control, will provide a large volume of goods for export. In the three years prior to the "Mukden incident" Manchuria alone exported an annual average of $150,000,000 of its products to other nations and to China proper, most important of which were soya beans, bean oil and cakes, coal, millet and corn, and iron and steel. In the years before the Japanese occupation, Manchuria enjoyed a substantial excess of exports over imports and helped to balance the total trade of China. Under Japanese domination exports continued at a high level, but Japan took an increasing proportion of the total, amounting to 55 per cent in 1939. About 15 per cent was exported to China proper.

Although exports from Manchuria will probably decline in the first post-war years, due to decreased production, increased domestic consumption and reduced shipments to Japan, they will still be substantial. In the past years only an insignificant proportion of Manchurian exports went to this country. It is expected, however, that in the future such products as raw silk, and hides, skins and furs will be shipped to the United States in increased quantities.

In 1936-1937, Formosa's exports, mainly agricultural products, were valued at an annual average of $115,000,000. The bulk of these shipments went to Japan in exchange for manufactured goods. Formosa's exports in post-war years will continue to be large but for some time much of her sugar, rice, forest products, tea and alcohol, which constitute the bulk of her exports, will be required for shipment to the mainland of China. Nevertheless it is predicted that exports of tea will be expanded and that the United States will buy more than in pre-war years.

In the 1935-1937 period the United States took a little over a quarter of China's exports. Chinese authorities believe that in the post-war period a much larger proportion of their exports will go to this country. To help pay for the vastly increased purchases planned in the United States for the Chinese industrialization program, China will make special efforts to develop the export of those items which are in good demand in this country.

It is expected that the Chinese export trade will be handled mainly by private interests. Chinese authorities state, however, that the commodity testing bureaus set up by the government for the purpose of improving the quality of the principal export items will be continued in operation after the war. These bureaus are expected to be of great value in helping Chinese exporters meet the requirements of foreign markets.

A. Viola Smith

Representative in China

In preparation for the opening up of active trade relations with China, Miss A. Viola Smith, who for the past two years has been the China-America Council's Washington representative, sailed on February 23 from Seattle for Shanghai, where she will be the China representative of the Council. Miss Smith, former Trade Commissioner and Consul in Shanghai, spent more than twenty years in China as an official of the U. S. Commerce and State Departments.

Miss Smith was the first woman to be appointed into the Foreign Trade Service of the United States. As Registrar of the China Trade Act, the Federal incorporation law designed especially to facilitate American business with China, she was in close touch with the problems confronting American concerns in the China trade. She has traveled extensively all over China — covering 100,000 miles by automobile alone — and is well known in governmental and business circles in every part of that country.

Westinghouse Plans Expanded Export Trade From West Coast

R. H. MacGillivray

To further plans for expanding export trade to Australia, the Orient and Western South America, Chas. A. Dostal, Vice President in charge of the Pacific Coast District for the Westinghouse Electric Corporation, announces the appointment of R. H. MacGillivray as regional supervisor of the Pacific Coast area for the Westinghouse Electric International Company, headquarters in San Francisco.

As representative of the International Company (foreign distributors for the parent Westinghouse Electric Corporation), Mr. MacGillivray will cooperate with Pacific Coast exporters and importers in the promotion of foreign business. He will be responsible for increasing export trade volume for Westinghouse by assisting in the detailed handling of all equipment to be negotiated, sold or installed in the Pacific basin.

In making the announcement, Mr. Dostal said the appointment represents a "first step" in the International Company's program to expand interests in the growing volume of export trade centered in the West Coast area.

West Coast Key to Pacific Trade

Mr. MacGillivray pointed out that "the West Coast represents the key to unlimited opportunities in domestic and foreign trade because of its rapid and continued manufacturing expansion and its natural position as a gateway for the flow of American goods now in such heavy demand by those lands in the Pacific area and the Orient.

"These factors have made Westinghouse confident that, with war restrictions gradually ending, much of its export business will originate on this Coast," he said. "It is our desire to cooperate in every way with local export representatives in making Westinghouse products available in the vast Pacific territory which the West Coast services."

Prior to assuming the newly-created post, Mr. MacGillivray was regional export supervisor in Washington, D. C., where during the war years he helped meet the electrical requirements of the Allied Nations by making Westinghouse equipment available to foreign government missions in cooperation with United States government agencies.

A veteran of the Westinghouse organization, he joined the company in 1922 as an industrial sales engineer. Since then he has filled various positions including merchandise manager of the Northern New York area, headquarters syndicate representative, and other important posts.

A native of New York, Mr. MacGillivray was educated in schools there and prior to now has centered his activities on the Atlantic Seaboard. He is an active member of the American Institute of Electrical Engineers.

WORLD TRADE ASSISTANT APPOINTED

Appointment of Karl F. Koenig as assistant manager of the World Trade Department of the San Francisco Chamber of Commerce is announced by Louis B. Lundborg, general manager of the Chamber.

Koenig is a native San Franciscan and University of California graduate of the College of Commerce, majoring in foreign trade. He has traveled extensively in Europe and has a knowledge of German, Spanish and French.

From 1930 until his entry into the armed services in 1942, he served in the International Banking Department of the Bank of America. For five years he acted as the bank's assistant foreign exchange trader, later transferring to the Letter of Credit Department, where he handled Acceptance financing of imports and exports and other financial responsibilities.

After 3 years' service in the Army as an administrative officer assigned to the Air Corps, Koenig returned to inactive duty early in 1944. He joined the U. S. Treasury Department Procurement Division, in the Office of Surplus Property, at that time known as the Federal Property Utilization Branch. Here he served as assistant to the Division Chief, until his appointment as Chief of the General Accounts Section of the Finance Division.

Karl F. Koenig

L. A. Chamber Expands Foreign Trade Department

With the development of foreign markets for Los Angeles county's products as its major objective for 1946, the Los Angeles Chamber of Commerce through General Manager Harold W. Wright, has announced a series of expansions in the organization's World Trade Department.

Stanley T. Olafson, now manager of the department with which he has been associated for the past eighteen years, succeeded the late Clarence H. Matson. With the help of an enlarged staff he plans to accelerate the trade development program. Mr. Olafson will establish all policies of the organization upon the advice of the World Trade committee and direct the activities of the entire staff. He also will be in charge of the Chamber's policies in harbor affairs.

John A. Sowers, former manager of the Domestic and Foreign Trade department of the Oakland Chamber of Commerce will assist him. Mr. Sowers was born in Ohio, and educated at Annapolis, George Washington and Georgetown Universities, and the University of California. His broad experience includes the teaching of social science, export management, advertising and merchandising and foreign trade. He has traveled extensively in the Pacific littoral. Mr. Sowers personally will direct the Orient division of the department.

Robert V. Nimmey has been added to the department to direct the British Empire division. He has traveled throughout the British Empire, represented numerous American firms, and has had considerable manufacturing experience. Born and educated in England, Mr. Nimmey is a naturalized American citizen. He has handled the export of merchandise for several American firms.

In charge of the European division of the World Trade department will be William J. Dunkerely, a former member of the staff who recently returned from the service where he was a captain in the United States Army. His past experience in the department, plus his service abroad will qualify him for his new work.

Shown left to right are: Robert Nimmey, John Sowers, Stanley Olafson, Justin Gleichauf and William Dunkerely of the recently expanded Foreign Trade Department of the Los Angeles Chamber of Commerce. Mr. Olafson is manager of the department.

The Latin American division will be under the direction of Justin Gleichauf, who joined the Chamber staff two years ago. Mr. Gleichauf has traveled extensively throughout Latin American in the interest of foreign trade. Other members of the staff are John M. Costello, former congressman from Southern California who is in charge of the Washington office of the Los Angeles Chamber; and Harry O. Johnson who maintains permanent headquarters in Mexico City.

TWA Now Compiling Foreign Trade Index

An Index of Foreign Trade Opportunities is now being compiled by the local office of Transcontinental & Western Air, Inc., through the facilities of TWA's International Division. Information in the Index will cover Europe, the Middle East and the Mediterranean Areas.

Details include products offered for export to the United States and names and addresses of firms which are interested in importing products from the United States.

Silk to San Francisco

A cargo of eleven hundred bales of Japanese raw silk reached San Francisco April 1. The precious cargo is aboard the SS Trinity Victory, which sailed from Yokohama March 19 direct for San Francisco. The vessel is operated by the President Lines as agent for the War Shipping Administration. Destined for eastern mills, the silk will soon be processed into stockings and lingerie and other scarce items of milady's wardrobe.

Freight Forwarder Legislation

Establishment of a legally authorized and Interstate Commerce Commission supervised basis of compensation for freight forwarders' use of motor trucks in their assembling and distribution services is the objective of a bill, H. R. 2764, which became law.

For nearly nine years, since the ICC in July, 1937, ruled that it had no jurisdiction over freight forwarders and that forwarder-truck joint rates were illegal, these services, held by shippers and consignees in the smaller cities to be a vital part of freight forwarder service, necessary to enable them to compete with industries in the large cities, have been in an uncertain state.

Although the Supreme Court sustained the ICC decisions, the Commission repeatedly postponed the termination date for the services, until Congress in May, 1942, passed legislation placing freight forwarders under ICC regulation.

Under the 1942 Act truckers were authorized to file assembling and distribution rates available to freight forwarders "and others" able to utilize them under like conditions in conjunction with through carload or truckload movements. Eighteen months were allowed for the establishment of such rates, during which existing joint rates might be continued.

Little progress was made in effecting the new system. Congress in emergency acts granted first another 18 months, and then an additional nine months ending last February 15. But, meanwhile, it appeared that the truckers were unwilling to file rates available to all able to utilize them as part of a through movement, and the bill just passed was drafted to authorize rates only for freight forwarders.

Under it the ICC is directed to determine and prescribe at the earliest practicable time reasonable terms and conditions governing agreements between forwarders and common carriers, pending which time the present joint rates may be continued. The agreements must be filed with the Commission and are subject to its approval.

While the new act permits separate special treatment of forwarders, it leaves untouched the provisions of the 1942 Act under which truckers are authorized to make special rates available to any shippers or groups of shippers able to utilize the truck services for assembly and distribution in connection with through consolidated movements.

Dictionary of Foreign Trade

Called a "dictionary" a new book by Frank Henius and published by Prentice-Hall, Inc., might well be called an encyclopedia. It contains 745 pages of vital information for the foreign trader and for every one concerned with shipping.

The book is intended to bring together in one volume a definition of foreign trade terms, usages, practices and procedures. Every effort has been made to supply complete and specific information in every case, even to the point of listing and explaining the many abbreviations used in international trade. The author has drawn on 40 years of experience—as a foreign trader and counselor, and in order to give as much aid as possible to those who may be just entering the field of foreign trade, and to peoples of foreign countries who desire to understand the trade terms and practices which they encounter in dealing with us, there is detailed explanation of many terms that might otherwise be deemed unnecessary.

The book fills a real need and is very timely. The price is $10.00.

Want to Travel?

If you want to go abroad on a business trip, see the U. S. Commerce Department. That government agency is now allocating passenger accommodations, both plane and ship, on return trips from Europe and on travel to and from India, Africa, the Middle East, and the Far East. Priorities are not needed for space to Europe. The Department says preference is given to businessmen whose travel will be more effective in expanding exports and imports and in increasing employment in the U. S.

250,000 MILES

The Essex, first of her class of aircraft carriers to be commissioned, established a remarkable distance record. She covered a quarter of a million miles of ocean, averaging 240 miles a day for every day since commissioning, including the very few days in port, until the war's end. This is more mileage than would normally be expected in the entire lifetime of a capital fighting ship. To the immense satisfaction of the Navy and of the Westinghouse men who designed and built her propulsion machinery, the turbines and gears required only routine maintenance.

Diesel Workboats for Overseas Service

Socony-Vacuum Builds Fleet of Diesel-Powered Vessels, and Dump Barges, for South American and Netherlands Indies Operations

By T. Orchard Lisle

While the operation of ocean-going tankers is generally recognized as an oil company's normal business function, it is not so widely realized that a host of smaller craft of numerous types form part of oil industry fleets at home and abroad.

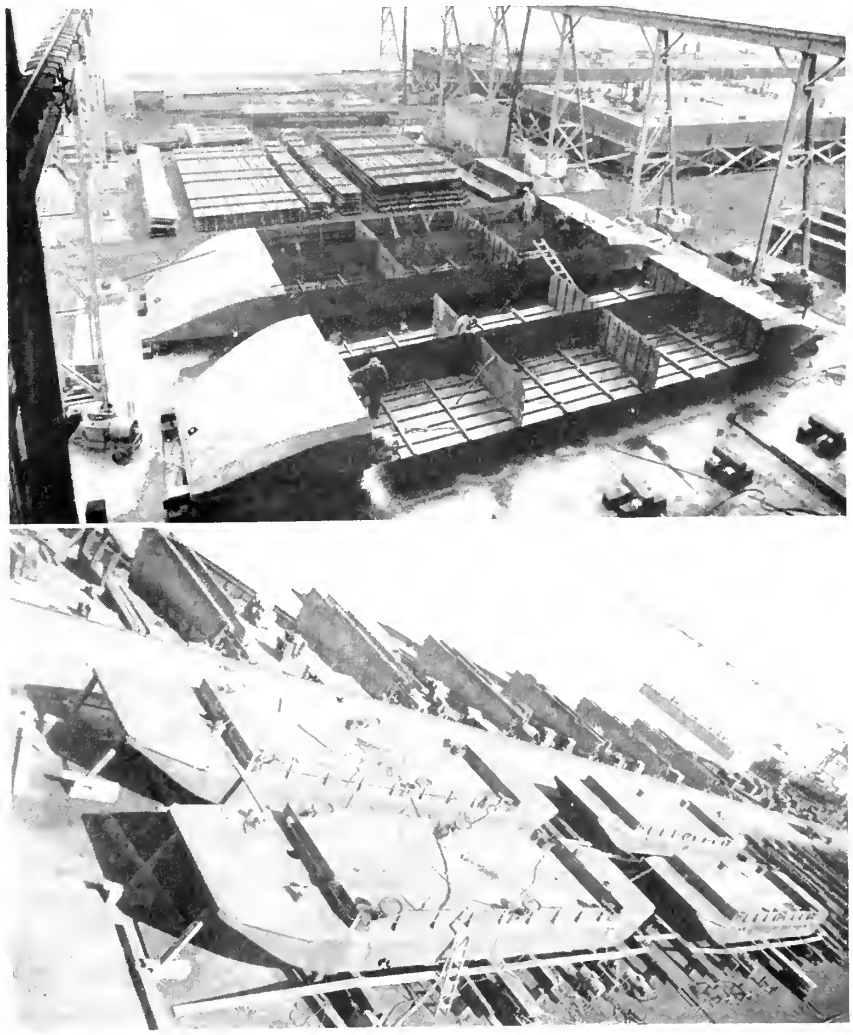
The smaller class of vessels for the petroleum industry is typified in the river tugs, house barges, oil barges and launches built last year as well as now under construction for the marine transportation department of the Socony-Vacuum Oil Company, Inc., New York, for the overseas operations of subsidiary and affiliated companies. This particular fleet consists of a total of 63 new craft.

In 1945, the company built three twin-screw and three single-screw, tunnel stern, shallow draft towboats and sixteen house barges in Eastern Venezuela for use by the Socony-Vacuum Oil Company of Venezuela, in exploration work on the Orinoco River and its tributary waters. Now under construction are 41 towboats, oil barges, staff launches, mooring launches and service launches for South America and for the Netherlands Indies. The latter order will represent a substantial investment, and consists of twelve staff launches; two service launches; four mooring launches; five towboats and eighteen barges. All but the barges are diesel powered.

The vessels built last year were fabricated in the United States by the Chicago Bridge and Iron Company, and were built on temporary ways on a beach at Guira, Eastern Venezuela, by native labor under the direction of F. X. Sullivan of the Marine Transportation Department of Socony-Vacuum. These boats provide accommodation and transportation for exploration, seismograph and drilling crews from Cuidad Bolivar as far as the foothills of the Andes about 1,000 miles up the Orinoco. The rainy season there lasts about nine months, making the work of the exploring parties arduous and unpleasant, especially as they are obliged to go up the tributary rivers and swampy areas where no white man has previously penetrated.

While the work was under way at Guira everything possible seemed to block progress. There were several earthquakes; a revolution; storms washed away the underpinning of the makeshift ways; and one ship carrying supplies to the yard suffered a collision and ran ashore, while another freighter with additional supplies caught fire at her pier in Brooklyn. Finally the boats were completed. Then they had to make a risky, rough-weather crossing over the 35 miles of Gulf of Paria and 300 miles over water separating the yard from the base at Cuidad Bolivar. Some damage was done, but all craft

Oil barges under construction at Decatur Plant of Ingalls Shipbuilding Corp.



Above and right center: Four of the 16 house barges an the erection ways at Guira, eastern Venezuela.

made the trip and no lives were lost. Each of the tugs is powered with Mack diesel engines, and has sleeping accommodation for four men, while the house barges can sleep up to 20 persons.

With further regard to the fleet now under construction, eight of the barges are for South America and these are being fabricated at the Birmingham yard of the Ingalls Shipbuilding Company and will be erected abroad. The ten barges for Sumatra, Netherlands Indies are for the Standard-Vacuum Oil Co., Inc., and are being built at Ingall's Decatur plant. They will be shipped to the Netherlands Indies complete and ready for operation. Lack of unloading facilities necessitates building the boats for Venezuela on the spot.

The barges are of 75 tons capacity, are of welded steel construction, and for the time being some will be used for carrying deck cargo, and later be converted to carrying bulk oil. Each is 69 ft. long by 10 ft. beam and 4 ft. 3 in. moulded depth, with 2 ft. 3 in. loaded draft. Each hull is divided by four watertight transverse bulkheads and one centerline bulkhead. There are slight variations in the equipment specifications, as some will be operated by the Cia. de Petrolio, some by the Socony-Vacuum of Venezuela, and others by the Colombian Petroleum Company. One safety feature is the fitting of Vac-Rel relief valves to the cargo tanks on all of the barges.

One of the steel towboats built in 1945 and now in service on the Orinoco River.

The five towboats for the 1946 program are also of steel construction, and are being built by Higgins of New Orleans. Their length is 48 ft. by 13 ft. 4 in. beam and 4 ft. 3 in. draft. Each is being powered with two Buda diesel engines of 125 hp. at 1,400 rpm., driving twin 32 in. diameter bronze propellers of Socony-Vacuum design at 715 rpm. in tunnels in the stern. Reduction gears are installed between the engines and the propeller shaft. The latter is of 2⅜-inch diameter Monel metal, and they run through Micarta-lined stern bearings.

For starting and lighting there are two sets of 200 amp. hour, 30-volt, Exide storage batteries, and these are kept charged by the 750-watt, 32-volt generators on the main engines. The exhausts are carried through Maxim silencers and spark arrestors in the stack. Fuel for the engines passes through Purolator filters. The fresh water cooling system being closed, the supply runs through coil-

welded steel pipes arranged outside the bilge plates on both sides of the hull. In addition to navigating lights, cabin light fixtures, there are two half-mile searchlights. All the towboats will be operated by native crews under the direction of a company port captain.

The staff launches, the service launches and mooring launches, all of which are diesel driven, are now being built by Higgins of New Orleans. One staff launch is for the South American Gulf Oil Co., for operation in Colombia. This com-

pany is owned jointly by Socony-Vacuum and the Texas Company. Two staff launches are for the Socony-Vacuum Oil Company of Venezuela, while nine staff launches are for Socony-Vacuum Oil Company of Colombia. Two service launches and four mooring launches will be shipped to Sumatra, where they will be operated by the Standard-Vacuum Oil Company, which is jointly owned by Socony-Vacuum and the Standard Oil Company of New Jersey.

These eighteen craft are all 30 ft. by 5 ft. 9 in. by 3 ft. 4½ in. They are to be used for the transportation of survey and seismograph parties. An interesting feature of the hull, which was designed by W. D. Fletcher, supervisor of technical section of Socony-Vacuum's marine construction and repair division, is the diagonal placing of the frames, all of which are straight and connected to a one-inch steel pipe at the chine and to a two-inch pipe at the keel, the latter being used for cooling the engine water. The cooling system is closed and uses fresh water. While the hulls are mainly welded the diagonals may be riveted to the plates.

Each boat is powered with a six-cylinder, 3⅝ in. by 5⅛ in. Buda marine diesel engine turning at 1,600 rpm. and driving through a reverse gear. The propeller is a Columbian, 16-inch diameter by 14-inch pitch, and having an 0.63 area ratio. The propeller shafts are of 1⅝ in. diameter, and run through Goodrich rubber stern frame bearings. Hulls are of the V-type with hard chine form and flat bottoms. Their speed is 16 land miles, or 14.1 knots. Maxim silencers are fitted to the engine exhausts which are carried through the side of the hull above the waterline.

The staff launches are of the open type with canopies for protection from the sun and rain. There are short decks fore and aft, and a cockpit forward, while the after cockpit is large enough to carry the seismograph instruments. In the engine room, forward, there are two six-volt, 204 ampere hour Willard storage batteries, while aft of the engine is a 58-gallon fuel tank. Engine controls and the steering wheel are at the forward end of the after cockpit, the engine being fitted with a Columbian Bronze Corp's Bowden wire control, while the engine is fitted on Micarta chocks bolted in place.

In the case of the service launches, the engine controls and steering wheel are in the forward cockpit, which has a wooden roof. In the after cockpit there are insulated compartments, the one on the port side being for ice and the one on the starboard side being for food storage. There is a cabin with a portable table, seats and two lockers, and there is a toilet under one of the seats. Under the after deck there is a 20-gallon tinned copper drinking water tank. These boats mainly differ from the staff launches in that they have a cabin, and are designed for the particular operating conditions of the Netherlands Indies, whereas the staff launches are for operating in Venezuelan and Colombian inland waters, several hundred miles north of the Equator.

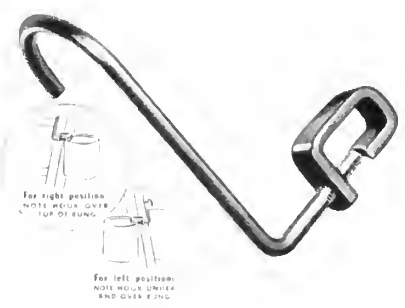
Harold F. Sheets, chairman of the board of Socony-Vacuum Oil Company, Inc., of New York, was a Pacific Coast visitor in March inspecting properties and operations of the General Petroleum Carporatian, a Sacony-Vacuum affiliate, and giving special attention to marine terminal facilities. Having lived abroad for many years in the interests of foreign marketing by his company, Mr. Sheets is regarded an expert in world trade affairs. He predicts a bright future for Pacific ports and shipping. While in Los Angeles, he was the honored guest and speaker at a luncheon meeting of prominent industrialists and civic leaders. In the photograph below he is pictured with General Petroleum officers. Left to right are C. S. Beesemeyer, Vice-President and Director of Marketing; President S. J. Dickey, Mr. Sheets, R. A. Sperry, Vice-President.

Paint Hooks That Fit Any Ladder and Any Size Can

The new Persson Paint Hook puts the paint can in its right place, provides the answer to spilled cans, wasted paint, and costly accidents. There is no bothersome can handle to interfere with the brush; the can opening is left entirely free for dipping and stirring; and the can is placed exactly where needed for ease in painting, with safe, secure positioning at all times.

A slight, simple adjustment permits the can to be hung on right or left side of ladder. For right position, the hook is slipped over the top of rung. For left position the hook goes under and over the rung. A quarter turn on the clamp places the paint can in upright position.

Two cans may be hung on opposite sides of any ladder, without interference to the painter. Persson Hooks leave both hands free for neat, rapid painting. In addition these hooks are suitable for use with most other receptacles. The location of the ladder may be changed without removing receptacle.



"Pick" Passes

Noted Accident Prevention Expert Dies Very Suddenly

Byron O. Pickard, popularly known as "Pick" and for nearly 20 years Manager of the Accident Prevention Bureau of the Waterfront Employers Association of the Pacific Coast, died very suddenly at his Berkeley, California, home on March 7th. He had worked at his office all day on March 6th but early on the morning of March 7th had a heart attack and passed away in a few minutes.

Born October 27, 1882, in Omaha, Nebraska, he came to California sometime before the age of twenty, and studied mining engineering at the University of California from 1902-1905 when he transferred to the Michigan College of Mines, taking his B. S. and E. M. degrees there in 1907.

He opened his own business in Douglas, Arizona, operating as a Mining Engineer in that state and Mexico until 1917, when he entered the U. S. Bureau of Mines as Assistant Chief Safety Engineer. At that time he was located at Pittsburgh, Pa. He was shortly transferred to Washington, D. C., where he became the Assistant Chief Mining Engineer of the Bureau. He was transferred from there to the Lake Superior district as the Mining Engineer for the Bureau, with headquarters at Houghton, Michigan.

In 1918 he became Administrative District Engineer of the Western Division, comprising the states of Oregon, California, Arizona, and Nevada, with his headquarters in Berkeley. From then until 1927, he trained rescue crews for the Bureau of Mines and directed rescue operations at the Argonaut Mine disaster in 1922.

He was a member and Past Master of Hillcrest Lodge 573, F & A. M., a member of the Theta Tau Honor Society and the Theta Chi Fraternity, a member and past president of the A.S.S.E. and past chairman of the marine section of the National Safety Council in 1938. He was active in the Propeller Club and was a past chairman of the House Committee.

During the second world war he was California State Chairman of the National Committee for Conservation of Manpower in War Industries, and taught safety engineering courses in the Bay Area under the auspices of the University of California.

He is survived by his wife, Mrs. B. O. Pickard, and two daughters, Miss Bonnie Pickard and Mrs. Ellsworth Rose, also his mother, Mrs. O. J. Pickard, and sister, Mrs. J. J. Jorgensen, both of Denver, Colorado, and another sister, Mrs. L. C. Wehlers of Omaha, Nebraska.

Byron O. Pickard

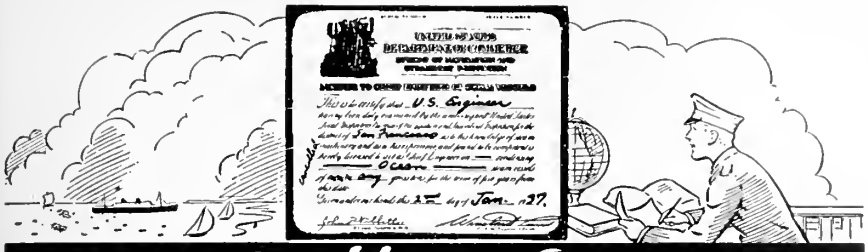
Byron Pickard was a pioneer in accident prevention work for the longshoremen. Under his patient, careful, expert guidance were brought out the first codes for safety on docks; safe practices for longshoremen on ships, safety for seamen and longshoremen incorporated in ship design, and others. Several of these codes became models for similar work on other coasts. This work begun in San Francisco soon made its importance and its economy felt in other ports and under Pickard the ports of the Pacific Coast became unified and standardized in their safety programs.

The reduction in accident frequency rates has been very impressive over the past 20 years, sufficiently so to bring substantial reductions in insurance rates. The Accident Prevention Bureau was able under Pick's leading to create great interest in safety meetings and to maintain the sympathetic interest and support of its sponsors to a degree perhaps never before attained by any American cooperative maritime effort.

As a tribute to this man who was a dear personal friend of more than one member of the Pacific Marine Review staff we quote from "The Preventer," his own brainchild, the eulogy composed by his associates.

"While we admire men for what they accomplish, we love them for what they are. As a pioneer in accident prevention, Byron O. Pickard is respected throughout the country. Of those hundreds fortunate enough to have known Pick personally, few could help but love him for his constant consideration for the feelings of others, his ever-youthful enthusiasm tempered by mature wisdom, his very human prejudices in little things and his great toleration and open-mindedness in the things that mattered in his work, his willingness to drive himself to the very limit of his endurance, and his equal ability to relax and enjoy himself with his friends.

"Pick's work could never be finished because he always had a further goal when one objective was reached. But he has left an idea and an inspiration to guide us and the memory of a warm friend to make our lives happier."



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Correction of Unsatisfactory Brush Performance

The maintenance of satisfactory performance of commutating equipment necessitates watchfulness and care on the part of the operator. This is especially true at times such as these when heavy production schedules, long hours and peak loads place an added burden on all power equipment. Commutators in poor condition should be re-surfaced at the first opportunity, carefully inspected for feather-edge mica, if undercut, and kept in good condition by daily application of a canvas wiper as described heretofore. At the first indication of unsatisfactory performance the cause should be sought and the faulty condition corrected before serious damage is done.

Some potential sources of operating difficulties can be detected before trouble occurs. Others are less evident and the first indication of their presence appears in some such form as imperfections of the commutator surface, visible sparking, excessive heating or brush noise. The same fault may give more than one indication of its presence, or the first indication to appear may itself cause others to follow. For example, sparking may be the immediate cause of poor commutator surface and that, in turn, lead to noisy operation which can be permanently relieved only when the primary cause of sparking has been determined and eliminated. There is of necessity, therefore, considerable overlapping in the discussion of these readily detected indications of less obvious faults.

Sources Of Poor Commutator Surface

Defects in commutator surface arise from many causes and likewise occur in many varied forms. Mechanial faults, such as rough edges on bars, uneven surface, eccentricity and high or low bars, call for resurfacing, for which approved methods have been discussed. If high or low bars are observed the tightness of the commutator should be checked and "V" ring or clamping bolts tightened when looseness is evident. After undercutting, the commutator should be carefully inspected for feather-edge mica, or mica fins, since this is an all too common source of poor commutator surface and sparking.

Streaking and Threading

Circumferential streaks in the commutator surface may result from mica flakes, copper or other foreign material embedded in the brush faces. If mica or copper is noted, inspect the commutator for mica fins. In case of copper in the brush faces look also for a source of abrasion or evidence of poor commutation, especially evidence of high current density in restricted portions of the brush face. The latter condition is frequently indicated by a dull or etched band, parallel to brush width, at that portion of the brush face where the high current density occurs. In extreme cases this condition may lead to "pitting" of the brush faces to appreciable depth. Localized bands of high current density result from a faulty commutation cycle, usually too rapid reversal of current or over- or under-commutation. Such a condition can often be corrected by shifting the brush position or by changing the interpole field strength. It is not advisable, on interpole machines, to shift the brushes far from the neutral point. Should a moderate shifting of the brushes not improve performance sufficiently, further improvement should be obtained by adjusting the interpole field strength.

If an abrasive brush grade is used, and streaking or copper deposit is noted, a less abrasive grade should relieve the trouble. The presence of oil on the commutator surface increases the tendency of copper to accumulate on the faces of the brushes and cause streaking. Low average current density in the brush faces is another condition which sometimes results in streaking of the commutator surface. This effect, which occurs most frequently with lampblack base, electro-graphitic brushes, can usually be corrected by removing some of the brushes of each polarity, thus raising the current density, or by using a brush grade having better film forming properties.

Threading, i. e., fine, threadlike grooves in the commutator surface, usually represents an advanced stage of streaking and results from similar causes.

Bar Etching and Burning

Bar etching or incipient burning of commutator bars usually results from visible sparking or a band of very high current density in the brush face producing interface sparking not noticeable at the edges of the brush. Adjustment of the brush position or interpole field strength should correct this condition if the source lies in imperfect compensation during the commutation period. There are, however, various other causes of sparking which will be summarized later. Feather-edge mica is such a frequent source of bar etching and burning that it should be one of first causes sought when this trouble develops, especially if it appears at isolated sections along the edge of the bar.

Burned bars, unless the result of

some transient fault such as a flashover or an external short circuit, represent merely an advanced stage of bar etching and their prevention is accomplished in like manner. If the burning is severe the commutator should be resurfaced after the primary source of the burning has been corrected.

Pole Pitch Marking

One cause of etched and burned bars is a loose or high resistance connection between the end of an armature coil and the commutator riser. These poor connections, which may have considerable resistance when the armature is revolving, may make firm contact when the armature is at rest and, for this reason, are too often hard to detect by measurement of the connection resistance with the machine at standstill. However, they can be located by the resulting bar marking which appears on the bar immediately ahead of the one with the poor connection. In Figure 1, a high resistance connection to commutator segment No. 2 is indicated by the dotted line connecting it to the armature winding. Coil A is carrying the full load current of one armature path which, in the relation of commutator to brush shown in the upper drawing, should normally divide between segments 1 and 2. However, due to the high resistance connection of coil B to segment No. 2, most of the current in coil A is forced to flow through the rapidly narrowing contact between segment No. 1 and the brush, creating an extremely high current density which may, of itself, cause sparking and bar marking. When segment No. 1 moves from under the brush, the current concentrated at the trailing edge has to pass through coils B and C to reach a low resistance connection to the commutator. Shift of the current from segment No. 1 to segment No. 3 is retarded by the inductance in these coils and some of the current jumps from the trailing edge of segment No. 1 to the brush, producing a spark. If this condition is not soon recognized and corrected the resulting burning at the bar edge destroys contact with the brush and the point of last contact is at the edge of this burned area. Obviously such a condition is progressive in its action and, if not corrected, will produce a bad flat spot in the commutator.

Bar marking, usually of less severity, can generally be observed at the other end of the armature path affected, one pole pitch on the commutator from the point at which the fault exists. It is also not uncommon to find traces of marking at pole pitch intervals around the entire commutator. This results from the unbalancing of the armature circuits produced by the faulty connection. Cross connections in the armature winding tend to minimize, or entirely eliminate, this secondary marking.

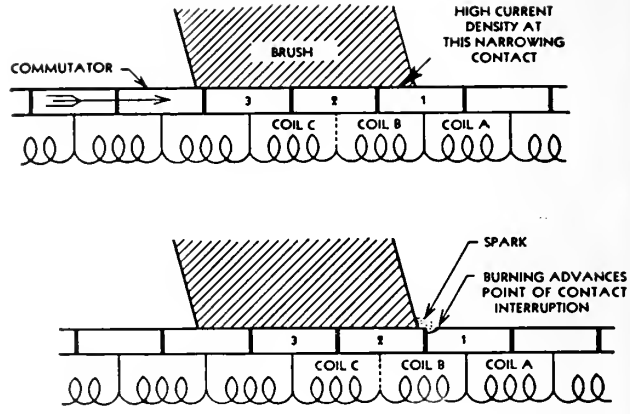


Fig. 1: A loose or high resistance connection between armature coil and commutator causes burning of the next bar ahead.

Slot Pitch Marking

Marking of every second, third of fourth bar is usually associated with the number of coils per slot. Figure 2 represents diagrammatically a machine with three coils per armature slot, only one group of three coils being shown. As drawn, commutator segment No. 2 is about to make contact with the brush, starting the commutation cycle of the leading coil in the slot. Commutation of this coil is completed when segment No. 1 leaves the brush during which time the slots carrying this group of coils will have moved to position A. Commutation of the second coil does not begin until segment No. 3 reaches the brush and the slots are in position B. The commutation cycle ends with the slots in position C. Commutation of the trailing coil in the slot occurs while the slots are moving from position D to position E. It is quite apparent that field conditions during the commutation cycle are different for each of these coils and, although the difference is exaggerated in the drawing, conditions encountered in practice may result in decided difference in commutating field encountered by two or more coils in the same slot. When this occurs there is a tendency for marking to appear on the commutator at slot pitch intervals.

If the commutating zone of the magnetic field is wide enough it may be possible to set the brushes in a position giving acceptable commutation for all coils in the slot, thus preventing recurrence of the bar marking. Should marking continue after the best brush position is found the influence of the interpole field

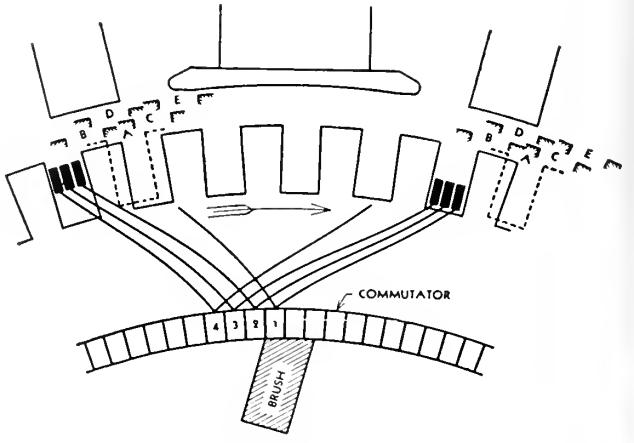


Fig. 2: With more than one coil per slot, commutation of each coil occurs at o different position in the field.

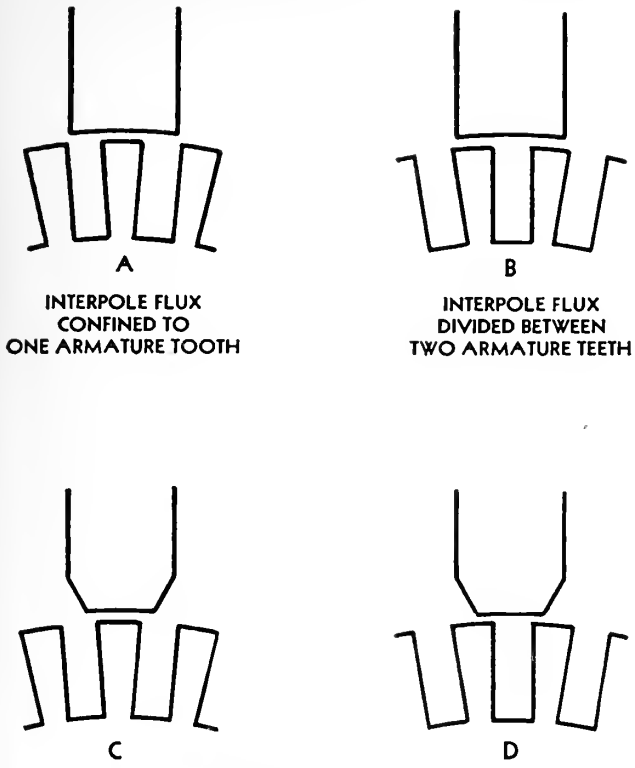


Fig. 3: Ratio of interpole flux span on armature to tooth pitch should be an integral value.

should be widened by attaching pole face shoes or increasing the interpole air gap. The interpole is often backed up by non-magnetic shims between the pole piece and the field frame. Removal of non-magnetic shims to obtain the required spread of interpole flux does not decrease the interpole strength. However, if magnetic shims are removed or the pole piece machined off, the interpole flux is reduced and should be restored to its original value. When the interpole winding is shunted this can be done by removing or increasing the resistance of the shunt; otherwise, it may be necessary to increase the number of turns on the interpole. The use of brushes with higher contact drop or with slight polishing action are other methods of reducing the tendency for commutator marking to develop on machines with more than one coil per slot.

Flat Spots

Flat spots sometimes result from merchanical causes, such as the pound from a loose bearing or unequal angular velocity on a generator driven by a reciprocating engine. As a rule, however, they result from failure to correct some faulty condition which is first indicated by burned bars and their recurrence is prevented by the correction of this condition. After the cause has been removed the commutator should be turned or ground. Sandpapering will clean off the burned surface at a flat spot but will not restore a true cylindrical contour to the commutator and the spot is liable to develop again even though the original cause has been removed.

Discoloration

Discoloration of the commutator surface may indicate excessive temperature, contaminated atmosphere or the presence of oil on the commutator. Discoloration from heat is usually recognizable as such. Sources of excessive heating and their correction will be discussed in a later portion of this article. Elimination of atmospheric contamination is often a difficult task. In many industries contamination of the atmosphere by certain chemicals cannot be entirely avoided. Many of these materials, of which chlorine, sulphur and acid fumes are examples, cause discoloration of the commutator surface and interfere with satisfactory performance. The use of brushes with mild polishing action will sometimes prevent the development of operating difficulties but, in extreme cases, air conditioning has proved to be the only means of obtaining satisfactory operation. Oil on the commutator surface tends to develop a dark, high resistance glaze which may lead to burning of the surface. It also increases the tendency for the brush faces to pick up copper. Oil sometimes creeps from the bearings to the commutator surface and is sometimes deposited from oil mist in the air. If the source cannot be removed, or the oil mist removed from the air by filtration, the use of brushes with some polishing action will usually aid in maintaining satisfactory contact with the commutator and good machine performance. Frequent use of a canvas wiper is also recommended under such conditions.

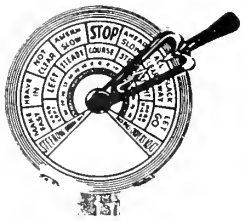
Raw Surface

A raw or bright metallic copper surface on the commutator is not desirable since a film of surface oxidation is advantageous from the standpoint of both commutation and friction. Among the more common causes of raw commutator surface are the use of abrasive brushes, serious accumulation of copper in brush faces, atmospheric contamination and operation at too low average current density. Some forms of atmospheric contamination impede or entirely prevent the development of a good surface film on the commutator or, when they occur, may destroy a surface film already established. The discussion of "contact poisons" in Modern Pyramids No. 2 cites specific examples of this effect. The use of brushes capable of developing an electro-graphitic film on the commutator surface will often improve operation under these conditions. The electro-graphitic film appears to protect the commutator surface from the contaminated air sufficiently for the desired oxide film to be formed. Raw commutator surface resulting from low average current density can usually be corrected by removing enough of the brushes to bring the current density up to an

(Continued on page 361)

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE SEXTANT

CHAPTER III

Errors and Adjustments of the Sextant

Just as a watch or any other fine instrument must be adjusted at regular intervals, so must a sextant be adjusted if the owner or user expects to get satisfaction from it in determining his position on the surface of the earth. However there is this difference between the adjustments of a watch and a sextant, and that is that most of the adjustments of a sextant must be made by the owner, usually out at sea far from any sextant manufacturer or any instrument concern which might make the adjustments for him. Although the average navigator takes good care of his sextant, it is not always realized that the construction of the sextant makes it an instrument which may develop errors unless it is constantly checked and adjusted.

The errors of a sextant—not including the human error in its use—are all concerned with the optical parts of the sextant, a fact which should be appreciated after having read chapter II of this series on the "Principles of the Sextant".

There are three classes of errors which either creep into a sextant while it is being used or carried around, or which are the result of imperfect manufacture. Of the latter—those errors caused by imperfect manufacture.—we can be thankful that they are few and far between. As a matter of fact no reputable manufacturer would permit an imperfect sextant to leave his factory. The reader must be aware that a great many "bootleg" sextants have appeared on the market during the past few years—sextants that bear the name of reputable manufacturers, but which were made by unskilled workmen who have traded on the names of well-known sextant makers.

But, to get back to the errors in a sextant.

I always like to classify these errors into three groups—

First, the error built into the sextant itself during its manufacture—the error which cannot be compensated for and which cannot be remedied.

Second, the error built into the sextant itself during its manufacture—the error which can be compensated for. The extent and amount of this error can be determined in a way which will be explained later.

Third, the errors which creep into a sextant caused by its being handled every day by its owner or user. This type of errors can be corrected by the owner or user, and no man should ever go to sea expecting to use a sextant unless and until he is fully familiar with the method of determining, and correcting, this latter class of errors.

These errors will be more readily understandable if they are further divided into two classes which may be termed NON-ADJUSTABLE ERRORS (or those which the user is unable to correct for himself, or which cannot under any circumstances be corrected) and ADJUSTABLE ERRORS (which the user should always be able to correct).

NON-ADUSTABLE ERRORS

These errors, which are really all errors of construction, may be further divided into three classes—

1. Graduation error.
2. Centering (or eccentricity) error.
3. Prismatic error.

1. **Graduation Error.** An error due to the fact that the divisions (degrees) on the arc are not equally spaced. This is an error due to faulty manufacture. Neither the user nor an experienced adjuster can remedy this. Any sextant which has a **graduation error** is useless.

2. **Centering (or Eccentricity Error).** This is an error of manufacture, and the user or owner has no means of determining the amount of this error, or of doing anything about it if he could determine the amount of error. It is caused by the fact that the pivot about which the index arm rotates was not placed in the exact center of the circle of which the arc is a part. Such an error varies at different positions of the index arm, generally increasing with the angle measured. The Naval Observatory at Washington is equipped to determine the amount of this error for each 10° or 15° angle. The amount of this error is noted on the CERTIFICATE OF INSPECTION issued by the Naval Observatory upon their examining and checking a sextant.

3. **Prismatic Error.** This error is sometimes called a "shade error" which is caused if the two faces of the shade glass are not ground exactly parallel. It cannot be adjusted but if suspected it may be ascertained by taking an observation with the particular shade and noting the reading, and then taking an observation without the shade, and comparing the reading. Any error found should be carefully recorded. If a combina-

tion of shades is habitually used, observations should be taken with these in a similar way.

Both the index shades and the horizon shades may be examined in this way by making contact with the direct and reflected images of the Sun, using the inverting telescope and the darker eye-piece (not forgetting to adjust the rising piece to make the two images equally bright). If, on removing the dark eye-piece and turning in the shade to be tested, the sun's images remain in contact, the shade is accurate. If, however, the images of the sun do not remain in contact then the difference in the sextant readings of their being in contact with and without the shade is the shade error for that particular shade or combination of shades.

The question of whether the error in each case is positive or negative must be carefully considered. If the index arm has to be moved higher on the arc proper to obtain contact with the faulty shade, then this error, being, so to speak, "more", is to be subtracted and is a minus (-) error. If, however, the angle to obtain contact with the faulty shade is lower (i. e., towards zero), then this error is, so to speak, "less", so is to be added and is a plus (+) error.

It should be pointed out that in modern sextants, shade error is rare and can certainly be ignored in any sextant with a CERTIFICATE OF INSPECTION. Modern manufacturing methods have eliminated this error.

Shade error can, of course, be caused by the shades becoming loose or damaged by twisting, but such a condition should be apparent at once to the careful observer. In this case the use of the shades should be discontinued until they may be properly tested and repaired and one or other of the dark eye-pieces fitted to the telescope and used. It is important to do this, as by using the telescope eye-piece any shade error is eliminated.

THE CERTIFICATE OF INSPECTION. The Naval Observatory at Washington is equipped to examine and check sextants and upon examination will issue a CERTIFICATE OF INSPECTION which includes —

1. The date sextant examined.
2. Name of sextant.
3. Serial number of sextant.
4. A tabulation showing the corrections be applied to readings of the sextant in **addition to the index** error.

From this it may seem that the residue of all these NON-ADJUSTABLE ERRORS, if any, is tabulated on this CERTIFICATE OF INSPECTION, which is pasted inside the sextant case lid.

Before you purchase a sextant, except from a reputable instrument manufacturer or dealer, make sure that—

1. A CERTIFICATE OF INSPECTION is pasted on the inside of the lid of the sextant case.
2. That this CERTIFICATE OF INSPECTION applies to that particular sextant.
3. That the CERTIFICATE OF INSPECTION bears a recent date.

ADUSTABLE ERRORS

The errors of the sextant which the user can control and correct himself are four in number. These are familiar to seamen of all the ages and are known as the FOUR ADJUSTMENTS OF THE SEXTANT. A sextant is, thusly, considered to be "in adjustment", or "out of adjustment".

THE FIRST THREE OF THESE ADJUSTMENTS MUST BE MADE IN THE ORDER NAMED: First Adjustment; Second Adjustment; Third Adjustment. The Fourth Adjustment can be made without reference to the other three.

1. **First Adjustment.** The index mirror must be perpendicular to the plane of the instrument.

2. **Second Adjustment.** The horizon glass must be perpendicular to the plane of the instrument.

3. **Third Adjustment.** The horizon glass must be parallel to the index mirrors when the index arm is set at zero (0°) on the arc.

4. **Fourth Adjustment.** The axis of the telescope when shipped (i. e., in place in the instrument) must be parallel to the plane of the instrument.

In my next article in this series I will take up these adjustments one by one and show how to determine whether or not the sextant is "in adjustment", and if not, how to adjust.

(To be continued)

Your Problems Answered

(Continued from page 359)

average of 40 amperes per square inch. Should the full complement of brushes be required to carry peak loads it is advisable to change to a grade of brush with better film forming characteristics.

Seek the Source

The importance of maintaining a good commutator surface is widely recognized but frequent reconditioning of the surface should not be necessary to attain this end. It is much better to seek the source of any faults which may appear and correct the primary defect. In this manner interruptions of service for commutator maintainence can be largely eliminated and the cost of maintenance correspondingly reduced.

Volz Flat Surface Safety Lifting Clamp

Lifting of light or heavy plates, barrels or other containers, stampings or welded assemblies, or any metal with sufficient flat surface to enable the jaws of the clamp to engage it, is facilitated through the use of the Volz flat surface lifting clamp, manufactured by Merrill Brothers, Maspeth, N. Y.

It picks up and securely holds, irrespective of position of the clamp when attached and lifted.

It releases instantly and automatically when the load or weight is relieved from the grip of the jaws.

It is claimed that this clamp has two definite clamping principles — one a pressure grip, the other a wedge grip—making it what is claimed an impossibility for the load or the article being held to slip, even though it contains a coating of grease or oil.

All working parts are used in a strong drop forging casing, eliminating thereby all danger of bent parts by exposure.

The cantilever basic principle actuates the one jaw, the stationary jaw being of special construction, which allows the tremendous wedge power and grip.

The entire device, from the shackle to the gripping jaws, is drop forged; made in four sizes, ½, 1, 3 and 6 ton capacities; and will take metal from 0" to 2" in thickness.

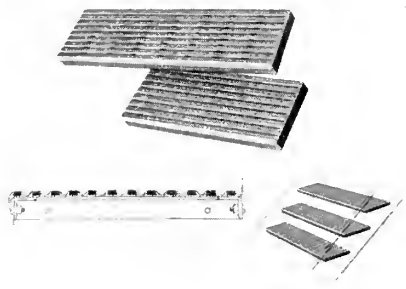
Keep Posted!

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Anti-Slip Ladder Treads

Ladder treads that combine the safety and non-slip qualities of a safe-groove type tread with structural sections to form a substantial ladder tread are now manufactured by Wooster Products, Inc., Wooster, Ohio. The anti-slip protection is afforded by the abrasive grit filler in the safe-groove tread.

These ladder treads require little maintenance. The corrugated surface of the tread section is self-draining and the abrasive surfaces are not usually affected by oil or grease or icing in cold weather. The grooves in the tread section provide drainage and are also a depository for loose dirt and debris so that the walkway surfaces are kept clean; 1/8" by 3/4" drainage slots in grooves of the tread section can be punched in all grooves for tankers and supply ships, or for engine room use where special drainage may be required.



The abrasive filler in the safe-groove tread section is of the approved type which has been tested for the Navy in accordance with the Bureau of Ships Standard Ladder Drawing No. 390599 Type J (Official Labortary Test, June 8, 1942).

Wooster combination ladder treads and deck treads have been approved by the Bureau of Ships, U. S. Navy Department. They have been subjected to severe tests for structural load carrying capacity and durability, and for the durability of the abrasive filler.

Wooster safe-groove ladder treads are made in standard widths of 4", 6", 8", 9" and 12", and in lengths 15", 16", 18", 20", 21", 24". Special sizes to order.

Pipe Joint Compound In Stick Form

Lake Chemical Co., Chicago, announces Pipetite-Stik, pipe joint compound in handy, clean, easy to use stick form. All that is necessary is to rub three or four strokes of stick across pipe thread. It spreads and fills threads when turned. Encased in a convenient cardboard holder, the stick may be carried around in a pocket or tool kit, always ready for instant use.

These are the features of Pipe-tite-Stik: it withstands gasoline, oil, butane, propane, Freon, air, water, steam, acid, gas, brine, sulphur dioxide; the joints can be disconnected easily months and years after applying; it lubricates and completely seals pipe joint threads, nuts, bolts, gaskets, turnbuckles; and it cannot flow into and clog even the smallest size pipes. It withstands vibration, temperature changes, deflection, pressure; and the joints can be remade without having to clean the threads. It also prevents rusting.

Plymouth Nylon Yacht Ropes

Yacht ropes, anchor lines and mooring lines made of nylon will be available to yacht owners this year, according to information released by the Plymouth Cordage Company of Plymouth, Massachusetts, the pioneers in nylon rope making. These synthetic ropes are being shipped to yacht supply houses for the 1946 season.

Yachtsmen will find these new nylon lines possess many distinct advantages, but perhaps the most outstanding are their extremely high tensile strength, resistance to rot and

KEEP POSTED

The manufacturers of the new equipment announced in this department will be pleased to furnish complete details without obligation on your part. For quick service, please use this coupon.

PACIFIC MARINE REVIEW

500 Sansome Street - - - San Francisco

Send me descriptive data of the following new equipment as reviewed in your .....issue.

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(Identify by name of manufacturer and machine)

NAME.....

BUSINESS.....

ADDRESS.....

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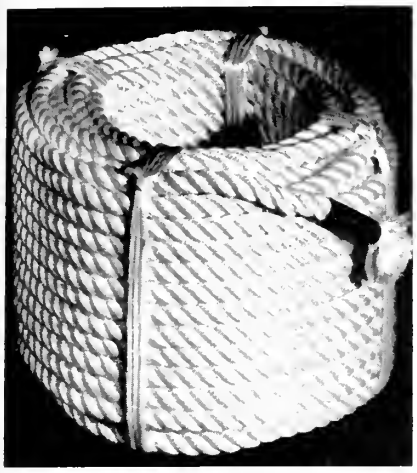
Nylon



marine decay, and exceptional elasticity and long life. Its rot-proof qualities permit it to be stowed immediately in a locker when wet.

In addition to these advantages, yachtsmen who have tested nylon rope during the past two years have found it easy to handle.

The superiority of nylon rope was proved during the war when it was used almost exclusively for tow-lines and mountain ropes. The company is now bending every effort to produce a large enough supply of nylon yacht rope for the 1946 season in view of the continuing scarcity of manila and linen lines and the heavy demand for fine ropes from boat owners whose lines have worn out and must now be replaced.

Great Salvage Job At Manila Bay

The greatest salvage job of the war was the clearing of Manila Harbor and the Subic Bay areas in the Philippines.

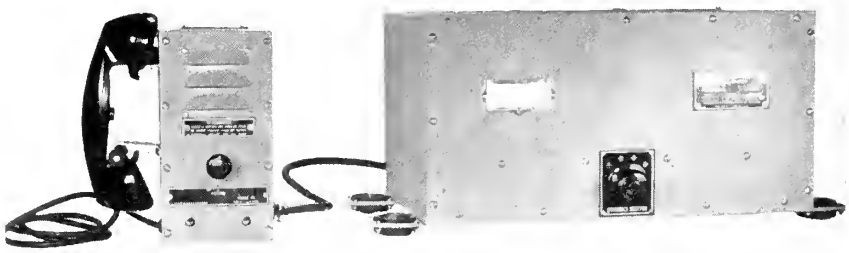
An estimated 650 wrecked vessels were found in Manila Bay and surrounding harbors, but within ten days the Army was enabled to continue landing supplies and within three months the port had been cleared of 350 vessels and was fully open.

Radiotelephone for Small Craft

Of interest to owners of small harbor and pleasure craft is the announcement by Radiomarine Corporation of America, New York, that its 1946 line of high quality marine radiotelephone equipment will include a combination radiotelephone transmitter and receiver, ET-8028. Operated from a 6 or 12 volt d.c. battery power supply system, this 10 watt instrument can be used on either of four transmitting frequencies which makes it particularly adaptable for service on the smaller power boats and harbor craft.

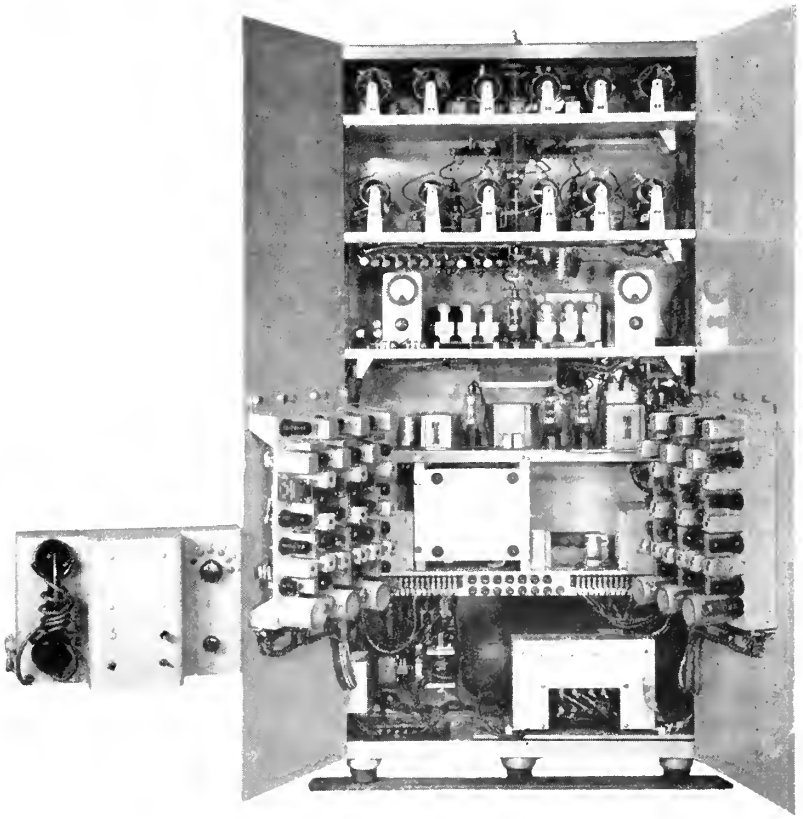
It has a good daylight range with correspondingly greater range at night. The receiver and transmitter are crystal controlled, a feature which enables the use of a single switch to place both transmitter and receiver on a desired channel. As in larger and more expensive sets, the ET-8028 is equipped with a remote control unit with standard telephone hand-set and built-in loud-speaker for use while waiting for calls. Despite its modest cost and compact size, this model has been designed with the usual RCA thoroughness for use under adverse sea and weather conditions. The overall dimentions are: height 13⅜ inches, depth 13⅞ inches, width 23⅝ inches, weight 40 lbs.

Radiomarine produces radio direction finders, radiotelegraph transmitters and receivers, automatic alarms, lifeboat radios, and will also produce new loran and radar navigational devices.



Above: Radiomarine radiotelephone, Model ET-8028.

Below: Model ET-8031, interior view. Radiomarine's new 75-watt radiotelephone with automatic remote control unit.



On the Ways — SHIPS IN THE MAKING

Left: STAR-SPANGLED SHIP—New luxury liner, Del Norte, made an impressive sight in this night scene taken just before launching at Ingalls Shipbuilding Corporation yards in Pascagoula, Miss. One of three sister ships, she is to be placed on the New Orleans - South American run by the Delta Line this spring.

Light Cruiser Fresno Now Afloat the Hackensack

The light 6,000-ton cruiser U.S.S. Fresno (CL121-Atlanta type cruiser) named for Fresno, California, took to the Hackensack River March 5, from U. S. Steel's Federal shipyard.

This was the last naval launching at the yard in 13 years of fighter shipbuilding, now largely replaced by commercial ship construction.

A bottle of champagne was bashed on the bow of the ship in the traditional christening ceremony just as she began to slide. The smashing blow was swung by the sponsor, Mrs. Ruth R. Martin, of Fresno. Mrs. Martin was chosen "Fresno's Mother of the Year for 1944."

The cruiser launched is the second ship to bear the name Fresno. The first was a naval overseas transportation ship which saw service in the First World War.

The vessel is the fifth "anti-aircraft" cruiser built by this shipyard. In addition to the original Atlanta, the others were the first Juneau, sunk in the same engagement as the first Atlanta; the second Juneau, commissioned February 15, and the Spokane.

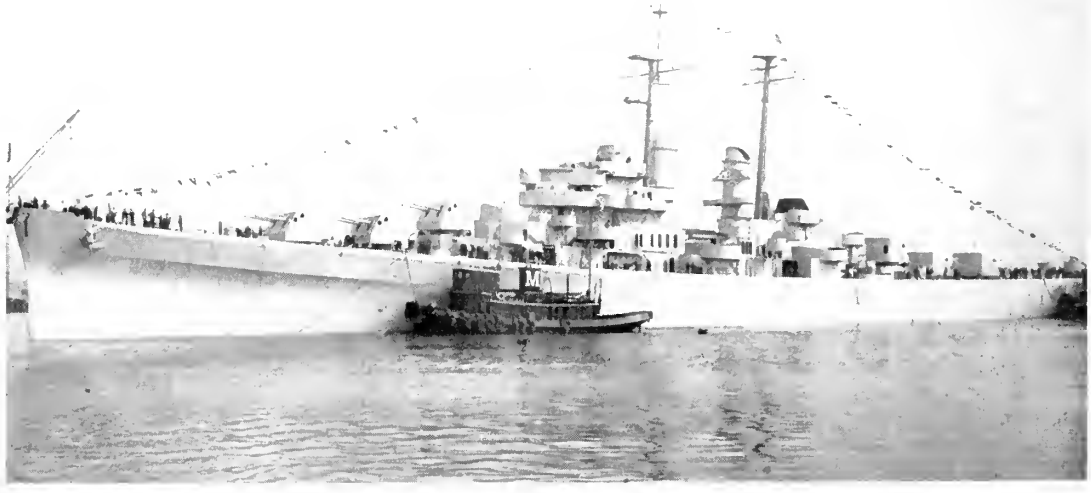
Major changes made since the original Atlanta was completed, include those in radar. The Fresno will carry 33 tons of radar equipment, consisting of seven distinct types operating 13 different sets. This will equip the cruiser to spot not only aircraft through fog, darkness, and beyond the horizon, but likewise surface ships, buoys, submarines, and land.

The ship's radar also will exercise fire control over the guns, thus insuring greater accuracy. All can be operated centrally by modern fire control and radar systems. It will find and destroy enemy craft while they still are out of sight.

The main battery consists of 12 five-inch guns in six turrets. Besides them, there are 32 guns of 40 millimeter calibre in 10 mounts and eight 20 millimeter guns. She is designed for a wartime complement of 47 officers and 706 men.

The vessel will be driven by two propellers, each 14½ feet in diameter, which will turn at the rate of 265 revolutions per minute at full speed ahead. They are connected through double reduction gears to high pressure steam turbines that develop a total of 75,000 shaft horsepower.

Steam at 600 pounds pressure per square inch will be generated by four oil-burning water tube boilers. Her fuel capacity is 1528 tons of oil. With this equipment, the Fresno should at least equal in speed the initial Atlanta, which recorded more than 33 knots on trials.



Cruiser Fresno (Atlanta Class, CL 121) took to the Hackensack River March 5.

FOR MECHLING BARGE LINE

Four new covered cargo barges leave Dravo Corporation's Neville Island Plant on their maiden trip to Joilet, Ill. The barges are 195' x 35' x 11' and feature nine watertight compartments in each hull.

Standard Acquires Tugs and Barges

Standard Oil Company of New Jersey has announced the acquisition of its own fleet for operation in the New York Harbor area with the purchase of six tugs and 19 barges with a carrying capacity ranging from 5000 to 30,000 barrels. Previously, the company contracted with outside carriers to transport all its products to its affiliates' terminals, dealers and consumers.

The acquisition of this fleet will enable the Standard Oil Company of New Jersey, largest supplier of fuel on the eastern seaboard, to improve further its service.

HER GUN PLATFORM REMOVED, her name again on her bow and in trim Socony-Vacuum colors, the veteran tanker Shabonee is converted.

New Grace Liner Santa Margarita Launched

With the launching of the new air-conditioned passenger and freight ship Santa Margarita on March 1, at the North Carolina Shipbuilding Company, Fred L. Doelker, vice president of Grace Line in charge on the Pacific Coast, has been advised by R. Ranney Adams, president, that this vessel, the third of the combination liners, will be placed in the New York and West Coast of South America service via the Panama Canal. This ship is the third to be launched. The previous two were the Santa Barbara and Santa Cecilia. These will operate in the same trade as the Santa Margarita, Doelker announced.

Like her eight sister-ships, now under construction or being fitted out for service, the Santa Margarita will accommodate 52 passengers.

All nine new Grace ships are of a modified C-2 type. Each displaces 14,945 tons, is 459 feet long, 63 feet wide and will carry 9000 tons of freight, including 100,000 cubic feet of refrigerated cargo.

Ship Warrants Act

Controls exercised over shipping by merchant ship warrants are still in effect despite termination of the United Maritime Authority agreement as of March 2, 1946, the War Shipping Administration states.

Public Law 173, Seventy-seventh Congress, commonly known as the Ship Warrants Act, as extended by Public Law 610, provides for the exercise of certain controls over shipping for six months after the termination of World War II shall have been proclaimed, or until such earlier time as the Congress or the President may designate.

Accordingly, until further notice, vessels are required, under the rules and regulations issued pursuant to the Public Laws involved, to hold valid United States merchant ship warrants to be entitled to priority in the use of shore facilities in United States ports.

OFF THE BOTTOM of New York Harbor and safely dry-docked after narrow escapes in two World Wars, the Brazilian ship SS Poconé is being repaired in U. S. Steel's Kearny, N. J. yard, to carry peacetime passengers and cargoes. Her stack and boilers had been removed for renovation before the photo was taken.

U. S. Navy tug Acoma, launched by the San Pedro yard of Bethlehem Steel Co. early in the year.

BETHLEHEM NAVY TUGS CHRISTENED

In a brief ceremony held February 21 at the Terminal Island shipyard of the Bethlehem Steel Co., shipbuilding division, Mrs. W. J. Courtiour christened the United States Navy tug Arawak. Miss Patsy Courtiour, her daughter, was maid of honor.

Mrs. Courtiour, wife of W. J. Courtiour, superintendent of repair for the San Pedro yard, in christening this vessel represented the repair forces of the yard, by whose efforts an average of two vessels per working day were repaired and returned to service during the war years with an enviable record for speed and quality of workmanship.

Above is the Acoma's sponsor, Mrs. W. A. Harrington cracking the traditional bottle of champagne at the christening.

U. S. Navy tug, YTB 702, christened the Arawak by Mrs. W. J. Courtiour with Miss Patsy Courtiour, maid of honor and Mr. W. J. Courtiour, superintendent of Repair, San Pedro yard.

The Arawak is the second of a series of four 100-foot, diesel-electric driven tugs of a new type designed for combination harbor and sea duty.

Oceangoing Tugs for Rescue Service

Allocation of three oceangoing tugs to the Navy Department for rescue service in the North Atlantic was announced by the War Shipping Administration on March 5.

Assignment of the 194-foot V4-M-A1 tugs will assist the Navy in carrying out salvage and rescue work which was being hampered by the lack of equipment and personnel resulting from the accelerated demobilization plans.

Launching at Consolidated

Pacing West Coast post-war shipbuilding, Consolidated Steel Corporation, February 19, launched the S. S. Carrier Dove at its Wilmington, California, shipyard. The Carrier Dove is the sixth vessel to be launched of a fleet of ten being built under contract with the U. S. Maritime Commission for assignment to private operators.

The big turbiner displacing 14,000 tons with an overall length of 460 feet and a beam of 63 feet and her nine sister ships are the largest merchant vessels ever built by a Southern California shipyard.

The big ship gayly painted, in contrast to the drab color of wartime-built ships was sponsored by Mrs. James E. Harvey, wife of Dr. J. E. Harvey, prominent Pasadena physician. Assisting the sponsor as matron of honor was Mrs. Norman L. MacLeod, Sr.

The launching of the Carrier Dove brought to 196 the parade of ships which have slid down the Consolidated Steel's ways into the waters of the Los Angeles-Long Beach Harbor.

The Carrier Dove was immediately towed to her berth at Consolidated Steel's docks where she joined four other ships of her class, the Spitfire, Ocean Rover, National Eagle and Mountain Wave for extensive outfitting.

The S.S. Messenger, first vessel built under the present peacetime contract by Consolidated Steel Corporation, was previously delivered to the States Marine Corporation of New York, via the U. S. Maritime Commission.

Guam Rounds Out First Year in Fleet

A year at sea may be the normal lot of a warship. But a great deal can happen during a year of warfare.

Veteran of some of the Pacific's most intense war patrols, the large cruiser Guam, recently returned to the West Coast with hundreds of Army and Navy personnel eligible for demobilization, and thus wound up, by this "magic carpet" assignment, her first year of active service with the Fleet.

Built by New York Shipbuilding Corporation and commissioned in September, 1944, the Guam and her sister ship, the Alaska, have been called "the American version of the pocket battleship." These two are the Navy's only large cruisers so far commissioned.

The Guam has an overall length of 808 feet, a beam of 89½ feet, and a displacement of 31,940 tons. Her armament includes nine 12-inch and 12 five-inch guns and a large number of 40 and 20-millimeter anti-aircraft guns. Her ship's wartime complement consists of some 125 officers and 2000 enlisted men.

Early in January, 1945, the Guam left the East Coast bound for the Pacific, enroute to Ulithi to join Task Force 58 in company with the carriers Intrepid, Franklin and Bataan and eight escorting destroyers. The Guam was assigned to operate with the carriers Yorktown, Intrepid, Enterprise, Independence, and Langley under the direct command of Vice Admiral A. W. Radford. On March 14, she sailed from Ulithi bound for the home waters of Japan. On March 18, she received her baptism of fire 70 miles off the island of Shikoku. Five Kamikaze attacks were made on the carrier force and escorts. The Enterprise and the Intrepid were hit, but the attacks were beaten off. The next day the carrier Franklin was seriously damaged by two 500-pound bomb hits that turned her into a blazing inferno. The Guam was detached from her group to protect the stricken carrier and escort her out of range of land-based aircraft.

When the Guam returned to home base after more than two months in enemy sea, her task group had destroyed over a thousand enemy planes.

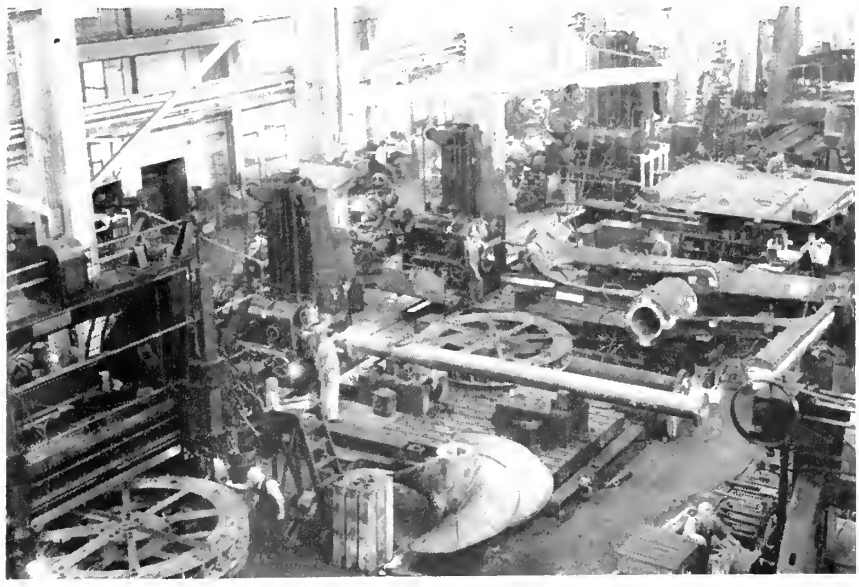
On May 24, the Guam sortied from Ulithi again, operating with two new fighting partners. Once again the Guam's unit was assigned to bombard a Jap-held island, Okino Daito, site of important Jap radar installations.

The Guam then sailed for the huge new fleet anchorage in San Pedro Bay in the Philippines. There she became the flagship of a new cruiser force, Task Force 95, under command of Admiral Francis S. Low, which proceeded to Buckner Bay, Okinawa, early in July. This force headed for Formosa, turned toward the China Coast and swung northward along the coast to Yungkia, 250 miles south of Shanghai. Then, it returned to Okinawa to complete an historic triangle.

When the war ended the Guam was made flagship of the North China Force under the overall command of Admiral T. C. Kinkaid, Commander, Seventh Fleet. For the next two months the Guam rested at anchor in Jinsen, the mightiest ship in the harbor and by far the largest ever to visit there. She left Jinsen on November 14, and reached San Francisco, December 3.

U. S. S. Guam, on patol prior to completing her first year stint with the fleet.

SHAVING SHIP'S PARTS AT FEDERAL SHIPBUILDING & DRYDOCK CO.



A group of boring mills in Federal's modern machine shop, machining parts for a C-2 cargo vessel: drilling flanges on line shaft; boring stern frame; and boring the rudder.

Design for Welding

(Continued from page 309)

ations. With such a system of weld identification any defect can be immediately traced to its source whether that source be plate edge preparation, welding technique or poor shipfitting.

With the wide spread use of radiography we had positive knowledge that each welded joint was capable of developing its designed stress without failure. Furthermore, we knew the quality of the welding that was being performed in the various shops and on the ways, and we could readily investigate any relaxation of the high standards of workmanship that we had adopted. We no longer had to deal with opinions as to whether the workmanship was satisfactory; our pictures were indisputable. There was no argument against a picture—especially when (as happened from time to time) the unsatisfactory weld was chipped out in the presence of the welder and his supervisor. The few non-believers soon learned that the film did not lie and that the only course to follow was that of careful workmanship and adherence to approved procedure.

In general the tendency was for the welders to improve the quality of their welding and to accept the evidence brought forth by the radiograph for what it was worth. Each welder realized that his work was subject to possible check. As a result he paid particular attention to plate edge preparation, realizing that the quality of his work depended on the quality of the work done before him; this in turn tended to improve the shipfitting itself. Each craft concerned realized that in radiography the inspection forces knew at whom to point the finger.

Our confidence in the standards established and maintained has been verified by an enviable absence of structural failures upon any of the vessels built by Marinship.

Industry's Stake In Shipping

(Continued from page 321)

with construction costs comparable to, and possibly lower than prices of our surplus ships.

Alternative: Lower Costs

But American ship operators aren't licked yet. They can cut the cost of handling cargo and the length of ship turnaround time in port. Cargo-handling costs are 30% to 50% of shipping costs. New efficiencies and technological advances are badly needed.

Perhaps much can be adapted from the Navy's new science of packaging and materials handling, including palletized loading. Large containers instead of a cargo-sling full of small packages offer possibilities, as do experiments with new types of cranes, booms, hatches. Loaded truck-trailers handled through side hatches might be feasible in the coastwise trade.

One worry to shipowners is the demand of maritime labor unions, both seafaring and dockside, for higher wages and shorter hours and their "feather bedding" rules.

Want International Pacts

These unions are now seeking international agreements to bring foreign maritime wages up closer to our rates. If this fails, ship operators hope the unions will see that the future of their jobs depends on making American ship labor, particularly in cargo handling, more efficient than foreign.

Less government regulation and red tape would help American ship lines. One line lists 36 government agencies it must deal with.

If American industry wants an American merchant marine it can help a lot by assisting ship operators in reducing cargo-handling costs; supporting government and private programs designed to foster our shipping; and, above all, "Shipping American."

Admiralty Decisions

(Continued from page 335)

was held that a Government employee might sue the Panama Railroad Company, wholly owned by the United States, should he so elect instead of accepting the benefits of the Compensation Act. Perhaps even more closely in point are cases involving suits by Government employees against the Director General of Railroads arising during the period of the First World War when the Government had taken over and operated the railroads under an act of Congress which gave the right to sue the Director General. In these latter cases it was held that the compensation act was not the exclusive remedy of the plaintiffs. In **Payne, Director General** vs. **Cohlmeyer,** (275 Fed. 803 7th Circuit) a deputy marshal of the United States was allowed to maintain a suit for injuries, the court saying, "While an employee may elect to take under this Compensation Act he is not required to do so." And in **Dahn** vs. **McAdoo, Director General,** (256 Fed. 549 (DC Iowa), 267 Fed. 105, 258 U. S. 421), it was likewise held that a United States railway mail clerk who sustained injuries as a result of alleged negligence on the part of the Illinois Central Railroad could maintain such a suit, although in the particular case his prior acceptance of benefits under the compensation act was held a bar.

There are certain cases, however, that do not support the contentions of respondent in this case; namely, **Dobson** vs. **United States,** (1928 A. M.C. 1583, Second Circuit), and **Bradey** vs. **United States,** (1945, A. M.C. 1329, Second Circuit). Each of these cases, however, involved the Public Vessels Act.

The Court's opinion points out, in addition to the above, that the recent **Brady case** handed down by Judge Learned Hand has certain language that might be turned around to stand for the propositions advanced by the respondent. However, the Court quite correctly concluded that Judge Learned Hand did not intend for such a result to follow. As previously stated, the exceptions to the libel were therefore overruled. The libellant will therefore be permitted to continue his case upon the merits under the Suits in Admiralty Act.

Running LIGHTS

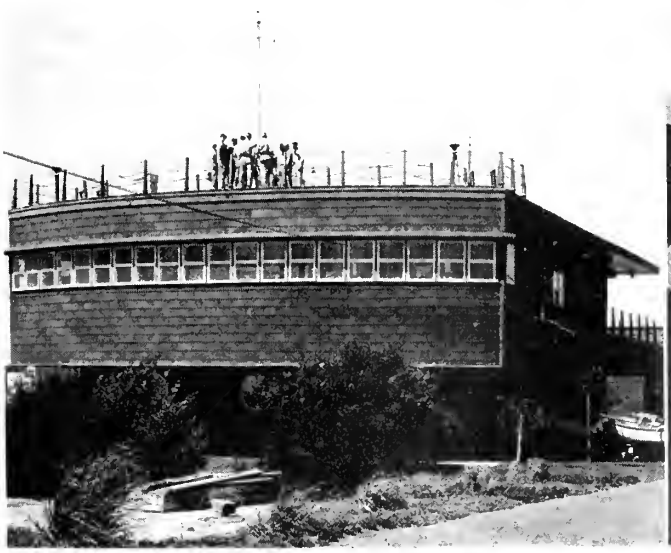
WHO'S WHO AFLOAT AND ASHORE

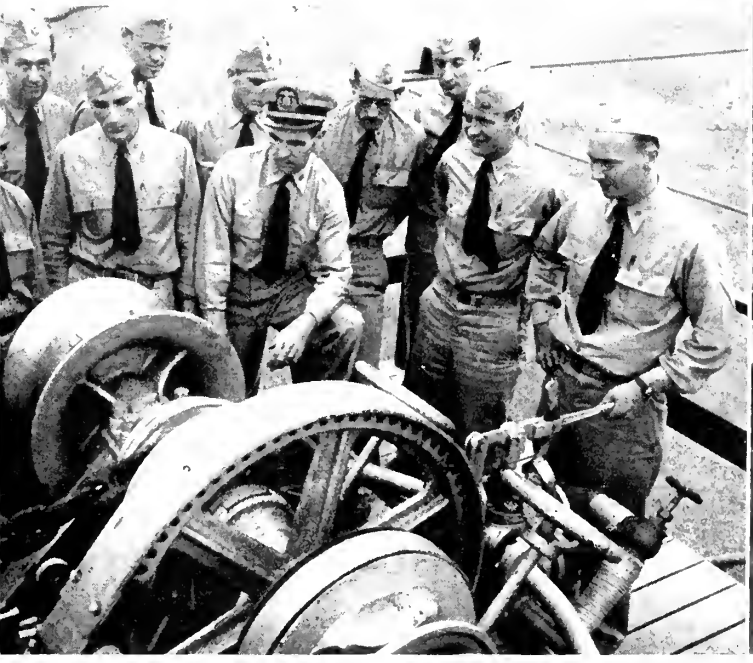
Edited by B. H. Boynton

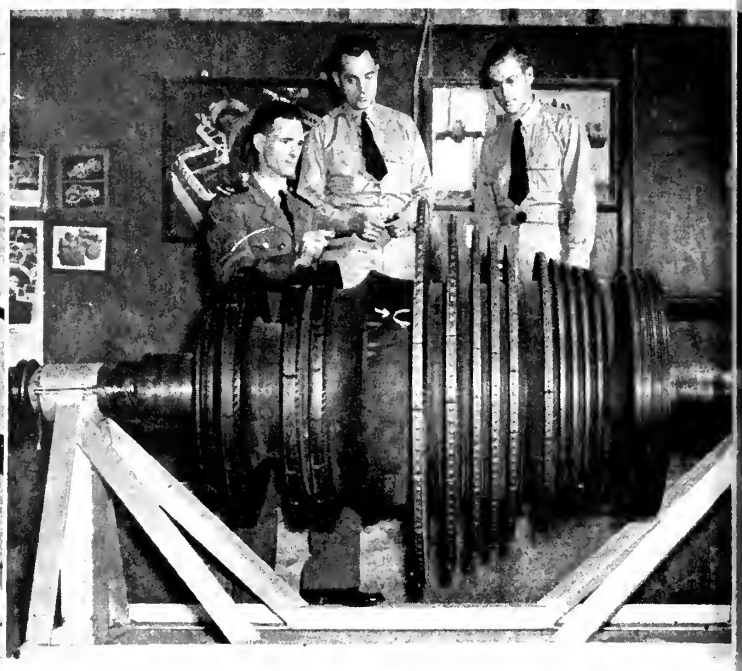
USMS instructor at Alameda explaining to the guests of the "fourth estate" a part of the troining equipment.

Strip at bottom, left: Glory of the Seas Hall which houses the simulated bridge, boot shop and novigation classrooms. Right: The press on tour inspecting the simuloted bridge.

A Day at the USMS Officers' School in Alameda







Above: Ensign Ethan Allen, USMS, instructs Deck Officer Condidates at Alameda in the operation of the windlass. This is one of many actual operating shipboard devices used for practical training on the station. At right: This low pressure rotor is a recent acquisition of the Turbine Lab in the Engineering Building. Ensign Laurance Butzer, USMS, demonstrates to students the working principles of the unit.

At left: Captain Malcolm E. Crossman, USMS, explains to the members of the press the functions of an experimental engine.

Below, left: Closs-room instruction at USMS Officers' School at Alameda.

Captain Malcolm E. Crossman, USMS, superintendent of the United States Maritime Service Officers' School, Alameda, California, was luncheon host to a group of San Francisco Bay Area editors and publishers on March 13.

Among those present were: A. Kofman, publisher, Alameda Times-Star; Colonel Thor Smith, associate publisher, The San Francisco Call-Bulletin; Joshua Eppinger, executive editor, The San Francisco Examiner; W. D. Chalmers, associate publisher, The San Francisco Chronicle; H. J. Debenham, assistant circulation manager, The San Francisco News; G. W. Roe, managing editor, The Oakland Post-Enquirer, Raymond Lawrence, feature columnist, The Oakland Tribune; B. N. DeRochie, assistant publisher, The Pacific Marine Review, and Pat Martin, editor, The Log Magazine.

The newspaper and magazine executives were given a personally conducted tour of the School by Captain Crossman and his ranking officers. This included life saving demonstrations in the station swimming pool, visits to class rooms with actual demonstrations of the work being accomplished, and movies of the station activities. At 1600, after a busy af-

USMS March '46 Graduates At Alameda

ABOVE: ENGINEER OFFICERS' SECTION

Section 6032-E: First row, left to right: Frank Bland, John Rankin, Dale Hansen, Lt. (jg) Irving Colt (Section Officer), Joseph Switzer, Edwin Zwan, Robert Brown. Second row: Robin Forsberg, Kenneth Frame, Robert Shaemaker, Albert Powers, Paul Kantus, William Payne, Robert Wigger. Third row, Dale Lovdahl, David Allen, Randall Garrett, Melvin Heid, George Nichols, John Kalafatich, Thomas Barton.

●

Section 6031-E: First row, left to right: Buck McFarlin, Norman Hastan, Walter Springer, Lieut. Richard Juhre (Section Officer), Lawrance Aspinall, Harold Messer, Anthany Detmer, Raymond Baray. Second row: William Merrill, Wade Goodin, William Thampson, Douglas Gillette, Robert Scott, Clyde Harrell, Thomas Dull, William Davis. Third row: Terry Blaire, Colin Fraser, Francis Stroup, Arthur Madding, Ralph Edwards, John Franks, Ernest Swinney, Frederick Stoddard.

●

DECK OFFICERS' SECTION

Section 6031-D: First row, left to right: Donald Thomas, Ralph Taylor, Robert Menzie, Lt. (jg) Douglass North (Section Officer), Lesley Denton, Robert Smith, Rex Lovett. Second row: Marion Gove, Thomas McCue, Winston Hays, Rowland Pesi, Gordon Leonard, William Braege, Frank Darnell, Austin Kelly. Third row: William Boyd, Homer Scott, William Bunker, Sherwood Duryea, Ernest Omesta J, Lewis Seevers, Robert King, Leland Locklin.

●

Section 6032-D: First row, left to right: Malcolm Bizzle, Oliver Jones, Hugh Arnold, Lt. (jg) Case Davison (Section Officer), William Smith, James Singleton, Harold Merson. Second row: Edward Thorne, Truman Robinson, Jerrold Elsbree, Dudley Collette, Henry Marscheck, Marlow Stark, Phil Armstrong, Billy Helms. Third row: Robert Klotz, Clyde Nelson, Peter Weber, Karl Bergheer, Clifford Phipps, Robert Scharpff, Prestan Pearson, Vincent Callaghan, John Wolter. (Edward Gillette and Dale Broten, absent.)

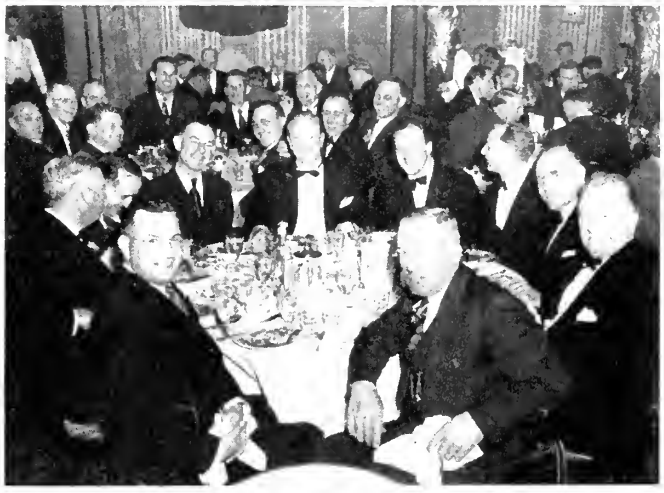
ternoon, the group enjoyed a snack in the coffee room.

As they entered the coffee room, each man was presented with the latest copy of **Neptune**, the school publication, which was just off the press. The news chiefs showed keen interest in the publication.

Scenes from the Eighteenth Annual BILGE CLUB BANQUET

Held at Biltmore Hotel, Los Angeles

February 23, 1946

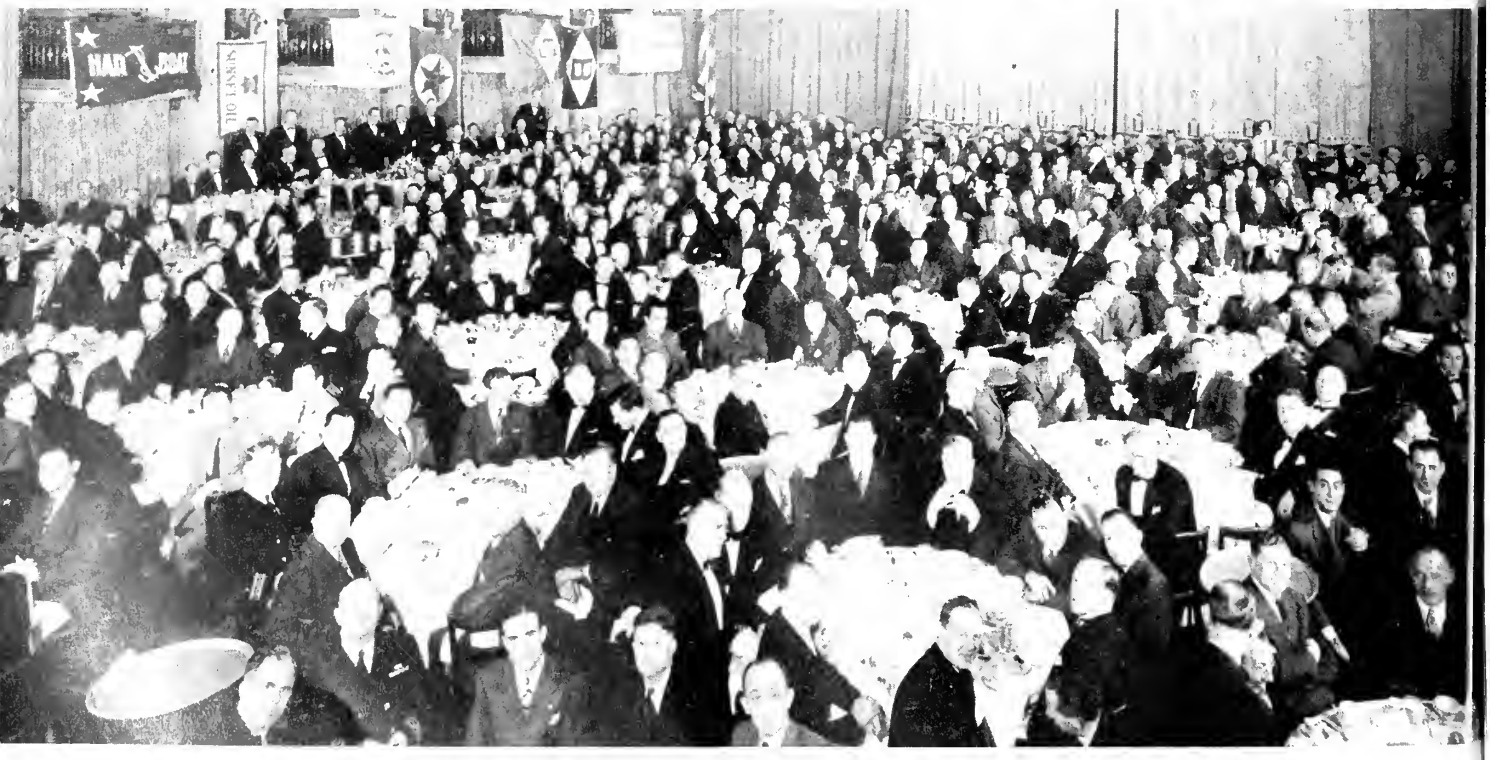


At top, left to right: John Zanella, T. W. Buchhalz, Al Bora, Earl Archibald, Frank Cavanaugh, Art Pegg, F. Jackson, Jack Malseed and W. McCloud.

Harry Reese, Rolf Berg, R. Cyrus, Rolf Monsen, Tom Cook, Birger A. Guthe, Captain R. Berbom, Captain H. Halvarsen, Charles E. Markey and Frank Redman.

Strip across the bottom of the page: Panoramic view of the annual banquet.

The Bilge Clubs busy secretary, Robert "Bob" Snodgrass.



Head table at Bilge Club Banquet, left to right: T. W. Buchholz, Harry Summers, Jack Malseed, Art Pegg, Dan Dobler, A. O. Pegg, Al Boro, Hal Bowen, William Mason, Walter Richards, Sr., Earl Archibald and R. W. "Duke" Decker.

(1) Left: Joseph H. Barry, Bern de Rochie, Paul Faulkner, William McGilvrey, unidentified, and Carl Martin.

(2) Left to right, front foreground: Captain T. W. Peters, Lloyd Moore, James Craig, Don Montague, Ed Emerson, George Nagel, George Fryette, Win Rash, Robert Snodgrass and Joe Costello.

(3) Atlas Paint & Vornish group: Standing: Russell Johnson and George Fryette. Seated: Ed Emerson and George Nagel.

(4) Standing: Joe Hare and George La France. In this group are: Fred Archbald at left foreground and Roy Harris alongside.

(1)

(3)

(2)

(4)

Occasion of New Location in

At top, left: George E. Swett, Mr. and Mrs. Herbert E. Foster and Mrs. Swett.

A striking tribute to the popularity of George E. Swett, head of the firm of George E. Swett & Company, engineers, was the response of over three hundred men of San Francisco's ship operating, shipbuilding and allied maritime industries to come aboard for the Open House which dedicated new quarters of the marine and industrial supply firm at 256 Mission Street on March 15.

The new building gives the Swett organization approximately 20,000 square feet of space for storage, sales and executive offices and departmental functions.

This firm is ready to offer ship owners new equipment and reconversion service immediately. Such equipment includes refrigeration, air-conditioning, steam pumps, valves, blowers, governors, deck machinery, steering gears, thrust and journal bearings, fans, propellers, soot blowers, gages, heat exchangers, packing, porous stone filters, safety valves, recording instruments and others.

The engineers will occupy all but a few feet of the ground floor of

At right, top scene includes: Joe McNulty, Lt. Wm. J. Pax, Howard Waterson, Andy Hall, A. D. Smith, Eric Marlborough, John Davidson and George Barr.

Center includes: Charles Worden, Jack Burress, Bill Cathcart, Joe McNulty, Geo. Darward, A. D. Smith and Helen Waltrip.

Below: Jack Mahan, Geo. Swett, Jack Fox, Geo. Bloxham, John R. Gregory, J. F. McConkey and E. A. Williams, Jr.

The trio on the left are: H. C. Gothings, Irving Fairbanks of G. E. and A. L. Adkins.

Open House—San Francisco

their building. The basement will house heavy storage, including pumps, blowers, motors, along with many spare parts. The first floor will be used as a display room and for light storage. On the second floor are the executive offices, service department and light repair shop. The engineers and draftsmen will occupy all of the third floor.

At the present time there are 52 employees, under the direction of George E. Swett, who started the firm in San Francisco in 1920. L. A. Stone is assistant general manager; W. J. Kinney, manager of service department; H. N. Craig, purchases and stores; Major J. E. Swett, service engineer; Robert W. Long, sales engineer; Henry Guilmette, sales engineer; William Pullen, sales engineer; Walter Keats, chief storekeeper; R. E. Estes, auditor, and Doris C. Southworth, cashier.

George E. Swett's family were shipbuilders on the Penobscot River and constructed some of the famous marine clipper ships. It was there that young George grew up learning to like vessels that sail the seas. Off at the University of Maine George studied electrical engineering, and upon graduation served for ten years with the General Electric Company in their testing, engineering and sales departments. During the last years with GE he collaborated with Allan Cunningham of Seattle, pioneer marine auxiliary designer and manufacturer of original designs of electric

(Please turn to Page 67)

At top: Jim, Margaret and George Swett.

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The group on the left include: Lawrence Rapp, Ed Swayne, Jim Swett, E. F. Essner, Charles Herbert, Bernard White and Vernon Showell. Below in the elevator are: Jerry Ford, Henry Buffaloe, L. V. Aitchesan, James Ayres, B. N. and W. "Eddie" Martin, Margaret Swett in center.

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Below: Bill Kinney, superintendent of construction with G. E. Swett Co.; Sidney Scott, Western Pipe & Steel; C. M. (Dad) Le Count and Hughes Ogilvie of General Electric Co.

Head table for February meeting: J. B. Brogan, pres. of Pacific-American Shipowners Assn.; Frank P. Foisie, pres. of the Waterfront Employers' Assn.; Guest Speaker Gregory Harrison; Joseph J. Geary, pres. of Propeller Club; Albert W. Gatov, Carroll F. Reeves, Lewis A. Lapham and K. C. Tripp.

NEED FOR CONCERTED ACTION TOLD

The need for cooperative action by the shipping industry in the fields where their interests are mutual and non-competitive was stressed by Barrister Gregory Harrison in his talk "What Lies Ahead for American Shipping" at the San Francisco Propeller Club in February.

Harrison defined these fields as those of public, government and labor relations in a meaty talk which presented the problems—and a few advantages—of the present situation.

Among the latter are those of public sentiment in favor of foreign trade and a strong merchant marine, and the government's orderly approach to ship disposition.

He closed by pointing out that Pacific Coast shipping has been a leader in common approach and its future lies in the continued exercise of cooperative action.

President Joe Geary introduced the new members for February: Ralph E. Crosby, chief electrical draftsman, Bethlehem Steel Co., Shipbuilding Division; Richard D. Karr, chief, technical section, War Shipping Administration; Lt. Comdr. Kenneth R. Madison, USNR, faculty advisor for Propeller Club, U. S. Merchant Marine Cadet School, San Mateo, California, and W. J. Williams, superintending engineer, Matson Navigation Company. Former members reinstated after tour in the service were: Oscar J. Beyfuss, Ship's Agent; and George P. Bradford, De La Rama Steamship Company.

Left to right: Gregory Harrison, Joseph J. Geary and Albert W. Gatov.

Pacific MARINE REVIEW

NEWS FLASHES

NEW 650 ft. PASSENGER AND CARGO VESSELS READY FOR BIDDING.

The Maritime Commission has called for bids to be opened on April 15, for three 650 ft. twin screw turbine-driven passenger and cargo vessels of the Commission design P3-S2-DL1. These ships are intended for the American Export Lines' Mediterranean trade and will have a speed of 22 knots. The bid opening was originally planned for March 18, but is now scheduled as above.

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BID OPENING SCHEDULED FOR 670 ft. PASSENGER LINERS.

On April 25, the Maritime Commission will open bids for two 670 ft. twin screw turbine-driven passenger liners of the Commission design P3-S2-DA1. These ships are intended for the East Coast South American route and will have a speed of 28 knots. These liners will be the fastest merchant vessels ever built in the United States. The bid opening was originally scheduled for March 28th.

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QUALIFICATIONS FOR BIDDERS UNDER MARITIME COMMISSION PROCEDURE.

The Maritime Commission may require information of any kind it deems material in deciding a bidder's qualifications and responsibility. He must possess the ability, experience, financial resources, and equipment necessary to properly perform the contract. Bids must be accompanied by a guaranty in the sum of $50,000. to assure the execution of the contract and the surety bonds required thereunder. No bids may be withdrawn after they have been opened.

Use of Government owned shipyards.

In cases where the shipyard is entirely government owned, the value of its use will be deemed to be 3½% of the bid price. In the event that the shipyard facilities are partially government-owned, the number of shipways built or rebuilt at government expense will be the determining factor. However, any shipways that will be in excess of the bidder's needs after August 30, 1946, may be excluded. The status of all yards was determined on February 18, 1946, and will be published in the Federal Register at least five days prior to the opening of bids.

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SUN SHIPYARD LOW BIDDER ON ORE CARRIERS.

The Sun Shipbuilding and Drydock Company was low bidder for the proposed construction of four 560 ft. single screw turbine-driven dry bulk cargo vessels, 16 knot speed, type C5-S-AX1, designed for use of the Ore Steamship Corporation, New York. Bidding was as follows:

Sun Shipbuilding and Drydock Company,	$4,748,000, delivery in 390, 420, 450, and 480 days.
Bethlehem-Sparrows Point,	$4,900,000, delivery in 260, 305, 395, and 456 days.
Newport News Shipbuilding Company,	$6,750,000, delivery in 420, 465, 510, 555 days.

DIESEL POWER SURPASSES STEAM ON INLAND RIVERS.

During the year 1945 Diesel propulsion which started from scratch barely 20 years ago surpassed steam on the Nation's 13,000 miles of inland waterways. As of December 31 last, 60% of the total available h.p. on the 1125 vessels principally engaged in shallow water commerce was Diesel. New vessel construction has been very largely Diesel and most power replacement programs have been in the same category.

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MATSON BUYS PLANE FOR HAWAII FLIGHTS.

A four-engined Douglas DC-4 airplane, soon to fly between the Pacific Coast and Hawaii chiefly in connection with Matson's air transport division in San Francisco has been purchased by the Matson line. The air transport division is now converting and overhauling various aircraft for civilian use and a company plane is necessary for transporting personnel and equipment where time and speed are important.

* * * * *

PRIVATE VESSELS MAY SOON CARRY ARMY AND NAVY CARGO.

The War Shipping Administration's policy and that of the Maritime Commission is to return to private operators as fast as possible, and in so far as possible, all ocean freight movements. Since the Army and Navy will probably have returned nearly all merchant type vessels operated by them during the war period back to WSA by July 1, 1946, it appears likely that a high percentage of all Army and Navy cargoes will be handled by private vessels after July 1.

* * * * *

U.S. TO IMPORT 5,000 BALES OF JAPANESE RAW SILK.

The RFC announced on March 8, that it would bring 5,000 bales of Japanese raw silk to this country shortly and follow with regular shipments as soon as possible. The U. S. Commercial Corporation, RFC subsidiary, will import the silk under arrangement with General MacArthur and the War Department, and sell it in this country under sealed bids.

* * * * *

MOORE DRY DOCK COMPANY GETS BIG CONVERSION JOB.

Contracts for the reconversion of the troopship General M. C. Meigs and General W. H. Gordon have been awarded to the Moore Dry Dock Company of Oakland. The Yard's bid was $454,382. for the two vessels, which are of the P2-S-2-R2 type. The ships will be used on the Oriental run by the American President Line. The transports were built by the Federal Shipbuilding Corporation of Kearny, New Jersey, and accommodated 5,000 troops. They are 622 feet in length, 75 feet beam, and have a speed of 20 knots. Tonnage is 5,000 deadweight. These will be the first large passenger liners to be turned back to West Coast private operators.

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BIG HARBOR JOB AT SAN DIEGO.

The Army Engineers have completed their recommendation for a flood control and navigation project at Mission Bay, San Diego, that will total $14,680,000 figured on a pre-war basis. The job involves flood control improvements on the San Diego River, alteration of a railroad bridge, construction and alteration of highway bridges, utility relocations, and drainage structures. Navigation improvements in Mission Bay include dredging, filling, stone jettys, levees, small craft moorings and floats, removal and construction of highway bridges, sheet pile bulkheads, and land acquisition.

The project will be charted and described further in the May Pacific Marine Review.

BIDS OPENED ON RECONVERSION OF PRESIDENT POLK.

On March 25, the Maritime Commission office in San Francisco opened bids for the reconversion of the American President Line's round-the-world liner President Polk. Low bidder was the United Engineering Corporation followed by Todd's Los Angeles yard, Moore Dry Dock Company and Bethlehem's local yard. There were various conditions attached to some of the bids and the award will be made in Washington.

A second APL pre-war round-the-world vessel will be up for bids during April. This is the President Monroe. Both the Polk and Monroe are C3 type vessels and will be used on the Orient run from San Francisco.

* * * * *

AMERICAN PRESIDENT LINES ROUND-THE-WORLD SERVICE.

The famed round-the-world service inaugurated by Robert Dollar will consist of freighters only, for the next several years. C4 type of vessels will be used. The P2s, C2s and prewar C3s will be used in APL's other services.

* * * * *

NEW CEILINGS FOR SHIP CHANDLERS.

Dollar and cent ceiling prices, exactly as requested by WSA, have been established for sales by ship chandlers to vessel operators by the OPA. The ceilings, which were effective March 25, are listed for 75 different commodities, or groups of commodities, and include most of the items sold by ship chandlers to merchant vessels for subsequent resale to vessel personnel.

* * * * *

FIVE HUNDRED LEASED SHIPS RETURNED BY WSA.

Over five hundred vessels under charter to the WSA during the war have been returned to their owners here and abroad. A report of the division of re-delivered chartered vessels shows 322 tankers, five passenger ships, three barges, one cable vessel and 171 dry cargo ships. The reason for the preponderance of tankers lies in the fact that their return began last Fall.

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FIFTY LIBERTY SHIPS TO ITALY.

The Italian Government has announced that its Trade Mission in the United States has arranged for the purchase of 50 Liberty ships from the Maritime Commission for a total of $24,000,000.

* * * * *

JOSHUA HENDY BUYS WAR BUILT FACILITIES AT ITS PLANT.

Subject to the approval of the War Assets Corporation, the Maritime Commission has approved the sale to the Joshua Hendy Iron Works, Sunnyvale, California, of all government-owned war built facilities at its Sunnyvale plant.

The Commission will accept the Hendy offer of $565,500, pay a $2,925,000 mortgage held by the Commission and assume all the Commission's liabilities at the plant. Government facilities there cost some $5,571,000.

The Hendy Company built power equipment for merchant vessels during the war and made many specialized military devices.

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BRITAIN'S LAUNCHING RECORD.

Cargo liners are being launched in Britain's shipyards at the rate of one a week. By the end of the year, one a day will be gliding down the ways. The all-welded construction used on many U. S. vessels has been rejected in England in favor of the normal riveting and part-welding.

SWEDISH-AMERICA LINE ORDERS LORAN UNITS.

An initial commercial order for 17 electronic long range position finders capable of a navigational "fix" in from two to seven minutes under any weather conditions at off-shore distances of from 750 to 14,000 miles has been placed by the Swedish-America line with the Sperry Gyroscope Company.

* * * * *

TUGS FOR HAWAII.

The Hawaiian Pineapple Company has awarded contracts for the construction of two 145 ft. ocean going tugs to the Bath Iron Works Corporation. The vessels will be used in transporting fresh pineapples from the plantations on the island of Lanai to Honolulu, an 80 mile haul, and will also be equipped to handle all types of heavy duty deep-sea towing. They were designed by W. C. Nickum and Sons, naval architects of Seattle.

* * * * *

PACIFIC COAST SHIPYARDS LED COUNTRY IN 1945 PRODUCTION.

As in each of the war years, the Pacific Coast shipyards completed in 1945, the largest percentage of the total number and tonnage of merchant vessels built by all yards throughout the country, finishing 454 vessels of 3,485,000 gross tons. Atlantic Coast yards delivered 324 vessels of 2,533,000 gross tons, Gulf yards 235 vessels of 1,439,000 gross tons and Great Lakes yards, 54 vessels of 205,000 gross tons, all of which were of the Cl-M Diesel-propelled type. For the fourth successive year the State of California led the country in producing merchant vessels, turning out 330 or almost 1/3 of the total completed in the United States. The State of Oregon was second with 111 vessels. The large merchant ships completed in 1945 were produced by 39 shipyards.

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TABULATION OF PROPELLING MACHINERY IN 1945 PROGRAM.

The types of propelling machinery installed in merchant ships of over 2,000 gross tons in 1945 were as follows:

Geared turbine	492	ships	3,811,450 h.p.
Turbo-electric	188	"	1,424,980 h.p.
Reciprocating	147	"	366,000 h.p.
Diesel	214	"	361,950 h.p.
Total	1,041	"	5,964,380 h.p.

The h.p. of propelling machinery installed in large merchant ships during the 7 war years totalled 23,073,558. Almost one-half of this total is made up of geared turbines amounting to 10,459,340 shaft h.p., followed by turbo-electric which totalled 7,108,500.

* * * * *

NEW DRY DOCKS AT SEATTLE.

The Puget Sound Bridge & Dredging Company of Seattle is reported to be planning the construction of four dry docks for ship repair work at an estimated cost of $5,000,000 for its own account.

* * * * *

JAPS LAUNCH TRAIN FERRY.

A 4000 ton train ferry, the first Japanese ship to be launched since the cessation of hostilities, has been launched in the Port of Uraga with 8th Army representatives on hand to witness the event.

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C & H SUGAR REFINING CORP. TO BUILD AT LOS ANGELES.

The California & Hawaiian Sugar Refining Corp. has acquired 5 acres in Los Angeles for the ultimate installation of a sugar refinery. Temporarily a distribu-

tion station for tank truck delivery of liquid sugar products will be established. W. R. Junk will manage the plant.

* * * * *

SHIPYARDS TO BE RETAINED BY NAVY AND USMC.

The Surplus Property Administration in its recommendation to Congress asked that 13 privately-owned yards and 29 additional new units be retained in working order for purposes of National Defense.

The Navy plans to hold in commission 25 new yards, and facilities belonging to the government in twelve private yards. The Maritime Commission plans to retain 4 new yards, and facilities in one privately-owned yard. With this program the Surplus Property Administration is apparently in accord.

* * * * *

MARITIME COMMISSION ESTABLISHES RESERVE FLEET DIVISION.

The Reserve Fleet Division of the Maritime Commission is announced to have charge of the acquisition and maintenance of all vessels not needed in the operation of the post-war merchant marine but required by national security. Its functions will be those of a like division of the War Shipping Administration, and also include the handling of all matters relating to survey, acquisition, development and maintenance of sites where vessels are placed in temporary or permanent reserve fleets.

The acting director of the new division is Frank E. Hickey; assistant director is Ernest W. Gorman.

* * * * *

NEW COMPANY IN VANCOUVER.

Western Canada Steamships Ltd. is a four-company shipping organization being formed in Vancouver, B. C., to purchase a fleet of 12 to 20 freighters. The firm will operate on deep sea lanes in general British Columbia trade. The vessels are of the Canadian and Victory types, 10,000 tons, and will cost $575,000 each.

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ALUMINUM SHIPS.

The Aluminum Company of America is reported to have placed orders with two naval architects in New York for the design of two all-aluminum vessels for Alcoa's Caribbean service.

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SHIPYARDS IN NON-MARITIME WORK.

Although all operating shipyards have or will soon have backlogs of repair and conversion work that will carry them for from one to five years, some yards are proceeding to develop departments for handling non-maritime business. Bethlehem and Consolidated in California have elaborate programs in structural steel production and so have many others. An announcement is just made from the Moore Dry Dock Company, Oakland, that long standing orders for industrial work of all types may now proceed. In addition to steel for bridges and buildings the company specializes in roll grinding, roll corrugating, mill and coffee rolls and roller bearing barley mills. Ingalls is going in for Diesel electric locomotives; and many yards have plans for reaching foreign buyers of industrial equipment, as well as for ships, barges and smaller craft.

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REMITTANCES ABROAD ARE INCREASING.

During 1945, Americans and foreigners residing in the United States made remittances estimated at more than $300,000,000 to friends and relatives abroad, chiefly in Europe, Latin America and China, and the prospect is that these remittances will increase sharply in the next few years. This will be good news for foreign traders for it sets up an exchange balance that will aid the export market.

Before the war in 1939, such personal remittances of a non-commercial nature totalled $144,000,000, but they dropped to a new low of $100,000,000 in 1942.

* * * * *

TUGS FOR RUSSIA.

The Marietta Manufacturing Company, Point Pleasant, West Virginia, has a contract for construction of 6 steel ocean going tugs for the USSR. Each tug is to be 140 ft. long, 32 feet beam and 18½ feet deep with Skinner Unaflow marine steam engine developing 1200 h.p.

* * * * *

FRENCH SHIPS ORDERED IN VANCOUVER.

The Burrard Drydock Company, Vancouver, B. C., has a contract for construction of ten large coal carrying ships for the French Government to cost between twelve and fourteen million dollars. Five vessels are to be of 7500 tons and five of 5000 tons.

* * * * *

FRENCH ORDER DIESEL TRAWLERS.

The Bath Iron Works has a contract from the French Government for 32 Diesel propelled trawlers. Twenty of these are to be 117 ft. long, 22½ ft. beam and 12 ft. 9½ in. deep, with Burmeister and Wain Diesel engines developing 450 h.p. Six trawlers are to be 223 ft. long, 38½ ft. beam, and 20 ft. 8 in. deep, with Burmeister & Wain Diesel engines developing 1100 h.p. Six trawlers are to be 152 ft. long, 27 ft. beam and 15 ft. 5 in. deep. These will have De La Vergne (Baldwin Locomotive) Diesel engines developing 750 h.p.

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ALUMINUM ORE CARRIERS.

Gibbs & Cox, New York, are reported to be preparing plans for 3 aluminum-ore-carriers 350 ft. long, for the Aluminum Company of America.

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UNITED FRUIT.

The United Fruit Company is planning the construction of two passenger cargo ships with accommodations for 125 passengers. These are in addition to nine cargo passenger ships now under construction in the Bethlehem Sparrows Point Shipyard. The two new vessels are reported to be planned for 6400 deadweight tons and a 19 knot speed.

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CANADIAN NATIONAL STEAMSHIP COMPANY.

Plans are in preparation by a Pacific Coast naval architect for two new ships for the Canadian National Steamship Company, Vancouver, for service between Victoria, Vancouver, Prince Rupert and Skagway. It is possible that the ships may be built in Pacific Coast yards but the Canadian Minister of Transport said that the cost would be 35% to 40% higher than in Great Britain and construction of the Pacific Coast would depend on the obtaining of a government subsidy to take care of the difference.

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MARINE PAINT EXCLUDED FROM LINSEED OIL QUOTA.

The Secretary of Agriculture announces an amendment to War Food Order No. 42a that has the effect of excluding from the distribution quota all linseed oil used in marine paints when such paint is to be delivered to the Maritime Commission or W.S.A. The manufacturer must claim the exemption however on Form FDO 42-4.

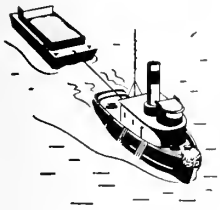
The supply of linseed is still tight. This week a representative of the Department of Agriculture now in Buenos Aires purchased for the United States the entire exportable surplus of Uruguay - some 4,000,000 bushels of linseed - which amounts to about 1300 tank cars of oil.

He is also expected to get a good share of the 25 to 30 million bushels available in Argentina. Other nations will participate in the Argentina distribution, however.

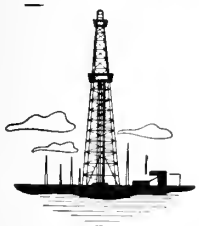
Cordage FOR EVERY PURPOSE

MANILA ROPE — **The availability of "AMERICAN BRAND" PURE MANILA ROPE in the immediate future, will depend upon (1) government restrictions which may exist, such as CPA Order M-84 and (2) the amount of first grade Manila fibre obtainable. As long as our output of "AMERICAN BRAND" PURE MANILA ROPE is limited, we will distribute what we have just as fairly as possible.**

Ship's Cordage is made with careful manufacturing attention to the specific requirements of the ultimate use, a fact responsible for the wide preference for "AMERICAN BRAND" ROPE.

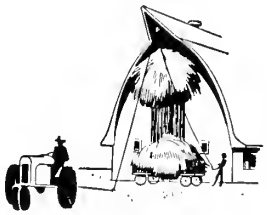


"AMERICAN BRAND" Tow Lines and other work boat cordage are made from long experience in deep sea, harbor and inland waterway requirements. Large quantities of "AMERICAN BRAND" ROPE are bought by fabricators for conversion into bumpers, nets, slings and ladders.



In the oil fields, "AMERICAN BRAND" is the accepted standard of top-quality in Drilling Cable, Crackers and Spinning Lines. In all industry, "AMERICAN BRAND" is the guide to quality cordage.

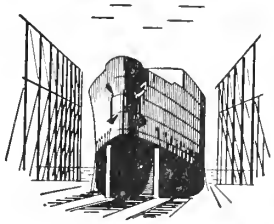
Twines of every description both hard and soft fibre and polished, are produced under "AMERICAN BRAND." For express packages, bundling of all kinds . . . for office, store, or home, "AMERICAN BRAND" TWINES are always uniformly strong...always dependable.



For farm and ranch use, "AMERICAN BRAND" ROPE provides exceptional resistance to heat, moisture and abrasion. It is ideal for haying. Lariat Rope is a specialty.

Lumbering is but one of many rugged industries which place heavy responsibility on cordage. "AMERICAN BRAND" ROPE is made to rigid requirements for materials and workmanship. You can count on its being top quality always.

"AMERICAN BRAND" fisherman's cordage has received special attention to assure maximum service life in spite of the repeated salt water soakings and drying out in wind and sun.



Shipbuilding and ship repair work consumes enormous quantities of "AMERICAN BRAND" Marine Oakum and Marline, as well as Rope. Industrial contractors use "AMERICAN BRAND" Plumbers Oakum and Twisted Jute Packing for sealing the joints in water and gas mains.

AMERICAN CORDAGE PRODUCTS

A COMPLETE LINE

ROPE
TWINE
OAKUM
PACKING

"AMERICAN BRAND" ROPE, TWINE, OAKUM and PACKING are nationally distributed from strategically located mills and jobbing houses, to promptly provide dealers with every type of cordage their customers need. It's convenient and economical to buy all your cordage from one source.

AMERICAN MANUFACTURING COMPANY, BROOKLYN 22, N. Y.

Branch Factories: **ST. LOUIS CORDAGE MILLS, ST. LOUIS 4, MO. • DELAWARE RIVER JUTE MILLS, PHILADELPHIA 48, PA.**

Sales Offices BALTIMORE • BOSTON • CHICAGO • HOUSTON • NEW ORLEANS • PHILADELPHIA

Head table—Left to right: Dick Walcott, United Engineering Co.; Captain Hunter of General Steamship Corporation; guest speaker Ray Winquist, General Steamship Co. and Fletcher Manson of General Engineering and Dry Dock Co.

"THE SHIPPING OUTLOOK"

Gleanings from the address of R. V. Winquist, vice president of General Steamship Company, in his talk before the Mariners Club of San Francisco on March 6:

"The post-war situation in shipping is presenting many a headache. We have under the American flag nearly half of the world's tonnage and about three times as much as we had before the war. In 1939 there were 75 million tons in the world – 11 million tons under the American flag. Today there are about 95 million tons – 55 to 60 million tons under the American flag. We have increased our shipping by five times, while the rest of the world has lost about one-half. It is not a very healthy picture.

"Before the war we handled 30% of our overseas trade with 3,300,000 tons; to handle 50%, as urged by many, it is estimated that we shall need 5½ million tons. After allowing for domestic operation, we have to absorb 9½ million tons in overseas trade if we reach the 16 million tons total. This 50% goal seems beyond reach in the trade between the Pacific Coast and Europe.

"The Ship Sales Bill provides for sale of all ships to and operation by private interests. They will be first sold to Americans on easy terms and the leavings in ships to be available to foreigners. It has been estimated that we can sell between 7 and 12 million tons to our allies.

"There will be plenty of shipping in the post-war world. British and other European yards are already busy turning out specialized types. And there are nearly 4600 ships available for sale. No matter how they are divided between American and foreign buyers, it is evident that our foreign trade transportation needs will be provided."

Above—At end of table: Joe A. Benoit, Marine Instrument Company; Charles Halpern, West Coast manager, Gotham Instrument Company; G. O'Toole, Matson Construction and Repair, Purchasing Department; and C. H. Peabody, Marine Instrument Company.

Head table guests—Dick Glissman, Frieda Salzman, Red Cross guest; Captain Raymond Demarest, S. Christy, and Felix V. Billig.

Bon Voyage

WITH THIS G-E CREW ABOARD

The G-E Line of Marine Refrigeration Equipment Includes:

Marine Compressors and Condensing Units
Freon-12 Condensers and Receivers
Cooling and Heating Coils
Direct Expansion Coils
Self-Contained Storage Cabinets
Remote Storage Cabinets
Conditioned-Air Cooling Units
Drinking Fountains and Water Coolers
Air-Cooled Condensing Units
Refrigeration Controls
Co-ordinated Marine Equipment

LEADING MARINE ENGINEERS and ship builders take no chances with refrigeration failure.

The ships they design and build steer clear of cargo spoilage or discomfort to passengers and crew. More and more ship specifications call for G-E refrigerating equipment . . . Navy-proved under the most severe conditions.

G-E equipment is available for every maritime refrigerating and air conditioning need. Write today giving details of your specific problems. We'll be glad to help. *General Electric Company, Air Conditioning Dept., Section 6594, Bloomfield, New Jersey.*

GENERAL ELECTRIC

Marine Refrigeration

A SHIPPING COMMISSIONER'S LEGAL BASIS

As early as 1790 the First Congress of the United States enacted a law requiring the master of every vessel bound on a foreign voyage, and of every vessel of 50 tons burden or upward bound from a port in one State to a port in any other than an adjoining State, to make a written agreement with each member of his crew declaring the nature and duration of the voyage.

Later it was found that seamen needed additional protection from the risks of being carried on long voyages without fair agreements, and in 1872 an act was passed, patterned after the British law which had been in effect for about 18 years, providing certain minimum particulars which the agreements, or articles, for foreign voyages were required to contain, and providing for the supervision of certain matters relating to the agreements by a Government official called a shipping commissioner. The law authorized the appointment of a shipping commissioner for each port of entry which is also a port of ocean navigation, and specified five general duties of a shipping commissioner, only two of which remain important today because of changed conditions. They are: (1) to superintend the engagement and discharge of seamen in the manner prescribed by law, and (2) to perform such other duties relating to merchant seamen or merchant ships as may be required by law.

Under existing law the crews of vessels bound on foreign voyages, other than those to the British North American possessions, the West Indies, or Mexico, and the crews of vessels of the burden of 75 tons or upward bound on intercoastal voyages, sign the required agreement with the master in the presence of a shipping commissioner. It is the duty of the shipping commissioner to see that each seaman is made acquainted with and understands the conditions of the agreement and that he does not sign it involuntarily or while intoxicated.

In the case of agreements signed before a shipping commissioner the law declares that the agreement must be, as near as may be, in the form which is set out in the law and requires certain particulars which the agreement must contain.

The agreement must state the nature and, as far as practicable, the duration of the intended voyage or engagement and the port or country at which the voyage is to terminate. This requirement has been waived during the war, however, provided a certain standard general description is used. The agreement must also describe each crew member and specify his employment, give the time at which each seaman is to be on board to begin work, state the capacity in which each seaman is to serve and the amount of wages which he is to receive.

A scale of the provisions to be served to each seaman must be included in the agreement. The form of agreement incorporated in the law specifies a minimum scale, although a higher scale could be used if agreed upon by the master and crew.

The parties to the agreement may also agree to adopt regulations as to conduct on board, and as to fines, short allowance of provisions, or other lawful punishment for misconduct, which may be sanctioned by Congress or authorized by the Secretary of Commerce not contrary to or not otherwise provided for by law.

Any stipulation in reference to advance and allotment of wages must be entered in the agreement, and other matters not contrary to law which are agreed upon may also be entered.

Shipping commissioners may ship crews for vessels in the coastwise trade, and other trades for which crews are not required to be signed on before a shipping commissioner, if requested to do so by the master or owner of the vessel. In the event a shipping commissioner does sign on a crew for a vessel in one of those trades, the same rules apply as when a crew is shipped for a foreign voyage, except that the agreement does not include a scale of provisions, stipulations in reference to advance and allotment of wages, and other matters not specifically required by law.

By statute it is made lawful for any seaman to stipulate in his shipping agreement for an allotment of any portion of the wages he may earn to certain specified allottees. No allotment, however, is valid unless made in writing and approved and signed by the shipping commissioner. It is the duty of the shipping commissioner to examine all allotments and the parties to them and to enforce compliance with the laws governing them.

Every seaman shipped before a shipping commissioner must also be discharged and receive his wages before a shipping commissioner if he is discharged in the United States. Upon completion of the discharge and settlement the master or owner and each seaman are required to sign a mutual release of all claims for wages on the past voyage, and the shipping commissioner must also sign and attest the release provided both the master and seaman assent to the settlement, or it has been adjusted by the shipping commissioner.

Upon the discharge of any seaman and payment of his wages, the shipping commissioner is required to enter in the seaman's continuous discharge book, or in a certificate of discharge if the seaman carries a certificate of identification instead of a continuous discharge book, a record of the length of employment on the particular voyage. The record contains a short description of the vessel and voyage and the name and rating of the seaman but must not contain other entries.

It is also provided by law that every shipping commissioner shall hear and decide any question whatsoever between a master, consignee, agent or owner and any member of his crew which both parties agree in writing to submit to him. Awards made thereunder are binding in any later legal proceedings.

Whenever any seaman belonging to or sent home on any merchant vessel engaged on a voyage which is to terminate in the United States dies during the voyage, the master takes into possession his effects. If the first port touched by the vessel is a port in the United States, the master must deliver the effects and wages due the deceased to the shipping commis-

(Proceedings Merchant Marine Council, United States Coast Guard.)

sioner, together with an account in the form which the shipping commissioner may require. It is the duty of the shipping commissioner to examine the account, and if the applicable provisions of law have been complied with, to grant the master a certificate to that effect. Within 1 week after receiving the effects of a deceased seaman the shipping commissioner is required to deliver them to the district court for distribution.

The effects and wages of deserting seamen are forfeited by law, and the procedure for their disposal is somewhat the same as that for the effects of deceased seamen. The master delivers the effects and the balance of the wages after the expenses occasioned by the desertion are paid to the shipping commissioner in the port at which the voyage terminates. It is his duty to account for and pay over the balance to the district court within 1 month after its receipt.

Fog Dispersal Burner

The development of a new type of burner for the dispersal of fog on airfields, using diesel fuel oil instead of more expensive low octane gasoline, was recently announced by the Babcock & Wilcox Company, exclusive designers of the equipment.

The company's system, recently demonstrated to the public for the first time at the Naval Auxiliary Air Station at Arcata, Calif., has far-reaching implications for the future of "FIDO" (Fog, Intensive, Dispersal, Of) both for the Army and Navy, and the commercial airlines. In addition to burning cheaper fuel, the new system represents several other improvements over earlier equipment, which was developed largely in England, where in 1943-44 it helped keep allied bombers in non-stop operation and saved many lives and planes that would otherwise have been lost due to intense fog. The firm of Babcock & Wilcox, Ltd., of London, England, was responsible for the development and construction of one of the early British burners.

The B & W system was developed in this country. Its burners may be installed with a minimum of disturbance to the existing airfield and a minimum of obstruction to aircraft operating on the field. Instantaneous combustion or rapid stopping of burner operation can be achieved, since the burners are ignited electrically at will from the control tower. Furthermore, the ignited burners burn with a bushy flame of an intense heat with complete combustion, and give off a minimum of smoke while in actual operation or in starting up or shutting down.

Another important feature of the B & W system is that it atomizes rather than vaporizes the fuel to prepare it for proper combustion. Drawing on a large background of experience in the development of oil burners for Navy and marine boilers, the company carried on careful experiments and developed an atomizing nozzle which operates equally well with diesel oil or higher grades of fuel, less atomizing pressure being required as the grade of fuel is improved. When diesel fuel is forced through the nozzle at pressures of 1000 to 1500 pounds per square inch, the oil burns with a clear flame. Since no preheating or vaporizing is necessary, the flame can be lighted as quickly as the fuel supply valve can be operated. Unlike the vaporizing burners, the system does not require concrete troughs or anchorages, thus simplifying installation problems. The nozzles, small steel tubes, are buried almost flush with the ground and require only simple bar guards for protection. By using combinations of various types of nozzles a wide range of thermal capacities can be obtained.

Arcata Airfield, about 350 miles north of San Francisco on the Pacific Coast, was chosen for experimental purposes because of severe fog conditions, weather data having shown the section to be one of the worst fog-bound places in the world, with fog rolling in and out several times during the day with very little notice. The installation at Arcata consists of a pumping unit with capacity of 840 gallons per minute of diesel oil at 1500 pounds per square inch pressure. This pump supplies fuel to a row of burner nozzles so arranged that fuels can be burned at various capacities to develop up to nine million British thermal units per hour per yard of runway length.

A Positive Waterproofer

Out of America's wartime laboratories emerges another miracle product. This one is of special interest to the marine field. It is Soldine V-110, a positive waterproofer, weatherproofer and preserver of fabrics. It's the answer to the mariner's desire for a formula that will keep precious water in fabric containers—that will make protective fabrics absolutely waterproof. It is the "This far and no farther!" for every wave that previously swept past a weather cloth.

From canvas canoe to ocean liner, marine uses for Soldine V-110 are universal. Its potentialities are limited only by number of articles that the water-sportsman, yachtsman, or ocean-going fleet owner has to waterproof.

Water—and its offspring, moisture, rot, mildew—has now been met and conquered by the use of V-110 on hatch covers, lifeboat covers, storage tarps, canopy and side curtains, canvas life preservers, weather cloths, sailboats and storage tops. Soldine Corporation of Evanston, Illinois, working with chemists from Northwestern University, is responsible for the development of this versatile formula.

Supplying water to our troops for drinking, cooking and other battle needs, often presents great difficulties. Out in the South Pacific it was necessary to obtain water from muddy streams and rivers, even from the salty ocean, or trek it through dense jungles, over tortuous mountain trails. Then the water had to be distilled and stored. An unforeseen difficulty arose in the matter of storing the water. Canvas tanks of 3000 gallons capacity were originally designed for this purpose but the supposedly waterproof canvas of these tanks could not withstand the water pressure of 5 psi, plus the punishment of continual folding, rolling and packing. The canvas would leak, crack and peel. Numerous ways were tried to overcome the obstacle, but to no avail, until Soldine V-110, barely out of the laboratory, was applied to the tanks and did the trick. This was also found applicable to the impregnation and waterproofing of airplane cloth. All branches of the service found many and equally impressive uses for this new material.

As wartime assignments decrease V-110 will be released, in gradually increasing quantities, to the civilian market.

Thomas Coakley elected president of the Board of State Harbor Commissioners.

Coakley Head of Harbor Commission

Thomas Coakley was elected president of the Board of State Harbor Commissioners at a meeting of the board in San Francisco. He succeeds G. W. Mailliard, Jr., who resigned the post in order to serve as Finance Committee chairman in Governor Earl Warren's campaign for re-election.

Coakley is a member of the San Francisco law firm of Littler, Coakley and Lauritzen and has been a member of the Harbor Commission since May, 1943. Previously, he served as a deputy attorney-general of California under Earl Warren.

Other members of the board are W. G. Welt and N. Loyall McLaren. McLaren was recently appointed to fill the vacancy created by the resignation of Mailliard.

Vice President Appointment

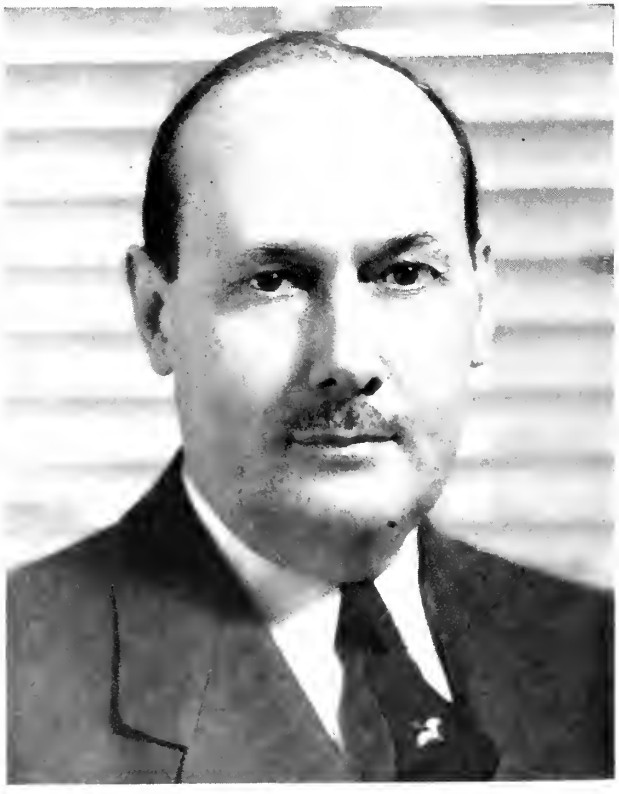
Nordberg Manufacturing Company, through its President, Robert E. Friend, on February 25th announced the election of F. H. Kilberry to the position of executive vice president and director, to fill the vacancy created by the resignation of C. E. Stryker, who has been associated with the company since 1940 in the capacity of vice president and assistant to the president.

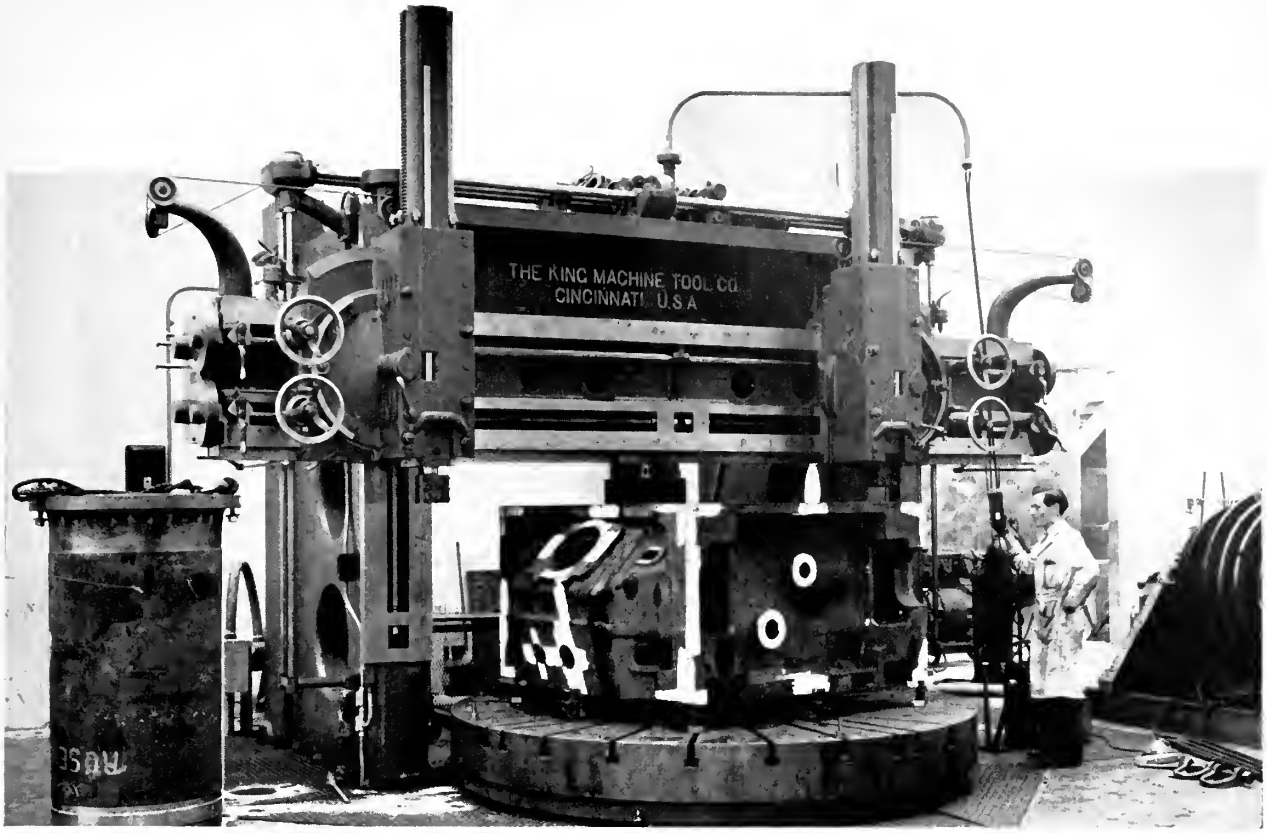
Mr. Stryker has been elected president of the Adel Precision Products Corp., of Burbank, California, and will assume his new position on March 1, 1946.

F. H. Kilberry has been identified with capital goods industries since 1920. In 1928 he became associated with Atlas Imperial Diesel Engine Company of Oakland, California. He was appointed assistant to the president and a director of that company in June, 1929, and in 1930 was appointed general manager. In 1932 he was elected vice president and general manager, and served in that capacity until his election to the presidency in 1938.

Under his management Atlas Imperial Diesel Engine Company developed from a West Coast operation to a position of international prominence in the smaller heavy duty Diesel engine field. Domestic activities were expanded to include an eastern plant at Matoon, Illinois, and four wholly owned sales and service subsidiaries located in New York, Seattle, Washington, Houston and Vancouver, British Columbia.

F. H. Kilberry, executive vice president of Nordberg Manufacturing Company.





King vertical boring mill with a 10-foot table working on a 5-ton upper cylinder head for the MS John Ericcson. The machine has two tool arms, which can be raised 76 inches above the table. It bores two interior, or an interior and an exterior surface simultaneously. . . . a scene in one of the shops of General Engineering and Dry Dock Corporation in San Francisco.

Continuous Service to the Marine Industry

For the past quarter of a Century

Offering the finest of facilities for new construction and complete ship repair and conversion

San Francisco . . . machine shops and pier facilities for general repairs
Headquarters: 1100 SANSOME STREET — GARFIELD 6168

Alameda . . . machinery, hull and industrial repairs — a half mile on the Estuary with —

Two Marine Railways
3000 and 5000 tons capacity

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10,500 tons capacity

Three Graving Docks
526 feet long, particularly adapted to flat bottom vessels

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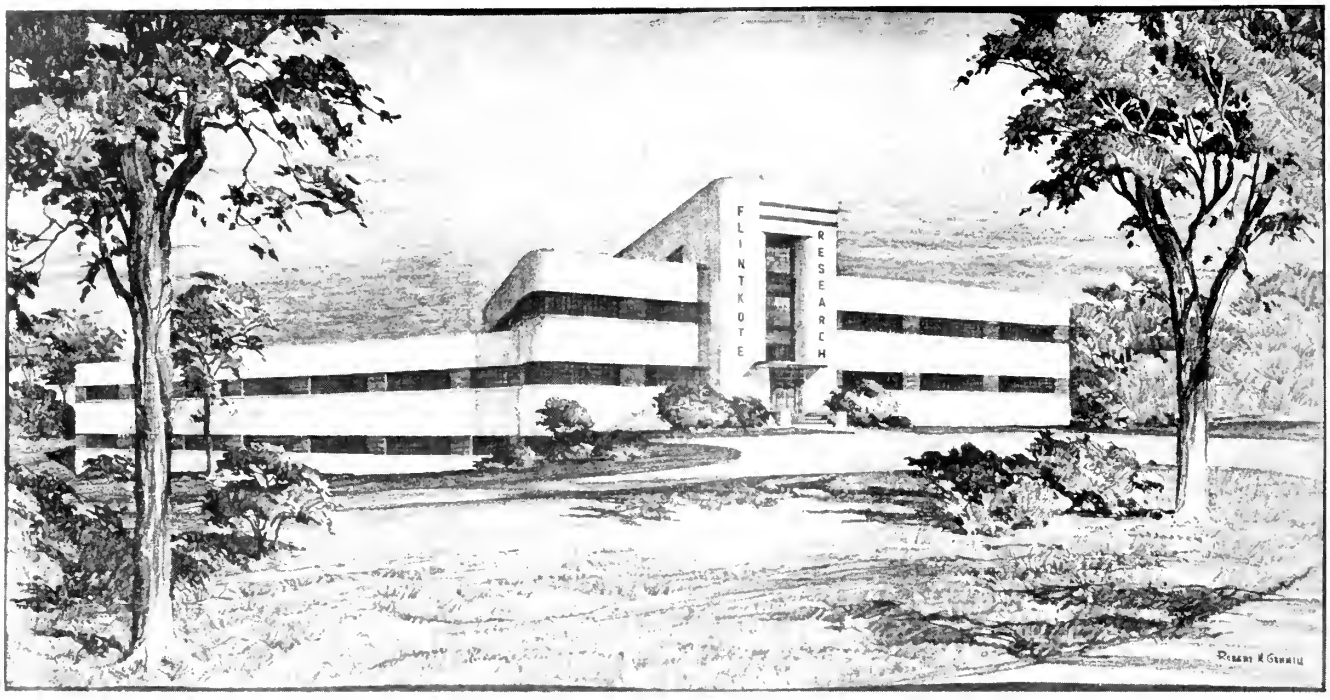
Complete 100 page book in color, showing all facilities available upon request.

GENERAL ENGINEERING *and* DRY DOCK CORPORATION

EXECUTIVE OFFICES — FOOT OF SCHILLER STREET, ALAMEDA, CALIFORNIA



Architects rendition of the Flintkote Research Laboratory at Morristown, New Jersey. The architects on this plant are Lacy, Atherton, Wilson & Davis of Wilkes-Barre, Pa.

Flintkote's New Research Laboratory and Wind Tunnel

Construction of a new research laboratory at Morristown, New Jersey, costing about $1,000,000 for plant and equipment is announced by I. J. Harvey, Jr., president of the Flintkote Company, New York. This is part of an accelerated program of product research and development and plant expansion representing a contemplated outlay of approximately $10,000,000.

Mr. Harvey also announced that a wind tunnel, believed to be the first installation of its kind by any manufacturer of roofing and siding materials, will be installed to test full-scale sections under wind velocities up to 70 miles per hour. There materials will undergo accelerated weathering tests and temperature trials, in addition to standard tests used in the industry for many years. In connection with this research an outdoor exposure farm covering 20,000 square feet in area will provide check testing under normal conditions. A companion exposure farm will be located at New Orleans to gage different climatic conditions found there. It is anticipated that sections up to full-scale home and farm structures will be tested at these exposure farms.

USMS-Radar and Electronics School

In keeping with its declared policy of maintaining an adequate supply of trained and efficient merchant marine personnel in all categories, and in recognition of the rapid adoption of radar and other electronic aids to navigation by the shipping industry, the U. S. Maritime Service has established a Radar and Electronics School at Sheepshead Bay, New York, it was announced by Captain H. J. Tiedemann, USMS, Pacific District Operations Officer at San Francisco.

Radio operators holding second grade radiotelegraph licenses or higher who have served a minimum of two years as radio operators in the Merchant Marine subsequent to December 7, 1941, and who are willing to remain at sea for at least one year upon completion of training, will be eligible for an 8-week course in maintenance and servicing of radar and such additional electronic adjuncts to safe and efficient vessel operation.

USMS Officer Assigned to Post

Following a career at sea and on the West Coast, Commander Stuart L. Patton, USMS, is busy preparing for his new duties as officer in charge, Training Aids Unit, U. S. Maritime Service Training Station, New York. He plans to be at his new task April 1, 1946.

It was on December 11, 1941, that Patton enlisted in the Coast Guard. He served in the public relations unit of the Coast Guard for about nine months.

On September 1, 1942, Patton became officer in charge of the United States Maritime Service Center. In September 1, 1944, then a lieutenant commander, he assumed the duties of executive officer for the Pacific District operations office of the USMS. This position he has held until his new assignment in New York.

Harold Dabbs, S. F. Junior Chamber of Commerce; Carroll Reeves, Propeller Club; O. C. Hansen, Foreign Trade Assn. of the S. F. C. of C.; G. E. Hay, General Steamship Corp., Ltd.; Thomas A. Short, Mariners Club; Roy C. Ward, Commercial Club; Vice Chairman W. E. Martin, of Westinghouse Electric Corp.; Joseph J. Geary, president of Propeller Club; George V. Cooley, Pacific - American S. S. Assn., and Gene Haffman, advisory committee chairman.

S. F. Preparatory Meeting for the Observance of National Maritime Day

National Maritime Day on May 22 commemorates the sailing of the S. S. Savannah, first steamship to cross the Atlantic Ocean in 1819 from Savannah, Ga., to Liverpool, England. In thirteen years since the presidential proclamation by the late President Franklin D. Roosevelt, National Maritime Day has grown until today it ranks equally with Army Day and Navy Day because of the importance of a substantial merchant marine to the peacetime prosperity and wartime safety of the United States. The observance locally not only will tie-in with the national program but will stress the great amount of good which accrues to the San Francisco Bay Area from the water-borne traffic through the Golden Gate.

General chairman Hugh Gallagher, vice president in charge of operations for Matson Navigation Company heads a committee of leaders in the shipping business planning observance and has appointed key men to see that the program now being adopted for this year will be carried out.

The general committee comprises: vice chairman, W. E. "Eddie" Martin, Westinghouse Electric Corp., publicity director, Frank C. DiMarco; George V. Cooley, Pacific-American Steamship Assn.; Harold Dobbs, San Francisco Junior Chamber of Commerce; E. H. Harms, Shipowners' Association of the Pacific Coast; Arnold Larsen, United Seaman's Service; D. N. Lillevand, Waterfront Employers' Association; H. H. Pierson, San Francisco Marine Exchange; Carroll Reeves, Propeller Club; Thomas A. Short, Mariner's Club and Roy C. Ward, Commercial Club.

Hugh Gallagher, vice president of Matson Navigation Company, chairman of the San Francisco Propeller Club Committee for the Observance of National Maritime Day, May 22.

Eugene F. Hoffman, American President Lines, is chairman of the Advisory Committee, which is to be entrusted with the important task of putting the program into action. Various shipping interests of San Francisco are combining to make this year's observance outstanding.

McCormick Changes Name to Pope & Talbot Lines

Pope & Talbot-McCormick Steamship Division henceforth will be known as Pope & Talbot Lines. The change was announced March 26 by Charles L. Wheeler, executive vice president of the parent company Pope & Talbot, Inc.

The new name has been under consideration for some time and was voted recently by the board of directors in San Francisco, Wheeler said. The company's ship markings will be designated with P T in red letters on a white circle within a blue star on the funnel and a house flag of the same insignia to identify Pope & Talbot Lines.

The McCormick Steamship Company as a firm identity is an old one in shipping annals, and was acquired by Pope & Talbot, Inc., in 1935. Since that time it has been legally known as the Pope & Talbot-McCormick Steamship Division and the name change to Pope & Talbot Lines is made to correctly identify the steamship company and its parent organization.

Pope & Talbot, Inc., in four years will be 100 years old and is the oldest lumber and shipping concern on the West Coast. The company operates vessels in intercoastal and coastwise service and between Pacific Coast ports and Puerto Rico.

Vice Admiral Richard S. Edwards, USN, commandant of the Western Sea Frontier.

Western Sea Frontier Gets New Chief

The command of the Western Sea Frontier, the highest ranking naval position on the West Coast, changed hands when Admiral Richard S. Edwards replaced Admiral Royal E. Ingersoll in ceremonies at the Federal Office Building in San Francisco.

Now headed by Admiral Edwards and his staff, the Western Sea Frontier embraces a huge sea area off the U. S. West Coast, extending northward almost to Alaska, westward almost to Hawaii, and southward almost to South America.

Mare Island Moves To Vallejo Address

According to Washington newspaper reports received in San Francisco, the address of the Mare Island Naval Shipyard has been changed from Mare Island, California to Vallejo, California.

USMC Member Sworn In

Richard Parkhurst of Boston, Mass., was sworn in on February 20, as a member of the United States Maritime Commission.

Present at the ceremony were Acting Chairman **Edward Macauley**, Commissioner **Raymond S. McKeough** and Commissioner **John M. Carmody**.

The Upson-Walton Company, Cleveland, manufactures wire rope, tackle blocks, boat fittings, accessories and brattice cloth in the modern plant. Inset shows original quarters of company in 1871.

Upson-Walton Company in 75th Year Sees Greatest Period Ahead

The Upson-Walton Company, of Cleveland, celebrated its 75th Anniversary February 1 by formulating its plans for the greatest period of achievement in this wire rope and ship chandlery company's history.

They are manufacturers of numerous products, including wire rope, tackle blocks, boat fittings, accessories and brattice cloth.

Joseph E. Upson and John W. Walton started out 75 years ago by forming a ship chandlery partnership for the purpose of serving the Great Lakes marine trade and for the rigging and fitting out of any vessels at the shipyards on the Great Lakes.

Today, the company maintains two plants at 12500 Elmwood Avenue; a forging plant in which its tackle blocks and fitting are made, and a wire rope plant which was completed in 1942, which is an outgrowth of one formerly operated in New Jersey at the beginning of World War I when it became impractical to import wire rope from Great Britain. Removal of the wire rope plant to the midwestern section of the country, where it is more accessible to industry, has also aided in the company's recent growth. The original headquarters of the company along Cleveland's river front still stands but is now used only as auxiliary space.

PMR's camera caught this Ets-Hokin Galvin crew in action, installing C-O-Two Fire Equipment unit on the tuna vessel White Star at San Francisco during March. The White Star will be featured in the May Pacific Marine Review.

Appointed Distributors of "Wilco" Products

Martin and Turner, marine supply house of Wilmington, California, covering the entire Los Angeles harbor area have recently been appointed distributors for Wilber & Son, manufacturers of "Wilco" life preservers as well as the Diamond Rubber Company, for the sale of rubber hose and mechanical rubber goods.

George W. Gammon, Jr., well known naval architect is now associated with this concern in a marine technical advisory capacity.

Martin and Turner are increasing their activities and lines in the marine supply field and have recently moved their San Francisco office into larger quarters there.

Harold von Rolf who has been associated with this firm for the past four years was recently elected a vice president, and **Eric L. Pedley,** who is in charge of the San Francisco office, was elected a vice president as well.

Shipping Executive Entering Terminal Business

W. J. Bush, well-known West Coast shipping executive, has resigned as vice president and operating manager of the American President Lines to enter the terminal business, it was recently announced by E. Russell Lutz, executive vice president, APL.

William J. Bush, former Vice President, Operations, APL

Mr. Bush and associates, including some Portland interests, have purchased control in the Oregon Terminals (Oceanic Docks) in Portland. With the resumption of normal peacetime sailing schedules, the docks will be re-opened as a public terminal to handle all types of cargo, including refrigerated cargo.

A native of San Francisco, Mr. Bush began his shipping career as an office boy for the old Pacific Steamship Company, eventually becoming secretary, and later became secretary to R. Stanley Dollar. He rose rapidly in the ranks of the old Dollar Lines and in 1936 was elected vice president in charge of operations.

In 1938 when the Dollar Lines was taken over and reorganized by the U. S. Maritime Commission and renamed American President Lines, Mr. Bush continued in the position as vice president and operating manager.

Cunard White Star Manager Visits S. F.

Europe is not ready to receive the pleasure traveller. This message was voiced in San Francisco by E. Seymour-Bell, assistant general manager of Cunard White Star, Ltd., recently on his visit to the Pacific Coast in formulating plans for post-war travel.

The Cunard White Star lines, which operate the S.S. Queen Mary, the S.S. Queen Elizabeth and other large ships, are receiving countless numbers of inquiries from residents of the Pacific Coast States on the possibilities of trans-Atlantic travel. But European countries are recovering slowly from the effects of World War II. Housing and food conditions there are sadly inadequate so that the traveler is going to find difficulty for some time in visiting Europe.

Mr. Seymour-Bell disclosed that several hundred thousand dollars worth of equipment for the Queen Elizabeth was stored in San Francisco up to a fortnight ago and has just been shipped East to complete the reconditioning of the huge vessel.

"A Shot in the Arm"

World-famed as a shipbuilder, Joseph A. Moore, Sr., of the Moore Dry Dock Company, comes up with many a good story, like this one:

As a warehouse guard was making his rounds one night he saw a head rising above a pile of lumber. In proper shipyard language he demanded an explanation and failing to get it, he shot the figure in the arm. In the cold light of dawn, the figure turned out to be the one shown in the accompanying picture, one Timothy A. Folger, whose biography appears in the Moore archives as follows:

"Timothy A. Folger, born 1736—died 1803, whose likeness is reproduced in the sailing ship figurehead which now adorns the south garden of the Moore Dry Dock Company, was the son of Joseph Folger, a descendant of the Folger who came from Ireland and settled in Rhode Island in 1642. Timothy was the great, great grandfather of Roy S. and William Folger of San Francisco. Timothy was a man of extraordinary natural talent and though, like many of his descendants, he only attended the most elementary schools, he became a distinguished lawyer and scientist. His literary attainments also were unusually brilliant and he was the father of certain remarkable inventions. He served his time aboard a sailing ship and this experience combined with his scientific knowledge, resulted in the development of some important marine inventions. He was a man of deep religious convictions but under the urge of financial desire he abandoned his churchly affiliations to become an influential member of an insurance group. And through this association he accumulated great wealth and thus established the foundation of the present Folger fortune."

The Moore's have established the Folger figurehead in the garden by their office door, and the spot is a favorite gathering place for distinguished visitors.

Distinguished Gentlemen at Moore Dry Dock Company Meet the Honorable Timothy A. Folger

Left to right, seated: W. H. Gerhauser, pres. American Shipbuilding Co.; Rear Admiral L. O. Colbert, director of Geodetic & Coast Survey, Washington, D. C.; Jack Belanger, General Electric Co., New York; Joseph A. Moore, Sr.; the late Vice Admiral Howard L. Vickery; Roy S. Folger, insurance executive; Carl W. Flesher, former regional director, U.S.M.C.; Munroe Lanier, pres., Ingalls Shipbldg. Corp.; Jos. A. Moore, Jr., pres. Moore Dry Dock Co.; and N. Levy, vice pres. and secty. of Moore's.
Standing: Charles Bryan, vice pres., Federal Shipbldg. Co.; Lt. Col. Horace G. Foster; G. H. Johnson, technical asst. to late Admiral Vickery; Timothy A. Folger, guest of honor; H. H. Haight, asst. vice pres. Crocker First National Bank; Harry W. Fowke, supt. hull construction, Moore Dry Dock Co.; Lt. Wm. A. Weber, asst. to the late Admiral, and James R. Moore.

Clinton E. Stryker, president and general manager of Adel Precision Products Corp.

General Manager of Adel Precision

Clinton E. Stryker of Milwaukee, has been elected president and general manager of Adel Precision Products Corp., of Burbank, California, according to an announcement by Henry S. Wright, chairman of the Adel board of directors.

Mr. Stryker was formerly vice president and assistant to the president of the Nordberg Manufacturing Company of Milwaukee, manufacturers of diesel engines and heavy machinery. Before that he was a partner with McKinsey, Kearney & Company, management consultants of Chicago. He has a broad experience in scientific management, engineering and manufacturing. He assumed his new duties with Adel on March 4.

Adel Precision Products Corp. is a major manufacturer of hydraulic equipment for aircraft.

Standard Oil Consolidated

In a move designed to give greater emphasis to mechanical development and engineering research, Standard Oil Development Company, central technical organization of Standard Oil Company (New Jersey), announced consolidation of its two engineering departments.

The consolidation brings into one organization more than 400 scientists and other employees of the General Engineering Department and the Process Engineering Department which have operated independently for nearly 10 years. The new organization, named the Esso Engineering Department, is directed by E. W. Luster, chief engineer, who reports to Dr. N. E. Loomis, vice president in charge of engineering.

Under the new setup, E. H. Barlow, former chief engineer, becomes consulting engineer of the development company, handling many of the contacts with company executives on engineering matters of general interest. Assistants to Mr. Luster are P. J. Byrne of the Process Engineering Department; C. E. Paules of the General Engineering Department, and N. F. Myers, former associate manager of the process division.

C. T. Harding is named chief process engineer, C. F. Hesselbach, chief mechanical engineer, and A. J. Ely, chief construction engineer. As part of the reorganization, a group of project engineers including G. W. Bauer, E. H. Clendenin, P. J. Harrington, C. A. Hillman, E. H. Kares and J. R. Schonberg, will serve as coordinators on major projects.

Pope & Talbot and Quaker Lines Coordinate Services

To provide a more frequent and complete service between Atlantic and Pacific Coast Ports, Pope & Talbot, Inc. (McCormick Steamship Division) and the Pacific-Atlantic Steamship Company (Quaker Line) General and Berth Agents for the War Shipping Administration announced recently the completion of plans for a new intercoastal steamship schedule immediately. The new schedule embraces a fleet of modern ships operating on a 10-day frequency between Atlantic Coast ports and Pacific Coast ports and is the result of the cooperation of these two companies with the W.S.A.

This new service will be of immeasurable benefit to shippers and consignees who may take advantage of the dual facilities and offices of the two carriers for sailings, ports of call and other information to expedite their shipments. Under this new coordinated schedule the first sailing westbound will be the S. S. Nampa Victory from Baltimore, March 16; Philadelphia, March 20; and Norfolk, March 22, followed by the S. S. Water Witch from Baltimore, March 26; Philadelphia, March 30; and Norfolk, April 1. Eastbound, their first sailings will be the S. S. Middlesex Victory from Puget Sound, April 1; Portland, April 5; San Francisco Bay, April 8; Los Angeles, April 10; followed by the S. S. Ocala Victory, Puget Sound, April 10; Portland, April 15; San Francisco Bay, April 18; Los Angeles, April 20.

Both the Quaker Line and Pope & Talbot, Inc. (McCormick Steamship Division) maintain terminals at the important coastal cities of both Atlantic and Pacific ports and are well equipped with modern dockside facilities for the rapid handling and dispatch of all cargo.

Foster Wheeler Gets Record Boiler Order

One of the largest stationary boiler orders ever placed in this country and valued at nearly $5,000,000 was received by Foster Wheeler Corporation.

The order, covering four steam generators, calls for the largest boilers ever designed for direct firing with pulverized anthracite. Each of the units will be capable of producing 400,000 pounds of steam per hour at 1350 pounds per square inch and at 955 degree Farenheit temperature.

The steam generators were ordered by the Pennsylvania Power & Light Company for its new 150,000 kilowatt steam-electric station scheduled to be completed at Sunbury, Pa., in the spring of 1948.

Ebasco Services, Inc., is handling the engineering and construction of the new plant.

Partners of Hunt, Mirk & Company. At left, Lee W. Delhi, president of California Metal Trades Assn., and Thomas J. Benney, senior member of the firm.

Lee Delhi Joins Hunt, Mirk & Co.

Lee W. Delhi, nationally known welding engineer and shipbuilder, has resigned as vice president in charge of operations at Western Pipe & Steel Company to become a member of the pioneer engineering and contracting firm of Hunt, Mirk and Company, San Francisco.

Announcement of Mr. Delhi's affiliation with Hunt, Mirk and Company was made recently by Thomas J. Benney, senior member of the firm, who said that Mr. Delhi's entry into the company will strengthen its financial position as well as expedite its post-war expansion program.

Hunt, Mirk and Company was founded in 1903, and has been active continuously in the engineering and construction of steam power plants, marine engineering, and all phases of steam distribution systems, electrical construction and hydro-electric installations.

During the war, Hunt Mirk's activities were confined largely to the development of engine room design work for the U. S. Maritime Commission and other governmental agencies. The company is now preparing to resume its pre-war activities on a more comprehensive basis. This will include design and construction of steam and power plants for lumber, food, cement, chemical and oil industries.

Mr. Delhi is president of the California Metal Trades Association. He is also national director of the American Welding Society and previously served two terms as Pacific Coast regional vice president of the organization.

With the purchase of Western Pipe & Steel by Consolidated Steel Corporation of Los Angeles, Mr. Delhi concluded 22 years service with the company. Under his direction the company designed and built more than 48 special all-welded C3-type vessels for the U. S. Maritime Commission, practically all of which were converted into specialized vessels for Army and Navy use.

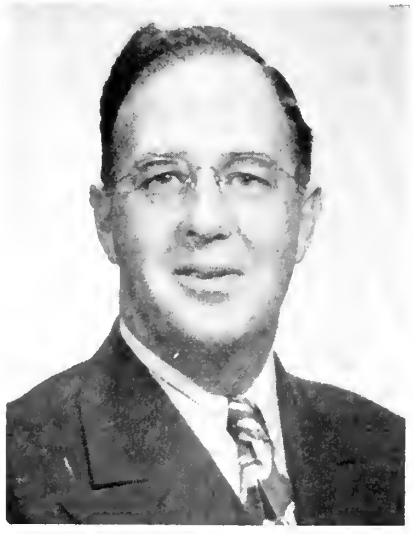
Mr. Delhi also had charge of the fabrication of many thousands of tons of steel for other firms, as well as a comprehensive program of ship repair work for the Navy and War Shipping Administration.

Consolidation of Matson's Maintenance Division With United

The facilities of the maintenance division of Matson Navigation Company's construction and repair department and United Engineering Company Ltd., have been consolidated under the name of United Engineering Company, a wholly owned subsidiary of Matson devoted to ship repair and maintenance, it was announced on March 25 by W. P. Roth, chairman of the board of Matson and R. E. Christy, former president of United Engineering Company Ltd.

United Engineering Company will have two plants, one at 500 Beale Street, San Francisco, and the other at the former United Engineering Company Ltd's ship repair yard on the Alameda Estuary. United Engineering Company Ltd's. Steuart Street and Folsom Street plants will be devoted to other use. United Engineering Company's San Francisco and Alameda plants include modern shops, warehouses and office facilities, and the Alameda plant operates two dry docks of 10,000 and 14,000 ton capacity as well as more than one mile of berthing space for vessels undergoing repair.

The maintenance division of Matson's construction and repair department had its inception in the latter part of 1924 on the ground floor of a building adjacent to the Embarcadero on San Francisco's waterfront. Fourteen years later its shop locations were transferred and expanded in a newly constructed building at 500 Beale Street. With the declaration of the National Emergency and the corresponding increase in Army, Navy and merchant shipping required to fight a global war, Matson was asked by the Government to expand its ship repair facilities. During 1942 the Division grew until its plant covered two city blocks and embraced an outfitting dock at Pier 36 operated for the United States Navy, and a repair dock at Pier 60 assigned to the company by the War Shipping Administration.



J. Paul Thompson, president.
United Engineering Company.

The United Engineering Company Ltd was founded in 1917 in a small machine shop on Spear Street near San Francisco's waterfront. In 1920 the Company purchased the property of the Risden Iron Works at Steuart and Folsom Streets which served as headquarters until the end of 1945. In 1940 property was acquired in Alameda on the Oakland Estuary previously occupied by the repair shops of the Southern Pacific Railroad, and a combination ship construction and repair yard was established which played an important role in handling the tremendous volume of such work being performed in the Bay Area during the war principally by constructing and delivering to the United States Navy twenty-one sixteen hundred ton ocean-going tugs.

Officers of the United Engineering Company include Mr. Roth and Mr. Christy as chairman and vice chairman of the Board, respectively, J. P. Thompson, president, George Sutherland, vice president and works manager, R. P. Hasenauer, treasurer.

Sailings From P. C. Ports to Puerto Rico

Allocation of merchant ship tonnage to move cargo from Pacific Coast ports direct to Puerto Rico has been approved on a test basis, the War Shipping Administration recently announced.

Pope & Talbot, Inc., has been designated as berth agent to handle the direct shipment of cargo.

Prior to the war, intercoastal cargoes destined for Puerto Rico were carried on regular East-bound voyages by American-Hawaiian Steamship Company and Pope & Talbot, Inc. Since resumption of intercoastal operation, many ships have been operating East-bound at full capacity and the handling of Puerto Rico cargo on these voyages would conflict with this through traffic.

In approving the trial allocation of a monthly sailing to Puerto Rico, the WSA approved allocation of other tonnage for future additional direct sailings to Pope & Talbot, Inc., and American-Hawaiian Steamship Co., if the cargo conditions justify it.

New No. California Marine Paint Firm

Manning-Mitchell, Inc., a new organization of marine paint specialists, announces a complete line of marine and industrial paints. Featured among the company's products are antifouling and anticorrosive paints, claimed to be extremely effective and long-lasting, and solutions for the treatment of steel to double the effective life of ordinary paint coatings.

Members of this firm's management are all veterans of the Navy's special protective coating department. Their intimate contact with and important contributions to its development of superior types of antifouling and anticorrosive bottom paints have gained for them reputations as authorities in the field.

Bernard M. Wolfe, president, held supervisory positions in the construction and repair division at Mare Island Navy Yard, in charge of the coordination program between research, manufacture and application of the antifouling paints and protective coatings. He was responsible for organizing the preservation program in the Navy Yard for the inactive and reserve fleets. A graduate of the United States Naval Academy and the Post Graduate School, U. S. Naval Academy, he is a member of the Society of Naval Architects and Marine Engineers.

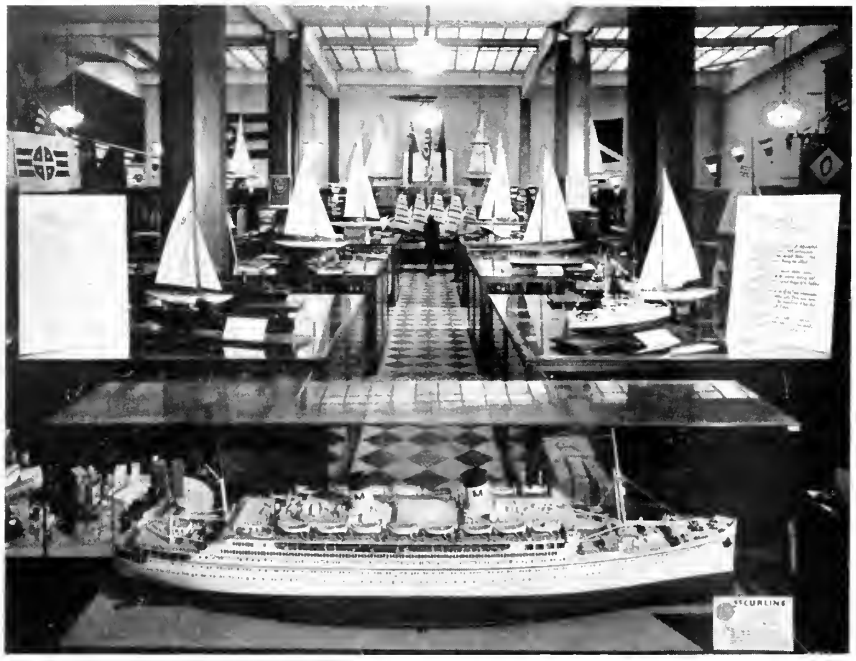
F. J. Dannenfelser, vice president, is a graduate mechanical engineer and naval architect (University of Michigan and Post Graduate School, U. S. Naval Academy). During his more than four years' service in the Navy, he equipped and instructed personnel and made official reports on sandblasting and application of the new plastic underwater paint at all shipyards in the continental United States east of the Mississippi River and in the West Indies. Prior to entering the service, Mr. Dannenfelser was associated with the DeVilbiss Company as a special paint equipment engineer.

Robert M. Mueller, secretary-treasurer, is a graduate architect and naval architect (Cornell University and Post Graduate School, U. S. Naval Academy). His assignments in the Navy were similar to Mr. Dannenfelser's. In addition, Mr. Mueller also proposed and helped to engineer the installation of a new plant for application of plastic paint at Kaiser Shipyard No. 3, Richmond, California. Before release to inactive status, he was stationed at Kaiser Yard No. 3 as Naval inspector.

Main offices of Manning-Mitchell, Inc., are located in San Francisco. Expansion developments are now under way for distribution of its products throughout California, the Pacific Northwest and the Gulf Coast.

SHORESIDE PERSONALITIES

BON VOYAGE: Norris Nash, public relations director of the Richmond shipyards for the past three and a half years, left recently for Willow Run, Michigan, where he is now associated with the administrative management of Kaiser-Frazer Motor Company.



The Ship Model display at Atkins' during March of this year.

SHIP MODEL CONTEST SPONSORED BY ATKINS

The second annual exhibition of ship models was recently held in Robert S. Atkins Company men's clothing store in San Francisco, for all those who love the sea and the ships that sail the seven seas. The Marine Exchange, the Museum of Science and Industry, and members and friends of both organizations have loaned models of ships, yachts and power boats for the splendid display. Models of every class,—old clippers, schooners, warships and other sailing and steam ship models, as well as the latest C-4's and others of the U. S. Maritime Commission built vessels, and the very recent Navy types were on display.

Hundreds of people have visited the store and inspected the craftsmanship and design of the distinguished five masted square-rigged German ship Preussen, which dominates the assortment of fine models. This collection is one of the best that has ever been assembled in San Francisco. It seems to this writer that such a fine collection should have a permanent home in a marine setting, like the former Aquatic Park museum which housed part of it before the war.

Fanciers of ships in bottles can see in this exhibit some remarkable work by Charles Van Remoortel, who specializes in building accurate small models in bottles with long and slender necks. Then there is the work of the Preston-Dahl firm, professional San Francisco model builders, to be seen in the model of a C-4 and the famed Gjoa, Roald Amundsen's Arctic exploration ship. The Boucher Model Works in New York is represented by the Matson Navigation Company's Lurline model, and the model of the Preussen made by Eric Swanson, who spent about four years in its construction. It is built on a scale of ¼ inch to the foot, after official plans.

SHORESIDE PERSONALITIES

Back With U. S. Lines

John F. Brennan, after serving as a lieutenant colonel in the Army, has resumed his post as head of the passenger department of the United States Lines, according to an announcement by John M. Franklin, president.

Part of Brennan's war service included two months duty in the office of the Chief of Transportation in Washington. Transferred to the New York Port of Embarkation at Brooklyn he was responsible for planning and controlling the distribution of all supplies for the U. S. Army Forces in the European and Mediterranean theatres of operation. San Francisco steamship and transportation men became well acquainted with him after V-E Day when he was assigned to the San Francisco Port of Embarkation in charge of similar supply operations for the Pacific theatre. Before the war, he served with the U. S. Lines passenger organization and was promoted to passenger traffic manager in 1936.

Another recent appointment by John M. Franklin, president of U. S. Lines, is that of Raymond M. Hicks, an executive of the company who has been made executive vice president.

William H. Schwartz, executive engineer of Alvin R. Campbell Co.

Schwartz Joins Cargo Handling Co.

William H. Schwartz is now executive engineer for the Alvin R. Campbell Company of San Francisco, designers and manufacturers of cargo handling equipment.

For the past five years Schwartz was assistant chief hull draftsman, in charge of ship repair and conversion with the Shipbuilding Division, Bethlehem Steel Company in San Francisco.

He graduated from the University of California as a mining engineer in 1936 and thereafter proceeded to Bolivia where he served for three and a half years as chief engineer and assistant mine superintendent with the Compania Minera Unificada del Cerro Rica de Potosi, returning to the U. S. A. just prior to the outbreak of war.

Battery-Powered Truck

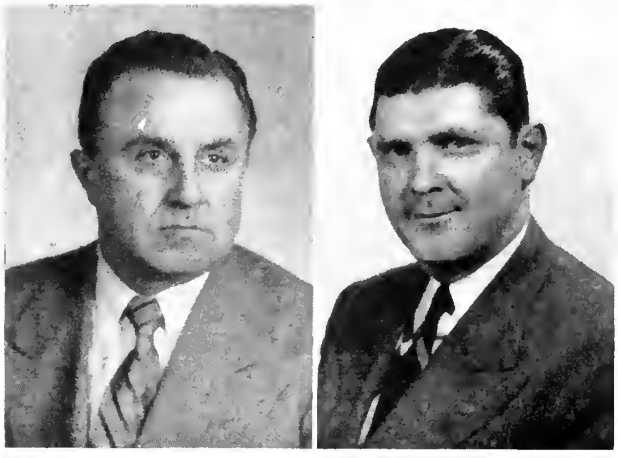
Convinced that industry's best post-war chance to cut manufacturing and distribution costs of consumer products, thereby creating more jobs and widening markets, lies in mechanizing its handling of materials, the Electric Industrial Truck Association has embarked on a broad program for 1946 to promote interest in the economics of the idea and to prove that the battery-powered truck belongs in that picture on the basis of performance.

Gordon J. Berry, Cleveland, president of the Association says that the program will dig down to fundamentals in establishing the proved advantages of the battery-powered truck in mechanized systems of material movement and storage.

Resigns WSA

H. Chase Stone, assistant deputy administrator in charge of recruitment and manning, War Shipping Administration, familiar to many in shipping circles on the West Coast, resigned his post effective March 1, it was announced by Granville Conway, acting administrator of WSA. Howard Hyde who was assistant director of this department will succeed Mr. Stone.

Another Shipping man connected with the WSA to leave his post is Felix Isherwood, who served as assistant to John E. Cushing, until the latter's return to the presidency of American-Hawaiian Steamship Company. Mr. Isherwood is joining the shipping company in an executive post under Mr. Cushing. He has seen service in Yokohama as agent for the States Steamship Company and also in Portland as agent for the Coastwise and United States Lines.



New vice presidents with Earle M. Jorgensen & Co. At left, Ralph K. Beall, vice pres. and director, and Paul C. Childs, vice pres. and district manager.

STEEL DISTRIBUTORS APPOINT VICE PRESIDENT

Ralph K. Beall has been appointed vice president and director of Earle M. Jorgensen Co., steel distributors. He retains his position as manager of sales of the Los Angeles office.

Paul C. Childs also has been appointed a vice president as well as district manager of the Oakland office.

Mr. Beall became associated with the Jorgensen Company in 1925 and Mr. Childs in 1933. The announcement of these promotions was made by Earle E. Jorgensen, president of the firm, as part of a reorganization made necessary by the company's expansion program. "Upon completion of building projects now under way," Mr. Jorgensen said, "our pre-war warehousing facilities will be more than doubled."

Returns to Jamison

The Jamison Cold Storage Co. of Hagerstown, Md., advises that J. V. Jamison 3rd has returned to take up his duties as president, after serving eighteen months on the heavy cruiser Wichita. His tour of duty was confined exclusively to the Pacific theatre, and he participated in the Second Battle of the Philippines, as well as supporting the landings and occupation of Okinawa.

J. V. Jamison, III, president.

Ed W. Whittemore of Atlas Marine Paint's Wilmington headquarters, and Richard E. Pierce, Atlas Marine Paint's San Francisco manager.

Atlas Paint & Varnish Company Names S. F. Manager

On a recent visit to San Francisco E. W. Whittemore of the Atlas Paint and Varnish Company of Los Angeles announced the opening of the Atlas Marine Paint Company of San Francisco, and the appointment of Richard E. Pierce as manager. The company will maintain offices and warehouse at 201 First Street, and will supply the entire line of Atlas marine paints and varnishes to the Northern California area.

Pierce, who is a graduate of the University of California, recently was released from the Army with five European and North African battle stars to his credit. He spent 11 months as a prisoner of war in a German prison camp.

Expansion of Atlas Line

Expansion of the new, improved line of Atlas Marine Paints, manufactured in Los Angeles, into the southern states has been announced.

The Galveston Ship Supply Company at Galveston and Houston, Texas, have taken over distribution of the specialized marine Atlas paints in their area through arrangements made by Ed Whittemore, sales manager of Atlas with J. C. Owen, manager and G. A. R. Dean, sales manger of the supply company.

New Gage Division

The Gotham Instrument Co. of New York announced the appointment of Jack Rudin to head their pressure gage department.

Mr. Rudin who was sales engineer for 24 years with the U. S. Gauge Co. and sales manager for the Champion Gauge Co., enjoys a wide acquaintance in the trade throughout this continent.

In addition to the manufacture of pressure gages, pressure recorders and controllers, the Gotham Instrument Co. is one of the largest independent manufacturers of industrial indicating, recording controlling and chemical thermometers in the U.S.A. with branch factories and offices at San Francisco, Chicago, and Canada.

HEROIC SHIP'S MASTER GIVEN DSM

With his wife by his side Captain Andrew W. Gavin, of New York (left), master of the Alcoa Pioneer, is presented with the engrossed citation accompanying award of Merchant Marine Distinguished Service Medal by Acting Chairman Edward Macauley, of the U. S. Maritime Commission.

(Continued from Page 375)

cargo winches, anchor windlasses, capstans and steering gears.

George E. Swett is a member of the Society of Naval Architects and Marine Engineers, Propeller Club, on the board of governors of the Mariners Club, and a director of the Citizens' Federal Savings and Loan Association of San Francisco, one of the oldest firms of its kind. He has two sons, Major James E. Swett, recently discharged from the U. S. Marine Corps after serving with great distinction, and Pfc. George E. Swett, Jr., just released from the U. S. Army. A daughter Margaret is employed by the firm.

A delightful and bountiful buffet lunch with accessories was served during the six-hour event.

Rosette to General Ship Supply Co.

Arthur B. Rosette, formerly sales manager of the Bay Cities Asbestos Company, has recently become manager of General Ship Supply Company. He is well known on the waterfront.

The General Ship Supply Company is one of the twin "General" units operated by Edward R. Berryman, who organized it in 1924 and followed with the General Ship Service Company in 1940. The latter company is engaged in chemical cleaning, boiler and tank cleaning, chipping, scaling and painting. Captain Vance D. Trout, who for many years was general superintendent of the United States Lines, is president and operating manager of this company.

During the war, both companies were operating on a 24-hour schedule. Due to the increasing business in the Slop Chest department and the need for larger warehousing facilities, an adjoining building in San Francisco was purchased and these increased facilities will be kept busy in this post-war period.

Earl Whitson will act as controller for both companies.

Left to right, Captain Trout, Arthur Rosette, and Mr. Berryman.

Admiral Joseph F. Farley (left) head of the U. S. Coast Guard, replaces Admiral Russell R. Waesche, retired, Commandant of the U.S.C.G. (at right).

Admiral Farley recently presented seven Coast Guard officers with Navy Commendation Ribbons.

COAST GUARD OFFICERS DECORATED FOR WARTIME SERVICE

Seven officers of the U. S. Coast Guard, well known to the maritime industry, have just received high decorations for their wartime service. This announcement was made by Coast Guard Headquarters, Washington, D. C.

Four received the Legion of Merit, and three were presented with the Navy Commendation Ribbon, on behalf of the Secretary of the Navy, James Forrestal. The presentation was made by the Coast Guard commandant, Admiral J. F. Farley.

Those awarded the Legion of Merit were Rear Admiral Harvey F. Johnson, USCG, engineer-in-chief; Rear Admiral Charles A. Park, USCG, chief operations officer; and Commodore E. M. Webster, USCG (retired), chief, Communication Division.

Officers receiving the Commendation Ribbon were Commodore F. P. Dillon, USCG, chief of the aids to navigation division; Capt. R. T. Merrill, USCGR, special assistant to the commandant; Capt. H. T. Jewell, USCG, Merchant Marine personnel division; and Capt. Rutherford B. Lank, USCG, assistant chief, Naval Engineering Division, Office of Engineering.

SPITFIRE TO PLY SOUTH AMERICAN LANES

Through the U. S. Maritime Commission, the 14,000 ton turbiner Spitfire, built at Consolidated Steel Company's yards at Wilmington, was delivered to the Grace Line on February 22. This vessel will operate in service between the ports of the West Coast of South America. This is the second vessel in a fleet of ten C-2 peace-built cargo vessels being constructed for the U. S. Maritime Commission Commission by Consolidated Steel's Los Angeles Shipbuilding division.

The Spitfire and her nine sisterships are the largest merchant craft ever built in the Los Angeles Harbor area, having an overall length of 459 feet, a 63 foot beam and displacing 14,000 tons.

Air-conditioned throughout, the Spitfire has a raked stem and cruiser stern. Its cargo features include deep tanks for dry or oil cargo, five cargo holds, three forward and two aft, special safety collision bulkheads forward and aft, several watertight bulkheads, and double masts which carry thirty ten and five ton cargo booms. The Spitfire is powered by turbines and has a cruising speed of approximately 19 knots.

Freakish February weather gives tropical voyager a taste of North Pole during construction in U. S. Steel's Federal Shipyard at Kearny, N. J.

Shoreside Personalities

Wade E. Miller of Higgins Pleasure Craft

HIGGINS NEW GENERAL MANAGER. Wade E. Miller, president of Higgins Pleasure Craft, 1811 S. Hope Street, distributors of Higgins products of Los Angeles and vicinity, has taken over the general management of the company following the resignation of Charles E. Dayton, February 19th.

Emerson Miller, brother of Wade, has joined the company in a sales capacity. The firm has a branch office at 1635 American Avenue in Long Beach and a showroom at 810 Coast Highway, Newport Beach.

LIEUT. FRANK C. DIMARCO, regional public relations officer for the training organization of WSA on the West Coast since last July was released from active duty March 1st to return to advertising and public relations activities in the Bay Area.

Originally enlisted in the U. S. Coast Guard shortly after Pearl Harbor, Lieutenant DiMarco was transferred to the Maritime Service to direct public relations and recruitment activities in Ohio, Michigan, and Kentucky. After more than two years of producing recruiting drives and city-wide Maritime Day observances, he was assigned to supervise public relations matters for the Training Organization on the West Coast; which position he held up until his release.

Lieutenant Frank C. DiMarco

Herman D. Nichols

Tubbs Cordage Executive Manila Bound

Herman D. Nichols, vice president of Tubbs Cordage Company, sailed March 1st for Manila, P. I., to assist in the rehabilitation of Philippine cordage properties. Working with other cordage people in the Islands, Mr. Nichols expressed the hope that increased quantities of Manila fiber will soon be on its way to this country to relieve the acute shortage of Manila rope that has existed since Pearl Harbor.

Among other cordage executives sailing with Mr. Nichols was C. A. Carter, vice president of the Manila Cordage Company.

Alaskan Distributor Visits L. A.

Elmer Fern, Alaska and Northern Canada distributor for Briskseal Refractory Co., and Xzit Sales Co., was a recent visitor to Los Angeles. During his stay in Los Angeles, Mr. Fern spent considerable time at the Brickseal and Xzit headquarters on South Hoover Street.

He handles distribution of Xzit fire scale and soot eradicator, Brickseal refractory coating and allied products in Alaskan ports, as well as principal towns of the interior and Northern Canada. Mr. Fern reports ample stocks of these products are maintained in principal ports of this northern territory.

Shipping Man C. of C. Head

Peter P. Mesquita was elected recently to the presidency of the Alameda Chamber of Commerce. PMR scribes first met "Pete" Mesquita in 1918 when he threw in his lot with George A. Armes, San Francisco builder of ships.

In 1934, "Pete" was appointed secretary-treasurer of the General Engineering and Dry Dock Company, a position which he has held ever since.

Peter P. Mesquita, recently elected president of Alameda Chamber of Commerce.

SURVEYORS AND EXECUTIVES OF AMERICAN BUREAU OF SHIPPING

ABS Surveyors on North America's West Coast

Los Angeles Harbor, Wilmington, California—Harry J. Summers, principal surveyor; Charles J. L. Schoefer, Charles J. Walker, Jr., Edwin W. Pike, David S. MacLagan, Harald N. Guldstrand, James E. Middlemas, John C. McKnight and Thomas G. Birdsey.

San Diego, California—K. M. Walker.

San Francisco, California—William B. Warren, principal surveyor for the Pacific Coast; Christopher D. Mues, William D. Schoning, Donald W. Day, Herbert A. Holm, Frank A. Jones, Thomas H. Purdom, Jr., Harold C. Amens, Jack Deckard and Ward F. Beckwith.

Portland, Oregon—Basil A. McLean, principal surveyor; Charles R. Hudson, John Ellison, James F. McCann, Jr., Joseph P. Long, Jr., Robert T. Ryan, Francis P. Miller, Clarence S. Montgomery, Robert Allen, Charles E. Stith, George B. King, Jr., Howard E. Hopkins, E. P. Turi, R. I. Randolph, B. O. Reese, E. L. Cox, Ray R. Faverty, Ludie H. Adamson, and Sidney S. Stewart.

Seattle, Washington—Sidney K. Smith, principal surveyor; John D. Wilson, Donald R. Head, Charles S. Rosenvold and Frank H. Gallagher.

ABS Surveyors on South America's West Coast

Callao, Peru—William H. Parsons.

Valparaiso, Chile—Herbert McLean.

ABS Surveyors in the Pacific

Malaya, Singapore—F. G. Ritchie.
Penang—H. T. Rigden.

China, Hong Kong—Anderson & Ashe in the Queen's Building.

Hawaii, Honolulu—John R. Black and Samuel C. Keller.

Philippine Islands, Manila—Ralph M. Johnson.

The East Indies, Batavia, Java—C. Van Steenwijk.
Sourabaya, Java—F. K. Kupper.

"Down Under" ABS Surveyors

Australia, Brisbane—James W. Herd.
Fremantle—R. J. Sinclair.
Melbourne—A. C. Meek.
Port Adelaide—A. J. R. Wood.
Sydney, New South Wales—David W. Gibson, acting surveyor.

New Zealand, Auckland—F. W. Blakey.
Dunedin—George W. Martin.
Wellington—George D. Lidgett, acting surveyor.

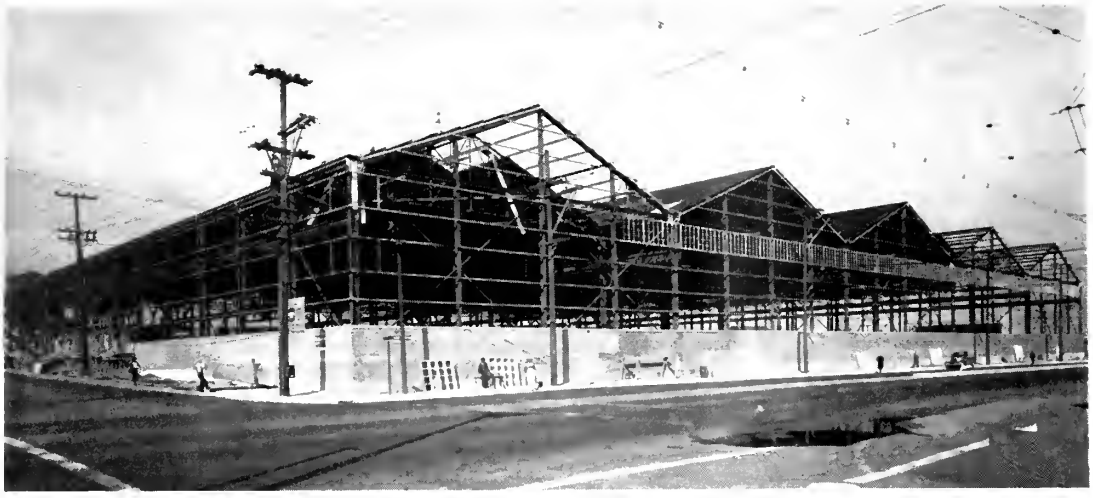
No changes have been made in the executive setup in the American Bureau of Shipping this year. J. Lewis Luckenbach was re-elected president and David Arnott, vice president and chief surveyor; Joseph W. Powell and William D. Winter, honorary vice presidents; Jerome B. Crowley, treasurer; John W. Cantillion, secretary and assistant treasurer, and Kenneth D. Hull assistant treasurer.

The ABS board of managers elected for a three-year term are: Donald C. Bowersock, Edward P. Farley, Homer L. Ferguson, John M. Griser, Basil Harris, Bushrod B. Howard, Daniel K. Ludwig, Joseph T. Lykes, Frederick R. Pratt, Henry R. Reed and H. Gerrish Smith. William H. Collins was elected for a one-year term.

The following men were elected to membership in the Bureau: Vice Admirals Emory S. Land and Howard L. Vickery (since deceased); William H. Collins, Bethlehem Steel Co.; F. R. Pratt, Socony Vacuum; W. L. Stewart, Jr., Union Oil Co.; Albert B. Kern, M. A. Hanna Co.; Miles F. York, Atlantic Mutual; Harold L. Gobeille, Cleveland-Cliffs Steamship Co.; W. C. Jones, Tomlinson Fleet, and A. T. Wood, Lake Carriers Association.

F-M Supervisor of Scale Service

E. L. Stine, who has been manager of the Scale department of the San Francisco branch of Fairbanks, Morse & Co., was appointed to the post of Supervisor of Scale Service with headquarters in Chicago.



San Francisco Mill Depot for Bethlehem Pacific Coast Steel Corporation nearing completion.

New Mill Depot for Bethlehem-Pacific

Without fanfare and while some strike bound Bay Area industries were marking time, one of the speediest steel erection jobs recorded in these parts was taking place at 3rd & Mariposa Streets. Here, a 4-acre plot of ground suddenly became a beehive of activity as a seasoned crew of steel erectors from the Bethlehem Pacific Coast Steel Corporation started placing the steel columns for a new mill depot for the Bethlehem-Pacific Company. The entire steel framework consisting of five 86 foot wide bays, each 375 feet in length and covering about four acres was erected in 17 working days.

The 1250 tons of structural steel used in putting up the steel framing for the building had been fabricated at the Alameda Works of Bethlehem Pacific's Steel Construction Division. During these preliminary operations, the foundations had been placed to support the structural steel framing members of the building.

Laying of the 170,000 square feet of steel roofing for the building is now nearing completion. Brick masonry work on the front wall of the building is finished. The mill depot is expected to be ready for occupancy by May 1st. It will be operated under the direction of W. C. Eshelman, general superintendent of Bethlehem Pacific's South San Francisco Steel Plant.

The methods employed for decades by steel fabricators in prefabricating and partly assembling the structural steel before actual erection are very similar to the mass production shipbuilding operations which were so widely publicized during the war. Many of these improved production methods were pioneered by Bethlehem's Fabricated Steel Construction Division and later adapted to shipbuilding practice in Bethlehem shipyards.

Bethlehem P. C. Steel Appointment

Bethlehem Pacific Coast Steel Corporation has just announced the appointment of **Edward G. English** as executive assistant to H. H. Fuller, president of the company. Mr. English was formerly manager of commercial research and supervisor of Pacific Coast mill scheduling. He started to work first for the Sheffield Steel Corporation in Kansas City, and later became assistant night superintendent of the sheet mill.

He joined the Pacific Coast Steel Company in 1925, serving in the engineering and sales departments at Seattle, Portland and Spokane offices until 1936, he was transferred to the general offices at San Francisco. His company became a part of Bethlehem in 1930. From 1936 to 1945 he was assistant to the general manager of sales.

Orin P. Walker replaces Mr. English as manager of commercial research. Mr. Walker was formerly assistant sales manager of Petroleum Equipment International and shortly after this company was acquired by Bethlehem, joined its commercial research staff.

Shoreside Personalities

Edward Valves Promotion

Raymond A. Durand, formerly assistant sales manager of Edward Valves, Inc., East Chicago, Indiana, has been advanced to the position of sales manager effective March 1, it was announced by W. F. Crawford, president of the company. He has been a member of the Edward engineering sales organization for more than nine years.

Changed to Harper Packing Co.

James A. McPeak and Raymond P. Farrell, formerly president and treasurer, respectively, of France Packing Company, Tacony, Philadelphia, are now associated with the Harper Packing Company, Inc., Chester, Pa., in a managerial and financial capacity. These new officers bring a combined total of fifty years' active experience in consultation, design and protection of metal packings for engines and compressors.

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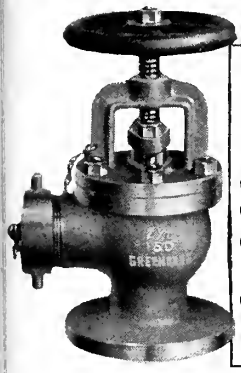

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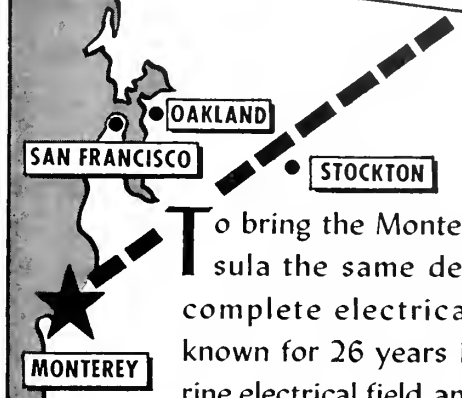

To bring the Monterey Peninsula the same dependable, complete electrical service known for 26 years in the marine electrical field, and now also serving California's industries, businesses, homes and farms.

Ets-Hokin & Galvan will establish a Monterey Peninsula plant and office at 484 Washington Street, Monterey, about July 1st.

As in six other major areas of the State, this plant will be completely equipped and staffed for every kind of electrical work—construction, repairs, supplies and C-O-TWO Fire Protection Equipment and supplies.

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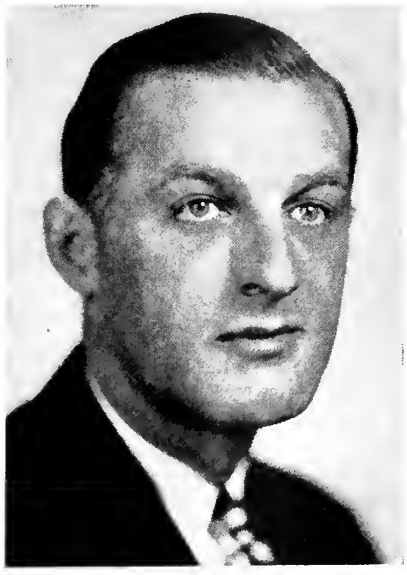
SHORESIDE PERSONALITIES

The appointment of **HOWARD N. MIDDLETON,** of the War Shipping Administration, as Pacific Coast manager of the San Francisco branch offices of Funch, Edye & Co., Inc., of New York was announced recently. Mr. Middleton, former secretary of the Pacific Westbound Conference, resigned his post as WSA West Coast traffic manager on March 15 to take up his new office.

C. E. SORAPURE, vice president of the company, said offices would be opened as quickly as suitable space can be obtained.

The company is an old established New York firm of ship agents and brokers. On the East Coast, it represents the Java-New York Line, Scandinavian-American Line, Royal Netherlands Steamship Company and other steamship firms. Its proposal to expand to the Pacific Coast evoked wide interest among old-established transpacific operators and shippers.

DAVID P. PENHALLOW of Honolulu has been appointed temporarily to the staff of Matson Navigation Company in a general consulting capacity principally to assist in the coordination of operational practices on the Pacific Coast and Hawaii, it was announced by **Hugh Gallagher,** Matson vice president. Mr. Penhallow, a lieutenant colonel now on terminal leave from the Army, served as director of cargo and passenger control in Honolulu.



John Stein

R. F. BURLEY, freight traffic manager, announced that **JOHN A. STEIN** has been reappointed as general freight agent for Pope and Talbot, Inc.

During the war, Mr. Stein served as a major at Fort Mason and had charge of the supervision of cargo handling on ships in the Bay Area and movement of critical war materials overseas.

Mr. Stein has been associated with Pope & Talbot interests since 1923 and had, until joining the service, held the post as general freight agent from 1936 to 1942.

R. J. ETIENNE, vice president of the Cyclops Iron Works, announced the appointment of **JOHN D. MARINE** as sales manager of that company.

Mr. Marine is graduate mechanical engineer and has long experience in sales and engineering of steam power, heating, air-conditioning, refrigeration and cranes.

THE RETIREMENT OF AUSTIN W. SPERRY from the Crane Company took place on February 1, 1946 after a record of 37 years' faithful service, during which time he has been a familiar figure in marine and club circles around the San Francisco Bay Area. Now he is following agrarian pursuits on a nice little "ranch" of six acres near Los Gatos, California.

His rich dramatic baritone has endeared him with members of The Family, Bohemian and, as many of our readers can testify, the Propeller Club and The Mariners Club in San Francisco. Austin is assuring his many friends that they will continue to see him around the customary maritime activities.

CAPT. H. J. TIEDEMANN, USMC Pacific district operations officer of San Francisco, announces that merchant seamen must apply for upgrade training within seven days of their last discharge, to become able-bodied seamen.

Enrollees at the Upgrade School are paid at the rate of $153 monthly. Applications for enrollment may be made at the USMS Enrolling office, 1000 Geary street, San Francisco, where full information can be obtained.




Left to right: R. M. Campbell, Earl Morris, James Glass, Jr., and John H. Schmid, all with Zurn Manufacturing Company.

ZURN NAMES VICE PRESIDENTS AND DISTRICT REPRESENTATIVE

Promotion of **James Glass, Jr.** to vice president in charge of sales and **John H. Schmid** to vice president in charge of engineering, and **Robert M. Campbell** to manager of advertising and sales has been announced by **Melvin A. Zurn,** president of the J. A. Zurn Mfg. Co., Erie, Pa. manufacturers of building, plumbing, drainage, marine and industrial products.

Mr. Glass has been associated with Zurn for more than twenty years in production and sales and was in charge of the Buffalo office.

Mr. Schmid at Zurn for seven years, was formerly with the engineer department of E. I. DuPont de Nemours & Co.

Mr. Campbell has been with Zurn for three years, coming from Benton and Bowles, Inc., New York.

Appointment of Earl Morris as district representative in charge of the Los Angeles office has been announced by Melvin A. Zurn, president, J. A. Zurn Mfg. Co. Mr. Morris has been with Crane Co., Los Angeles branch for sixteen years, and when he left was head of the Marine Department in that branch. Mr. Morris has offices at 10509 Montara Ave., Southgate, Los Angeles, Calif.

PRESENTED WITH SEASCAPE

Vice Admiral Emory S. Land, former War Shipping Administrator, being presented with an oil painting, the work of Captain George Eckstram, veteran Grace Line skipper. Presentation of the canvas is being made by Mrs. Isabel Peterson, director of United Seaman's Service Art Exhibition in which Captain Eckstram's paintings have won wide acclaim.

Appointment

H. F. Gelhaus, manager of the sales division of Todd Shipyards Corp., has announced the appointment of **George W. Peterson, Jr.,** to the sales division of that corporation. Peterson will assist Mr. Gelhaus in the San Francisco office.

Mr. Peterson is well known in Coast shipping circles, and prior to his present appointment was with the former Todd California Yards and Swayne & Hoyt Ltd.

Hot Off the Press

THE COOPER-BESSEMER CORPORATION of Mount Vernon, Ohio, has published three bulletins by B. C. Thiel, consulting engineer for the company. One is entitled "Calculating Pipe Sizes for Compressor Cylinders," a reprint by the company through the courtesy of the author and of the publication, The Petroleum Engineer. The treatise covers a new method of determining diameter of suction and discharge lines of a reciprocating compressor cylinder used at a leading oil field.

Another bulletin is entitled: "Controlled Water Jacket Cooling Reduces Maintenance Costs," a reprint through the courtesy of Petroleum Refiner; and the third bulletin is on "Modern Compressor Stations," which subject was originally treated in Oil and Gas Journal.

STOW MANUFACTURING CO. has put out manual No. 645C on flexible shaft remote valve operating gear. This manual supersedes Book 449 and other previous information related to the subject, and this manual is intended to serve as a guide in the selection, installation, and use of flexible shafting for remote controls for valves and all types of equipment actuated by rotating shafts. The manual is filled with graphs, charts and cutaway drawings of core construction, casing construction, remote control shaft components and every type of installation and assembly gadget.

A BOOKLET ON NORDBERG'S SINGLE ACTING DIESEL ENGINE has recently been distributed by the Nordberg Mfg. Co. of Milwaukee, describing the engine's use for marine service with direct or gear drive and for stationary installations, either oil or gas burning design. Illustrating the bulletin are blueprints of the equipment and photographs.

SHORESIDE PERSONALITIES

CAPTAIN WILLIAM E. PORTER, USMS, former master of the USMS training ship **American Seafarer,** has been appointed chief information officer for the training organization, WSA, replacing Lieut.-Comm. Louis Rosenbush, Jr., Commodore Telfair Knight, Commandant, USMS, announced. At the outbreak of the war Captain Porter was called into active duty and assigned to the Maritime Service as instructor in navigation at the United States Maritime Service Officers' school at Fort Trumbull, New London, Conn., In 1943, he was transferred to the United States Maritime Officers' school at Alameda as executive officer of that base and later assumed command of the American Seafarer.

ADVISORY COMMITTEE OF THE PROPELLER CLUB OF THE UNITED STATES

Seated, l to r: Lewis D. Parmelee, vice president AGWI Lines and pres. Propeller Club, Port of New York; Arthur M. Tode, honorary pres., the Propeller Club of the United States; John F. Gehan, vice pres. American Export Lines and National President of the Propeller Club; J. Lewis Luckenbach, pres., American Bureau of Shipping, and chairman, American M. M. Conference Committee; Harman Lewis, pres., Alcoa Steamship Co., and vice pres., Port of New York Propeller Club.

Standing, l to r: Henry F. Markwalter, v. p., Luckenbach SS Co.; Roger E. Montgomery, pres. and gen. mgr., National Marine Expositions, Inc.; Benn Barber, Admiralty Attorney, Waterman Steamship Agency; Henry Reed, Insurance Co. of North America; O. B. Whitaker, mgr. Marine Sales, Sperry Gyroscope Co.; Harold J. Hording, natl. secty., The Propeller Club of the United States.

New Helmsman at Kings Point

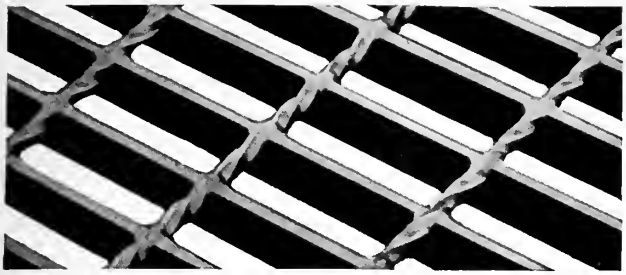
Commodore Richard R. McNulty, USNR, has been appointed Superintendent of the United States Merchant Marine Academy, Kings Point, New York, the War Shipping Administration announced.

Commodore McNulty will succeed Rear Admiral Giles C. Stedman, USNR, who has resigned at his own request to return to private industry after having served as Superintendent of the Academy for the past four years.

The change becomes effective March 31, 1946.

Commodore McNulty will continue to serve as Supervisor of the United States Merchant Marine Cadet Corps, which position he has held since the founding of the Corps in 1938.

Commodore McNulty was appointed Superintendent of the Academy by Commodore Telfair Knight, USMS, Assistant Deputy Administrator in charge of Training, under the authorization of Granville Conway, Acting War Shipping Administrator.



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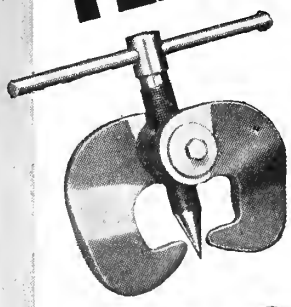

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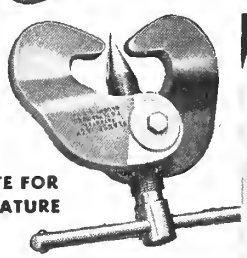

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BOOK REVIEWS

SEA, SURF, AND HELL,

Written by A. J. Liebling, Tom Treanor, Edwin C. Hill, (Prentice-Hall, Inc. $3.00).

Edited by Commander Arch A. Mercey, USCGR, and Lee Grover, Ch. Sp. USCGR, here is the stirring history of the fighting Coast Guard. The narrators have spun fine, factual tales of the achievements of men who served valiantly and well on every sea—and on most fighting fronts.

DESTROYERS IN ACTION

Written by Richard A. Shafer (Cornell Maritime Press, $2.50).

Toughest, most daring and dangerous of all Navy service in time of war is the lot of the courageous men who manned our destroyers—and this is their story. It's full of drama and action—well illustrated.

NECROLOGY

JOHN JACOB BROWN, 73, chairman of the boards of Foster Wheeler Corporation in New York, and in St. Catherine, Ontario, Canada, passed away in St. Lukes Hospital, New York on February 15 after a brief illness.

Born in Tyler, Texas, and after a private school education, he started business career as a construction engineer for the Consolidated Compress Company of Texas in 1895. Later he became associated with the Worthington Pump Company of New York as specialist on the development of hydraulic equipment for compressing cotton. In 1907 he became vice president of the Wheeler Condenser and Engineering Company and the Power Specialty Company, N. Y., and was elected president in 1918.

Upon consolidation of the Wheeler Condenser and Engineering Company as the Foster Wheeler Corporation, Mr. Brown was elected chairman.

The late J. J. Brown.

In 1923 he organized the Carteret (N. J.) Bank & Trust Company and served as its president until 1928. He was a director of Fidelity Union Trust Company of Newark, Cranford Trust Company and was a director of many other companies in the East. He was a member of the American Society of Naval Architects and Marine Engineers, the American Society of Mechanical Engineers and many engineers' and bankers' clubs.

S. F. Businessman Passes Away

Howard Mathew Tayler, 59, president of Tayler and Spotswood Company, died of a heart attack recently. A native San Franciscan, he was a member of the Olympic Club, San Francisco Rotary Club, the OPA advisory committee representing steel jobbers on the Pacific Coast, and was a past master of San Mateo Lodge 226, Free and Accepted Masons.

SHORESIDE PERSONALITIES

THE NORDBERG MFG. COMPANY announces the appointment of John G. Earle as special representative of its heavy machinery division. His work will largely be devoted to diesel engines with which he has had wide experience during his many years of association with the diesel field. Prior to his new position he was head of the diesel engine section of the U. S. Maritime Commission and previous to that was with the diesel division of Baldwin Locomotive Works. His headquarters will be at the company's New York office, 60 East 42nd Street.

Captain Ronald T. Strong has rejoined the Westinghouse Electric Corporation as manager of its San Diego office.

"STEAM-DETERGENT CLEANING WITH OAKITE SOLUTION-Lifting Guns," a 28-page booklet issued by the Oakite Products. Inc., New York, tells of the four major applications of steam-detergent cleaning: maintaining processing equipment to comply with sanitary regulations: cleaning machinery to facilitate subsequent rapair; preparing surfaces for repainting or refinishing; cleaning equipment too large for tank immersion, or where tanks are not available.

It also tells of case histories of many divergent industries that have used this method of cleaning.

THE SPERRY GYROSCOPE COMPANY, Inc., Great Neck, New York, has issued a booklet, "Rudder Angle Indicator" (Publication 18-5), telling of the extensive tests made on Sperry equipment in the laboratory and on board ship. The illustrations include line drawings of the rudder angle equipment arrangement, the rudder angle transmitter, and the 115 and 230 volt dynamotors.

NEWLY ISSUED IS THE "ARNOT SLEEPER," an attractive two-color booklet put out by Arnot and Company, Baltimore. This booklet shows how the versatile Arnot Sleeper can be used in homes, ships, and trains.

JUST OFF THE PRESS is the new 27-page booklet on opposed-piston diesel engines issued by Fairbanks Morse & Co., Chicago. Well illustrated, the booklet contains a two-page, four-color spread of the Model 38D8-1/8 Fairbanks Morse opposed piston diesel engine.

"EMERGENCY CUTTING," recently issued by the Victor Equipment Company of San Francisco, tells of the Pack Type Emergency Cutting Outfit for fire fighting originally designed and produced for the Navy.

FROM THE INDUSTRIAL LINING ENGINEERS, INC., Edgeworth, Penn., comes a four-page folder called "Lining for Industrial and Process Equipment." It contains a helpful comparison-chart of the different linings now in use.

THE STORY OF THE COCHRANE SAFETY RELIEF VALVE is told in Cochrane's new publication No. 4150. Of special interest is the revised "Sizing Data on Relief Valves" which includes capacity and pressure rise tables for size selection.

THE VICTOR EQUIPMENT COMPANY, of San Francisco, has issued its 1946 fully illustrated catalogue of welding supplies.

THE PHILIP CAREY MANUFACTURING CO., Lockland, Ohio, has just released a revised edition of their heat insulation materials catalog, "Heat Insulation for Industry." It has been developed to facilitate the specification and purchase of heat insulation for industrial and commercial use.

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Pacific MARINE REVIEW

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For "Cold-Water Casualties"

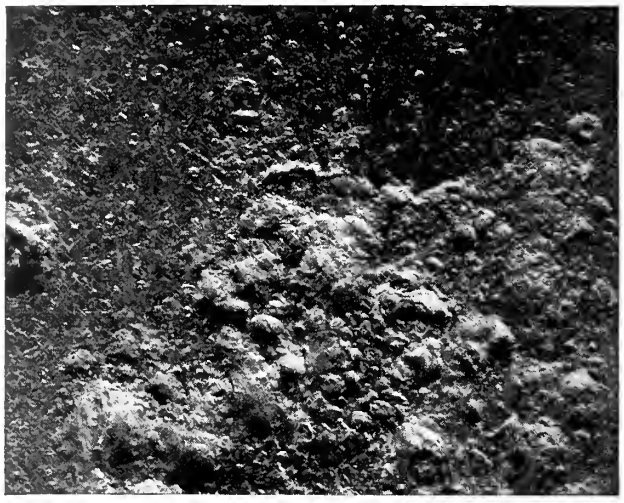
APEXIOR-NUMBER 3 has many valuable uses in the maintenance of ships' hulls and equipment, providing lasting protection for all metal surfaces exposed to fresh or salt water at temperatures under 125°F.

Applied to submerged stern areas, this durable protective coating eliminates water-to-metal contact, keeping pitting and corrosion to a minimum. And since APEXIOR NUMBER 3 is non-conducting, it also checks electrolytic corrosion due to the proximity of bronze propellers to steel hulls, affording protection to rudders, rudder posts, tail shafts, and struts. (No anti-fouling properties are claimed).

APEXIOR NUMBER 3 retards corrosion on ventilators and life-boats, on the cooling water sides of condenser tubes, in condenser water boxes and in many other applications above and below decks. It is effective on every type of cold water tank and, being non-toxic, is entirely suitable for the interiors of drinking water tanks.

In regular use by leading steamship companies for many years, brush-applied APEXIOR coatings are daily proving their high protective value. Adequate stocks are available in all important ports.

And "Victims Of Boiler Water"



APEXIOR NUMBER 1, brush-applied in a few thousandths of an inch thickness, forms a mechanical barrier between boiler metal and water or steam at all temperatures and pressures.

This tough shield over all pores and joints checks corrosion and resists the action of oxygen and entrained gases. A good heat conductor, it aids in maintaining thermal efficiency by retarding the formation of operating deposits and preventing them from bonding tightly in insulating layers. The surface of APEXIOR NUMBER 1 is chemically inert; any operating deposits form a mechanical bond only, and are easily removable.

APEXIOR NUMBER 1 is unaffected by boiler pressures and ratings, varying feedwater conditions or chemical treatments. Its regular use in engine and boiler rooms, wherever metal parts are exposed to hot water or steam, is followed by increased over-all operating efficiency. In common with APEXIOR NUMBER 3, it lengthens the service life of metal and reduces maintenance labor and costs in all applications.

Free Marine Service Manual will give you full information on the marine uses of APEXIOR protective coatings. The Dampney Company of America, Hyde Park, Boston 36, Massachusetts. Marine Dept., *East Coast:* 114 Liberty St., New York 6, N. Y., *West Coast:* C. C. Moore & Co., San Francisco, Cal.

Two new high-temperature Dampney coatings are Thur-Ma-Lox Number 7 Black (1600°F.) and Thur-Ma-Lox Number 10 Aluminum (1200°.) Properly applied, they provide lasting protection to dry metal surfaces subjected to the extreme temperatures indicated.

APEXIOR

Keeps new metal new . . . Gives old metal new life DAMPNEY

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Who Will Speak for Shipping?

Pacific MARINE REVIEW

The most important natural asset of any port city, and the back country which supports it and which it supports, is its shipping facilities.

Removal of our harbors would decrease the value of every piece of property in the port area, reduce the dollar volume of every business enterprise, and in a very short time reduce the number of jobs and the dollar income of every resident.

Yet we find that the general public and its representatives, from government bodies down through chambers of commerce and civic groups of all kinds take a lackadaisical if not scornful attitude toward our shipping and harbor trade when they should be concentrating their best efforts toward seeing that the port business is protected. Men who would protect with their lives their families and their homes will permit a primary source of their families' income to be jostled into disrepute and thereby destroyed.

Sound public relations—the depicting of that point where the public and industry have a common interest—should be and must be developed. The biggest men in every port community should be the spokesmen for their harbor and shipping and spokesmen should speak up. They should be alert to recognize that delays and frustrations to vital projects are due to either lack of knowledge — or opposing propaganda.

A clear statement of essential facts will usually win over the ignorant. The interminable argument in council chambers and committee meetings will be minimized when **facts** are made known.

Opposing propaganda is something else. We find our industry attacked by other industries, by political theorists, by government bureaus, by segments of itself. And, negatively, by failing to provide needed legislation or by lack of cooperation. Alertness to detect opposition, ability to dramatize the public's stake in the industry's welfare, and integrity before attack are the elements of sound public relations. The government could use these attributes and win public support by just **stating** a policy. The maritime industry can use them—plenty.

No man is too big for this job and no other interest should outrank it.

Alcoa Cargo-Passenger Liners

COMPLETED IN WEST COAST YARD

Three Victory type hulls under construction at the Oregon Shipbuilding Company, Portland, Oregon, for the Martime Commission are being converted into a special type of cargo-passenger liner for the Alcoa Steamship Company. They will be fitted for the South American trade carrying general cargo south-bound and bauxite ore northbound. Luxurious accommodations for 97 passengers are arranged on the promenade deck.

The design of the conversion features is being handled by George Sharp, naval architect, New York. The joiner work is being installed by Buckler-Chapman of Portland, Oregon, using the Martin Perry type of bulkhead. The official designation of these vessels as Victory type cargo carriers is AP-3; as Alcoa cargo-passenger liners they are designated AP-7. Table 1, herewith, gives principal characteristics of the hull and Table 2 sets forth the loading capacities both for general cargo and for bauxite ore. Drawings show the arrangement and self-trimming features of the bauxite loading and of the refrigeration and general cargo loading.

Propulsion Machinery

Two Maritime Commission water tube boilers (fitted with super heaters, desuperheaters, air preheaters, economizers and force draft blowers) supply steam at 450 psi 750° F. to a Westinghouse compound turbine connected to the single propeller shaft through Westinghouse double reduction gearing. Engine room is amidships and has the usual long shaft alley with tanks port and starboard. An unusual feature for American hulls and one found only in the Victory type is the full use of the Contra-Propeller system in the design of the ship's stern. The structure of the ship in way of the stern frame and the run aft is formed into ideal curves to make that portion of the hull a Contra-Propeller. Theoretically this should make a decided increase in the propulsive efficiency of these hulls. So far as our knowledge goes no data on this expected improvement have yet been published by the Maritime Commission.

The usual arrangement of Maritime Commission engine rooms prevails. One space houses the two boilers, the turbine and its gears, and the auxiliary machinery. A turbine drive feed pump is installed in the location usually given to the reciprocating feed pump and the latter has been relocated. Two 300 kw Worthington turbo-generators are installed to take care of the electrical load in cooking, ventilation, pumps, refrigeration, and lighting.

Table I Characteristics AP-7

Length Overall	455′ - 3″
Length B. P.	436′ - 6″
Beam	62′ - 0″
Draft Loaded, Max.	28′ - 6″
Total Deadweight 28′D	9360 Tons
Cubic Capacity General	375,420 cu. ft.
Cubic Capacity Refrigerated	16,000 cu. ft.
Propulsion Power	8,500 shp
Normal Sea Speed	15 Knots

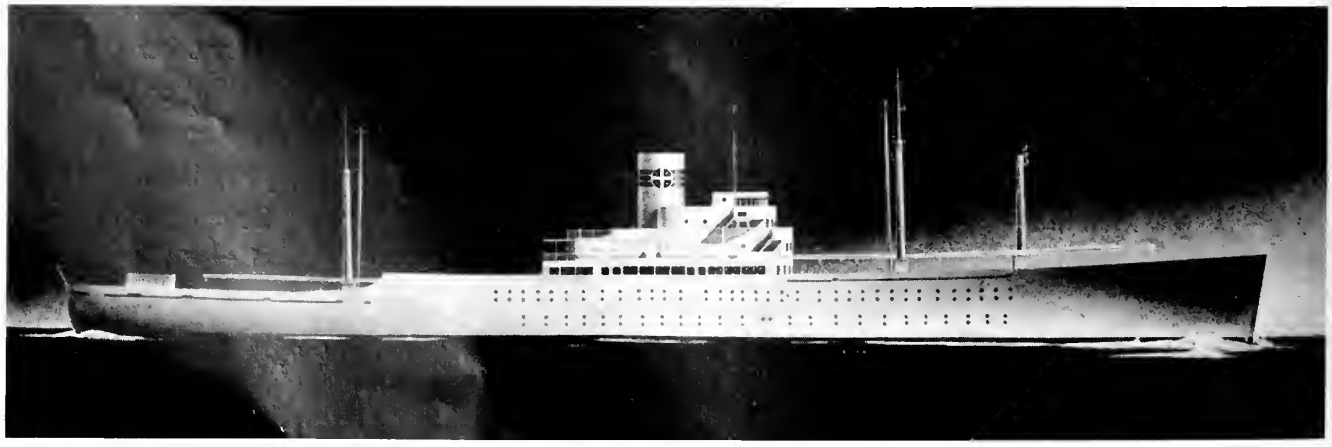
Combustion in and feed water to the boilers will be under automatic control.

Spaces immediately aft of the engine room port and starboard of the shaft alley are used for general service pumps on the port side and on the starboard side for a well-equipped machine shop and a room for a battery of CO_2 cylinders to take care of fires in engine room and other spaces.

Flats in the engine room support the turbo-generating sets and the electrical switchboard on the starboard side and the refrigeration and air conditioning units on the port side.

These vessels are designed: to carry a considerable volume of refrigerated

Artist's drawing of the new Alcoa Victory type ship. A point of special interest is the large port door leading to refrigeration holds. The door is dimly outlined in the picture near the center of the lower rows of portholes.



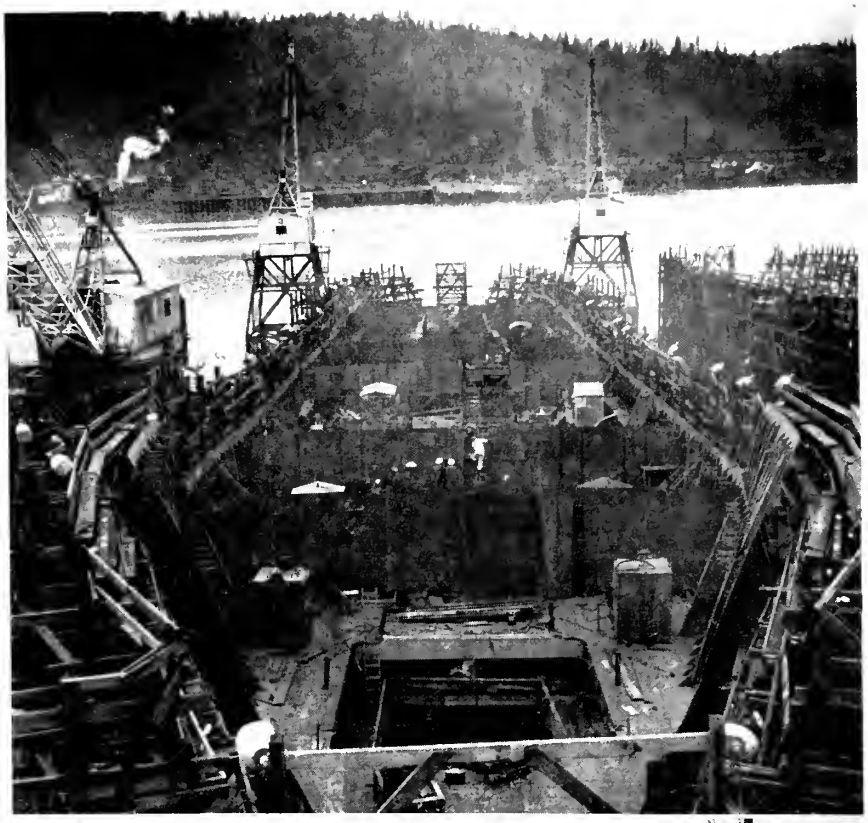
cargo; to take care of the refrigerated stores for 97 first class passengers and for the crew; and to provide air conditioning in all quarters both for crew and passengers.

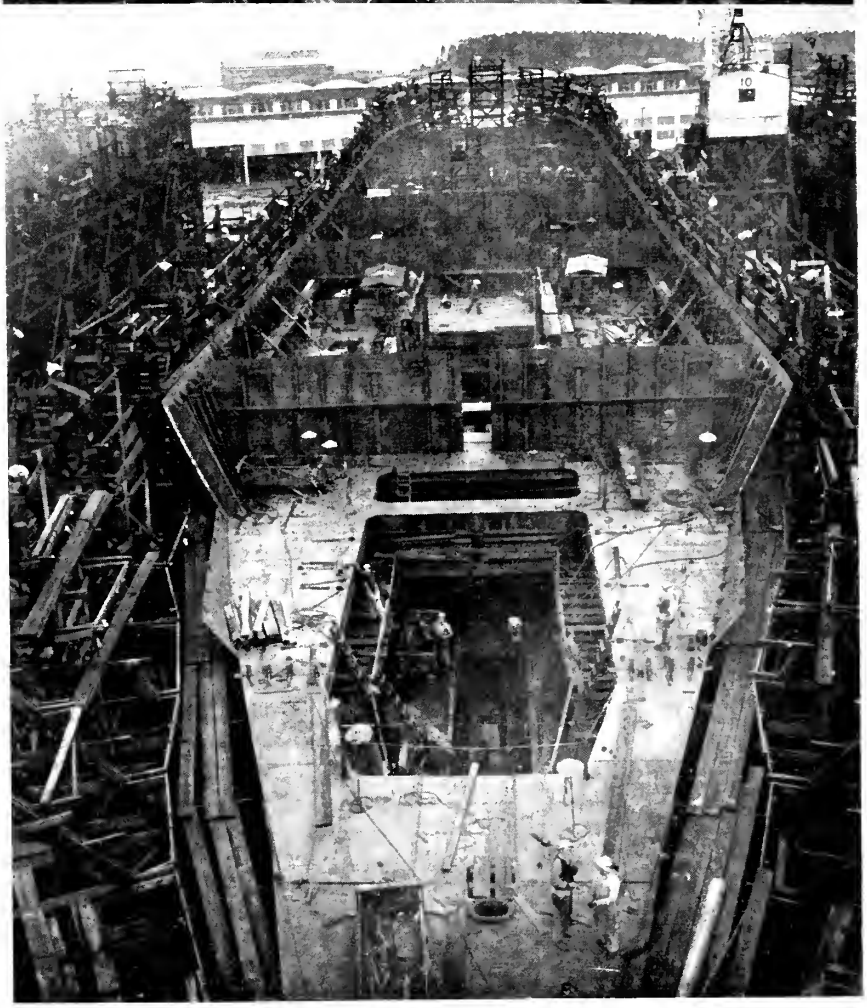
Cargo Handling

There are five cargo holds—three forward of machinery space and two aft. Hatchways serving these holds are uniformly 22′ 4″ wide and from bow aft have lengths of 25 feet, 33 feet, 30 feet, 36 feet and 45 feet. Double king posts are installed between hatches: No. 1 and No. 2; No. 2 and No. 3; and No. 4 and No. 5. No. 1 king post is fitted with two five ton 55 foot booms; No. 2 king post with two five ton 55 foot booms on the forward side, and on the after side two five ton 55 foot booms and one 50 ton 60 foot boom; and No. 3 king post with two five ton 50 foot booms and one 30 ton 60 foot boom on the forward side, and two five ton 50 foot booms on the after side.

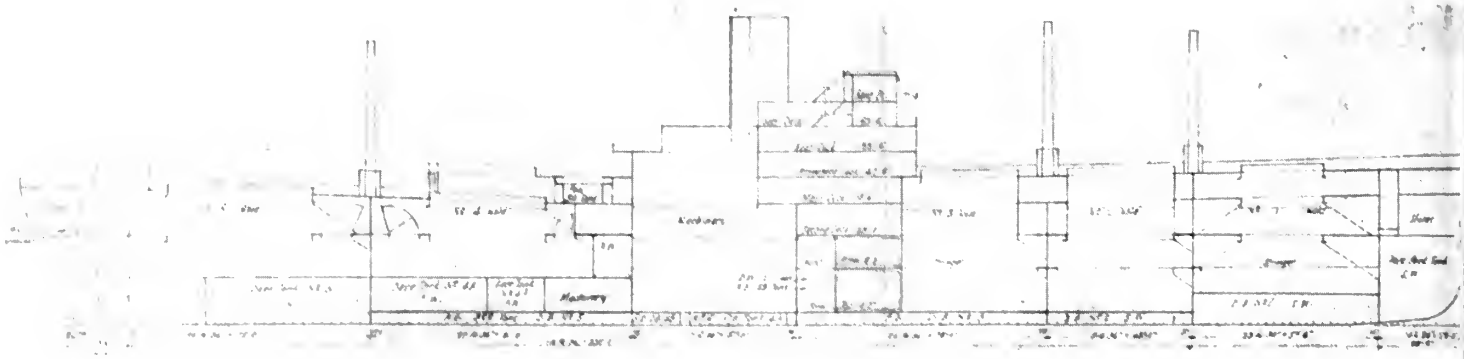
Twelve U. S. Maritime Commission unit type cargo winches driven by 50 hp Westinghouse motors take care of the lifts on these booms.

Refrigerated cargo is carried in insulated spaces on the first platform deck and hold levels immediately aft of Hold No. 3. At the hold level there is one large refrigerated cargo compartment stretching right across the vessel. Above on the first platform is another cargo compartment at the starboard side and on the port side three refrigerated rooms for ship's stores—a meat room at 5° F., a fruit and vegetable compartment at 35° F., and a dairy products chamber at 32° F. Directly above these on the second deck are three insulated chambers—a butcher shop which is held at 45° F., a fish room maintained at 5° and an ice storage box at 25° F. All of these insulated spaces as well as the steward's dry stores and the slop chest are loaded and unloaded through a thwartship passage and side ports port and starboard at second deck level. Opening off this passage are two vertical con-





Top of page: Hull 002, looking aft. Lower: Same hull, same date, looking forward.



Above: Inboard profile of Alcoa's new passenger and cargo vessel for the Caribbean service. Much of the superstructure is aluminum.

Below: Deck arrangement plans.

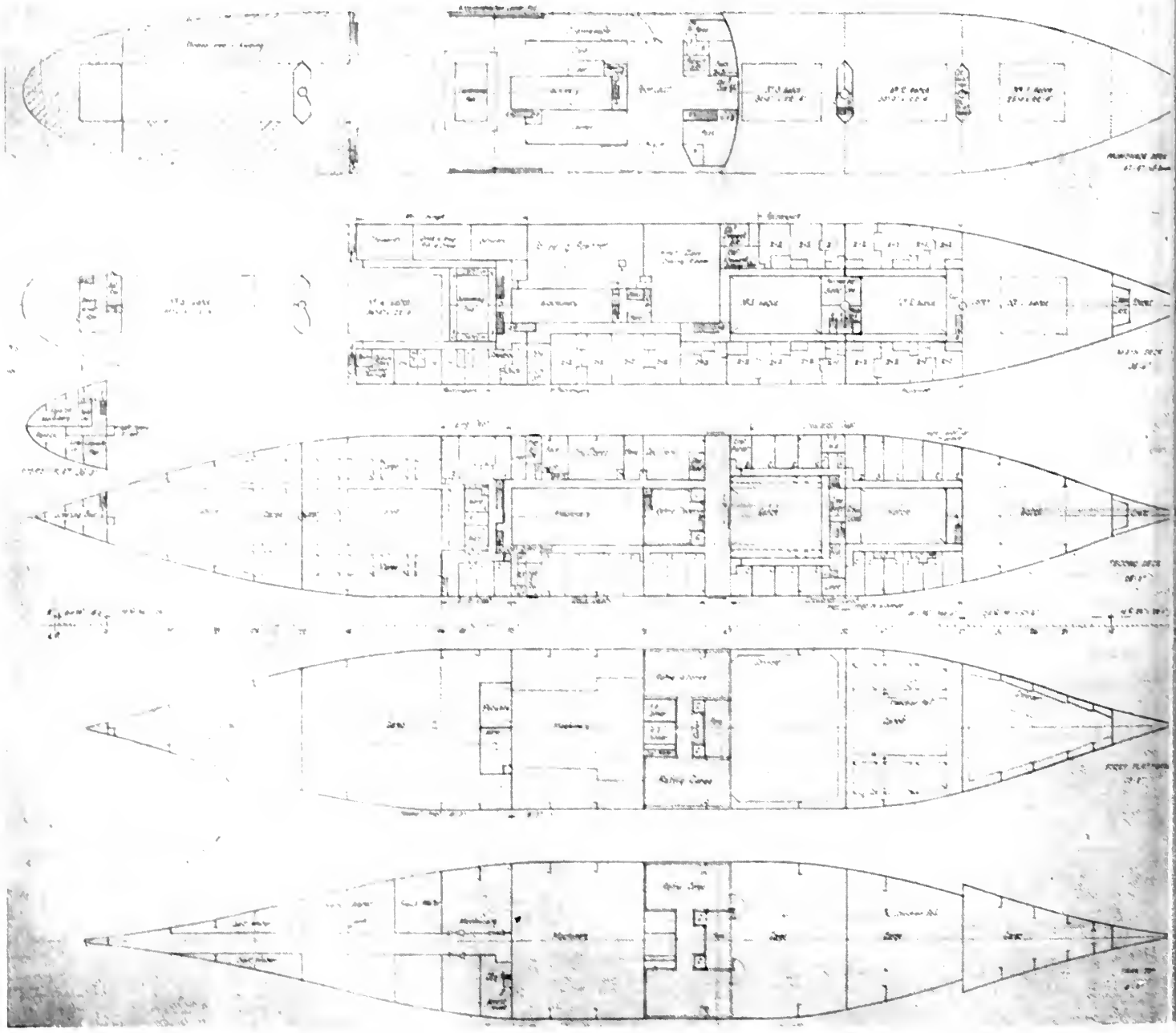


Table 2 Ship Capacity

Full Load Departure with Bauxite Northbound

Bauxite:-

No. 1 Hold	960
No. 2 Hold	1660
No. 3 Hold	2215
No. 4 Hold	2030
No. 5 Hold	1647
Total Bauxite	8512 Tons

Fuel Oil:-

No. 5 Double Bottom	327
Settling Tanks	128
Total Fuel Oil	455 Tons

Fresh Water:-

Distilled Water	21
No. 4 A Double Bottom	178
Potable Water	96
Total Fresh Water	295 Tons
Passengers, Crew and Effects	35
Stores	25
Swimming Pool	38
Total	98 Tons
Total Deadweight	9360 Tons

Draft 28'0" Even Keel

General Cargo - Cubic

Bale Capacity

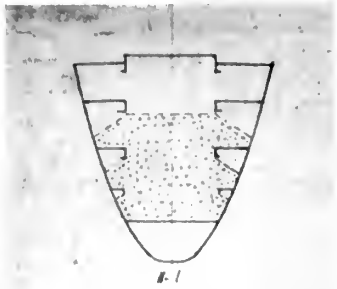
		Cubic Feet
Hold No. 1	Hold	27,910
	Upper Tween Deck	23,790
	Focsle Tween Deck	23,140
		74,840
Hold No. 2	Hold	27,950
	Lower	21,800
	Trunk	16,000
		65,750
Hold No. 3	Hold	54,880
	Lower tween Deck	
	Trunk	21,890
		76,770
Hold No. 4	Hold	49,390
	Tween Deck	37,130
		86,520
	Hold No. 5 Hold	25,910
	Tween Deck	45,630
		71,540
	TOTAL GENERAL CARGO	375,420

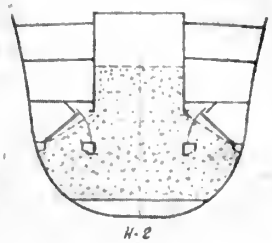
Refrigerated Cargo		**Net Cubic Feet**
Hold No. 3	Hold	12,000
	Tween Deck	4,000
	Total Refrigerated Cargo	16,000
	TOTAL CARGO	391,420

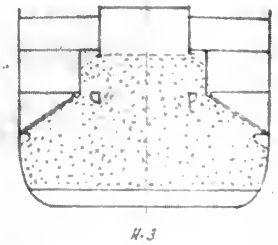
Tank Capacities		**Tons**
Fuel Oil	Double Bottom No. 3	430
	Double Bottom No. 4 B	52
	Double Bottom No. 5	328
	Settling Tanks	128
	Total Fuel Oil Capacity	938 Tons
Fresh Water	Double Bottom No. 4A	178
	Deep Tank No. 4A	269
	Deep Tank No. 4B	475
	Potable Water	145
	Distilled Water	21
	Total Fresh Water Capacity	1088 Tons
Salt Water	Double Bottom No. 1	282
	Double Bottom No. 2	179
	Deep Tank No. 5	428
	Fore Peak Tank	106
	After Peak Tank	34
	Total Salt Water Capacity	1029 Tons
	TOTAL TANK CAPACITIES	3055 Tons

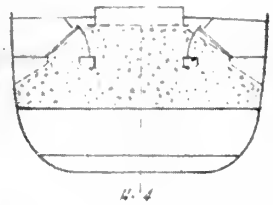
Passengers	50 Floor Beds, 47 Pullmans	97 Total
Crew	95 + 1 Pilot + 2 spares	98 Total
		195 Souls

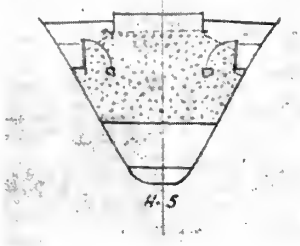
SECTIONS SHOWING SELF TRIMMING ARRANGEMENTS IN HOLDS

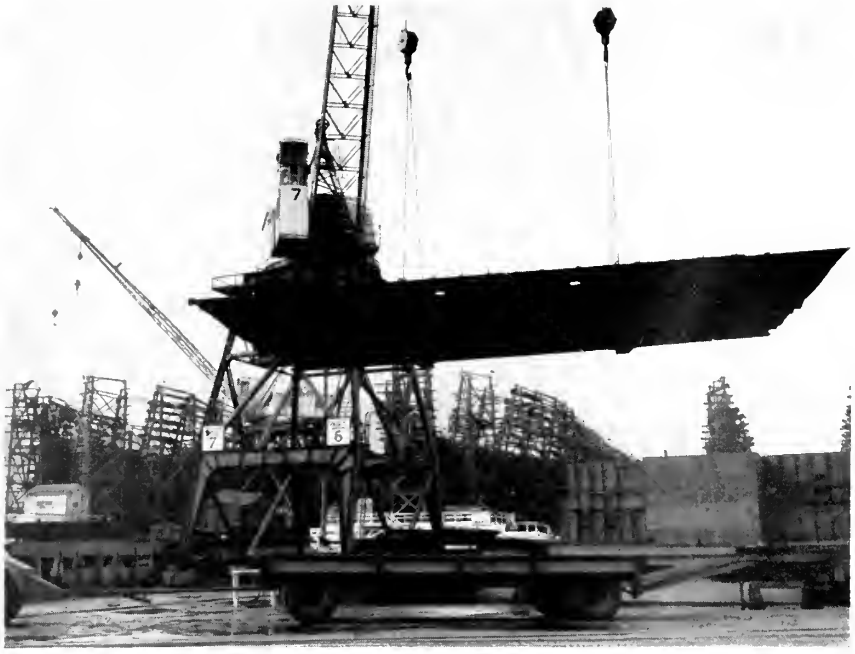












Like old times. (Well, not quite, but section lifts like this are not uncommon now that Oregon Ship is in production on the three luxury liners under construction for Alcoa.)

veyors or elevators with platforms about 5 feet square so that hand truck loads may be carried with the longshoreman. The trunks through which these conveyors operate open onto second deck, first platform deck and hold levels.

At the second deck level trimming hatches for bulk bauxite ore are fitted in way of cargo hatches 3, 4, and 5, and similar trimming arrangements are fitted in first platform deck in way of cargo hatch No. 2. The sectional drawings herewith illustrate the character of these arrangements.

Passenger Accommodations

Passengers are all housed on the promenade deck, the main deck, and the sun deck. On the main deck are bedrooms with a total capacity for 84 passengers; also the main galley and dining saloon. The promenade deck has public rooms surrounded by an enclosed promenade. A palm court occupies the forward end of the house enclosure. Opening off this court port side is the purser's office and a store and a stateroom and at the starboard side a large suite. Aft of the palm court port and starboard of the machinery casing are respectively a club room and a lounge, aft of these on the open deck is a nice built-in swimming pool amidships and deck game spaces port and starboard. On the sundeck in the forward end of the house are two beautiful suites each occupying a space 14 x 21. These form a very unusual feature inasmuch as they are on the deck above the officers' quarters and directly beneath the pilot house. All of the staterooms have private bath or shower and private toilet and all are airconditioned with regulation in the hands of the passenger.

Crew's Quarters

Accommodations for the officers are unique in that all licensed officers, deck and engine room, are housed on the boat deck; engineers on port side; and deck officers on starboard. The rooms for the chief are identical with those for the master, first assistant same as first officer, and so on. Only a fore and aft passageway on the centerline of ship lies between them and since this passageway ends at the after bulkhead of the captain's office and opens into that office there is a difference of four feet in thwartships dimensions of the captain's office and that of the chief. Aft around the machinery casing on this level are two deck cadets, the purser and the junior third officer on the starboard side, and two engineer cadets, the chief electrician and the junior third engineer on the port side. We are glad to see the engineer force moved up top side and think it should do much for the morale of the whole crew. All the rest of the crew are housed on the second deck in nice rooms. All crew quarters are air conditioned and ample provision of toilets, showers and baths is installed.

Aluminum

The entire superstructure above sundeck level including the outer casing of stack will be of aluminum. All lifeboats and lifeboat davits will also be of aluminum. Boats, davits, and boat winches are by Welin. Accommodation ladders will also be aluminum.

Navigation equipment will include all the most up-to-date devices including a full installation of radar.

The estimated cost of each vessel is around $4,000,000. Completion dates are tentatively set for September 5, 15 and 25, 1946.

Famous Old Four-Masted Barque Modernized With Diesel Power

Recently the Portuguese barque Foz Do Douro appeared on the high seas cruising along at 15 knots with her sails furled and Diesel engines furnishing the propelling power and not the wind. That is because not so long ago she was taken in by the Kensington Shipyard and Drydock Corporation of Philadelphia, Pa., and fitted out with a pair of Fairbanks-Morse Diesels and a full complement of required auxiliary equipment.

It was not a simple job, yet it was done with neatness and dispatch so characteristic of the type of work the Kensington yards are prone to do. Furthermore it was a most interesting installation, not only the conversion from wind to motor power but also the application of twin screw Diesel drive.

When the task was finished the officials of the shipyard were highly pleased—it hadn't been easy and time was limited for at that moment the war was still raging and she was

urgently needed for conveying prisoner of war supplies for the American Red Cross to the unfortunate inmates of prisoner of war camps in Germany. But if the shipyards folk were pleased, to say that the owners of the Foz Do Douro were pleased, would be putting it mildly.

Letters and cables were sent by her skipper and her owners telling of the satisfactory performance of her twin Fairbanks-Morse Diesels, their ease of operation and the splendid maneuverability of the motor vessel. "On her first Atlantic crossing, she acted very satisfactorily," writes Chief Engineer A. Moreira. "She averaged, heavily laden with cargo, 9 knots with a daily fuel consumption of only 35.8 barrels."

The voyage, with full cargo, was accomplished without aid of sail.

Historically the Foz Do Douro is most interesting. She will be remembered by many a captain and crew on the seven seas as the Abraham Rydberg, the training ship of the Swedish Merchant Marine. She was built in Scotland in 1892.

Since that time she has been in various trades, under Hawaiian, United States, Swedish and Portuguese flags. In 1925 she established a record for sailing ships by making the voyage from San Francisco to Unalaska, some 2400 miles in 7 days for an average speed of approximately 15 knots. Today she flies the flag of Portugal, out of Oporto, Julio Ribeior Campos, owner.

The principal dimensions are: registered length 260′ 9″, molded beam 43′ 2″, depth 23′ 6″ and of 2323 gross tons. The vessel has a steel hull and her sailing gear is that of a 4-masted barque.

The new main propulsion plant consists of twin 690 hp 300 rpm Model 37E14 Fairbanks-Morse two cycle Diesel engines embodying such features of design and construction as oil-cooled pistons, open head combustion, differential injection valves and back-flow scavenging—a design which originated by Fairbanks-Morse has been found most dependable in marine service.

The main generator is of 40 kw capacity, 115 volt dc marine type, drip proof and is direct connected to a 60 hp, 6-clinder Model 36 Fairbanks-Morse full Diesel engine. operating at 1200 rpm.

A 20 hp, 2-cylinder Model 36A4¼ Fairbanks-Morse Diesel 1200 rpm, operates the auxiliary air compressor and the general service pump. To the fore end of this auxiliary Diesel power plant is clutch-connected a Watreous 2½″ rotary fire, bilge and general service pump of 150 gpm capacity at 100# pressure. Also clutch-connected to the aft end is a Gardner-Denver ABD, 2-stage water-cooled 40 cfm, 250# air compressor. A 20 kw, 125 vdc variable speed, marine type tail-shaft generator is also provided.

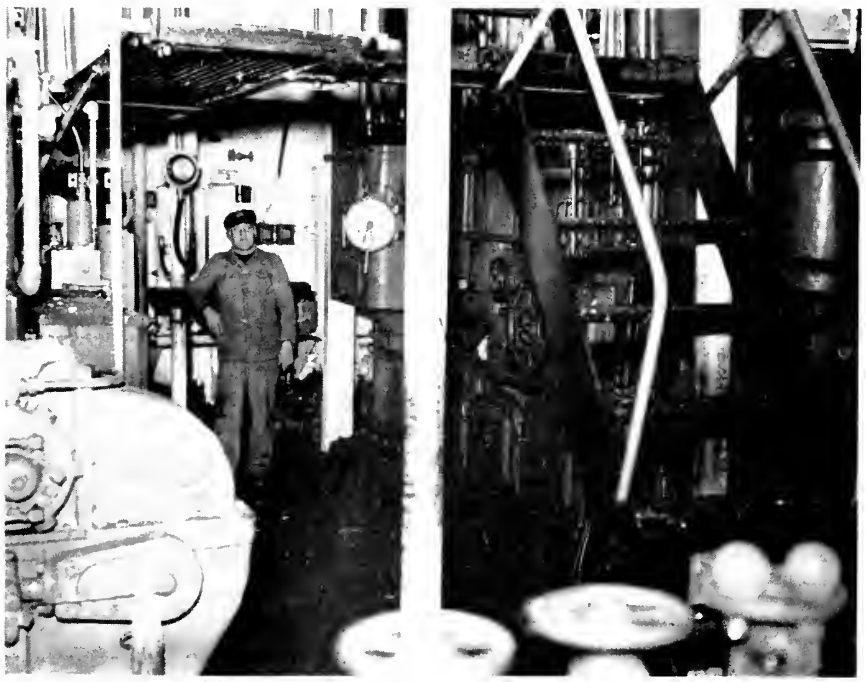
Other pumping equipment includes the following: two Fairbanks-Morse, motor-driven units, push button controlled, consisting of a 405 gpm centrifugal circulating pump for salt water and one 120 gpm lube-oil circulating pump. Two fresh water circulating pumps are also provided. These are 4″ suction, 3″ discharge, motor-driven centrifugal pumps driven by 7½ hp 115 volt, direct current marine type motors. Both pumping units are of Fairbanks-Morse make.

The complete engine room is nicely laid out with plenty of head room and space for the engineer's crew to move about comfortably.

All in all the conversion of the Foz Do Douro to Diesel power has been a happy circumstance to all concerned.

The Foz Do Douro

The Foz Do Douro's engine room.



The American Merchant Marine or The Merchant Marine and Government

John E. Cushing, who returned to his steamship company position the first of the year, is regarded as one of the best informed ship operators in the country. In the following article, a synopsis of his address before the San Francisco Propeller Club, and in the article on Page 391, a synopsis of an address before the San Francisco Foreign Trade Association, Mr. Cushing gives the industry its first over-all insight into the future of the steamship business.—Ed.

By John E. Cushing

President, American-Hawaiian Steamship Company and former Deputy Administrator for Pacific Ocean Areas, War Shipping Administration, World War II.

John E. Cushing

Throughout our industry today, we hear a lot about return to private operations, restoration of the open market, lifting of government restrictions and freedom of enterprise. They are all fine sounding phrases and they help make fine sounding speeches. Yet I wonder if right now in this transition period, it isn't the proper time to take a good hard look at them realistically, instead of accepting them casually, at their face value as we are so prone to do with statements we are glad to hear.

Please understand that I do not for a moment question the sincerity of those who make the statements and speeches to which I have referred. But I do question whether they have ever applied or can ever apply to merchant shipping. The one shipping operation which might successfully claim complete freedom of interference from governmental controls was that conducted a couple centuries ago in the Caribbean, by certain gentlemen of many races. Its most successful operator was one Henry Morgan, and it only lasted until government caught up with it.

It so happens that most of us started our shipping careers under the traditions of a time when Great Britain so completely dominated the merchant shipping field that she felt it in her national interest to minimize government aids and government interferences in world trade. That happy period was of brief duration. Roughly, it ran from the 1850's to the outbreak of World War I—say 60 years out of the 460 of Britain's long maritime history. Before that period and after it, her merchant marine was one of the chief instruments of her national policy—consistently fostered and assisted by her government and as always in such cases, equally consistently directed and controlled.

Of all the other maritime nations, I cannot speak with the same assurance, but I do not know of any whose shipping enjoyed even that short respite of absolute freedom. Some of you will undoubtedly say, "What about Norway?" She is in truth a unique case, because with her the building and running of ships,—as distinct from serving her own trades,—is the major factor in her national economy, and in consequence her shipping industry in a perfectly proper sense dominates, and controls her government, where shipping policy is involved.

But when you consider Germany, Japan, France, Holland, Sweden, Denmark, and, above all, our own United States, you will find that their merchant shipping and their governments have been definitely intertwined from beginning to end.

So whatever we mean when we talk of free enterprise in relation to ocean shipping, it is not what we mean when we talk of it in relation to Henry Ford or United States Steel or the grocery store on the corner. Even in our domestic trades, American shipping would not last a figurative five minutes if the flag protection was withdrawn, and most certainly flag protection can only be established and preserved by government.

I guess, therefore, realistically, free enterprise when applied to shipping throughout the world, can mean at most freedom from direct government operation—but with plenty of government interference, regulation, direction and control—as compared to complete socialization where government bureaus initiate, supervise and actually perform the multitudinous activities which go to the running of ships.

If you will accept that guess for a moment at face value, it is interesting to see the widely divergent approaches which the various maritime nations seem to be making toward the

(Continued on Page 448)

The Intercoastal Trade

By John E. Cushing

The intercoastal trade, like many another veteran newly returned from the wars, is back on its old job—but not the same old job. It faces new problems and changed conditions which must be met and solved for the sake of its very existence.

I need not tell you how important it is to the Pacific Coast that these problems find their answer. For almost one hundred years our domestic shipping—intercoastal, coastwise and offshore—has been the basic foundation on which our port developments, our waterfront employment, and our merchant marine itself has rested.

Before the war the protected trades in sailings, cargo tonnage and ships represented more than all the rest of our Pacific Coast shipping combined —year in and year out. With no invidious comparisons, the intercoastal branch of the family was, in many ways the more important. Primarily it is a long voyage trade — 13,000 miles more or less on a round. That meant the ships it employed were of a size and type which could journey anywhere in the world. It meant big cargoes and it supported in our ports the facilities and improvements which big ships and big cargoes require. It is not too much to claim that—cargowise—it was the most important single element in Pacific Coast shipping.

Nationally in another way it proved its worth. In two great wars and a minor one its steamers were the shock troops who took the brunt of supporting our armed forces through the initial stages, in the shipping field. Without the intercoastal fleet in the summer of 1917 and the winter of 1941 our start down the road to victory would have been a definitely slower one. Our deficiency in ships and in trained personnel—afloat and ashore — would have taken much longer to overcome, while we stood idle or on the defensive at home.

The trade has always given the nation a natural reserve of ocean-going ships in actual operation on a route where they are readily available in emergency and plying waters close enough to our coasts to minimize the chances of adverse enemy action.

It cannot, of course, do more than act as a forlorn hope but in that role it has proved its value by actual performance. To meet our new responsibilities we must have a merchant shipping reserve which will probably be substantially in excess of the totals that our active domestic and foreign fleets combined can provide, but no matter how scientifically an immobilized reserve is kept in being, it will take precious time to break it out, to man it, and to get it going. Like everything else in this world a dead ship is no adequate substitute for a live one.

So on two counts—economic and military — the problems of intercoastal shipping are of concern to the nation and more particularly to this Pacific Coast.

Time permits only a brief mention of the part which intercoastal shipping played in World War II. Its record was in the highest tradition of our merchant navy. Many of its ships and—sadly—many of its best men did not return. The ships which did come back are battered and worn with four weary years of the hardest kind of usage. Their age and the beating they took does not justify more than temporary reconditioning. The trade must be retooled on a wholesale basis.

Before I leave the past for the present and the future I ask your indulgence to touch briefly on one intercoastal contribution which has been little publicized as such. In the spring of 1941 the position of the British army in Egypt was critical in the extreme. There was a call for help from London to Washington and help was promised. In those far-off days we were still clinging to neutrality. Under a technical but highly realistic subterfuge—Egyptian neutrality—American ships were asked to do the job. It was largely the voluntary contribution of the intercoastal lines that set up the slender lifeline over which flowed the munitions and supplies which played no small part in saving Suez. Technically every man aboard those vessels could have been summarily hanged in the event of German capture and for once international law would have been with the Germans. Fortunately that did not happen although one of the fleet fell victim to German bombs and many others suffered personnel casualties and physical damage from the same cause.

You are all familiar with the stirring story of the conversion of American industry to the uses of war. In the intercoastal trade it was not conversion. It was obliteration.

A few weeks after Pearl Harbor the trade had ceased to exist. Skilled and specialized organizations which had taken years to build were of necessity dispersed almost overnight. The transcontinental railroads shouldered the added burden of the Canal traffic and as we all know did a magnificent job of handling it.

With the ending of the war the intercoastal lines began to take stock. It needed no Einstein to figure the answer. There was no X in the equation. In terms of simple arithmetic pre-war rates were totally inadequate for post-war costs. The Government could make the intercoastal owners a present of the new ships necessary for retooling and even the most careful operator would have drowned forthwith in a sea of red ink.

Offshore, of course, the problem was met by the simple device of taking the pre-war conference tariffs and adding a percentage surcharge to cover cost increases. In the domestic trades there was no such easy answer. The intercoastal and coastwise operations had come under the jurisdiction of the Interstate Commerce Commission in 1940. The procedures of the Commission to protect the public interest are properly not designed to make hasty, emergency action on rate increases an easy matter. There was

also the complication of the inescapable relationship between rail and water rates and its effect on waterborne cargo volume.

Thanks to the courage and foresight of Granville Conway, acting administrator of the War Shipping Administration, and his associates, the United States moved vigorously and effectively to tackle the problem. Two months after V-J Day a limited number of Victory freighters were assigned by the Administration to the various holders of service certificates in the intercoastal trade on a basis roughly proportioned to the pre-war service of each individual line. Later similar action was taken to re-establish the coastwise services.

It was realized in advance that the experiment would be at taxpayers' expense to a greater or lesser degree, but it was felt there was ample justification for the action. It meant the continued operation of a substantial number of ships — fifty plus, intercoastally — which would otherwise have been forced into lay-up—also at taxpayers' expense. It meant continued employment of officers and crews, of longshore and repair yard labor, in fact of all the manpower and materials which go into an operation of that size. It meant revenue for port facilities and for the Panama Canal—for the most part taxpayers' operations. Finally it meant a demonstration in practical terms of the measure of rate increase necessary if the domestic trades are to be preserved under ultimate private operation.

The next move came in late March when the War Shipping Administration, joined by the Maritime Commission, petitioned the Interstate Commerce Commission to conduct a full investigation of intercoastal and coastwise rates and their relationship to the rates of competing forms of transportation. Bearing out the military interest in the preservation of domestic shipping the War and Navy Departments have urged on the Commission that it act affirmatively and speedily.

Because it so pertinently illustrates this interest, I take the liberty of quoting Secretary of the Navy Forrestal: "Tonnage engaged in coastwise and intercoastal trades is of particular significance from the aspect of national defense. In the event of an emergency, such shipping constitutes a ready reserve for utilization in the immediate solution of such logistic tasks as may require prompt and decisive accomplishment. The nature of the trade makes such tonnage peculiarly important since there exists neither any danger of internment nor any lengthy delay in their availability for emergency service."

I doubt that there is any substantial number of people in the United States who would favor government operation of domestic shipping on any permanent basis. Certainly that does not motivate the officials who are behind the present experiment. It is a stop-gap only but a useful and constructive one. That it is not unpopular with the shipping public has been amply demonstrated by the fact that in spite of all sorts of warborne handicaps, cargo offerings from a scanty and discouraging beginning are now close to a capacity basis in both directions.

It would be presumptuous to anticipate the Commission investigation by making even a guess at the overall percentage of rate increase necessary to put the domestic trades on a paying basis, nor do I want to bother you with a lot of figures. I do feel that you may be interested, however, in a few specific illustrations which I think will clearly demonstrate why there is no need for an X in this particular equation.

To make the cost figures clearer I should first state that in pre-war times an intercoastal turnaround meant anywhere from 80 to 100 days. On the long leg between the Coasts the transit time ran roughly from 17 to 21 days. With the higher speed Victories now running, turnaround has dropped to somewhere in the 70 day bracket and transit time has been reduced to 14 days. All this time saving has been taken into account in the figures which follow and which come from actual experience.

In 1939 the ship wage and overtime bill for an intercoastal round was about $14,000. Today it is $27,000. Pre-war the ship's complement fed for 80c per man per day. Now the figure is $1.37. On the cargo side for almost identical commodity makeups a ton of cargo handled in and out in 1939 for an average of $3.12. In 1946 the same operation is costing about $6.03. Thanks to the skill of the Maritime Commission designers the fuel bill is proportionately less in percentage increase despite the much higher speed. It has risen only 50 per cent with oil prices some 70 per cent higher than pre-war. The much maligned Panama Canal tolls are about the only operating item which stands unchanged.

Overall excluding repairs, insurance and overhead, on which conditions do not now permit a fair comparison, a normal round voyage would run in 1939 at about $85,000. Today it in-

The American-Hawaiian Steamship Company, of which Mr. Cushing is president, has a long record in the intercoastal trade and previously had operated to the South Pacific. The suggestion is made that the company will soon be serving the South Pacific again.

S.S. MEXICAN, dating from 1907, the "Mexican" is one of the oldest ships in service.

volves the expenditure of $150,000 plus and sometimes a pretty big plus. Neither figure carries any allowance for capital charges and both are based on the same totals for cargo tonnage handled.

Before any shipper friends who may be present find their blood pressures unduly rising, I hasten to say that there are certain to be offsetting factors and that any reckoning of rate increase percentages from cost figures alone may well prove misleading. For example we may piously hope at least for a marked improvement in labor performance which was in the depths of its post-war slump during the period covered by the figures. Many of our pier facilities have had to be makeshifts with consequent high piling, double handling, and short room for sorting, all of which make for higher cargo costs. Supplies of all sorts will follow the general market and no governmental control yet devised has beaten the old formula that what goes up must eventually come down.

Finally on the traffic side there are two unknown factors. Pre-war the trade was always out of balance. It took more ships to carry the Eastbound cargo than there was Westbound cargo to fill them. Our own figures year in and year out showed 95 per cent full Eastbound to 62½ per cent full Westbound. Any holding increase in Westbound volume would have a marked effect as an offset to increased costs since it costs about as much to run a full ship as an empty one.

Again the law permits the Commission to establish through rates and routes between rail and water. The war wiped out the water element before this phase had even been explored. I do not believe anyone on either side of the fence can venture a worthwhile opinion on all its implications but properly set up and administered it could mean much by way of added revenue to the participating carriers without any undue hardship to the shipper.

We come now to the retooling problem. Without teaching the highly controversial question of whether the prices established by the Ship Sales Bill can be maintained over any extended period, the bill itself makes no distinction in sales or charter prices between foreign and domestic operation under the American flag. Whether the domestic trades can support the prices prescribed is, of course, just a part of the whole problem of costs versus revenues. A generous interpretation of the trade-in provisions by the Maritime Commission—i. e., credit for old ships turned in against the purchase of new—would be most helpful and in no way against the public interest. The domestic trades would be particularly benefited by a liberal approach since conditions in their field made replacement a practical impossibility in the period between the two wars.

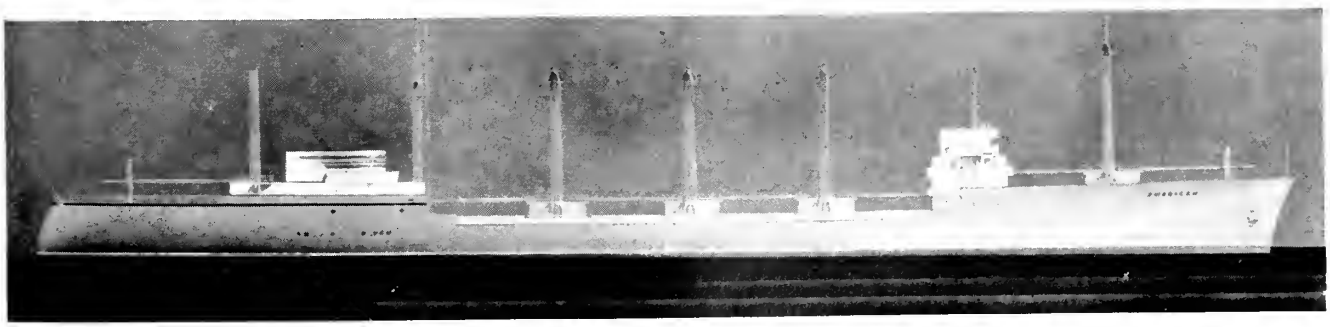
Unfortunately none of the major Maritime Commission types of new construction are ideally suited to the intercoastal operation. They were built and properly so, either as all purpose ships for war use or to meet the special requirements of the subsidized offshore trade routes. They can be made to do but they are not what one would order on one's own account. They will have to do because the Ship Sales formula prices are far below the building price today of a new and specially designed vessel. Unless some new formula can be found, history will repeat itself and an orderly and progressive modernization of our domestic fleets over the next twenty years will be impossible.

From the shipper's standpoint the new tools available should spell improved service. The greater speeds will make transit time more nearly comparable to rail. The war has developed numerous new tricks—though no revolutionary changes—in refinements of stowage and handling. Some of them will unquestionably be adapted to peacetime use. Under stricter regulation, rate wars, rate instability, and the fear of unfair discrimination should be out of the picture. Through billing should simplify the mechanics of water shipment. With cutthroat rate competition out the lines should be able while maintaining keen service competition, to work together in introducing improved claim procedures, minimizing paper work, and even tackling certain phases of marine insurance which tend to make shipment by water more cumbersome than by land.

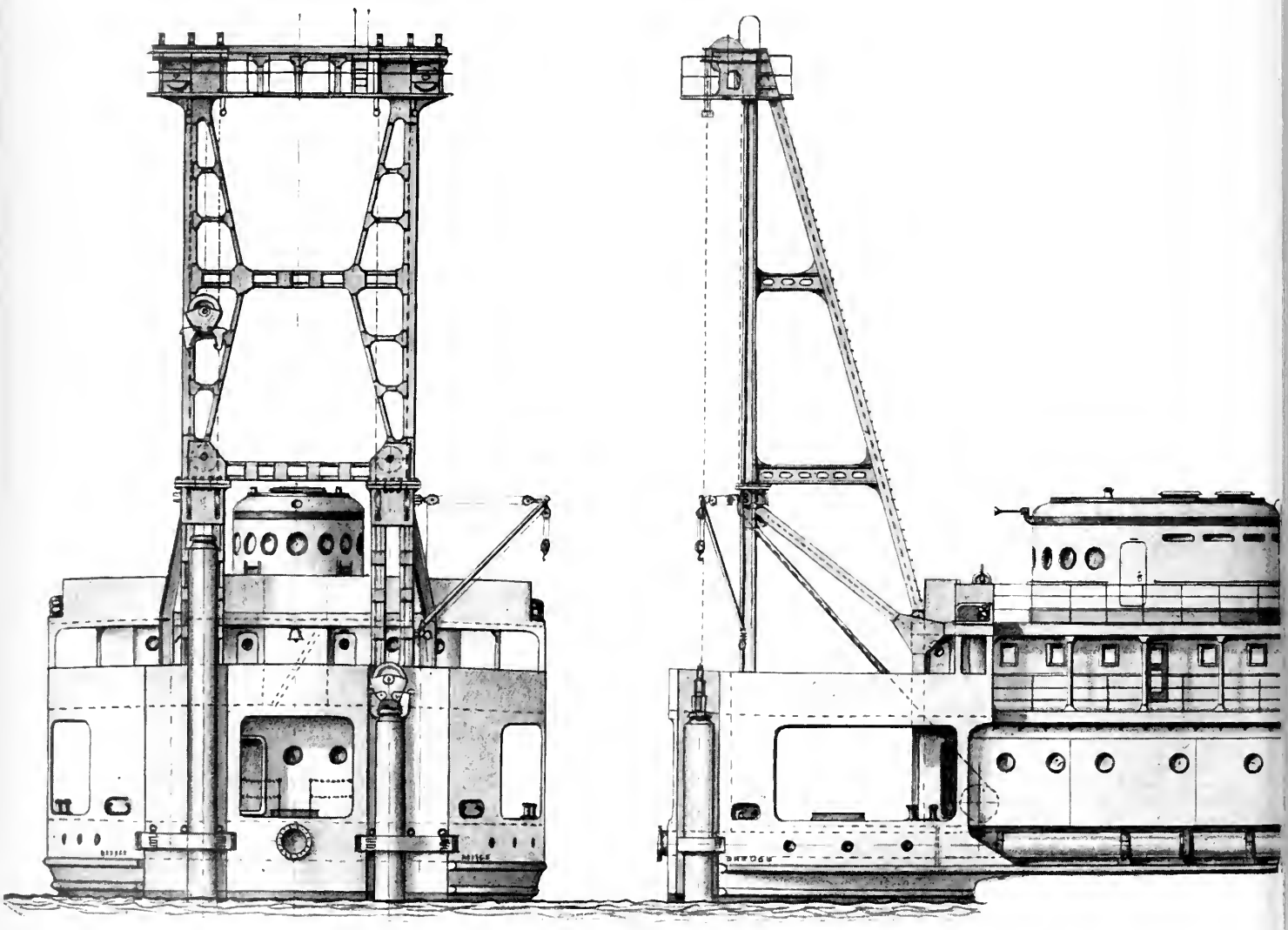
The domestic trades have never been subsidized beyond the flag protection which the founding fathers in their wisdom gave them. In general I think they should continue under that policy. There should certainly be no operating subsidy direct or indirect, and no free canal tolls. It may be that some consideration should be given to assumption by the government of a share of the costs of new construction which would encourage continuous modernization and which might well be considered a proper charge against national defense. In this same category there should be more equality of treatment between the domestic carriers and the subsidized lines in our foreign trade, with respect to Federal taxation and replacement funds.

I believe our domestic shipping is a national necessity. I believe it should be privately owned and operated under proper Federal legislation. I believe it is a vital part of our Pacific Coast economy. I am sure there will always be an intercoastal trade and so I ask of all of you your cooperation, support and sympathetic understanding to help us through the rough going that seems to lie directly ahead.

The C-4 as originally designed for the American-Hawaiian Steamship Co.



The Kinmont Ocean-going Hydraulic Dredge



The navigating bridge and pilot house on the after end of the Kinmont dredge. Pilot house occupies the aft half of the exhaust stack.

The power plants of modern hydraulic dredges and ships are similar in many respects. The main pump drive of the dredge and the propulsion drive of the ship are comparable. Of course, the dredge has two additional machinery departments utilizing power—the cutter drive and winding machinery—which are not found on a ship. These assist the main pump when the dredge is in operation. There is also a close similarity between the auxiliaries of both types of vessel.

A well-known consulting engineer, George Pelton, 10 Park Avenue, New York City, recently completed basic designs for a new-type hydraulic dredge for Kinmont Manufacturing Company of Los Angeles, California, builders of hydraulic dredges and dredging machinery, whose aim is to present to the dredging industry the "last word" in hydraulic dredges, with the most efficient type of power plant.

This seagoing dredge is provided with the Kinmont self-propelling device designed by Mr. Pelton. When preparations are made to go to sea,

this device permits the pump drive to become the propeller drive, and the dredge then becomes a ship. The various sizes of power units installed insure any desired speed up to 10 knots. The generator sets not being used for propulsion may be overhauled and made ready for the next dredging operation or held in reserve for emergency.

This 24-inch heavy duty, hydraulic dredge is suitable for all types of dredging work by hydraulic method.

Following are general specifications of this self-propelled hydraulic dredge:

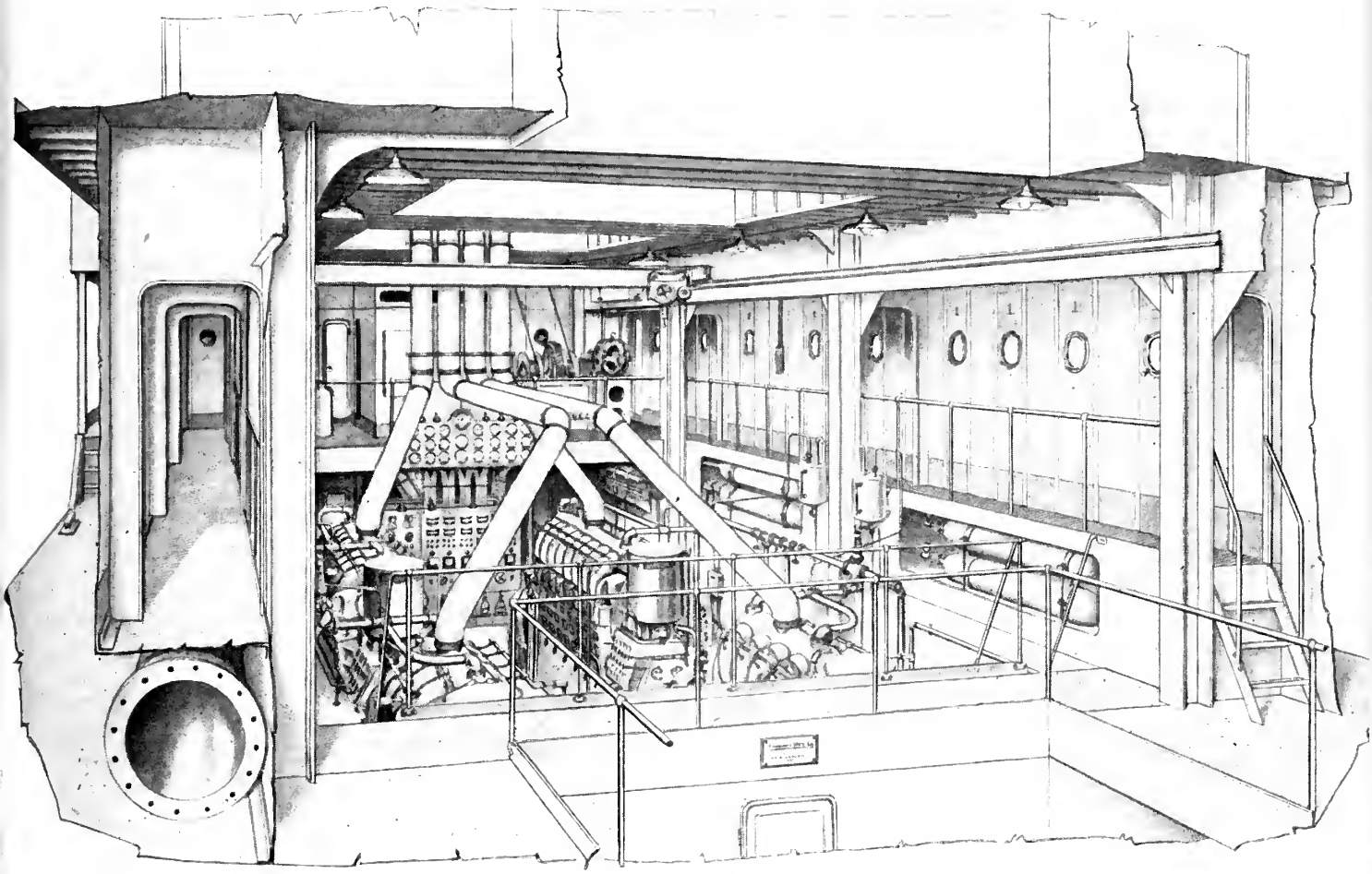
Hull Construction—The steel hull is of all welded construction. The characteristics of its design make it well adaptable and convenient for dredging operation and provide it with fine seagoing quality when the dredge is at sea. The hull is divided by two longitudinal and five cross bulkheads in several water-tight compartments. These compartments are intended for safety, particularly in the case of the Main Pump Room, where breakage of the main pump can cause the flooding and sinking of the dredge. Such accidents are well known and have resulted in the sinking of many dredges. The Main Pump Room is equipped with quick operating water-tight doors and spill pipes. Two longitudinal trusses provide the principal backbone of hull strength. They run the full length of the dredge and are in line with the longitudinal bulkheads to which they are fastened, as well as to cross bulkheads. These trusses project high above the main deck and are tied across the top in several places by means of cross-members, and are also fastened to the Main House.

This method of construction makes the hull extremely strong and eliminates the use of "Hog Frame" and "Hog Wires." However, there is a frame located at the front end of the Main House, which is similar in appearance to a hog frame, but its function is to act as a supporting frame for fastening of back guy wires of the "A"-frame, and to support the "Heavy Lift Boom," intended for handling the main pump and to serve the forward end of the dredge.

The "A"-Frame—The "A"-frame is made as a combination of two frames; the lower "Bridge Frame," and the upper "A"-frame. The lower frame is made solid with the hull, the upper rests on top of it, hinged at the bottom of each foot. This construction adds more strength to the front end of the hull, and adds extra facilities for handling parts of cutter drive and others. It also plays a part when securing the ladder for a sea trip. The upper "A"-frame becomes smaller and much simplified.

The "Spud Frame"—The "Spud Frame" is designed with a special provision which allows it to be lowered down in horizontal position for safety during the sea voyage, making the dredge more seaworthy. This is done by means of unbolting the flanges of Parting Joints of the Main Upright Members, then tilting the frame back on hinges, which are at the lower end of each back leg. It clears the smoke stack and comes to rest on the top of the upper deck when lowering it down. Lowering and raising of the

Engine room view, looking in the after direction, showing four Diesel generating sets. Note on the left the recess in the side of the house for dredge discharge pipe. Also the after hoisting units at the end of the engine room on the deck above engine room floor.



Spud Frame is done by means of a spud hoisting machinery.

The After End—The After End of the dredge rises high above the water and has "shipshape" appearance. It becomes a bow when the dredge goes to sea, for this, two large side plate doors and one end plate door are bolted in place, making the bow completely enclosed. It becomes a fine breakwater against heavy waves. The round shape of this bow cuts down resistance when traveling.

The Main House — The Main House is also made of steel. It adds more strength to the hull as it is tied to longitudinal trusses, as described above. All outside doors are watertight. Light is admitted through a number of portholes on both sides of the house and on the front end.

Living Quarters—Living Quarters are located always on the top of the Main House and arranged according to the Basic Plans, offering the best possible arrangement per number available square feet of space.

If the dredge is purchased originally without Living Quarters, same can be installed at a later date and be purchased in pre-fabricated stage made to fit existing conditions, provided the Basic Arrangement is used.

Dredge Machinery—The performance of the hydraulic dredge depends on three distinct well balanced departments of dredging machinery, which are: Pumping Machinery, Cutting Machinery and Guiding Machinery. By means of the dredge ladder all three are brought in contact with the material to be dredged at a specified depth.

Pumping Machinery—This department of dredging machinery receives and disposes of dredging material by means of hydraulic method of "pumping." For this, it consists of a specially designed dredge pump, suction and discharge pipes, and the driving mechanism, which rotates the pump impeller.

Dredge Pump (usually called the Main Pump) The features of "Kinmont Dredge Pump" are easily observed on the illustrations, yet we would like to say a few words, pointing out the principal advantages of the design. First: Well proportioned areas of the cross sections of all passages inside the shell and the impeller with easy curves, respectively, make the pump highly efficient. Second: Better pump protection against the wear by the lining method consisting of "metal to metal contact" of surfaces forming joints between the liners and the pump casing. Third: Complete elimination of all square shape (90°) corners in the passages between the pump and the impeller. The method of "metal to metal contact" of joints inside the pump, between the shell and the liners, completely eliminates clearance spaces where the wear originates, as rapidly traveling particles of mixture under pressure have the tendency to work their way in these clearance spaces. As this continues, they open up more and more and become badly worn ahead of other areas. This shortens the life of the liners, necessitating their replacement before being completely worn out. Sharp 90° corners of passages are subject to the same conditions as the clearance spaces. The wear generally starts in the sharp corners and then spreads out to other areas.

Removable Top Discharge Outlet—is another feature of the Pump Design. This allows replacement of the outlet in case it wears out before the pump casing. In cases where it is desired to do some work on building up vanes of the impeller, or hard facing surfaces of its shrouds, removal of the discharge outlet provides fine access to the impeller, and makes possible downward welding on same. The stuffing box around the impeller shaft has only one bolt with which packing gland is tightened.

Location of the Main Pump on the Dredge and Its Effect on Suction and Discharge Pipes—The main pump is located on the forward end of the dredge, as close to the forward bulkhead as is possible, allowing only enough room for servicing it. This location of the main pump reduces suction lift, which is very essential—the extra length added to the discharge pipe requires no extra power.

Driving Mechanism—Pump drive covered by this paragraph deals only with the part of a drive which does not go beyond connection to the Power Unit, which is made by a double engagement type flexible coupling. Everything beyond this point will be discussed in a separate paragraph under the heading "The Power Plant." The main pump is mounted on the steel bed plate, which also carries the spring bearing and the "Kingsbury Type" thrust bearing with corresponding shafts (pump shaft and thrust shaft). As an optional feature where constant speed motor should be used without any possibility for variable speeds, then "Kinmont Mechanical Speed Changer" can be installed. This device has the appearance of a gear box, provides the pump drive with four different speed changes, totaling 20% reduction, each step representing a 5% drop (for example, if high speed is 300 rpm, then 280, 260 and 240 rpm can be had). Change of speed is done by replacement of one shaft with gear in the Speed Changer, which is very simple and can be done in a rather short time.

Cutting Machinery — Cutting machinery consists of a digging cutter and machinery which drives it, usually called "Cutter Drive." Four different types of cutters are offered. Each is designed to dig a certain class of dredging material for which it is most suited.

These cutters are as follows:

(1) All tooth cutter for rock digging.

(2) Heavy duty blade cutter for hard materials.

(3) Light duty blade cutter for light materials.

(4) Basket blade cutter for soft materials.

The cutter is screwed on the end of the shaft, which projects over the forward end of the Dredge Ladder. This shaft is made of several sections, all connected together into one long shaft, which is supported by the Dredge Ladder. The opposite end of this shaft is connected to a "Cutter Drive" located on the after end of the ladder.

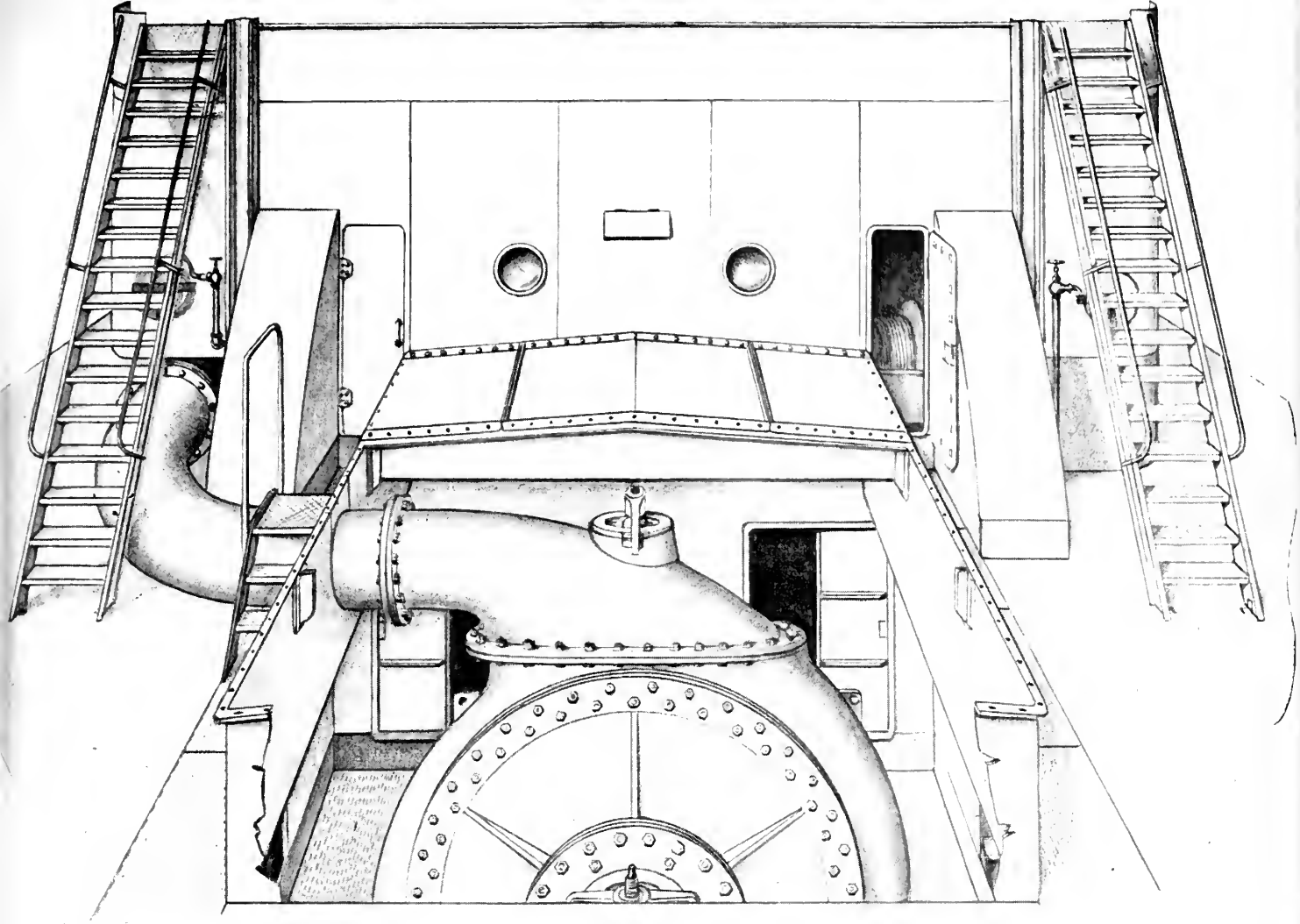
Cutter Drive—The Cutter Drive consists of two sets of reduction gears, each placed in a separate Gear Case. This arrangement has definite advantages as it permits keeping the Low Speed Gear Case out of the water, as it is located on the extreme after end of the ladder. Even when the ladder is lowered to its maximum digging position of 45°, there is no chance for the water to get into the Gear Case and mix with the oil. The High Speed Gear Case is located ahead of the Low Speed Case, but much higher, which keeps it out of the water at all times. In case one set of gears (high or low speed) has to be taken out, it is necessary to open only one set, without disturbing the other.

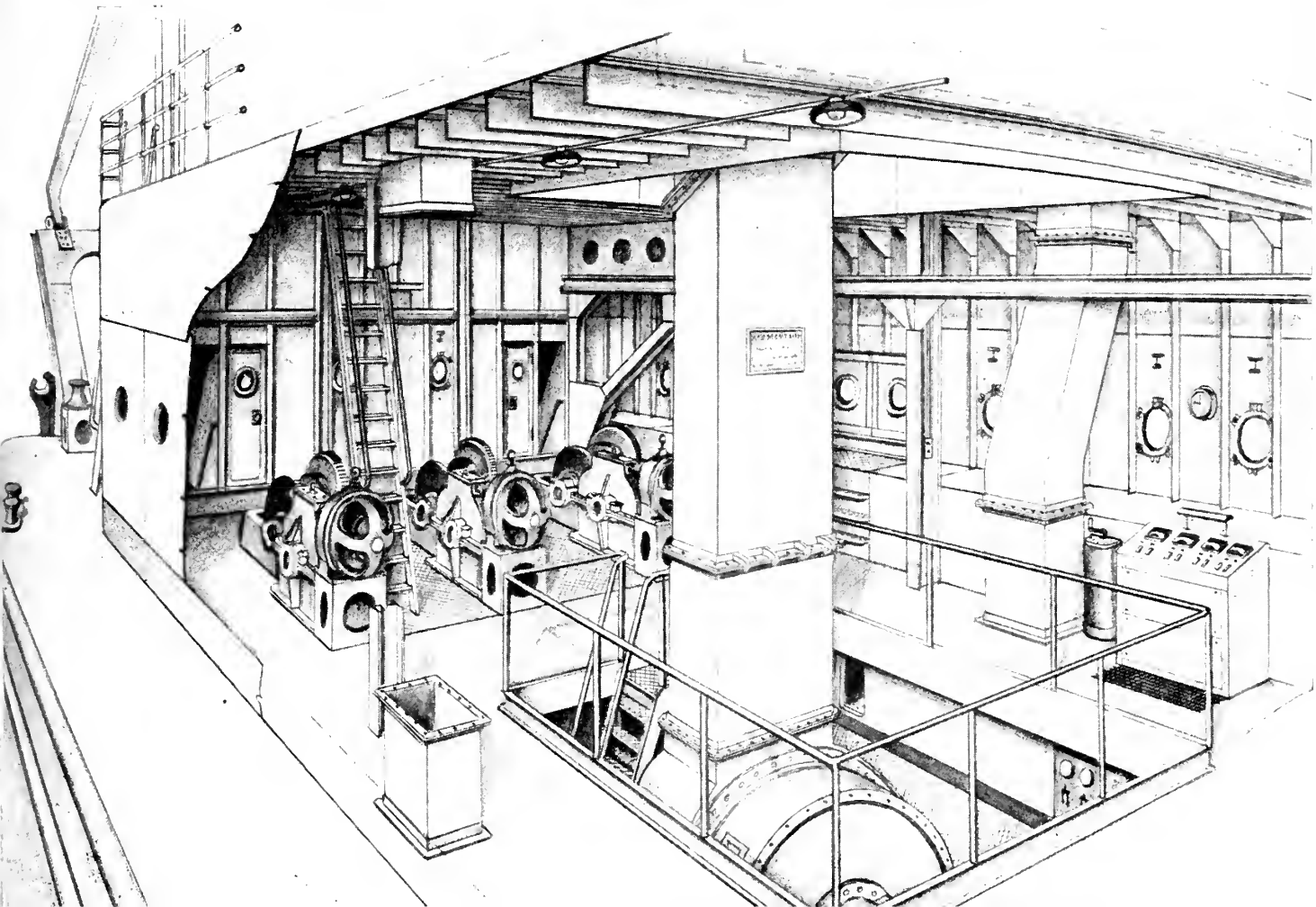
The Cutter Shaft is provided with

On the facing page:

Upper: Forward end of the dredge showing the main pumps inside the pump room with the pump hatch open. In back of the pump two quick-operating watertight doors can be seen.

Lower: The interior of forward end of main house, showing forward hoists, main pump motor and controls.





a specially designed Shear Pin Coupling, which protects the cutter machinery against breakdowns, particularly if the cutter gets jammed or receives a sudden severe shock. The Shear Ping Coupling will respond also to any other cause. The thrust which develops in the Cutter Shaft during the digging and due to the inclined position of the shaft, as the ladder goes down, is taken care of by a specially provided thrust bearing located on the after end of the ladder. The cutter drive is driven by an electric motor which is mounted on the pedestal adjacent to the back and of the High Speed Gear Case and is connected to a high speed pinion shaft by means of double engagement type flexible coupling.

The Cutter Motor should be of variable speed type if ac current is used, so that correct speed can be selected with the change of the material while dredge is digging. If dc current is used, this is accomplished much easier as dc current lends itself into variable speed by means of special controls.

Guiding Machinery—This machinery has several duties to perform:

Standard Equipment

No. 1 Duty — Swinging of the dredge from side to side.

No. 2 Duty—Raising and lowering of the dredge ladder.

No. 3 Duty—Raising and lowering of the spuds.

Extra Equipment

No. 4 Duty—Moving swinging anchors.

This machinery is commonly known as the Winding Machinery—an old-fashioned term, which cannot very well be applied to the "Modern Kinmont Machinery." In general, either one consists of several hoisting units, ordinarily five units, in special cases, seven.

The characteristics of an old-fashioned Winding Machinery are as follows: All hoisting drums generally are mounted on one foundation and are driven by one electric motor, or by any other available source of power. When the dredge is in operation (or is digging) usually there are two hoisting drums working, the other drums being held on brakes with clutches disengaged. If clutches are mounted on the side of Low Speed Gears, then all shafts and gears will be constantly in rotation. If clutches are mounted on the Intermediate Shaft, then drum shafts and gears of drums which are not at work will be at a standstill. The Intermediate Shaft will be revolving—this means that many parts rotate unnecessarily, using power and wearing out more rapidly.

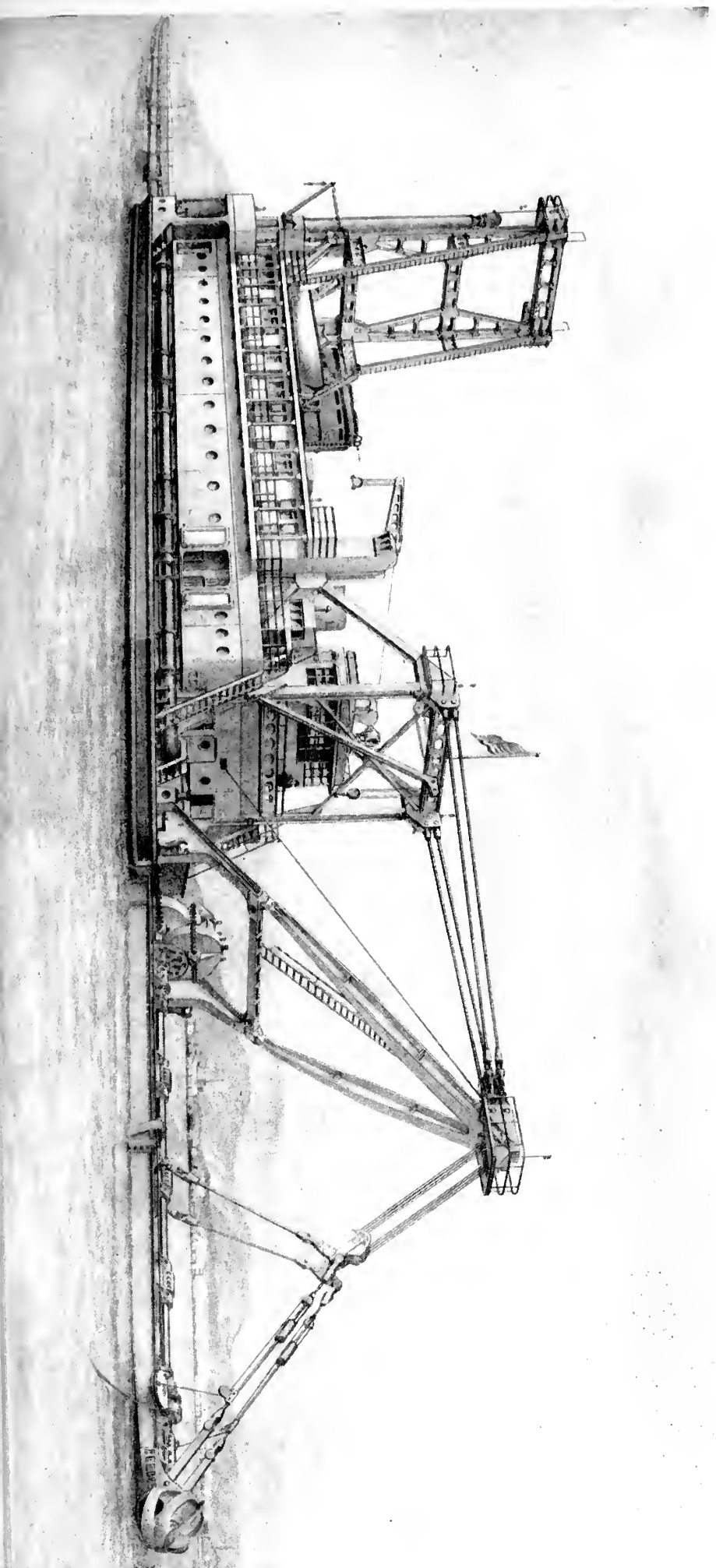
Kinmont Modern "Guiding Machinery" received this name because its function is to lead or guide the dredge when it is digging. This machinery consists of five (for Standard Equipment) or seven (for Special Equipment) individually driven hoisting units, each provided with a separate motor, arranged in groups of two: Forward Hoists and After Hoists. Forward Hoists perform No. 1 and No. 2 duties (also No. 4 in special cases), and are located inside the forward end of the Main House. After hoists performing No. 3 duty are located inside the after end of the Main House. All hoisting units are driven by individual electric motors. This system offers exceptional flexibility during the operation of the dredge, prolongs the life of the part composing hoisting units, and provides each unit with correct power and speed, which is hard to achieve in the old-fashioned types.

Forward Hoists — Two separate hoisting units similar in appearance, but driven by different size motors, are for dredge swinging. The unit which pulls the dredge during "digging swing" requires more power, with less speed, than the unit which pulls the dredge on her "return swing," as at that time no digging is done, less power but more speed is required. The third hoisting unit of a forward group performs plain hoisting duties of raising and lowering of the dredge ladder, which represents a heavy lift. It is equipped with a reversible electric motor, permitting raising and lowering of the ladder by push-button electric control — pushing upper button will raise the ladder, pushing center button will bring it to a stop, and pushing lower button will lower it. For quick lowering (or dropping) of the ladder, it is necessary to disengage the clutch, which generally is kept engaged. The clutch is also used as a brake.

After Hoists—There are two separate hoists, one for each spud, both are exactly alike, but slightly different in appearance than hoists of the forward group. These are two drum type, both drums being on the same shaft for single and double purchase duty, meaning that raising of the spud can be started on the double purchase, then by means of control changed to a single purchase. Spud can also be raised all the way up on a single or double purchase, respectively. Special spud grip allows dropping of spud without the danger of running the entire length of the wire off the drums.

Dredge Ladder—The principal duties of the dredge ladder (sometimes called "Digging Ladder") are: To reach down to a specified depth where material is to be excavated, break it up with digging cutter and pick it up by hydraulic suction. The mouthpiece of the ladder suction pipe opens inside the cutter so nothing can pass it by. This part of the ladder is called "ladder head" (the digging end of the dredge). The design proves that long experience lies back of every detail of "Kinmont Ladder Head." It has the strength, accessibility and the correct shape. It is also provided with Cutless Bearing for the ladder shaft. At a proper distance directly in the back of it, there are two special single sheave blocks for swinging wires, one on each side. These blocks are specially designed. They are fully balanced and will adjust themselves to any desired position, but will not swing, turn over or be subject to a hard drop. The digging end of the ladder is supported by ladder falls, with multiple equalizer which equalizes the pull of all holding straps. Other duties of the ladder are: To support the cutter shaft; suction pipe and the cutter drive with its motor. The ladder is the part of the dredge which gets the roughest service, so it has to be properly designed to stand the abuse. Kinmont make ladder has all the strength necessary, also the shape, which does not allow it to drag when the dredge is in shallow digging. The ladder is made in two pieces with the joint in the middle, so it can be taken apart for the sea voyage. The illustrations cover pretty well all other characteristics, including the entrance of the suction pipe into the hull. It also shows a flexible rubber sleeve. The ladder is attached to the dredge by means of hinges called trunnions, on which it hangs and pivots when lowered or raised. Trunnions of the design are made extra large to reduce the pressure per square inch of bearing surfaces, which gives longer life, more safety and strength.

Spuds and Spud Casings—In order to swing the dredge from side to side so she can dig with her cutter, it is necessary to pivot her at the after end. This is done by means of long spuds, which are put through the



spud casings attached to the after end of the dredge. Specially designed "Kinmont Twin Type" spud casings are well illustrated in this presentation. In addition to this, we want to point out that upper casings can be made with "cushioning" provision, allowing the spud casing to move in all four directions for a distance of a few inches, just enough to prevent the breakage of spud under excessive strain, which may occur at a certain interval. Kinmont Twin Type spud casings allow the change of "center" distance of spuds from smaller to a longer, depending on how much headway the dredge has to make. This is done by means of changing caps (or keepers) on spud casings from one center distance to another, and replacing spuds accordingly. The lower spud casings are made solid with the hull, and so can the upper casings. Cushion provision is an "extra" feature, and will be installed only if it is stipulated in original proposal, otherwise it will be made solid. Cushion feature can always be installed at a later date.

Power Plant — First should be pointed out all known types of power plants which can be adapted for the hydraulic dredge:

(1) All Steam
  (1-a) Part steam, part steam electric
  (1-b) Steam electric
(2) All Diesel
  (2-a) Part diesel, part diesel electric
  (2-b) Diesel electric
(3) All electric where power is received from shore.

Steam electric (#1-b) and Diesel electric (2-b) can operate as (#3) — all electric. In this article we are showing a 24" hydraulic dredge, gauging it by the size of its main pump, which is the customary way. It is claimed, from all available sources, that for all purposes of modern dredging, the Diesel electric power plant is the best type to select. There is considerable debate on this subject. A number of the dredge designers speak openly against Diesel power, instead strongly recommending Steam power, claiming that Diesel power has not proven satisfactory on various existing dredges; but it is rather doubtful that any of them can set as an example the dredge built with Ultra Modern Power Plant.

Our illustrations show this power

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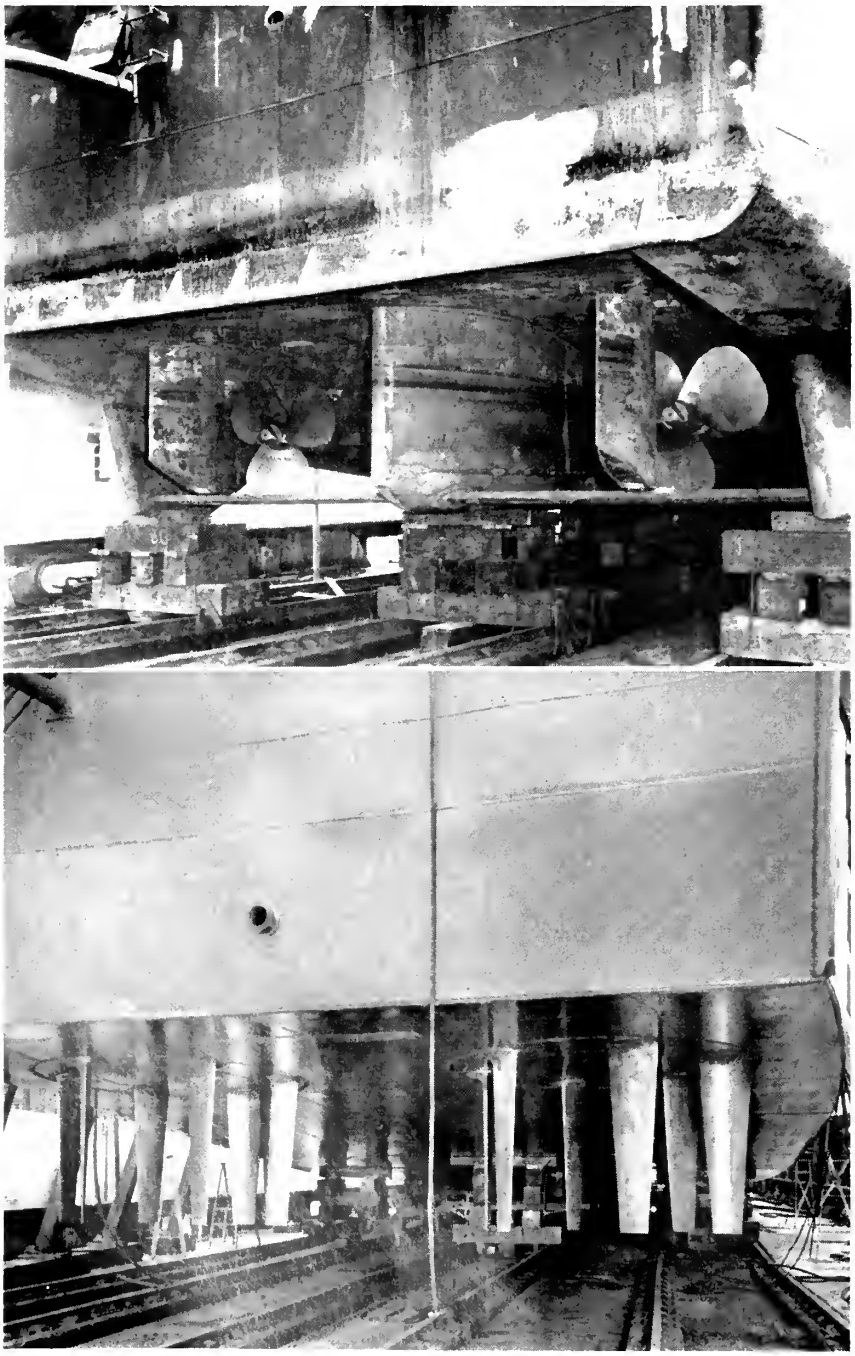
Cycloidal Propeller

U. S. Navy Tests the Kirsten System of Propulsion on West Coast

Upper: Before the hull lines of the Navy's LSM-458 were changed for cycloidal propulsion the stern of the ship had the usual propellers, rudders, skegs and struts. All these were removed and the aft part of the ship completely rebuilt before the cycloidal propellers could be installed. Lower: The complete underwater installation of cycloidal propellers on the Navy's LSM-458, looking forward from the stern, is shown in this photo. All encumbrances have been eliminated, and there is a clean, undisturbed flow along the hull bottom. Experts agree that in addition to increasing the maneuverability of vessels to an almost unbelievable degree, the cost of the cycloidal ship hull is reduced by the simpler construction.



The revolutionary cycloidal propeller, which gives ships unbelievable maneuverability, without sacrifice of speed, underwent extensive tests early in April in Puget Sound, mounted on the Navy LSM 458. Although the Navy did not reveal complete results of the tests, Navy spokesmen indicated that "almost unheard of maneuverability" is possible with this radically different propeller. Further tests are being conducted.

Invented by Professor Frederick K. Kirsten of the University of Washington, the cycloidal propeller was designed and built by Pacific Car and Foundry Company at Renton, Washington, with Kirsten as consulting engineer. The new propeller, which utilizes blades instead of the convential screw, was installed on the 900-ton LSM 458 at Everett Pacific Shipbuilding and Dry Dock Company of Everett, Washington, under the supervision of T. M. Rowlands, Chief Engineer. Pacific Car and Foundry Company hold the exclusive manufacturing license for the propeller, under the Kirsten patents.

One of the astounding maneuvers made by the LSM during the test runs was athwart-ship propulsion without ahead or astern movement of the ship. That is, the ship actually moved sideways under its own power. The vessel also was spun completely around without fore and aft movement, using its bow as a pivot.

The cycloidal propeller consists of twin propellers having an orbit diameter of seven feet, equipped with six vertical blades, each of which revolves on its own axis, as the rotors revolve. These twin rotors, circular steel housings flush with the hull, are connected to the vessel's drive shaft with a right-angle, beveled gear drive. Although the propeller somewhat resembles an egg beater, the principle is wholly different in that the revolving blades push all the water in one direction, whereas an

egg beater throws fluid in two directions.

Paul Pigott, President of Pacific Car and Foundry Company, emphasized that use of the cycloidal propeller is not restricted exclusively to Naval and military purposes. He stated that the propeller will prove of great value for such vessels as tug boats, crane barges, ferry boats, and inland and river watercraft of all types. Thor Henrikson, Chief Engineer, indicated that the use of the cycloidal propeller will result in a smoother and more streamlined hull. This is made possible by elimination of rudder gear and other appendages in screw ships. The tests indicated that the propeller materially reduces vibrations inherent in screw propulsion.

Professor Kirsten, the inventor, first conceived cycloidal propulsion in 1921 and at that time, undertook considerable research and development. Kirsten installed his new propeller on a sleek-lined 38-foot speed boat which performed many unusual maneuvers along Seattle's waterfront in the 1920's. Many tests were performed at the University of Washington wind tunnels and at the Navy Towing Basin in Washington, D. C. Scientific articles covering the amazing propeller were published in technical magazines, but in this country there was no further response to this revolutionary idea.

In Austria, however, the idea took form and the Voith-Schneider Company began to apply cycloidal propulsion to marine vessels as early as 1928. In the late fall of 1944, the United States Government became interested in this form of propulsion. Early in 1945, the U. S. Army and the U. S. Navy decided to investigate cycloidal propulsion and the U. S. Army ordered the alteration of a harbor tow boat to be equipped with cycloidal propellers of the variable pitch type. At the same time the U. S. Navy decided to try cycloidal propellers of the fixed pitch type on a landing craft of the LSM type. At the present time, the Navy ship is continuing its trials and the text is confined to this application.

The LSM-458 selected for this experiment is a vessel of 914 tons sea going displacement, 203 feet long and a 34-foot beam. It is powered by two General Motors Model 16-278A Diesel engines, generating 1800 hp at 800 shaft rpm.

The engineering work on the propeller was started in February, 1945, at Pacific Car and Foundry Company, and the two units were finished, shop tested and ready for installation in December of the same year. The propellers were installed in the ship by Everett Pacific Shipbuilding and Dry Dock Company in January, 1946, and the official trials commenced early in April.

In the yards of the Everett Pacific Shipbuilding and Dry Dock Company one of the cycloidal propellers is being lowered into position on the Navy's LSM-458. Each propeller has an orbit diameter of 7 feet, and is equipped with six vertical blades, each of which revolves on its own axis as the rotor revolves.

The propellers have an orbit diameter of 7 feet and are equipped with 6 blades each which are cast hollow of manganese bronze. The propeller rotor, which carries the blades, is driven through a unique spiral bevel gear drive invented by Professor Kirsten and built by Gleason Gear Works of Rochester, N. Y. The pinion shaft is directly connected to the engine shaft by a flexible coupling and consists of an inner pinion integral with the shaft and an outer pinion keyed to the shaft. These two pinions on the same shaft drive two spiral bevel ring gears mounted on a common spider which in turn is keyed to and drives the rotor shaft. The gear system is so designed that the pinion shaft is mounted on roller bearings and is free to float endwise. The spiral angle of the gears is cut opposite and of the proper relation to proportion the gear loads correctly and balance the pinion thrust. The gear drive might be considered the same as a herringbone gear drive but with the use of spiral bevel gears. The reduction from the engine shaft to the rotor shaft is $6\frac{1}{2}$:1.

The blade mechanism consists of a central control shaft which mounts the sun gear in the rotor and is normally stationary except when used for steering. Three idler gears mesh with the sun gear, and each idler meshes with two blade gears. As the rotor turns, the blades revolve around

View of the port cycloidal propeller looking aft from the interior of the Navy's LSM-458, after installation. The auxiliary hand wheel is for emergency steering. Steering is accomplished in the propeller by the control shaft, which, when turned by the worm and worm gear on the top, shifts the axis of symmetry of the propeller, and all blades impart their thrust in a new direction. Propeller controls are fully pneumatic, and complete vessel control is possible from the bridge. The name plate on the propeller reads: "Kirsten Cycloidal Propeller, manufactured by Pacific Car and Foundry Company, Renton, Washington."

their own axes at one-half the rotor speed; the ratio between the blade gears and the sun gear being 2:1. The blades mount vertically on their spindles and turn on their axes, while the propeller as a whole, revolves around its center shaft. This rotative motion of the blade is controlled so that each blade produces a useful thrust during practically its entire revolution on its orbit.

By virtue of its steering control, the propeller thrust may be directed any direction radially outward from the propeller shaft. Thus the ship may be rapidly reversed by turning the control through 180 degrees without altering the direction of rotation of the rotor. Consequently, the necessity of a reverse gear is eliminated, and its weight and cost are a great saving.

In accordance with Navy specifications, all bearings and gears in the propeller are force-feed lubricated. The oil is circulated through strainers, heaters and coolers by external shaft driven pumps with electrical standby units. The oil in the upper housing returns by gravity to the sump tank and the oil in the rotor is pumped out by internal gear pumps.

The double blade seals are constantly under oil pressure even when the propeller is stationary, a constant head is maintained in excess of the [illegible] water pressure to insure no [illegible] water into the propeller. The [illegible] shaft seal consists of three parts [illegible] is circulated between the two lower units for lubrication, and an oil pressure is maintained between the two upper units similar to the blade seals. Any leakage which might occur has no chance of entrance into the mechanism but may be spotted by entrance into the bilge.

The steering is accomplished in the propeller by the control shaft, which when turned by the worm and worm gear on the top, shifts the axis of symmetry of the propeller, and all blades impart their thrust in a new direction.

The propeller controls are fully pneumatic and were designed by the Westinghouse Air Brake Co. of Wilmerding, Pa. At the same time, the engine controls were converted to pneumatic and combined with the propeller controls in the same stand on the bridge. Complete vessel control is now possible from the bridge. Located in the starboard propeller room is a complete duplicate control stand for emergency operation. The necessary emergency valves and the control valve for either bridge or propeller room control are located in the engine room.

The screw propeller and the cycloidal propeller are so widely different in physical form and in their functions that no reasonable comparison can be made. The screw's single function is to produce a sternward thrust which propels the ship. The cycloidal propeller, which also produces this thrust, incorporates in addition the function of the rudder with such dynamic power that the ship may undertake maneuvers which are unthinkable and impossible with rudder control. Tests have proven that under certain conditions the efficiency of the cycloidal propeller is superior to the efficiencies obtainable with the screw.

The former screw installation included many screw auxiliaries, such as the two rudders, the ponderous skags, the stiffener strut which provides bearing support for the rudders and furthermore, the propeller hubs and shafts together with the strut supports of the stern bearings. All these appendages, projecting from the hull into the water, and which are swept by the high velocity slip stream, constitute a hull drag which exceeds 10 per cent of the total hull friction in many cases.

The use of cycloidal propellers eliminates all this encumbrance and provides a clean, undisturbed flow along the hull bottom. The higher operating efficiencies are partly explained by the cleaner and smoother hull shape. It is at once apparent that the cost of the cycloidal ship hull is reduced by the simpler construction.

It is possible to so direct the thrust that the vessel may be spun completely around without fore or aft movement. Another astounding maneuver possible only with cycloidal propellers is athwart ship propulsion without ahead or astern movement of the ship. The ship may actually be moved sideways. Thus a cycloidal vessel may be self-propelled out of close quarters without difficulty.

It is important to note that the effectiveness of a rudder depends upon its speed in the water. The lower the ship speed, the less effective is the rudder control. Thus the rudder action is poor just when it is most needed, namely when the ship approaches a landing with its speed cut to a minimum. A large ocean liner, for example, requires the help of a number of tug boats for its berthing, and for any maneuver in close quarters. The cycloidal vessel can use all of its engine power for any required maneuver, whether the ship is at a stand-still or under slow progression. No auxiliary towing craft will ever be required for a ship of any size, if equipped with cycloidal propellers.

Another source of great annoyance in screw vessels is the vibration induced by the propellers. The periodic approach and recession of the propeller blade tips toward and away from the hull creates corresponding

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The Reber Plan

Mr. John Reber of San Francisco has a plan and sticks to it. In that respect he is to be commended. Few individuals these days have definite plans and fewer still stick to the plans they have. Mr. Reber is not an engineer and does not claim to be. He is a promoter of his plan.

This plan is now some 25 years old. During that time several features have been added. Basically, however, the plan has one essential feature—the erection of two impervious dams across the bay by which it is proposed to turn lower San Francisco Bay, and San Pablo-Suisun Bays respectively, into fresh water lakes. All other features of the Reber Plan—the causeways across the bay, the reclamation of land for industrial and other purposes, the expansion of pier space and the assurance of fresh water conditions for the agricultural lands of the delta—are attainable to possibly better advantage without the Reber idea.

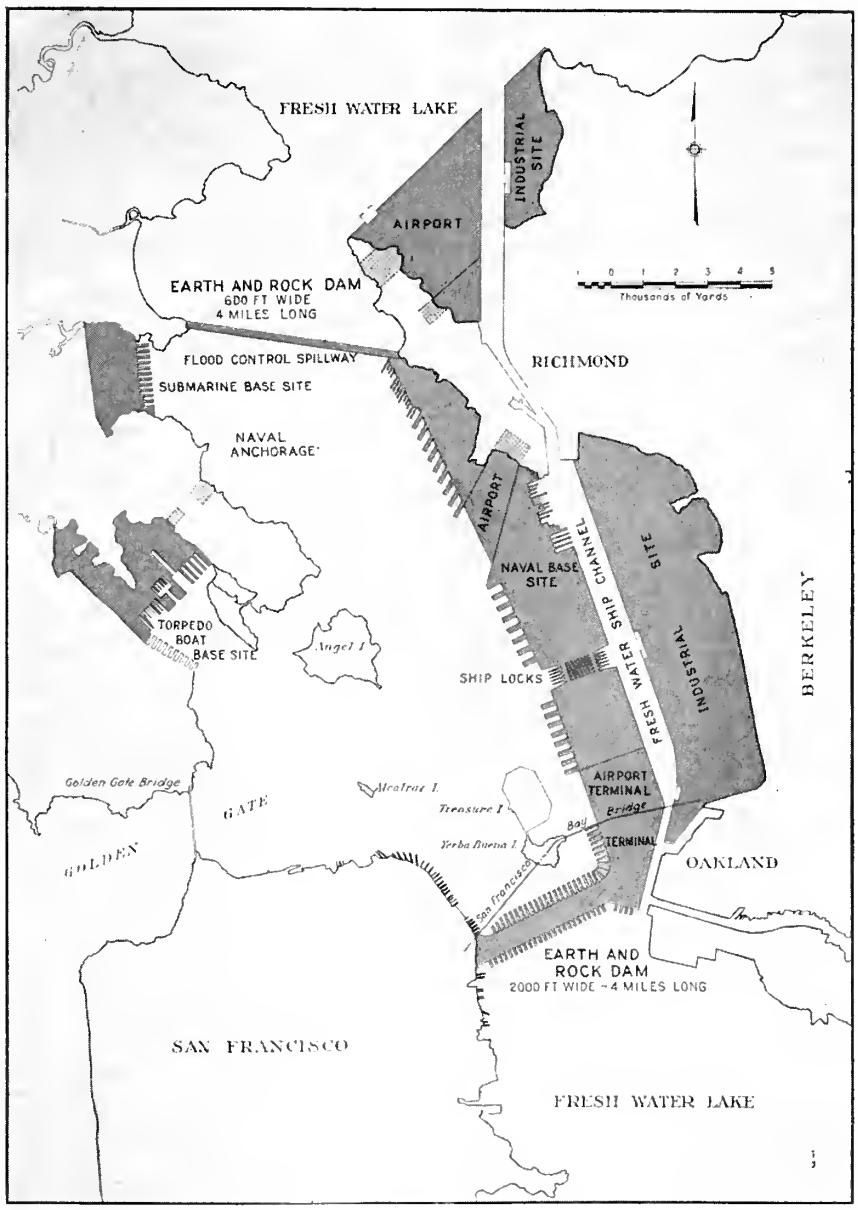
Recently this plan is again securing powerful support in the publicly acknowledged interest of Senator Sheridan Downey, of California. It was first given wide publicity during the promotion of the "Bridge the Bay" idea. At that time this plan was proposed as two causeways—one from San Francisco to Alameda, the other from Richmond Point to San Quentin Point—which would take the place of the proposed Golden Gate and Bay Bridges with much greater capacity and at much lower cost. Each of these causeways was to have locks for the passage of ships and a great advantage claimed was a tideless upper and lower bay of great area that would gradually change to fresh water.

At that time extensive experiments with models demonstrated that it was practicallly impossible to prevent salt water creeping up through the locks or to maintain in a fresh condition the body of water above such causeways. Several attempts have been made—notably at the mouth of the Nile—to preserve fresh water and create additional agricultural land in river deltas by installing salt water barriers equipped with locks, but in every instance the salt water has crept through and maintained the original status above the barrier. The new Reber Plan with its "fresh water" canal joining upper and lower lakes removes the ship locks from the barriers to a point on the canal. This, however, does not alter the fact that the salt water will go through.

Since the original proposal of this plan several large public undertakings have greatly changed some of the factors affecting the advantages claimed. The Central Valley Water Project is guaranteed to provide enough constant fresh water flow in the Sacramento to take care of the infiltration of salt water that is causing trouble in the island farms of the delta. Water conservancy measures taken by Santa Clara County have greatly reduced the annual flow of fresh water into the southern end of the Bay. This latter is affected by

(Continued on Page 450)

The criticized Reber plan.



MARITIME DAY

Bands, Floats, Exhibits Feature First Peacetime Event

By Frank Di Marco

With exactly one month remaining before the celebration of the greatest National Maritime Day (May 22) in the annals of Bay Area observances of the event, those who have been busy for the past several weeks on preparations now are able to release details of the program which will salute the Merchant Marine and allied industries in the Bay Area in a manner far surpassing anything previously undertaken.

Hugh Gallagher vice president of Matson Navigation Co., who is serving as chairman of the San Francisco Propeller Club's Committee for National Maritime Day, acted as spokesman in giving a composite report of the committee's wide-range activities. In releasing his report, Gallagher pointed out that while National Maritime Day will be officially observed on May 22, and most of the scheduled events will take place that day, activities extending through many days during May will serve to focus public attention on the Merchant Marine.

Gallagher also stressed that all groups in the maritime industry, and the entire Bay Area rather than San Francisco alone, are cooperating to make National Maritime Day here in 1946 the greatest ever and a precedent for future observances.

The opening signal for Maritime Day came on May 5th when the Pacific Inter-Club Yachting Association made a striking advance salute to the maritime industry by having their opening regatta of the season take the form of an armada of pleasure craft sailing through the Golden Gate. The armada was led by a pilot boat of the San Francisco Bar Pilots Association, which had aboard a number of maritime leaders.

From May 13th to 31st on the floor of the Marine Exchange (465 California Street) an exposition devoted to the maritime industry will be held and is expected to attract many thousands of visitors.

Open to the public without charge, the outstanding feature of the exposition will be the first public showing of a post-war passenger liner stateroom—in full size and completely furnished to afford the public the opportunity of actually inspecting the type of accommodations which will be available to those who make sea voyages on American merchant ships now that the Merchant Marine is returning to peacetime pursuits. The stateroom will be on display through joint arrangements with Joslyn & Ryan, naval architects, and Arnot & Co., metal furniture firm.

In conjunction with the stateroom will be displays of marine and nautical equipment used both in the building and operation of merchant ships. Among those firms which have arranged to show their products are Westinghouse Manufacturing Corp., Radio Marine Corporation of America, Marine Instrument Corp., and Moore Drydock Co.

On May 15th the exceedingly pop-

ular radio show, "Breakfast on Nob Hill," broadcast over Station KSFO with Bill Baldwin as master of ceremonies, will be entirely devoted to a salute to National Maritime Day. Held in the Birch Room of the Fairmont Hotel, breakfast is served at 8 a. m. and the broadcast goes on the air at 9 a.m.

Attendance at the broadcast will be limited to those having reservations. Those who do attend will have a chance to win one of several prizes, including a free trip to Honolulu for two persons or a $1000 Victory bond, a week-end for two at Sonoma Mission Inn, nylon hosiery and theater tickets.

All other events marking the observance will take place on National Maritime Day, May 22nd (Wednesday).

The first American merchant ship which enters through the Golden Gate on the morning of May 22nd will be the "honor" ship of Maritime Day in the Bay Area. The ship's captain will be the honored guest at a luncheon at the Commercial Club and the entire crew will be honored guests at a dance in the evening at the United Seamen's Service.

Shortly after 9 a.m. a solemn tribute to the great many merchant seamen who gave their lives while transporting the men and supplies needed to win the war—through never-ending perils and to every beachhead—will be held at the center of the Golden Gate Bridge. Capt. H. J. Tiedemann, Pacific District Operations Officer, U. S. Maritime Service, surrounded by an honor guard from the Merchant Marine Cadet Corps, will cast a memorial wreath from the bridge into the sea. As the wreath is carried away on the waters, every ship in the harbor will "sound off" simultaneously with a blast on its whistle. This will officially mark the commencement of National Maritime Day here.

Next event will be a mammoth parade starting from the Civic Center at 10:45 a.m., down Market Street to Montgomery, along Montgomery to California Street to pass before the reviewing stand at the Merchants Exchange Building, and thence to the Embarcadero to disband.

The parade promises to be one of the most spectacular and interesting ever held in San Francisco because it will include a large number of floats especially designed to depict every activity and phase of the maritime industry—shipbuilding, ship operation, manning, supplying, servicing and repairing. Nothing like this has ever been done before and a precedent for future observances of National Maritime Day here will be set. In addition to the floats, there will be bands, marching units, contingents from labor and fraternal organizations and others.

Companies and organizations which have pledged to enter floats are: Matson Navigation Co., American Hawaiian Steamship Co., Luckenbach Steamship Co., Moore-McCormack Lines, United States Lines, Pope & Talbot, Inc., American President Lines, Kaiser Shipyards, Moore Drydock Co., Joslyn & Ryan, Society of Mechanical Engineers, General Steamship Corp., Bethlehem Steel Co., Enterprise Engine Co., Chamber of Commerce, Mariners Club, Propeller Club, U. S. Maritime Service, San Francisco Port of Embarkation, Transportation Post of the American Legion, American Merchant Marine Library Association, and Women's Organization of the American Merchant Marine.

At 12:15 p.m. the regular National Maritime Day luncheon will be held at the Commercial Club. Attendants will be members of the Propeller Club, Mariners Club, Chamber and Junior Chamber of Commerce and other groups. They will hear a keynote speech by a national figure whose name is yet to be released.

From 3 to 5 p.m. open house will be held by the Women's Organization of the American Merchant Marine at the Davy Jones Locker Canteen, 1000 Geary Street, to tell the story of the work done by the WOAMM for merchant seamen during the war. Refreshments will be served.

The Palace Hotel will be the scene at 6:30 p.m. of the 17th annual Spring Frolic of the Mariners Club. The affair will be signalized as a tribute to the Merchant Marine and the maritime industry in the Bay Area.

A dance for merchant seamen will start at 8 p.m. at the United Seamen's Service clubroom, 439 Market Street.

All during National Maritime Day there will be specially-arranged broadcasts on all local radio stations. Films portraying the activities of the American Merchant Marine will be distributed to schools for showing to students. Posters will be placed

Top: Hugh Gallagher, general chairman of San Francisco Maritime Day Committee.

Center: Gene Hoffman, chairman of the Advisory Committee (that's the kind of a committee to get on!).

Bottom: Frank Di Marco. Between his recent shedding of a Navy lieutenant's uniform and opening his own office in the Kohl Building, Frank has found time to arrange the best observance in Maritime Day history.

Eddie Martin. Vice chairman of the Maritime Day Committee, who, in the absence of Chairman Gallagher, carried the load. (Maybe that is why Hugh has the happy look indicated on page 405.)

throughout the Bay Area and special displays will be arranged in the show windows of a large number of downtown stores and banks. Special speakers representing the maritime industry will address all local civic clubs, such as the Kiwanis, Advertising Clubs, etc., to emphasize the significance of this important event.

Capt. Claude B. Mayo, USN (Ret'd), superintendent of the California State Maritime Academy, has consented to have the training ship Golden State open for public inspection all during National Maritime Day. The training ship, recently returned from a lengthy cruise, will be berthed at Pier 16, San Francisco.

Post-war Diesel Yacht for West Coast Cruising

Wells Designed 167-Footer for Major Max Fleischmann to be Powered with Twin 900 hp. Enterprise Engines

Toward the end of the war one often heard the remark that "the days of large country estates and luxurious power yachts have gone forever," which just shows how incorrect can be the guesses of "expert" industrial forecasters. The fact is, at the end of the war less than one year old, the demand for fine yachts was greater than the supply, and many new craft are on order, although strikes are delaying production. This demand is encouraging to the shipbuilding, engineering and allied marine trades because it will provide work for a very large number of skilled men released from war jobs.

When completed early in 1947, one of the most outstanding new yachts of the year will be the 167-footer Haida now in the final stages of design on the drawing boards of John H. Wells, New York naval architect, who has been commissioned by Major Max Fleischmann to draft a steel vessel suitable for pleasure and relaxation service on the Pacific Coast.

While this yacht is to be built in an Eastern yard, namely, the Bath Iron Works, Bath, Maine, she will have Diesel propelling engines constructed by the Enterprise Engine Company, San Francisco, California.

Profile and superstructure of the Haida will be streamlined in accordance with modern ship design, but the streamlining will be carried out in a very conservative manner; in fact simplicity is the theme of her entire conception, including the interior accommodations, furnishings, decorations and fixtures. The main idea is to make her strong, seaworthy and comfortable; also capable of offshore cruises under all weather conditions. She will be air-conditioned and will have all the latest available navigating equipment, including radar, radio, fathometer, pitometer log, metal mike, and gyro compass; also CO_2 fire protection, and pilot house control of the main engines. Sufficient bunker space is being arranged to enable the vessel to cruise from U. S. West Coast ports to Alaska and return. Her decks will be of teak, and she will be classed by the American Bureau of Shipping.

Plans of the Fleischmann yacht show that she will have the following dimensions:

Length OA	167 ft. 6½ in.
Length BP	161 ft. 3 in.
Breadth	25 ft. 0 in.
Power	1,800 s.hp.
Speed	16 knots

The Haida will have twin screws, and the propeller shafts will be direct connected to two eight-cylinder, 12 in. by 15 in. supercharged four-cycle type Enterprise Diesel engines of the airless injection type. Normally these engines run at a higher speed than they will in this craft and develop 1,000 hp each; but as maximum possible ship speed is not an important factor with the Fleischmann yacht, it has been decided to adopt the best all-round revolutions and power output of 900 s.hp. at 500 rpm, and presumably little of importance is lost by this conservatism. The vessel will be equipped with specially designed three-bladed bronze propellers. As the engines are direct reversible there will be no reduction gearing, hy-

draulic clutch or electric transmission of power.

For auxiliary purposes the present plans call for two 30 kw Diesel-generator sets, but it is expected that two 40 kw units may actually be installed because of the heavy load required by the auxiliary equipment, and by the big storage batteries.

Roominess is one of the features of this attractive vessel. In the superstructure forward is the dining saloon —a room 22 ft. by 15 ft. seating eight persons. Over this accommodation is the pilot house, which will be equipped in so modern and complete a manner that the navigator may start, stop and maneuver the main engines from alongside the steering gear, and has at his command everything in the way of modern instruments to facilitate navigation.

Next to the dining saloon is a large pantry, with a companion leading down to the galley on the lower deck. Then comes the captain's quarters located on the starboard side and on the same deck as the galley and pilot house. They are complete with private toilet and bath. On the port side parallel with the skipper's cabin is a fishing-gear room and stores.

Aft again is the engine-room casing with the smoke stack above. However, the stack is really a dummy, except that it is used for carrying off the galley fumes and heating boiler outlet, as the Diesel engines exhaust under water and do not need the stack. Nevertheless, the stack space is well utilized because it houses two 8,000 cu. ft. blowers for ventilating the engine room as well as the officers' and crew's quarters.

Abaft the engine room casing on the same deck is the owner's daytime office with its own private toilet attached. Next is the main lounge, a spacious compartment 26 ft. by 16 ft. extending the full width of the superstructure. Aft again is the deck space for the owner and his guests. In the center is an escape hatch running from Major Fleischmann's sleeping quarters below, and the top of this hatch forms a table for use in fine weather.

On the lower deck, running from the stem to stern of the ship are the following accommodations: First comes the forepeak and crew's toilet with a chain locker below. The forecastle has six pipe berths.

The officers' and engineers' quarters are next in line and consist of five cabins each with two fixed berths. Their toilets and shower are forward of these cabins on the starboard side. Each cabin has wash basins with running hot and cold water. Aft of the officers' sleeping quarters is their mess room, and then comes the galley and meat chill box running the full width of the hull. The galley is equipped with a large oil-fired range, hot table and the usual cooking utensils.

Next in line is the engine room. In addition to the main and auxiliary Diesels, and the usual electrically-driven pumps, there will be installed a 23 cu. ft., 250 lb. pressure, motor-driven starting air compressor for serving the Diesel engines. The auxiliary power units are mounted on vibration dampers to ensure smooth operation. Fresh water cooling will be used for the main and auxiliary engines, a closed system being arranged in the design layout, but oil cooling will be used for the main engine pistons. For cleaning the fuel and lube oil there will be two centrifugal machines.

In order to provide absence of noise when in harbor in the daytime, and when moored or anchored at night, an unusually large storage battery group is being installed in the lazarette at the extreme after part of the hull, and this unit will be of 980 amps capacity. When power is being drawn from the storage supply, the auxiliary engines are shut down. Also in the engine room is an automatic hot-water boiler for supplying the ship's heating radiators and for heating the air-conditioning preheaters in cold weather. The steering gear is one other piece of machinery that is located in the engine room.

For total refrigeration there is a three-ton direct-expansion Freon system plant using a water condenser. A 10-ton Freon direct-expansion compressor driven by a 10 hp electric motor is used for air conditioning. There are two units—one in a hold in the forepart of the ship, and the other in the after hold. Both are automatically controlled by individual thermostats in the cabins and saloons. All owner's and guests' staterooms are air conditioned as are the dining saloon and lounge. The ventilating system is supplied by the two blowers in the stack and fresh air is piped through ducts in the engine room to various locations. This blower system is piped to the officers' and crew's quarters and to the galley, and is equipped with preheaters.

Aft of the engine room, separated by an insulated and water tight bulkhead, are two guests' staterooms, the larger having twin beds while the other has a single bed. One bathroom on the portside abaft of the single cabin serves both compartments.

An insulated and watertight bulkhead separates the guests' quarters from Mrs. Fleischmann's accommodation. The latter consists of a tastefully furnished stateroom on the starboard side, directly connected to a dressing room on the portside and to a private bathroom. Her cabin has a three-quarters bed. Next comes Major Fleischmann's stateroom, which is fitted with a large berth and settee, and has a private toilet and shower.

On top of the ship's superstructure are located the yacht's launches, dinghys, life rafts and a canoe. The owner's launch is of the cabin type, 26 ft. by 8 ft. She has a cabin with two bunks and toilet; is equipped with a 120 hp gasoline motor, and has a fish box, chair, etc., in the cockpit aft. To make her a lifeboat, the hull has air tanks fitted into the sides.

The crew's launch also is of the cabin type, 24 ft. by 7 ft., and is driven by a 100 hp gasoline motor. She has a small toilet under a seat forward, and is provided with a fish box.

When completed and commissioned Major Fleischmann new craft will make a worthy addition to America's marine pleasure fleet. Her appearance in Pacific Coast waters will be awaited with much interest.

Following is listed some of the equipment which will be installed on the Fleichmann yacht:

Designer	John H. Wells, Inc.
Builder	Bath Iron Works
Main Diesels	Enterprise
Auxiliary Diesels	U. S. Motor
Storage Batteries	Exide
Gyro compass	Sperry
Automatic steering	Sperry metal mike
Steering gear	Sperry
Air conditioning system	Young Radiator
Davits	Welin
Heating boiler	Way Wolff
Propellers	Hyde
Insulation	Possibly Fiberglas
Fire extinguishing system	Kidde
Underwater exhaust	McLachlan
Oil burning range	Shipmate
Cabin decoration	Vogel
Joinery	Hopeman Bros.
Fathometer	Submarine Signal
Radar	Raytheon or Sperry
Fuel and Lube oil centrifuges	Sharples
Tube log	Pitometer

Dehumidification and the U. S. Navy "Inactive Fleets"

By Capt. T. H. Urdahl, USNR
and
Comdr. E. R. Queer, USNR

With the end of World War II preservation measures to implement the U. S. Navy's "Keep the Fleet" program are not only well defined but are already being applied. At the end of World War I the same factors which make up the problems of preservation were as well known as they are today but the "engineering link" between desirability and practicability had not been forged. The preservation methods employed were made by the application of materials readily at hand. Such ineffective and costly methods have served as ample reminder of the necessity for a more adequate means of protecting our Naval vessels against the ravages which nature holds in the form of atmospheric corrosion. Today, approximately 2700 ships of combatant and non-combatant types are being protected by employing scientific means of dehumidification, painting, thin film rust preventive compound application, and tight packaging. The speed at which the ship so preserved can be returned to an active status has been a primary consideration in the selection of preservation methods. Through these procedures, both quick and inexpensive, it is certain that our Navy will remain in an excellent condition of readiness for many years.

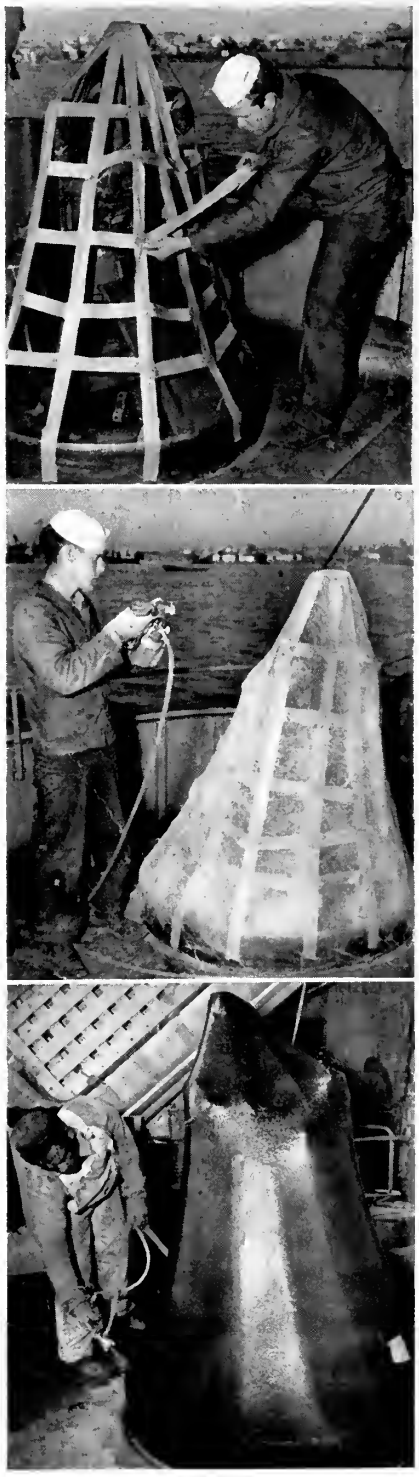
The problem presented in the preservation of a ship contains the following rather elementary factors:

1. Moisture and atmospheric conditions cause corrosion of metals, mold, mildew and general deterioration of equipment and materials aboard.
2. The removal of equipment and materials for storage ashore is expensive and storage offers no protection against deterioration unless adequately treated.
3. Adequately closing a ship's hull provides an excellent vapor and water barrier and quantities of atmospheric moisture admitted by breathing and infiltration can thus be controlled.
4. Preservation by means of coatings alone is not sufficient.

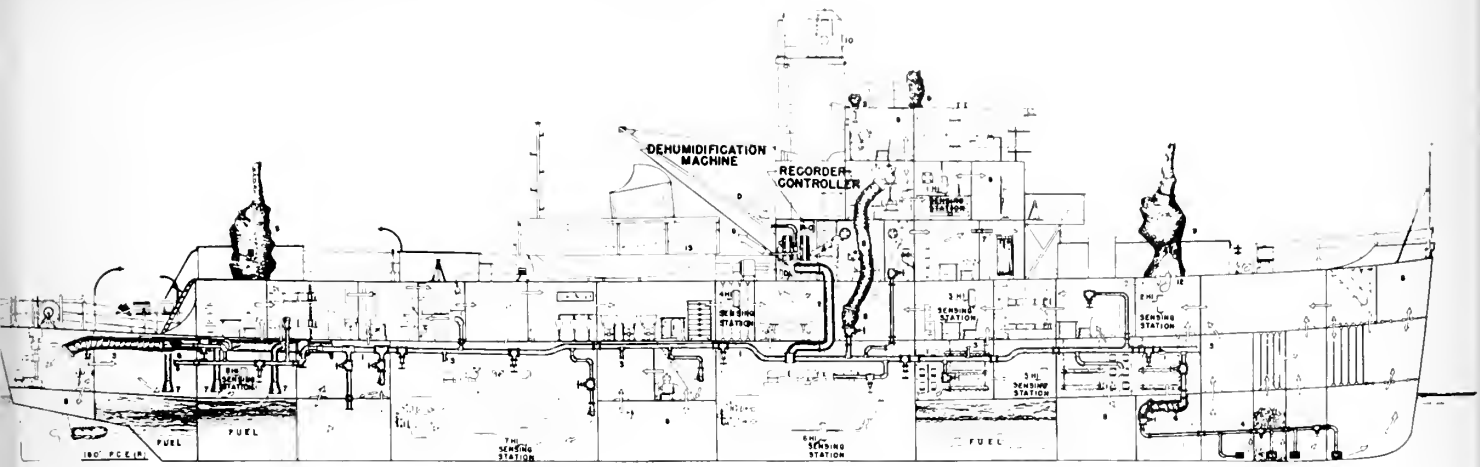
The solution most immediately apparent in analyzing these factors is that of using the ship as a storehouse for all of its own required equipment. The ship must be as tight as economically practicable against the admission of outside air and moisture. The atmosphere within should then be sustained at a relative humidity of 30 per cent or less, since at this point it has been determined that general deterioration is inhibited for an indefinite period. The practicability of obtaining this solution was dependent upon development and manufacture of equipment which could maintain the desired low humidity condition under the entire range of weather conditions prevailing throughout the year in any of the fourteen berthing areas variously dispersed about the continental United States. Also basic to the matter of obtaining adequate equipment was quantitative data concerning moisture loads to be removed in order to arrive at economical unit sizes to cover the space requirements of various types of vessels.

A great deal of thought concerning this and similar preservation problems has taken place over the past 20 years. Some development work had been carried on toward providing equipment of a satisfactory type to accompany the desired control of humidity just prior to World War II at which time the Navy's development efforts were diverted to the essentially higher priority of active fleet equipment.

However, the past work had form-



The first step in readying the guns is to see that they are thoroughly cleaned and free from rust. All protruding parts are then covered with felt and a "tent" is made over the gun with a type of adhesive tape. After the tape has been applied the webbing agent is sprayed on. This agent is a liquid when it is put into the tube of the spray gun. It is invisible when it leaves the gun and forms the web upon contact with the air. The next stage is the applying of what is called stripable coating. This is applied in three layers, yellow, red and blue. During these applications, two holes are left in the cover, one on each side of the gun. Through these holes heat is applied and the paint thoroughly dried out. After the moisture is removed, one hole is patched. Into the larger hole is inserted a lucite window. Silica is placed inside the packaging and it is closely watched for a color change. Silica absorbs moisture from the air and keeps the gun dry. When the silica has changed from white to blue in color, it is no longer any use and has to be changed.



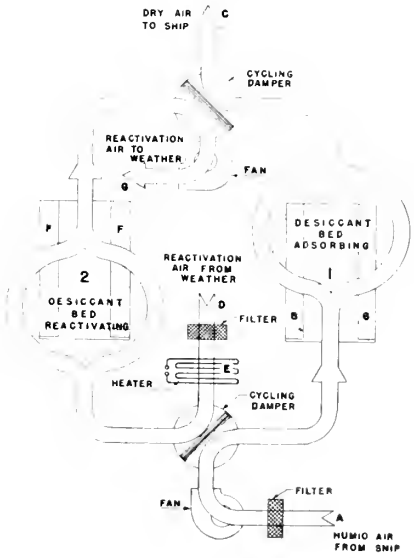
ed a basis for recent development for future requirements. The dehumidification of vessels for cargo preservation had been successfully accomplished by one company, who pioneered the idea. All of this background including that with cargo vessels contributed in pointing out the many difficulties and variables that such a problem involved, and by no means least, showed the necessity for the development of more practical and efficient equipment.

The present program and the equipment which is basic to its success was begun, evolved, and completed in the last two years, with the assistance and advice of many manufacturers, and consultants whose various contributions were carefully screened, considered and finally molded by the Bureau of Ships into a composite idea upon which the Navy was able to proceed. Test installations were made in various localities on various types of inactive vessels for the purpose of determining the practicability of these preservation measures. Dehumidifying machines were designed, tested and redesigned toward obtaining the desired efficiency and ruggedness of construction toward long life with a minimum of attention.

The results have produced dehumidifying machines employing solid chemical desiccants and a method of control of these machines combining the features of averaging, recording and indicating. In addition to these, other means of moisture removal with static desiccants, methods of packaging deck equipment and ordnance and under certain conditions the application of preservatives on bright steel surfaces. With the equipment now being installed the ship virtually becomes a dry storage warehouse and the necessity for additional storage ashore is eliminated.

The Ship. Upon receipt of orders to the Inactive Fleet, the ship proceeds immediately with preservation measures. Upon reporting, all urgent repairs will be accomplished and the ship will be dry docked to apply new anti-fouling paint and to have other essential underwater work undertaken. There is an immediate one-third reduction of the war time complement by detaching the special radar, communications and gunnery ratings.

Preliminary preservation measures, consisting of cleaning and drying the ship's hull and machinery, will be accomplished and thin film rust preventive compounds applied. The equipment is ready for immediate use without the removal of preservatives. Although there are very few vermin, germs and insects on naval vessels, prior to final closure, the ship is completely fumigated. During these initial preparations the dehumidification equipment is installed according to plan and made ready to operate. The last stage before the ship goes under dehumidification is to seal the envelope from the sea and the weather and to open doors and hatches as needed for the dry air flow. However, the watertight integrity of the ship is maintained at all times. Although it is desirable to make the topside as tight as practicable, it is not essential that the ship be made pressure tight to secure good economy of operation; watertightness however is absolutely imperative but easy of attainment.



Dehumidification is accomplished both dynamically and statically:

(a) Dynamic dehumidification consists of forcing the ship's air through an automatically controlled and reactivated chemical desiccant machine connected to a distribution system. The fire mains will be drained and since they extend throughout the ship they provide an excellent means for distributing the small quantities of dry air and return flow is controlled by choice of closure of access openings. Figure 1 shows a typical system. Fire protection is provided from the shore and fire boats. The distribution does not have to be positive to all spaces. It has been determined by test that diffusion will provide satisfactory distribution for inner bottoms, appending tanks and voids.

(b) Static dehumidification is obtained by placing metal containers of desiccants in closed voids, tanks and metal packages. This system is used only in spaces that cannot be easily reached dynamically or where the watertight integrity of the ship would be violated through opening doors,

hatches and manholes. Only about five per cent of the overall Inactive Fleet dehumidification will be accomplished statically.

The process of dehumidification is divided into two stages, namely: initial drying and maintenance drying. During the initial drying period all free water is removed from the bilges; steam, water and drainage piping; boilers and machinery. Portable dynamic machines are used to predry. After the pre-drying is accomplished and the main dynamic system

Rear Admiral Thomas B. Richey, USN, retired, has been appointed assistant vice president of Cargocaire Engineering Corporation, New York City.

put into operation, the moisture load is composed of air entrained vapor and a considerable quantity of water vapor adsorbed in the painted surfaces, lines, mattresses, etc. In initial drying the machines will operate continuously for four to six weeks drawing the absorbed water from the surfaces while the space humidity is reduced to 30 per cent. During the maintenance drying stage the moisture load is reduced to chiefly breathing caused by diurnal changes of temperature, infiltration and such topside and underwater leakage that may inadvertently occur. Such leaks must be found early and caulked, otherwise the dehumidification machine becomes a costly bilge pump. For the most economical use of the equipment the machine capacity should be installed to take care of that amount of ship's space to provide 12 hours of operation during the maintenance stage. Since breathing is the major load the machines operate principally at night and the early morning hours. The relative humidity decreases during the day because of rising temperature, whereas it rises at night because of falling temperature and breathing of weather air.

THE EQUIPMENT

Dynamic Dehumidifiers. The dynamic machines used for the Navy Inactive Fleet are the dual bed type. The desiccants employed are silica gel and activated alumina. The general arrangements of the machine circuits are shown in Figure 2. Humid air is drawn from the ship and passed through the absorbing desiccant bed. A high pressure fan returns the air to the ship through distribution system. A second air circuit is provided for the reactivation of the exhausted desiccant. In this, weather air is heated with electrical elements located either directly in the desiccant or by strip heaters in the air stream. The effluent reactivation air is discharged overboard to the weather. The control of the cycles is accomplished automatically with a timer or by a thermostat.

Most of the requirements will be taken care of with three standard sizes of machines. A summary of the specifications for the dehumidifier units is as follows:

Package Dehumidifier. The Package Dehumidifier is a single bed type developed for drying metal packages over mount guns and searchlights. It is also available for isolated compartments to which it is uneconomical to extend the dynamic system from a ship zone. The unit is also capable of handling small vessels such as landing craft. The cycle on this unit is automatic consisting of two hours and twenty-five minutes adsorption, and thirty-five minutes reactivation. The Package Dehumidifier with the proper reactivation air connections to the weather can be substituted for the Portable Dehumidifier mentioned hereafter.

Portable Dehumidifier. The Portable Dehumidifiers are used for initial drying of compartments, fresh water tanks, piping, boilers, etc. They have been found useful for initial drying of spaces that are to be treated statically and before and after painting. The unit consists of a container called a Desicannister filled with forty pounds of silica gel. To this is attached a fan with a heater unit. Air from the compartment to be dried is circulated through the Desicannister. In drying piping, the ship or weather air is predried and forced through the pipes. When the desiccant is exhausted three indicator gel ports show a pink color. The Desicannister is reactivated by removing the unit from the compartment to an undried portion of the ship or to the weather and using the built-in elec-

	Package	Small Size	Large Size
Adsorption Air cfm	20	150	500
Connected Load KW	1	3	8
Atatic Pressure External to Machine—Inches Water	1/8	3	5½
Adsorption Capacity Lb./Hr.			
95° F. 35% Humidity	5.4*	2.6	7.5
70° F. 35% Humidity	5.0*	2.0	5.5
40° F. 35% Humidity	2.9*	.....	2.5
Reactivation Economy Kw Hr./Lb. Water			
95° F. 35% Humidity	0.80	0.90	0.95
70° F. 35% Humidity	0.85	1.00	1.00
40° F. 35% Humidity	1.40	.....	1.25

* Lb. per day.

trical element to heat the air passing through the desiccant, until the indicator ports again show blue. Each unit is supplied with two Desicannisters.

Desicans. The Static Dehumidification is accomplished by placing approximately 5½ lbs. of silica gel in a permanent aluminum container with perforated surfaces. Each container is provided with a port containing indicator silica gel. These units are called Desicans and come packed eight or nine in a metal drum carrying case.

Breathers. Fuel tanks will contain oil or be coated with oil as a means of protection. Diurnal changes in temperature will cause breathing and to prevent an accumulation of condensed atmospheric moisture in the tanks, breathers are provided on the weather vents. The breather for fuel tanks contains an inexpensive desiccant that can be discarded. Desiccants will adsorb oil vapors which in addition to producing a hazard during reactivation will carbonize and damage the desiccant. Breathers may also be used on metal packages under static dehumidification. Some thought is being given to the development of a solar reactivated Breather.

Reactivator. An automatic temperature controlled electric oven is provided to reactivate the Desicans and those Breathers which may be used on metal packaging. The air is heated to 325° F. and circulated with a fan.

Controller-Recorder. The relative humidity in the dynamic zones will be controlled and recorded by a Controller-Recorder of unique design. This instrument is a combined development between the Bureau of Ships, Air Conditioning Section and an instrument manufacturer. The instrument consists of a main control and recording station to which are connected eight stations for sensing the relative humidity. In addition each sensing station contains a temperature element. A record of the temperature and humidity is printed in arabic numbers on an adding machine strip paper once every fifteen minutes continuously or once every 12 hours as desired. The identifying station number and the time are also printed.

For control purposes the instrument continuously averages the relative humidity at the eight sensing stations. If the average ship's relative humidity rises above, say 35 per cent, the dehumidifier will be turned on and continue to operate until the average is worked down to, say 27 per cent. The differential is adjustable so as to prevent short cycling of the dehumidifier. The Controller-Recorder will assist in balancing the distribution of dry air in the ship. If the humidity at a particular station is running above 35 per cent R.H., the air control valve (a fire main valve) in that subdivision of the ship is opened to allow an additional amount of dry air into that subdivision. Conversely, if another subdivision is below 25 per cent R.H., then the control valve for that section can be adjusted accordingly. With the aid of a simple direct reading air flow meter developed by the Bureau of Ships, these adjustments can be made by an enlisted man serving on watch. In the event of persistently high values of humidity an inspection must be made to determine the source of

(Continued on Page 456)

Oliver D. Colvin, naval architect and inventor of the Cargocaire system of dynamic control of humidity and ventilation for cargo ships, and Capt. Thomas F. Urdahl, U. S. Navy Bureau of Ships. Capt. Urdahl facetiously dubs the Navy's long-range preservation plan for laying up more than two thousand of Uncle Sam's best fighting ships "Operation Mothball." They inspect the skeleton display unit of the Cargocaire dehumidifier used in the plan as seen at the recent New York Chemical Show.

The scientific control of ship sweat and cargo sweat by dynamic dehumidificotion and controlled ventilation was perfected in 1936 by Colvin and has been successfully used by major U. S. shipping lines for the past eight years.

The Bendix Recorder-Controller, Model 725, a device which automatically controls the dehumidification machinery used to dry the holds of cargo vessels, is now available. Originally designed for humidity control of the sealed interior of inactive and reserve Navy vessels, it is applicable to the old or new air conditioning installations in merchant ships. The new Recorder-Controller consists of eight identical Measuring Units and a Central Station. The Measuring Units are dispersed throughout the hold or enclosure served by air conditioning machinery. Each unit is assigned a station number so that the recording made at the Recorder-Controller Central Station can be associated with that particular unit. Each Measuring Unit reports the temperature and humidity of its particular location to the Central Station through electrical connections between them.

Steam Turbine Drives

By M. Weitzner

At the meeting of the Northern California Section of the Society of Naval Architects and Marine Engineers, San Francisco, May 30th, the program consisted of a symposium on "Various Types of Main Propulsion Drive for Ships." Morris Weitzner of the Shipbuilding Division of Bethelehem Steel Company handled the Steam Turbine Drive, Charles G. Cox of the Nordberg Manufacturing Company spoke on the diesel drive, and G. L. Crow of the General Electric Company treated the diesel electric drive.

We present herewith a full abstract of the paper by Mr. Weitzner to be followed in the June issue with a complete report on the other two papers and on the discussion.

A symposium of this nature brings out all the important types of difference between the various types of marine machinery and is of great value to shipowners and ship builders.

Morris Weitzner, Chief Engineer of Bethlehem, San Francisco.

In the selection of the type of main propulsion and auxiliary machinery for a vessel the principal factors to be considered are reliability, fuel economy, space, weight, cost, and suitability for the service intended. The reciprocating steam engine, the geared steam turbine, the turbo-electric drive, the diesel straight geared and electric drives combine the above factors in various degrees. Each type has a field of application where it fits in well. These fields of application overlap. It is this overlap, which introduces considerable controversy in the selection of a unit for specific application. Arbitrary selection should be avoided, for it may result in an expensive proposition to the owners and a headache for the operators. Suitable choice can be arrived at only by consideration of all pertinent factors involved in each application. With the above in mind, I propose to discuss the merits of the geared steam turbine plant for marine propulsion.

Modern geared steam turbine installations have a very high degree of reliability, as a result of development over many years in service. Trials in service over long periods plus various theoretical studies and experiments and experience gained from land units were applied to marine service with good results. As pressures and temperatures were increased, designs and materials were provided to suit.

Experience prior to World War II was uniformly good, based on reports from owners and operators having experience with this type of equipment. This result was obtained with experienced personnel and under conditions which permitted repair whenever necessary. During World War II, there were a number of failures principally due to war conditions, such as: lack of maintenance, deferring of repairs, and inexperienced personnel. In spite of these conditions, this type of plant performed well, and today, the marine geared steam turbine plant occupies a very favorable position in the marine propulsion field with respect to reliability.

Fuel Economy

In general, for merchant vessels, the fuel consumed per SHP per hour for all purposes ranges from .61 pounds for a 4000 SHP installation operating with steam condition of 425#G and 740°F at the throttle, down to .51 pounds obtained recently on a 10,000 SHP installation operating with steam condition of 1400#G and 740°F at the throttle plus two stages of reheat to 565°F. For Naval vessels the fuel rates are somewhat higher.

This high level of fuel economy has been achieved partly by improvements in efficiency of the various units, but principally by adoption of higher steam pressures and temperatures.

Modern geared steam turbine plants operate with steam condition of 425#G and 740°F total temperature at the throttle. There are a few merchant vessels operating with 500#G and 850°F. One merchant vessel is operating with steam condition 1200#G and 740°F at the throttle plus reheat to 740°F, and another vessel is operating with 1400#G and 740° at the throttle plus reheat to 565°F. The Navy has adopted 600#G and 850°F total temperature as standard for its more important vessels.*

These pressures and temperatures were made possible by many improvements in the art of building machinery. Welding, for example, contributed greatly toward the construction of high pressure vessels. The application of welding to steel castings resulted in sounder structures for turbine casings and gear housings. "X"-ray and gamma-ray inspection made it possible to determine whether the welds and steel castings were sound. Alloy steels were developed which can withstand the temperatures involved.

The efficiency of the marine reduc-

*The author is confining his figures to American Merchant Marine.

tion gear has been raised to 98% or better, depending on type and size of unit. The drop in efficiency is about 1½% over the range from full power to 25% of power.

The efficiency of the marine propulsion turbine was raised considerably, through the use of double reduction gears and more efficient steam path through the turbines. Double reduction gears gave higher rotation speeds, short stiff turbine rotors and more efficient blade heights. This combined with better shaped nozzles and blades, reduced windage losses, and draining away of condensate in the wet regions, produced efficiencies of 75% or better in units of 4000 to 8500 SHP operating with steam condition of 425#G and 740°F at the throttle, and a back press of 1½" Hg absolute.

Important was the rise in efficiency of the modern water tube boiler, by the addition of economizers and air heaters, to 86% or better maintained in service by average experienced operators.

TABLE I — GEARED STEAM TURBINE FUEL ECONOMY

Name or Class of Vessel	Type of Vessel	Year Built	Steam Condition at Throttle Press. #G	Temp. ° F.	Total SHP	No. of Screws	Fuel Lbs. per SHP Hour
Pres. Cleveland	Passenger	1921	233	461° F.	12,500	2	.96
Pres. Jackson	Passenger	1921	229	464° F.	13,050	2	.96
American Legion	Passenger	1921	244	457° F.	11,856	2	1.10
Monterey	Passenger	1931	362	671° F.	22,113	2	.643
Lurline	Passenger	1932	376	666° F.	23,132	2	.644
S. S. Esso Baton Rouge	Tanker	1938	391	733° F.	3,420	1	.683
S. S. Mobil Lube	Tanker	1939	398	742° F.	4,641	1	.627
S. S. Explorer	Cargo	1939	435	738° F.	8,073	1	.600
S. S. Platt	Tanker	1939	428	755° F.	13,830	2	.59
S. S. Del Brazil	Pass. & Cargo	1940	420	760° F.	8,193	1	.574
C1B-Cape San Martin	Cargo	1940	428	738° F.	4,153	1	.605
Bluefield Victory	Cargo	1944	447	783° F.	8,610	1	.604
S. S. Examiner*	Cargo	1941	.....	.....	.....	1	.....
S. S. Venor†	Ore Ship	1945	1,435	747° F.	11,766	1	.504
S. S. Borinquen	Passenger	1931	366	638° F.	6,547	1	.755

Note: All fuel rates adjusted to 18,500 BTU per pound. Data from SNAME Trans. Vol. 30, 1922.
* 1 Stage Reheat to 740° F. † 2 Stage Reheat to 565° F.

TABLE II — VOLUME REQUIRED GEARED STEAM TURBINES

Name of Vessel	Type of Vessel	Total SHP	No. of Screws	Cu. Ft./SHP
S. S. Borinquen	Passenger	6,420	1	21.6
S. S. Mariposa	Passenger	25,000	2	16.0
S. S. Explorer	Freighter	8,073	1	14.0
S. S. Del Brazil	Passenger & Cargo	8,193	1	17.0
S. S. Baton Rouge	Tanker	3,420	1	29.5
S. S. Platt	Tanker	13,830	2	12.4
1937 Destroyer	Naval	50,000	2	1.5
1937 Cruiser	Naval	75,000	2	2.0

TABLE III — WEIGHT GEARED STEAM TURBINES

Name of Vessel	Type of Vessel	Max. SHP	No. of Screws	Estimated Wet Mach. Wt. (Tons)	SHP per Ton Wt.	Steam Press. & Temp.	
Virginia Sinclair	Tanker	4,500	1	500	9	380#G	685° F.
Borinquen	Pass. & Cargo	6,420	1	835	8	375#G	650° F.
Exporter	Pass. & Cargo	8,800	1	726	12.1	425#G	740° F.
Examiner	Pass. & Cargo	8,800	1	780	11.2	1200#G	748° F. Reheat to 740° F.
Venore	Ore Carrier	13,000	1	902	14.4	1400#G	740° F. & 565° F. Reheat
1937	Destroyer	.....	2	.....	73.0	565#G	750° F.
1937	Cruiser	.....	2	.....	54	540#G	825° F.

G. L. Crow of General Electric, whose paper on Diesel Electric Drive will appear in the June Pacific Marine Review.

Low and high pressure feed heaters using steam bled from the turbine may reduce fuel consumption by 2% for each heater.

Driving the auxiliaries with electric motors gives a gain of the order of 3% and in some cases more.

Comparing the modern 425#G and 740°F installation with one operating at 265#G and 75° superheat, which was standard about twenty years ago, the estimated reduction is about 13% for steam conditions alone.

Adopting 600#G and 840°F for a 6000 SHP installation gives a reduction of about 6% from a 425#G installation.

Comparisons of the fuel economy of various propulsion drives involves other considerations than just fuel rates. Various types of drives affect weight of machinery and space required for carrying fuel. A fairer basis would be ton miles of cargo (deadweight) carried per ton of fuel at required speed. Vessels seldom run at exactly the same speed and therefore some simpler basis is in order.

A modification of the conventional fuel coefficient, from

$$\frac{\text{displacement } 2/3 \times \text{speed}^{\,3}}{\text{Tons fuel per 24 hours}}$$

to

$$\frac{\text{cargo deadweight } 2/3 \times \text{speed}^{\,3}}{\text{tons fuel per 24 hours}}$$

For an owner this would be a better gauge of fuel performance than fuel rates. In this connection it is hoped that operators and owners will volunteer the necessary data in the inter-

Charles G. Cox, Nordberg Manufacturing Co., whose paper on the Diesel Drive will appear in the June Pacific Marine Review.

est of furthering the art of shipbuilding and ship-operation.

Table I gives trial data on fuel consumption for various well-known American steamers with varying steam conditions on geared steam turbine drives.

Space

Space devoted to machinery is governed by the requirements of the tonnage rules. That this space must be at least 13% of the gross tonnage if the 32% deduction for figuring the net tonnage is to be allowed. Compliance with these rules results in an allotment of space adequate for making a satisfactory geared turbine installation.

Due to the limited space available on naval vessels geared turbines of large power fit in very well. Table II gives an idea of the cubic requirements for various installations.

Weight

The earning capacity of a vessel is affected adversely by excess weight. The weight of a machinery plant should be as low as possible consistent with the requirements for ruggedness and reliability. The modern geared steam turbine plant is in a favorable position with respect to this item, because of its high shaft horse power output per ton weight. Table III contains data showing the power output per ton weight for several installations.

In comparing various vessels, the total weight of the main and auxiliary machinery should be included. Remember that each class of ship includes special service equipment which other classes of vessels do not require.

Cost

Based on information obtained prior to World War II, geared steam turbine plants cost 5 to 15% less than other types of drives for a given vessel. World War II may have changed this condition by standardization and quantity production methods. It is difficult to state just what the present relative costs are.

In comparing fuel consumptions it is important to compare total costs of fuel and for operating costs to include such items as cost of lubricating oil, maintenance, and repairs. Based on information gathered informally, these operating costs for the geared steam turbine plant are low compared to other drives of equal power.

Suitability for the Service

The geared steam turbine plant has given good service in many freighters, tankers, passenger vessels, passenger and cargo vessels, on carriers and many Naval vessels. The applicable power range is from 3000 SHP to about 40000 SHP per shaft. It has satisfactory maneuvering and backing qualities. For the usual weight and space allowed for fuel in the design of a merchant vessel, it has a satisfactory cruising radius.

These many installations have proven in service that the geared steam turbine is a thoroughly reliable unit for marine propulsion and that it has good all around economic performance characteristics. Further, as service experience is obtained with the higher pressures and temperatures, there is promise of better economy for future installations.

TURBO-ELECTRIC DRIVE

There were quite a number of installations with this drive prior to World War II and their record for reliability is good. During World War II, due to inexperienced personnel and other wartime conditions, a number of failures were experienced with this drive as well as with other types of drives. However, it must be said that in spite of all these conditions, the record of the turbo-electric drive established during World War II is good. The failures were relatively few and were not chargeable to this particular type of drive.

Fuel Economy

The over-all fuel economy of this plant is not as good by about 5% as that of the geared steam turbine plant for the same operating conditions.

Space

As stated under the geared steam turbine plant, the space normally allocated in merchant vessels is adequate for the installation of the usual types of drives. However, because this type of drive does not require long lengths of shafting, motor and generators may be placed wherever the space conditions permit best. This often leads to a better utilization of the space. This is quite a desirable feature in those vessels where the machinery is midship and the propulsion motor is located way aft.

Weight

In comparison to the geared steam steam turbine plant, the turbo-electric drive is usually heavier. On installations made prior to World War II, this difference in weight amounts to approximately 6% on the average.

Cost

The cost of a turbo-electric plant is somewhat more than that of a geared steam turbine plant. Based on information of installations prior to World War II, this difference amounts to about 5%. Of course it varies with different installations. It is possible that World War II has changed this, but it is hazardous to estimate the cost of the various types of plants today.

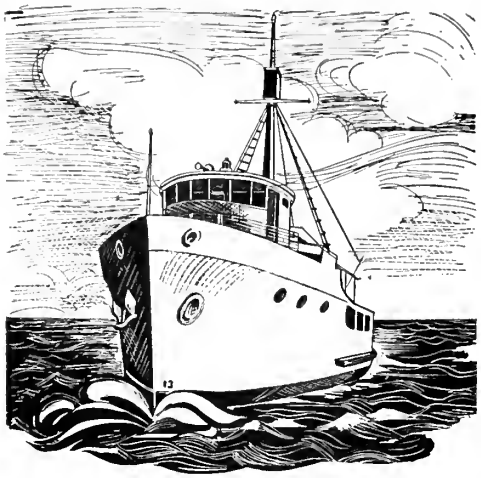
Suitability for Service

Where the turbo-electric drive fits into the marine propulsion field today depends on its special features such as:

(a) Greater flexibility in the arrangement of machinery;
(b) Full power for backing and maneuvering;
(c) Flexibility of operation;
(d) Use of the main propulsion generator for supplying electric power to equipment other than main propulsion; and
(e) Pilot house control.

During World War II, when the country's gear cutting facilities were taxed to the limit, many turbo-electric drives were installed. These installations, as well as ones installed prior to the war, have given good service. The applicable power ranges are from about 4000 up to about 50,000 SHP per shaft. Ships using this type of drive have a satisfactory cruising radius if the normal allotment of space and weight is allowed for in design of the vessel for fuel tanks.

Coast COMMERCIAL CRAFT



The Steel Tuna Clipper "White Star"

Built at Stockton, California, by Guntert and Zimmerman, the 350 ton steel tuna vessel White Star, recently completed her trial run and came up to every requirement of her owners, Van Camp Sea Food Company.

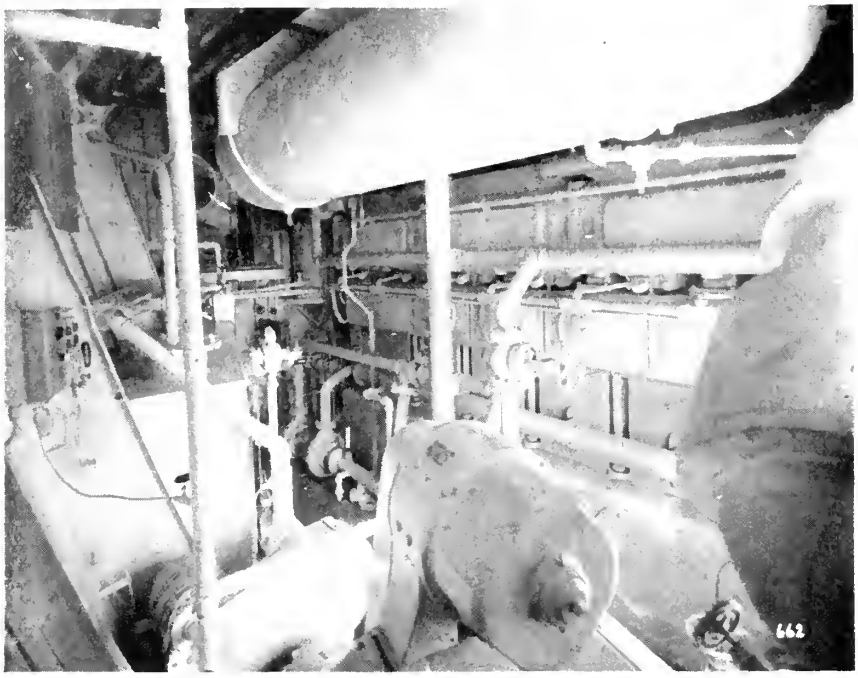
The ship was designed by W. C. Nickum & Sons, naval architects and marine engineers of Seattle. Contract was let to the Soule Steel Co., of San Francisco, but because of pressure of naval work in the Soule plant, was sublet to Guntert and Zimmerman.

The White Star is 138 feet long, with 32 foot beam and is the largest all-steel tuna clipper ever built. She will be the flagship of the Van Camp fleet. Equipped with a 1200 h.p. Enterprise engine, she has a cruising speed of 12½ knots and a cruising range of 12,000 miles. Refrigerated holds have a capacity of 475 tons of tuna. Total cost was $450,000.

A traditional feature of the ship is a chapel with an altar, customary with fishing craft likely to be manned by Portuguese sailors.

Record of Service

Within a few days after the attack on Pearl Harbor, former Van Camp tuna clippers had been taken over by the Navy and assigned to patrol and other duties. Often referred to as "floating ice boxes" they were inval-

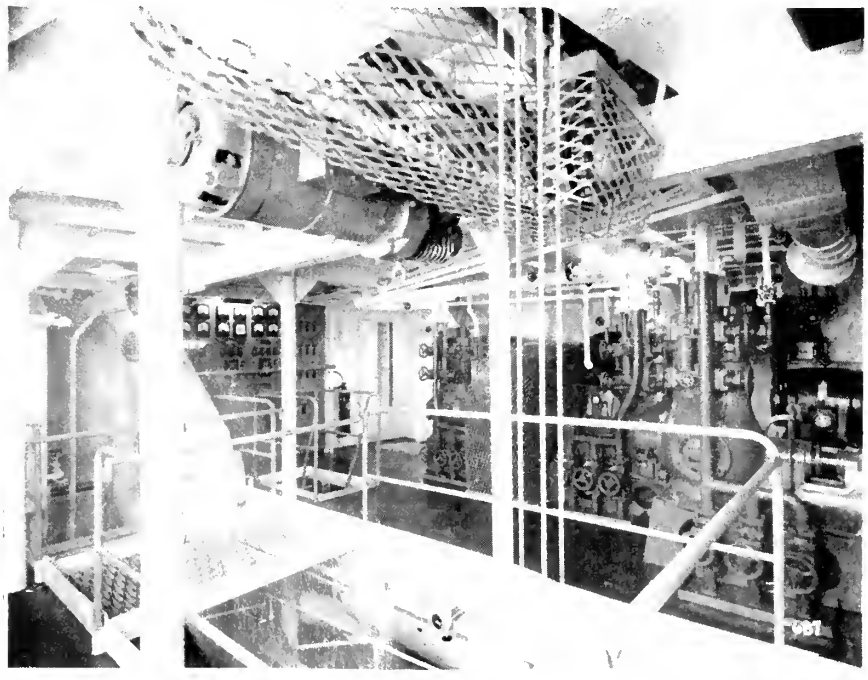


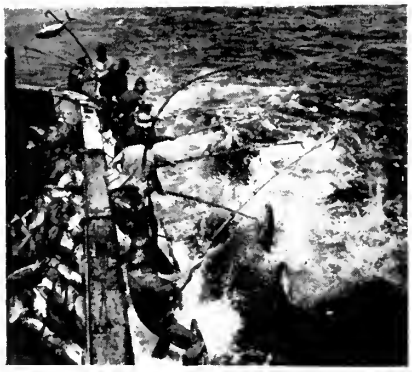
Main Enterprise Diesel engine, 1200 bhp.

uable in getting fresh meat, fresh vegetables and other foods to military installations on small South Pacific Islands which could not be reached by larger ships. On patrol duty, many former tuna clippers accounted for their share of enemy planes shot down.

"The value of these fishing boats was forcibly expressed by General MacArthur," said Gilbert Van Camp, president of Van Camp Sea Food Company, "when he stated that he would rather lose one of his bombing planes than one of the tuna clippers. This was high praise indeed, as everyone knows how few bombing planes MacArthur had in the South Pacific, especially in the early days of the war."

Baker refrigeration machinery in engine room.



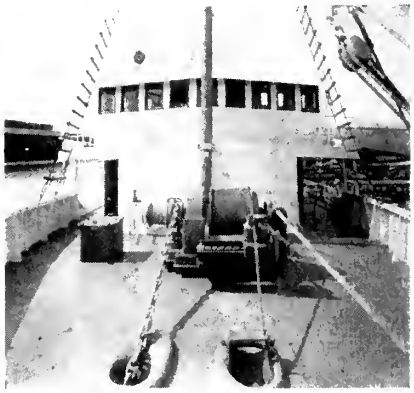


Fishing on the West Coast

Last year the fish catch in California was in excess of 550,000 tons This was split up about as follows:

Sardines	415,000 tons
Tuna	82,338 tons
Mackerel	30,000 tons
Fresh fish	25,000 tons

The total annual fishery of the entire United States including Alaska



View looking aft on upper deck, showing motor-driven anchor windlass.

averages around 2,000,000 tons per annum. Thus California produces in excess of 25% of the total fishery. The value of the fishery to the fisherman is around $35,000,000 per an-

Main Enterprise Diesel engine and Caterpillar Diesel-driven generator and pump.

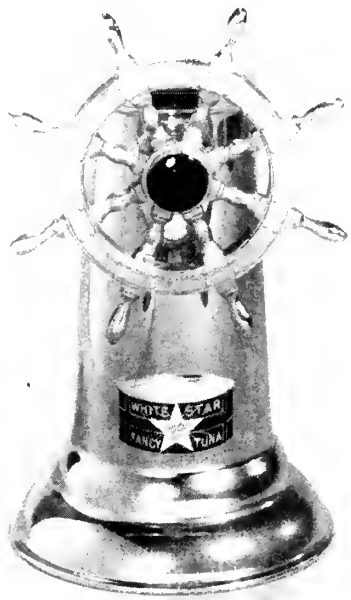
num whereas the value of the finished product at the producers' level is approximately $100,000,000 per year. Tuna fish accounts for half of the value both in its raw state as well as finished goods. The record catch of tuna occurred in 1940 amounting to 102,128 tons, but now that the tuna fishing fleet has been restored to above its 1940 capacity, it is expected that 1946 will establish an all-time high. As far as Gloucester is concerned, it does not begin to compare with the California fishery. Southern California fishery alone is greater than Gloucester.

Brine pumps and piping in passage between bait and fish holds.

Los Angeles-Long Beach Harbor again led all ports in the United States in number of pounds of fish caught during a year.

The harbor's total catch for 1945 was 441,180,000 pounds. This exceeded that of Boston by more than twice as many pounds, it being less than 200,000,000, although the value of the Boston port's catch is reported to have been more.

Steel hatches to fish and bait tonks on sheltered main deck.



A nifty cigar lighter souvenir distributed to guests at reception.

Pilot house with wheel stand, engine instruments and signals.

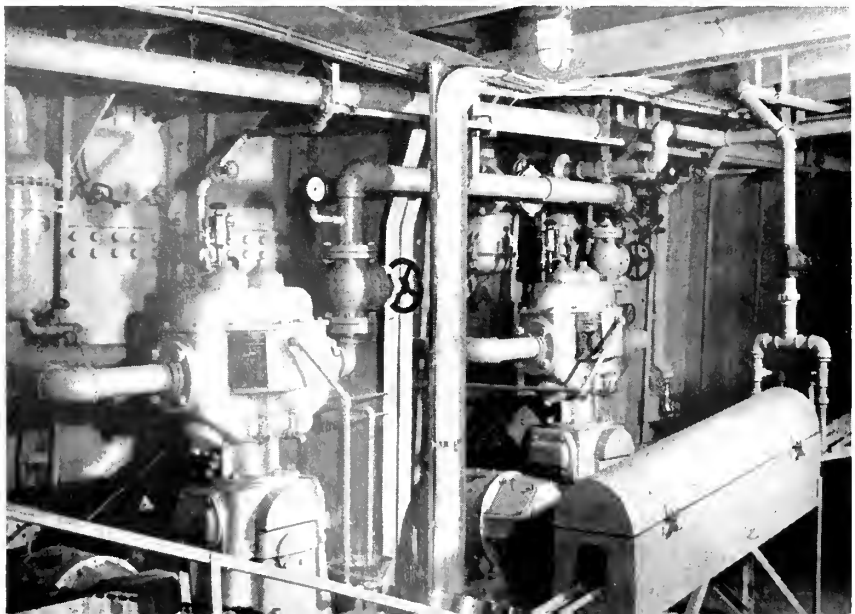
The below display of marine life was taken from the stomach of an "Irish Lord" weighing about 15 pounds (empty). Webster says it is a sculpin and that Bering sea natives like it for dinner. We would say it likes its dinner. The menu included crabs, sand sole, Tom cod, shiners, and candlefish, and what have you. The biggest fish in the picture is about eight inches long, just to give you an idea. A well-balanced diet with plenty of roughage. The "Lord" was captured at CRPA's Newport Station.

Cargo Vessel Converted To Cannery Ship

PORTLAND YARD COMPLETES $2,000,000 JOB

The Northwest Marine Iron Works, Portland, Oregon, has just completed the conversion of the 3500-ton Russian cargo ship Alma Ata to a modern crab and fish canning vessel. She will operate in the Okhotsk Sea, with Vladivostok as home port. Until last September, the conversion job was conducted as a lend-lease operation and was completed under a private contract between the Soviet purchasing mission and the repair yard. Total cost is said to be around $2,000,000 for the year-and-a-half job which included the dismantling of the entire original superstructure and construction of new and larger housing facilities for an increased number of officers, and also for cannery executives, an accounting office and a chemical laboratory as well as for the ship's crews, cannery labor, and fishing crews—a total of 515 persons.

The Alma Ata was built at Rotterdam in 1920 as the Maasdijk and was purchased by the Russian government in 1938. Her home port before the war was Odessa, whence she operated in general cargo trade. From Vladivostok she will remain at sea for nine months of the year, during which the catch of large Japanese crab, from April to August, and salmon from August to December, will be processed and canned and picked up by smaller ferrying vessels. From January to March she will remain in port.

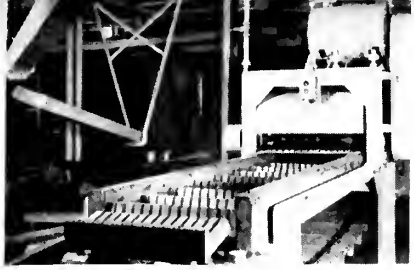


Can washer on cannery ship.

The outside skin of the ship is heavily insulated with rock wool and fiberglas to repel the extreme cold of the far north Okhotsk sea, while interior bulkheads throughout the quarters are finished of northwest plywood. A modern kitchen and large general mess hall for crew, cannery workers and fishermen is a feature.

Nine Boats Aboard

On the main deck are 18 two-ton davits for lifting and holding nine 42-foot fishing boats with their nets



Fish-cutting machine.

and catches and crews of seven men each, tanks for cooking the crabs, and a conveyor for transporting dismembered crab legs from the foredeck to the afterdeck, where shells are to be removed.

The actual canning equipment is placed on the second deck aft. Here are work tables where women will pack the cans, crimping machines for attaching the lids, six pressure cookers, and various conveyors and transport equipment for moving cans, cases and racks. All cannery workers engaged in the packing process must pass through a special wash room where they will be required to wash up before and after work to assure cleanliness.

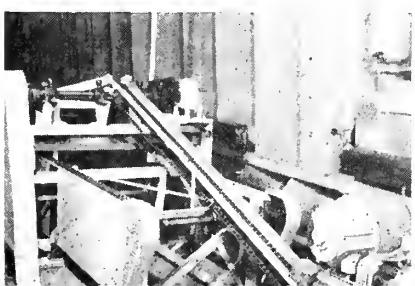
Of the ship's complement, 60 will be employed in ship operations and the remainder in fishig and cannery operations. One-half of the personnel will be women, many of them wives of the men employed.

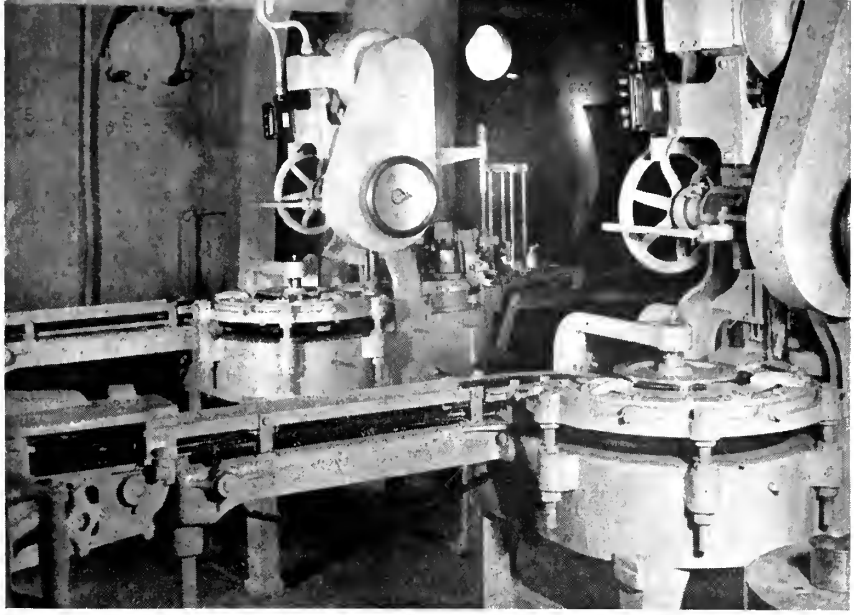
Quarters were built into the vessel for the 515 persons, who will be housed in rooms holding from one to ten persons, depending upon their positions. The lower decks amidships are finished up like those of a modern passenger vessel.

The vessel will be assigned a quota to meet, and if it exceeds the quota, the crew divides the surplus earnings among the various individuals who participated in catching and canning.

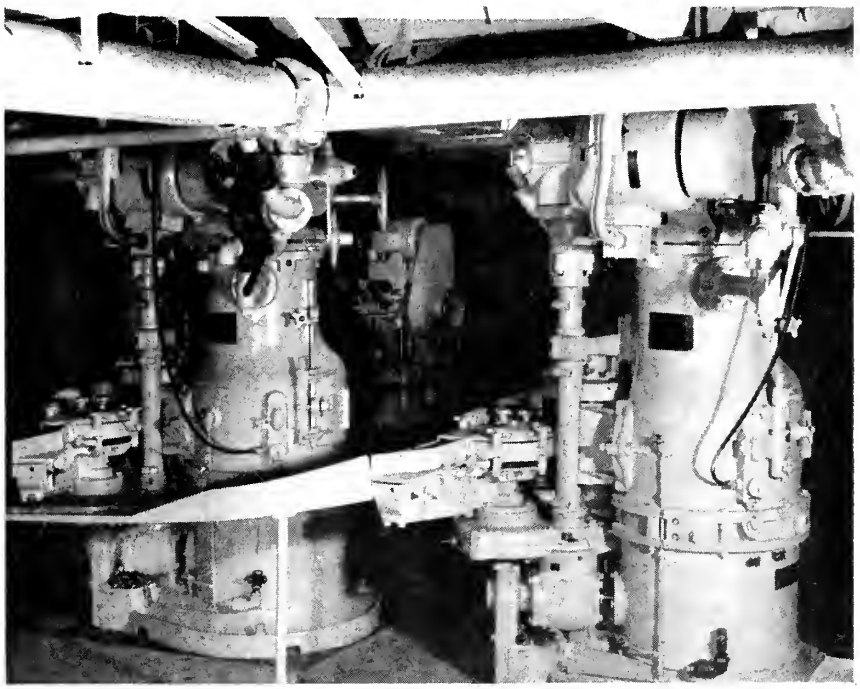
One other crab cannery ship, the Vsevold Sibertsev, was converted in Portland during the war by Poole, McGonigle & Jennings, while two similar vessels, the Mengensky and Chernyshevsky, were converted at San Francisco, all for operations in the Sea of Okhotsk.

Conveyor carrying cans to retorts for cooking.



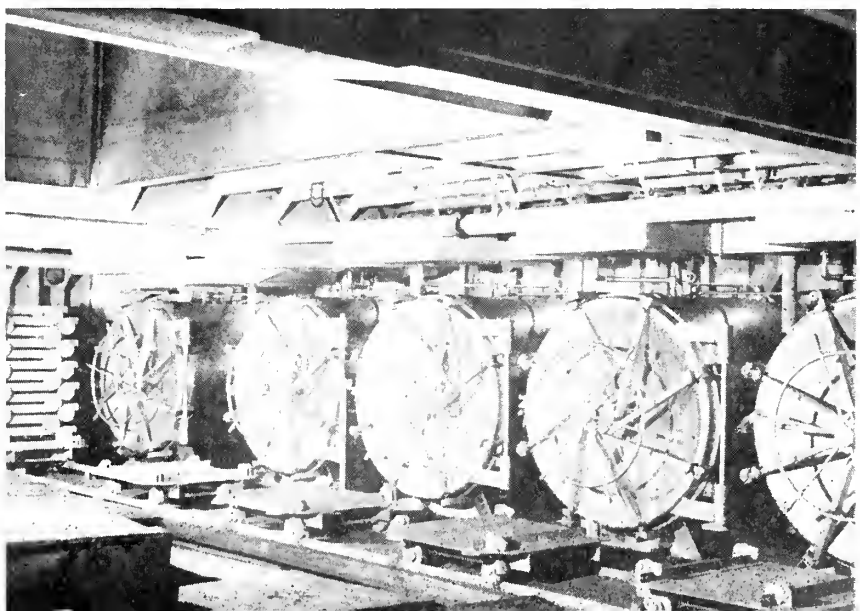


Can clinching machines, which clinch flange of can around top loosely.



The two vacuum machines which receive cans from clinchers. These tanks are vacuumized and after can has had all air removed, it has top sealed permanently while still in tank.

Six steam retorts in which sealed cans are cooked. Time for cooking is about 20 minutes. Retort capacity, 600 cans each.

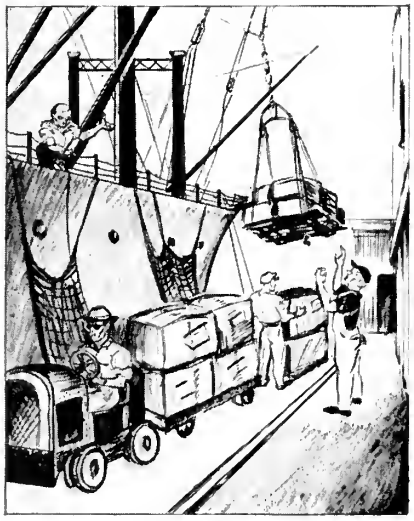


Admiralty Decisions

By Harold S. Dobbs
of the San Francisco Bar

Stevedore or Seaman?

It has been repeatedly held that a stevedore has the same status as a seaman insofar as his right to recover on a basis of breach of warranty of seaworthiness, provided the stevedore is actually engaged at the time of his injury in the loading or unloading of cargo. This rule is rather generally accepted and, therefore, it is interesting to review the decision of **John Bruszewski** vs. **Isthmian Steamship Company** (1946 A.M.C. 223), United States District Court (EDP), where the court makes



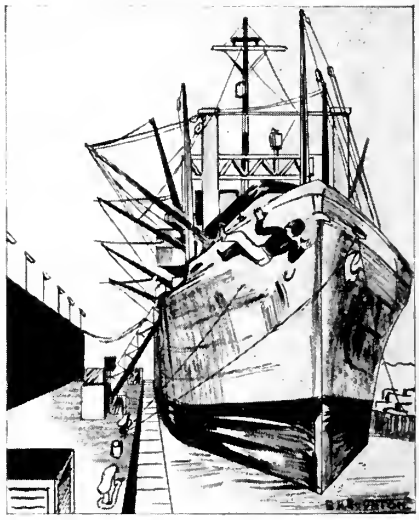
Longshore work.

a finding that the stevedore was not engaged in loading or unloading and, therefore, not entitled to rely for the proof of his case upon the warranty of seaworthiness. The court entered a directed verdict on behalf of the defendant at the close of all of the evidence in the case and the plaintiff subsequently filed a motion to vacate the judgment.

The plaintiff was a longshoreman in the employ of a stevedoring contractor who, together with eight other men, comprised a gang of nine who were ordered to report aboard the vessel George Read. The ship's officers refused to provide any men to repair a boom that had been broken and which was delaying the loading of the vessel and, therefore, the stevedoring gang were procured to repair it. The plaintiff, as a member of the nine man gang, reported to the vessel and proceeded to repair the broken boom which, by the way, was the only job that they were called to do. This gang took over the exclusive job of repair as well as operating the winch. Plaintiff was struck on the head when the block attached to the boom came loose. The plaintiff was seriously injured.

The vessel was operated under a so-called general agency agreement between the United States and the Isthmian Steamship Company. They served the vessel in accordance with the terms of the agreement. The contract designated the defendant as general agent of the United States and obligated it "to manage and conduct the business for the United States in accordance with such directions, orders or regulations as the latter has prescribed or from time to time may prescribe, and upon the terms and conditions herein provided of such vessels as have been or may be by the United States assigned to and accepted by the general agent for that purpose." The contract further provided that the agent should collect monies due, equip, supply and maintain the vessel among other things, subject to the direction and inspection of the United States. The master, under the agreement, was employed as an employee of the United States and the other officers and men required to fill the complement of the vessel were also employed as employees of the United States, subject to the orders of the master.

In directing a verdict for the defendant at the close of all of the evidence, the court first resolved that the general agency agreement constituted the defendant an owner **pro hac vice.**[1] A studied consideration of the provisions of the general agency agreement leaving possession and management of the vessel to the defendant gave it such a substantial measure of control over its operation, that the powers reserved to the United States under it were not such as would deprive the defendant of **de facto** control of the vessel, which is the criterion to be adopted in making a determination. **Brady** vs. **Roosevelt S. S. Co.** (317 U. S. 575, 1943 A. M. C. 1); **McCormick** vs. **Moore-McCormack Lines, Inc.** (1943 A. M. C. 1422, 54 Fed. Supp. 399). While it is true that some factual differences obtain here which are not to be found in the **Brady case,**[2] in that the master in the instant case was an agent and employee of the United States, and that it was the duty of the gen-



Not longshore work.

eral agent to procure and make available to the master, the officers and crew who were to be subject only to the master's orders, yet these differences are not controlling. An overall consideration shows that with the possession of the vessel in the defendant and its management and direction in it likewise, there was such a sufficient control and responsibility in the defendant as to give it the status of operator, and owner **pro hac vice,** and whatever differences obtain in the instant agreement and those which were set out in the agreement under consideration in the **Brady** vs. **Roosevelt case,** they were not such as

[1] For the occasion.
[2] See April Pacific Marine Review.

would divest the defendant company here of **de facto** control.

The next consideration to be determined by the court was whether or not the defendant company being the owner and operator **pro hac vice** was liable for the injuries occasioned to the plaintiff. The plaintiff placed main reliance for liability of the defendant upon the unseaworthiness of the vessel, and while he averred certain acts of negligence in his complaint no evidence was introduced at the trial in support of them.

The plaintiff took the position that, since he was employed as a stevedore, he had the same status as a seaman, and recovery may be had against the ship owner on the basis of breach of warranty of seaworthiness, which warranty is not dependent upon a showing of negligence. **Mahnich** vs. **Southern Steamship Co.** (321 U. S. 96, 1944 A. M. C. 1). He further asserted that the doctrine of the assumption of risk was not applicable in this status either. **Socony-Vacuum Co.** vs. **Smith** (305 U. S. 424, 1939 A. M. C. 1). The asserted authority for this position is **Joseph Sieracki** vs. **Seas Shipping Co., Inc.,** and **Bethlehem Sparrows Point Shipyard, Inc.,** Bethlehem Steel Company (1945 A. M. C. 407). In that case the court extended the protection afforded seamen to stevedores when actually engaged upon a ship, **in the loading or unloading thereof.** It did not attempt, however, to give a stevedore as such, all the rights, privileges and protection offered a seaman under the maritime law. As a matter of fact the court stated: "We do not hold that a stevedore is entitled to everything that a seaman may claim. All we are deciding now is that if he is injured on the ship in the course of unloading or loading the vessel he may have redress for a defect caused by its unseaworthiness." In other words, the court, not alone here, but throughout the opinion, limited the extension of the doctrine to the loading and unloading of a ship by a stevedore, or when he is performing a function essential to maritime service upon a ship. Here, however, no such situation obtains. The work the plaintiff was called upon to perform was in no sense essentially a maritime service, as the testimony shows the crew of the ship were not able to do the work and as a matter of fact the boastwain testified that the repair of the boom was a job for a shipyard. Again, the testimony shows that repair of the boom was the only purpose for which the plaintiff and the rest of the stevedore gang were called to the ship and that it was not an ordinary function for them to perform but in reality an unusual one. Accordingly, the test is not to look at the label given the individual but rather at the nature of the work he is called upon to do and, if a finding thereof shows it to be essentially one of a maritime nature, such as loading or unloading a vessel, then the criteria of the **Sieracki case** are met and the protection of a seaman can be afforded to a stevedore. If, however, the nature of the work is one which seamen do not ordinarily do or can do, as the testimony here shows, or if it partakes as here of a purely mechanical nature, the repair and removal of a piece of machinery, then it falls without the doctrine of the **Sieracki case,** and the plaintiff is relegated to a showing of actual negligence on the part of the ship owner in order to recover, as well as to be subject to other defenses such as the doctrine of the assumption of risk. Furthermore, in order to recover on a breach of the warranty of seaworthiness, it is essential that the vessel be unseaworthy with respect to the instrument whereby his injuries were occasioned. **Cassil** vs. **United States Emergency Fleet Corporation et al.** (1923 A. M. C. 655, 289 Fed. 774). Here, it would be a contradiction in terms, to say that there was a warranty of seaworthiness of the instrument occasioning the injury, when the instrument was a broken boom, the repair of which was the only reason for plaintiff being on the vessel at all. The court gave consideration to the further issue of assumption of risk, finally deciding that risk was assumed in this case because of the peculiar circumstances in this case.

Privileged Communications

The courts are constantly called upon to decide whether or not counsel representing defendants or respondents are required to produce the statements of witnesses taken immediately after an accident or injury of one kind or another. It has been claimed and subsequently held in many cases that defendants' or respondents' counsel must produce such statements prior to trial upon the request or motion of plaintiff or libelant. The courts theorize that each party is equally entitled to the information contained in the statements before trial. In **Shields et al.** vs. **Sobelman et al.** (U.S.D.C., Pa.), plaintiff's counsel filed a motion in the aforementioned district court requesting an order upon defense counsel to produce certain photographs of a winch, which was the physical instrumentality causing a serious accident to the plaintiff, which accident was the subject matter of a civil action pending in the aforementioned court. Plaintiff claims that the decision in the Circuit Court of Appeals in **George E. Hickman** vs. **John M. Taylor et al.** (1946 A.M.C. 1), is decisive in the case. It appears that shortly after the accident at a time when there was more than a probability that a claim would be made in respect of it and that litigation would ensue, Mr. Byrne, acting as attorney for a defendant in another case arising out of the same accident, went to the vessel with a photographer and personally directed and supervised the taking of the photographs in question, pointing out "just exactly what part of the particular machine was involved," having in mind, "what I wanted to show bearing upon liability or lack of liability in this case."

The question presented is not free from doubt. There is little distinction between the statement of a witness taken by a lawyer and a photograph taken for all intents and purposes also by a lawyer. Of course, the lawyer does not actually press the release of the camera that takes the picture, and does not develop the photographs; but they are made as he directs and they are evidence in the case, exactly as the statement of a witness is evidence in the case, and into them both go some of his legal knowledge as to what is relevant and what is not, and what evidence it behooves his client to be prepared to present.

In the **Hickman case** it appears that a distinction is made between a machine or a part of one which has hurt someone, and which may be in a lawyer's hands, and the statements of witnesses which the lawyer takes of witnesses. The opinion says that a piece of a machine which has hurt someone is among the things which "are not to be concealed until the day of trial for that reason." On the other hand, the court says the statement of a witness is an intangible

(Continued on Page 451)

Pacific MARINE REVIEW

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Regulations to Govern Sale And Charter of War-Built Fleet Issued by M. C.

Announcing that detailed regulations under the Merchant Ship Sales Act of 1946 were filed April 22, with the Federal Register, the Maritime Commission made known that it would now accept applications for the purchase or charter of dry cargo vessels and tankers built during World War II.

In awarding ships on the basis of applications, the Commission will observe certain preference requirements of the Ship Sales Act, including preference of citizens over non-citizens and consideration of an applicant's wartime tonnage loss.

"To allow for uniformity and equal treatment in the application of these preference standards the Commission has provided that all applications received in a given calendar month will be treated together," the Commission declared. "The first preference period will expire June 1, 1946. Citizen applications received during one calendar month will take precedence over all applications received in later calendar months."

A Commission press release issued simultaneously with filing of the regulations emphasized that citizen applicants will lose preference if they intend to transfer the vessel to a foreign flag, and that the Commission will not approve transfer of a P-2 or other passenger vessel, Liberty-type collier, or tanker to foreign registry after acquisition.

The regulations are contained in General Order 60, made part of Title 46—Shipping-Chapter II-U. S. Maritime Commission-Subchapter F-Merchant Ship Sales Act of 1946 - Part 299 - Rules and Regulations, Forms, and Citizenship Requirements - of the Code of Federal Regulations.

"The orderly sale of war-built vessels", the Commission stated, "is expected to re-establish a privately-owned American merchant fleet composed of modern vessels able to meet all normal competitive standards.

"Purchasers of the war-built vessels must pay at least 25 per cent down and the balance in annual installments over the 20-year life of the vessel, with 3½ per cent per year interest on the unpaid balance."

General Order 60 describes each of nine standard types of war-built vessels to be sold and lists their estimated pre-war domestic cost of construction, actual domestic war cost of construction, their statutory sales prices and floor prices in accordance with provisions of the Ship Sales Act. The price data contained in General Order 60 is as follows:

This table was a part of a preamble to General Order 60 outlining statutory requirements for the applications for acquisition of ships under the Ship Sales Act. The regulations cover nearly 80 mimeographed pages and include the necessary applications and forms to be used by applicants for purchase or charter of the ships.

"The Merchant Ship Sales Act of 1946 having been enacted on March 8, 1946, and the pre-war domestic cost of vessels covered thereby being published in this issue of the Federal Register pursuant to such Act, in section 299.56 below," the preamble to the regulations states, "the Maritime Commission will accept applications under the provisions of the Act and the following regulations. Subject to such provisions, the Maritime Commission will accept applications for the purchase or charter of vessels now under the jurisdiction and control of the Maritime Commission or

PRICES FOR STANDARD MARITIME COMMISSION VESSELS IN ACCORDANCE WITH THE MERCHANT SHIP SALES ACT OF 1946

TYPE VESSEL	Estimated Cost as of Jan. 1, 1941	Domestic War Cost	Statutory Sales Price (Unadjusted)	Price-Floor
DRY CARGO			50% 1941 Cost	35% War Cost
C1-MT-BU1	$1,063,000	$1,396,813	$ 531,500	$ 488,885
C1-M-AVI	1,280,000	1,982,464	640,000	693,862
C1	1,940,000	2,608,168	970,000	912,859
C2	2,100,000	2,736,624	1,050,000	957,818
C3	2,460,000	3,659,228	1,230,000	1,280,730
C4	3,300,000	4,420,965	1,650,000	1,547,338
VC2-S-AP2 (Victory-15K)	1,958,000	2,511,877	979,000	879,157
VC2-S-AP3 (Victory-17K)	2,130,000	2,872,659	1,065,000	1,005,431
N3	760,000	1,339,477	380,000	468,817
				31½% War Cost
EC2-S-C1 (Liberty)	1,278,000	1,728,590	639,000	544,506
TANKERS			87½% 1941 Cost	50% War Cost
T1-M-BT	994,000	1,774,038	869,750	887,019
T2-SE-A1 (14K)	2,316,000	3,010,703	2,026,500	1,505,352
T3-S-A1 (15K)	2,175,000	2,970,029	1,903,125	1,485,015

War Shipping Administration. (No charter agreement will be entered into prior to 60 days from date; and no contract of sale to a non-citizen of a tanker or C-type vessel will be entered into within 90 days from date, except as provided in the Act). Additional vessels will be available at such time as they may be transferred to the jurisdiction and control of the Maritime Commission or War Shipping Administration. The pre-war domestic cost of certain special types of vessels are not included in this publication, but will be published at a later date, after which applications for ships of such types will be entertained."

Announcing issuance of the regulations, which bore the approval date of April 13, 1946, the Commission pointed out that the sale of the ships differs from sale of other surplus war property in that the Merchant Ship Sales Act of 1946, under which the sales will be made, places responsibility upon the Maritime Commission to consider applications for purchase or charter of the vessels according "to regulations (General Order 60) issued today, and in the light of maritime policy expressed by the Ship Sales Act and also the Merchant Marine Act of 1936."

Approved sales and charters will eventually be announced by the Commission, but applications pending for Commission consideration will be held confidential, it was stated today.

Foreign Applications

An official of the Commission declared that that agency has been approached by representatives of France, Italy, Norway, Britain, Poland, most of the Latin Amercian maritime countries, and others, as to the possibility of acquiring, in most cases, some small freighters under the Ship Sales Act.

Questioned whether foreign nations might use American capital to purchase any war-built ship, this official declared it is his understanding that the Export-Import Bank will not lend money to foreign nations for the purpose of acquiring American-flag tonnage. He expressed the belief that all established American Steamship lines would get their applications before the Commission shortly and that the first month or two, after issuance of the regulations, would be the heaviest workload on the Commission.

Exchanges

Exchange by a purchaser of a war-built vessel of an old vessel for an allowance of credit on the new ship is provided for by the statute, the Commission pointed out, the purpose being to encourage retirement of obsolete vessels from the American merchant marine. However, Commission officials conceded they do not expect to get rid of "all the old crocks" in operation.

"To provide for uniform treatment of all purchasers of war-built vessels," the Commission stated, "provision is made for adjustment of prices paid on war-built vessels which were sold under other legislation and delivered to their owners prior to the passage of the Ship Sales Act. The readjustment has the effect of selling the vessel to a purchaser as of March 8, 1946, the date of passage of the Ship Sales Act, and under its terms. This changed date of sale requires recomputation of vessel cost."

The Commission also cited the fact that war-built dry cargo ships may be chartered by American citizens, but only after they have first been offered for sale, and that charter rates normally will not be less than 15 per cent per year of the statutory sales price. In addition, it was cited that applications will be considered from non-citizens (except for purchase of passenger vessels and Liberty-type colliers and tankers) provided such sales are consistent with the national and foreign defense policies of the United States, and only after American citizens have had a reasonable prior period in which to buy or charter. Citizens of the Philippines will have preference over other non-citizens up to July 4, 1946, it was added.

Vessel Inventory Directions For Ships Redelivered To W. S. A.

Directions as to the taking of inventories of vessels owned by the War Shipping Administration, when such ships are redelivered to WSA by a General Agent for simultaneous delivery to another General Agent have been issued by WSA in Supplement No. 2 to Operations Regulation No. 37, under date of April 18, 1946. The supplement reads as follows:

Operations Regulation No. 37—Supplement No. 2—Pertaining to all vessels owned by W. S. A. (Dry Cargo and Passenger Vessels & Tankers).

Subject: Vessel Inventories—WSA Owned Vessels.

Effective immediately, all War Shipping Administration owned vessels which are redelivered by a General Agent to the WSA for simultaneous delivery to another General Agent shall be physically inventoried by personnel assigned by the respective General Agents. The WSA will assign one qualified Observer to each vessel who will report on the accuracy and completeness of the inventory.

These instructions apply only to WSA owned vessels being redelivered from a General Agent for simultaneous delivery to another General Agent and do not apply to redelivery of vessels being operated for the WSA under bareboat or time charter agreements.

The responsibility for preparing the necessary typed priced inventories shall rest with the General Agent redelivering the vessel and detailed instructions as to form, distribution, number of copies required, etc., will be furnished all General Agents for their guidance in this respect.

Expenses necessarily incurred by virtue of complying with the foregoing shall be chargeable to the Agent's overhead account.

Policy Change Proposal to Be Laid Before Maritime Commission

Future shipping policies relative to subsidized versus nonsubsidized shipping, and the extent to which the Maritime Commission will encourage equal treatment in the servicing of all trade routes, will come before the Commission for consideration in the near future.

Commissioner Edward Macauley, Vice Chairman of the maritime agency, has prepared a series of suggested statements for consideration by the Maritime Commission, including a suggestion that the Commission should consider two subsidized lines to operate on the same route where it is shown adequate service for that route is not available.

Isthmian Becomes Associate Member of Pac. Westbound Conference

Modification of the agreement of the Pacific Westbound Conference so as to permit Isthmian Steamship

Co. to participate in contracts made by the Conference without necessity of posting a bond or becoming a voting member of the Conference has been proposed by the Isthmian Co. and member lines of the Conference. The basic agreement of the Conference is Maritime Commission Agreement 57, and the modification is designated 57-19.

Under terms of the proposed modification Isthmian agrees to abide by all the rates, rules, regulations and decisions of the Conference. The agreement modification is not to become valid and binding until approved under provisions of Section 15 of the 1916 Shipping Act.

Seven Wartime Regulations Are Revoked by W. S. A.

Lifting a number of wartime regulations with respect to the operation of merchant vessels controlled by the War Shipping Administration, that agency has revoked seven Operations Regulations. Issued under date of April 15, 1946, all of the revocations were made effective as of March 1, 1946.

Due to wartime security regulations some of the original regulations now revoked were not carried by us in our Letters. Rules revoked are:

Operations Regulation No. 14—issued October 12, 1942—prescribing procedure regarding advice to agents of WSA vessels transiting Panama Canal or calling at Canal Zone ports for bunkers or orders;

Operations Regulation No. 35—providing for assignment of Navy armed Guard to merchant ships owned by or under charter to WSA;

Operations Regulation No. 40—prescribing health precautions for WSA ships going to the West Coast of Africa;

Operations Regulation No. 56—issued May 12, 1943—providing for issuance by agents and general agents to masters of vessels a copy of pamphlet containing instructions relative to anti-gas measures and decontamination procedure (covered in our Letter No. F-626, of May 13, 1943);

Operations Regulation No. 61—issued June 7, 1943—providing for use of Form OPA R-544 for acknowledgment of delivery of bunker fuel and diesel oil, gasoline and kerosene—all rationed oil products (covered in our Letter No. F-645, of June 8, 1943);

Operations Regulation No. 76: issued November 6, 1943—relating to prisoners of war and requiring that notices be posted on ships' bulletin boards instructing crew members as to their conduct and rights when, after sinking of a vessel, they are questioned by warship commanders; and

Operations Regulation No. 81—relating to convoy conferences.

Wheeler Proposes Establishment Of Federal Traffic Bureau

Establishment of a Federal Traffic Bureau to negotiate and make contracts for transportation of Government traffic and perform other functions relating to such traffic would be provided for by a bill (S. 2088) introduced in the Senate by Senator Wheeler, Montana, Chairman of the Senate Interstate Commerce Committee, to which the measure was referred for consideration. Powers, duties, and responsibilities of all departments and agencies of the Government relating to such matters would be transferred to the proposed Bureau.

Powers of the Federal Traffic Bureau would extend to transportation subject to regulation under any part of the Interstate Commerce Act, as amended, the Civil Aeronautics Act of 1938, as amended, the Shipping Act of 1916, as amended, the Merchant Marine Act of 1936, as amended, and the Intercoastal Shipping Act of 1933, as amended. The Bureau would be charged with maintaining a continuous investigation into the justness and reasonableness of all present and proposed tariffs in so far as they shall relate to or concern, directly or indirectly, all actual or potential Government traffic.

Seamen Brought Under Minimum Wage Provisions In Bill Passed by House

Legislation to amend the Fair Labor Standards Act of 1938 was passed by the Senate and referred in the House to the House Labor Committee for consideration. The bill (S. 1349) was materially amended in the Senate following report from the Senate Committee on Education and Labor, but as passed by the Senate includes seamen under the minimum wage provisions of the statute, but excludes such employees from the maximum hours requirements. As passed by the Senate the minimum wage for employees engaged in commerce would be fixed at not less than 65 cents an hour.

Cates Named Executive Assistant to M. C. Vice Chairman

Designation of John M. Cates, Jr., Assistant to Commissioner, to serve as Executive Assistant to the the Vice Chairman has been made by Acting Maritime Commission Chairman Edward Macauley. Mr. Cates will act for and on behalf of the Vice Chairman as directed by him and will coordinate special activities under the supervision of the Vice Chairman. In addition, he will serve in the capacity of special assistant to the Acting Chairman.

Ruling on Waterman Case: Supreme Court Holds Red Sea Charters Are Renegotiable

Profits derived by steamship companies from operations under Red Sea charter contracts with the British Ministry of War Transport are subject to renegotiation by the Maritime Commission under terms of the Renegotiation Act, and claims to the contrary by the carriers cannot be brought into court pending exhaustion of the administrative remedies provided by law, the United States Supreme Court ruled.

The decision of the high court was handed down by Justice Black in the case (Docket No. 435, October Term, 1945) of Edward Macauley et al., Petitioners, vs. Waterman Steamship Corporation. Justice Douglas "concurs in the result," and Justice Jackson took no part in the consideration or decision of the case. No dissenting opinion was presented.

In all, nineteen carriers participated in the Red Sea charters, but two of them—the American President Lines and Weyerhaeuser Steamship Company—submitted their profits to renegotiation by the Commission. The remaining 17 cases, through mutual agreement, were held in abeyance pending the high court's ruling in the Waterman case.

W. S. A. Calls Upon Coastal Operators for Data on Cargoes, Ships, Revenues, Etc.

Cooperation of coastal and intercoastal ship operators in the resump-

tion of normal peacetime traffic has been enlisted by the War Shipping Administration, Acting Administrator Granville Conway announces. He added that, in order to meet an acute need for moving cargoes, WSA has worked out a four-point program calling for information as to cargoes and ships available, operating expenses and revenues, and the Government initiation of service which will be continued by private operators.

The program is linked with the WSA petition filed last week with the Interstate Commerce Commission requesting investigation of the lawfulness of existing railroad freight rates and practices which are competitive with the domestic water carriers.

Specifically, the WSA program asked the operators to—

(1) Survey types and amounts of cargoes to be moved.

(2) Survey types and numbers of ships available.

(3) Estimate operating expenses and revenues of operators.

(4) Comment upon initiation, under Government supervision, of service to be continued by private operators.

WSA asked that operators who have not already made surveys of ship requirements and studies of operating costs and revenues undertake them immediately and complete them as soon as possible. It was suggested that, to assist themselves, the operators make prompt adjustment of such pre-war rates as "the distorted rail tariffs may competitively permit." Lines that have not already done so were asked to study all possibilities of rate improvement, the WSA announcement said, and added:

"Based upon the survey of potential cargoes, revenues, types and numbers of ships available, the plan calls for the initiation of coastwise and intercoastal service by WSA through the agency of carriers authorized to operate under the Interstate Commerce Act. Limited common carrier services have already been initiated between North Atlantic-South Atlantic-Gulf of Mexico and the Pacific Coast, and in the Pacific coastwise trade. WSA officials pointed out that these services were expected to become self-sustaining after an initial period at least to the point of covering operating expenses."

Matson-Railway Express Agreement Filed for Maritime Commission Approval

An agreement (No. 7571) between Matson Navigation Company and the Railway Express Agency, Inc., under which Matson will transport the business of the express agency between San Francisco or Los Angeles and the Hawaiian Islands, has been filed with the Maritime Commission for approval.

Under the arrangement, Matson is relieved from liability in the handling of money, currency, gold coin, valuables, and merchandise on which Railway Express Agency, Inc., is to carry marine insurance as per contract between it and the tranportation companies over which lines it may pass.

Appointments in Maintenance And Repair Division Made by W. S. A.

Appointment of Directors and Assistant Directors of the Division of Maintenance and Repair of the War Shipping Administration for Atlantic and Pacific Districts has been made by that agency.

C. H. Kennerly has been named Director and C. F. Pitzer, Assistant Director, of the Division-Atlantic. These appointments are effective as of January 28, 1946.

A. D. Ells was appointed Director and James Scott, Assistant Director, of the Division-Pacific. Mr. Ells' appointment was made effective as of February 25, 1946, and that of Mr. Scott as of March 12, 1946.

Bills to Provide Freight Refunds For Frustrated Voyages Opposed by M. C.

Enactment of pending legislation providing for the refund by the United States of freight money paid for transportation of cargoes on voyages frustrated by the outbreak of the war in December, 1941, is opposed by the Maritime Commission, Acting Chairman Edward Macauley advised Representative Bland, Virginia, Chairman of the House Merchant Marine Committee, in a letter dated March 22, 1946. The letter has been incorporated in a Committee Document (103).

The bills involved in the communication were H.R. 2633, to authorize the refund by War Shipping Administration of certain freights for transportation on frustrated voyages, and H.R. 3802, a bill to amend Public Law No. 41, 78th Congress. That Public Law was enacted in the 78th Congress and authorized WSA to refund the freights as to certain frustrated voyages. Judge Bland asked the Commission on November 11, 1945, for a report on the two pending bills, Acting Chairman Macauley stated in his letter.

Non-Subsidized Lines Ask Revamping of Ship Tax Procedure

A general revamping of procedure under law relative to the make-up of reserve funds established by American steamship operators, so as to place subsidized and non-subsidized lines on the same footing as to complete tax exemption, is asked by representatives of non-subsidized lines, in testimony presented to the House Merchant Marine Committee. GEORGE W. MORGAN, Association of American Ship Owners, took the position that if it is sound policy through the "liberal provisions of Section 607" of the 1936 Merchant Marine Act to encourage twelve subsidized companies to accumulate their capital for ship replacement purposes, tax free, it would "seem equally desirable to offer the same encouragement and liberality to the unsubsidized companies."

In addition, DONALD MORRISON, Vice President, American-Hawaiian Steamship Company, appeared to support Congressional sanction of efforts of some shipowners, who have established construction reserve funds under Section 511 of the 1936 Act, to also take advantage of the replacement fund procedure under Section 112(f) of the Internal Revenue Code with respect to the same proceeds, that is the proceeds from the similar ship losses by sinking, requisition or otherwise. The Commissioner of Internal Revenue, sometime back, denied this latter permission, holding that the taxpayer was required at the outset to choose between the two alternative procedures and that having once deposited the proceeds from an involuntary conversion in a construction reserve fund under Section 511 of the 1936 Act, he was thereafter foreclosed from replacing the lost property under the involuntary conversion provisions of the Internal Revenue Code.

Chart Program of the Hydrographic Office

By Rear Admiral R. O. Glover, USN

Hydrographer of the Navy

WARTIME PRODUCTION

To meet the demands of naval operations, air action, and amphibious assault, wartime chart production at the Hydrographic Office skyrocketed to many times its peacetime level. From a pre-war average of 1,000,000 charts per year, the Hydrographic Office increased its output to over 45,000,000. New charts were developed at the rate of nearly 1,000 per year as compared with 60 in pre-war years. Hydrographic Office charts, other than combat charts, were used by all vessels of the United Nations in transporting men and materials to every fighting front in the world. In normal times the work of the Hydrographic Office had been carried on by 200 civilian career men. At its peak during the war the personnel numbered 1,800 including officers and enlisted personnel of the Navy in addition to an enlarged civilian staff. Work was organized on a 24-hour basis with three shifts of workers.

This article deals with the wartime production. The peacetime program will be described in our June issue.

Constructing a photogrammetric radial-lined plot of shoreline and topography from aerial photographs, using metal templates.

For more than a hundred years, the Hydrographic Office has served not only the United States Navy, but also an expanding Maritime Service and private commercial enterprise. Its charts cover every part of the seas and oceans, and its services fill every need of the navigator. The war made greater demands upon the Hydrographic Office than it has ever been called upon before to fulfill. That it satisfied these demands is evident from the following commendation from Admiral Nimitz:

> "The efficiency and promptness with which the Hydrographic Office has filled my needs has been and is an important contribution in offensive action against the Japanese Forces."

It is only recently that the Hydrographic Office has been able to reveal the manner in which many of these needs were met.

During the present post-war period and in the future, the Hydrographic Office will turn its full attention once more to the job of providing navigational charts and nautical publications, sailing directions, aeronautical charts and publications, and various books of tables and scientific information for navigators of the United States Navy and Merchant Marine.

When called upon to produce the varied charts necessary for conducting an offensive war in the Pacific, the Office found very few charts and little information of any value was available on such important spots as Guadalcanal, Bougainville, Truk, Tarawa, Kwajalein, Saipan, Iwo Jima, or Okinawa. Some of these islands had been held under League of Nations Mandate by the Japanese for more than twenty years and our ships had not been permitted to enter those waters. Charts available were known to be obsolete. It was necessary, therefore, not only to construct

Plotting the position of the ship with a three-arm protractor in order to place the position of soundings.

the many and complicated types of charts necessary for the precision accuracy of modern warfare, but also to go out and collect the basic information about the areas. In this, the survey ships of the Hydrographic Office and the planes of the fleet and the army took a most active part. Only recently have their activities and the types of charts and information subsequently produced been revealed for public knowledge.

Many new methods and shortcuts were devised to speed up production of the vitally needed charts and tables. Among the special types of charts produced were combat charts made for use in direct enemy attack. loran navigational charts for use with a new and then secret radio navigational aid, waterproof surface current and temperature charts for the aid of persons lost at sea, special air target charts, sea and swell charts, for seaplanes and aircraft carriers, bottom sediment charts, and other oceanographic information for use in the many amphibious landings.

In addition the Hydrographic Office continued to produce: pilot charts, nautical charts, notices to mariners, sailing directions, hydrographic bulletins, daily memoranda, ice supplements and aeronautical information.

Wartime Surveying

When the United States took over the defense of Greenland, hydrographic engineers were sent to work with the Greenland Ice Patrol to survey areas selected for bases. Lend-lease bases necessitated also surveys in various areas from Newfoundland to the Galapagos Islands.

After Pearl Harbor the work of the Hydrographic survey ships changed from dull routine to "never a dull moment," according to Commander Irving Johnson, Skipper of the USS SUMNER. Formerly employed in charting areas of commercial importance chiefly in the Americas, these ships were shifted to areas of military importance. All of the scientific aids to hydrographic surveying developed during the past quarter century were put to use. Among these aids are the fathometer, the wire drag, the aerial camera, taut wire measuring gear, and radio acoustic ranging.

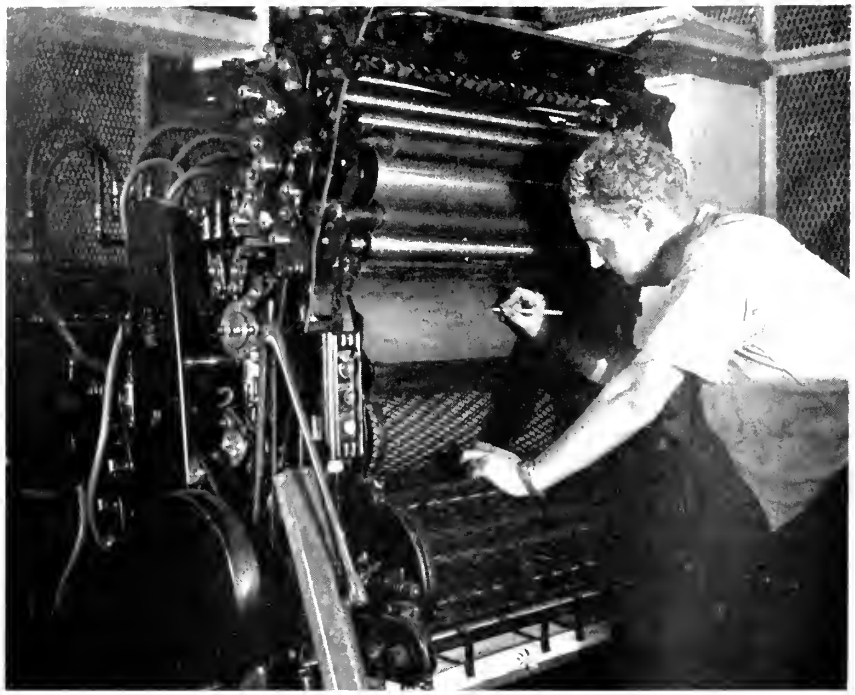
The USS Bowditch, a typical modern survey ship, is a miniature surveying and chart producing plant. This vessel has a length of 236 feet, a beam of 53 feet, and a displacement of 6,500 tons. Powered by Diesel engines, she has a cruising radius of 19,000 nautical miles. On her decks are two 50-foot boats and two 40-foot boats outfitted for sounding and dragging operations, and eight auxiliary boats ranging from 17 to 36 feet in length. It is planned that survey ships will in the future carry a helicopter on their decks and thus be able to do their own aerial photographic work. Bowditch provides not only space for storing surveying instruments, beacons, towers, lumber, cement, canvas, and signal materials, but also drafting rooms, printing presses, storage for chart paper, and a huge camera. This ship not only made original surveys during the war, but also constructed and printed charts which it delivered immediately to the fleet. Three Diesel engine auxiliary vessels, 100-feet long, with a 23-foot beam, and with a cruising radius of 4,500 miles, complete this surveying unit. Bowditch, with her auxiliary vessels, can stay for a period of nine to ten months away from her base.

During the war, the job of the survey ships was not only to take soundings and to chart and find safe anchorages in enemy waters, but also to make anchorages by blasting out coral heads, dragging channels, and by establishing or repairing aids to navigation. They acquired tidal information for the amphibious forces, making it possible for LST's to go over a reef at high tide and to unload when automatically beached within the reef at low tide. Before the Seabeas were organized, survey parties even built coral piers for landing forces.

Under Fire

These ships generally travelled with the Fleet in wartime, but in many instances they went into enemy waters alone with only a few small guns for protection. At Empress Augusta Bay, one survey ship went to work under fire and in less than thirty-six hours had turned off its presses, ready for Fleet distribution, serviceable charts of the harbor, its reefs, shoals, and docking facilities.

Using a stereoscope on an aerial photographic print, tracing the shoreline and topographic contours.



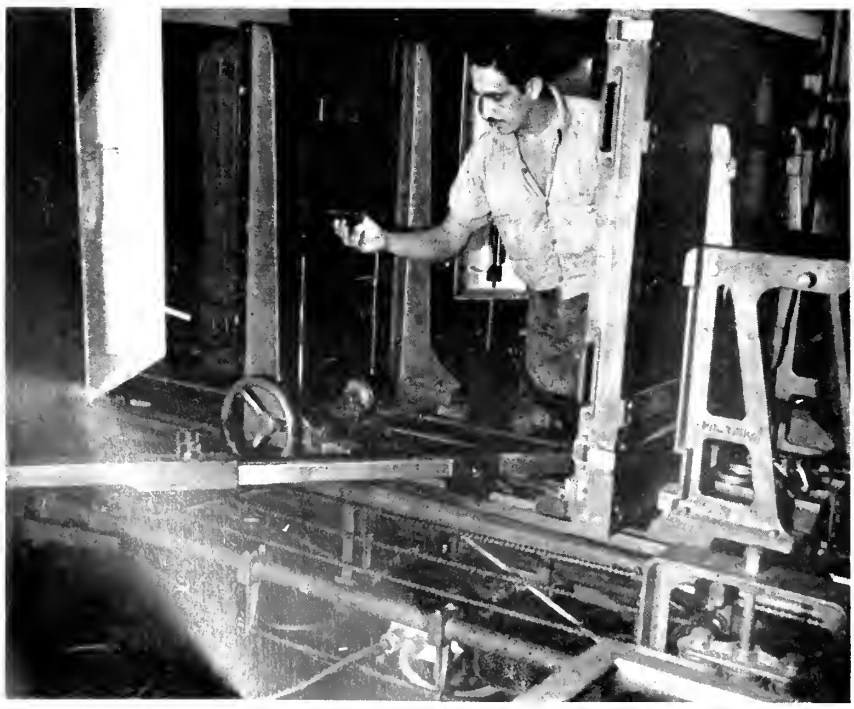
Correcting the zinc plates on the Harris offset press (lithographic) aboard a survey ship. The larger survey ships are now equipped to publish charts in the field. Chart size 17 x 22.

One survey party landed on an island, not knowing the Japs were there; they took their soundings and departed. The next day, the Marines landed.

USS Sumner, during the war, charted fifty islands, accomplishing this record in spite of the fact that she was under enemy attack forty times and led in one invasion. The men often went ashore almost as quickly as the Marines, and started baseline measurements.

The charts produced aboard survey vessels were usually large-scale harbor charts showing in detail, soundings, obstructions, reefs, and anchorages. Sailing directions were printed on the charts. These charts were the first ever published aboard ship. They reduced chart production time from a peacetime average of nine months for surveying and two years (at the Hydrographic Office) for construction and printing, to an average overall time aboard the survey ships of six weeks. Distribution numbered several thousand copies of each chart. Field charts were sent immediately to the Hydrographic Office for re-drafting and reprinting for general issue to the fleet.

Setting the lens of the camera aboard the largest survey ship in the world.



The Hydrographic Office conducts a training program for both officers and men for duty aboard survey ships. Officers are chiefly graduate civil engineers and others have some valuable technical experience as, for instance, draftsmen or lithographers.

Chart Construction

In gearing itself to supply wartime needs, the Chart Construction Division of the Hydrographic Office adopted a number of new methods which virtually put it on a production line basis. The slower method of engraving charts on copper was reserved only for a few original charts. For the mass of wartime charts, the much faster Duco-coated zinc plate method was used and will continue to be used for most Hydrographic charts. This "Duco" method was originated at Hydro in 1938 and utilizes fast photographic methods and zinc plates. The charts are printed in four colors on lithographic presses after having been compiled, constructed, and prepared on zinc Duco plates. Two of the colors, magenta and gray, replaced the buff and orange tints formerly used on Hydrographic charts because these latter became indistinguishable under the red lights used on blacked-out ships.

Another new and most important method used in the construction of wartime charts was photogrammetry. Thousands of pictures were made of areas which we planned to attack. They were rushed to the Hydrographic Office, where they were studied under stereoptican instruments while topography, enemy installations, and other valuable information were outlined on each picture. Then the pictures were arranged in correct sequence on a large table, and the important facts shown on each picture were correctly placed and outlined on charts. The chart of Iwo Jima, for example, was constructed entirely from aerial photographs taken while the Japs still held it. The pictures were flown to Wash-

This beacon at one end of base line is placed on a sandy spit. In order to secure wire guys in sand, "dead men" are buried about three or four feet deep where necessary.

ington, and from them Hydro workers compiled a chart which was flown back for actual bombardment and invasion. It is interesting to note that photographs were taken also from the periscopes of submarines.

Two most important sources of information for chart construction, in addition to photographs, were Hydrographic Office survey ships, whose work is discussed elsewhere, and captured Japanese charts. Large numbers of Japanese charts bound for distribution to the Jap Fleet were captured at Kwajalein. They were of immense value since we had little information on the Japanese-held islands of the Pacific, whereas the Japanese had surveyed them accurately. The Hydrographic Office chart of Truk Atoll was constructed mainly from captured Japanese charts.

Mariners have been sending navigational data to the Hydrographic Office for the past 116 years, and of course, this source of information continued during the war years. Since 1830 more than 10,000,000 reports have been received from ships. These reports include information on soundings, wind and current directions, weather, and floating derelicts. The Hydrographic Office has utilized every piece of this information in compiling and revising both navigational and oceanographic charts and in its many other publications. Charts are corrected and revised at each stage in their construction until the moment they are loaded on trucks for distribution.

An LCM towing a floater into position. A floater is used as a survey signal and as a navigational aid.

Strong, well-placed wire guys are the best insurance against the tripod tipping over in a typhoon.

The speed-up of processes in chart construction is indicated by the following facts. When the Marines landed on Tulagi in the Solomons on August 7, 1942, the survey ships immediately went to work. A series of five field charts of the entire area was developed and rushed by plane to the Hydrographic Office. The charts were combined and worked into a single comprehensive chart. In less than four weeks, the complete charts were in use by the Fleet.

Combat Charts

The most important group of charts published by the Hydrographic Office during the war, to which everything else was made second-

U. S. Navy Hydrographic Office survey vessel, largest survey vessel in the world.

ary, were the combat charts prepared specifically for use in bombardment and invasion of enemy territory in the Pacific Theatre. The combined resources of Army and Navy information were used in their preparation. Aerial photographic coverage and on-the-spot surveying contributed to their exactness.

Charts on five different scales provided information for the approach of ships to an invasion area, offshore bombardment of enemy installations, military ground operations, and air-support of these shore operations. The Navy produced the approach and bombardment charts and prepared aerial target charts. The Army took the responsibility for the charts for military ground operations and other aerial target charts. Basic factual data, conventions, symbols, and military grids were in perfect agreement on all these charts. To the man on the ground, the gunner on a ship, and the bombardier in the air, the charts told identically the same story on a scale best suited to his use. By means of a common point referencing system which consisted of two special grids in addition to the latitude and longitude network, specific targets could be designated with great speed and accuracy, the reference being the same for the land, sea, and air charts.

Aerial photography contributed greatly to the accuracy of these charts. Aerial photographs by the thousands were flown back from future combat areas and studied under a stereoscopic instrument. Topography, enemy positions, and other important targets were indicated. The photos were then placed in their correct positions on a huge table and the information transposed from the photos to its proper position on the charts. Additional information from Hydrographic surveys was incorporated, and the charts were then rushed back to the fleet for use in approaching and bombarding enemy shores. The success of our amphibious operations was due in large part to the complete cooperation and interchange of information on the part of the Army and the Navy, and to faster methods, in the production of these highly accurate charts.

Wave Judith Underdahl inspects Naval Air Pilot Charts and Target Charts, which are part of the first public exhibit of secret and confidential charts in the Library of Congress.

Loran Charts and Tables

Loran, named for Long Range Aid to Navigation by Radio was developed and put into practical use during the war years. It is a most important contribution to navigation because it gives good service in all kinds of weather, it is highly accurate, and enables the navigator to obtain a fix with great speed.

This system employs the principle of measuring the difference in time of receipt of two synchronized radio impulses. From stations on shore, pairs of high-powered transmitters send out continuously signals called "pulses". The signal from one of each pair called the "slave" station is sent out a short time after the signal from the other, or "master" station. The interval between signals is kept constant. Thus, when the navigator synchronizes his receiver with an incoming pair of signals, the receiver automatically measures in millionths of seconds (microseconds) the difference in time between the arrival of the two signals. The points on the earth's surface for which the difference in distance from two given points remains constant fall along a hyperbolic curve which forms a line of position. When readings are obtained from two or more pairs of stations, they give several lines of position and establish a fix.

The direct signals or ground waves from loran transmitters can be picked up for a radius about 700 miles from the transmitting stations. Reflected signals, or skywaves, usually reflected from the ionosphere only at night, are stable enough to be used for readings. They extend the radius to 1,400 miles.

The Hydrographic Office has worked out all the calculations necessary to interpret the loran readings and has published them as 'Loran Tables". For the use of navigators on aircraft, where speed in establishing a fix is a critical factor, the Hydrographic Office has published a series of charts with the loran

(Continued on Page 453)

Pacific WORLD TRADE
Reg. U. S. Pat. Off.

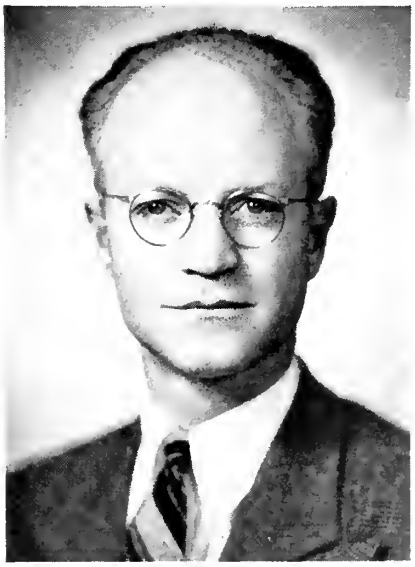
By T. Douglas MacMullen

The Present Argentine Trade Situation

By Elmer George Davis
Pacific Coast Manager, Argentine
Trade Promotion Corporation

While there was a shortage of consumer goods of all kinds in this country during the war, many Argentine manufacturers found ready markets for such items as candy, woolen piece goods, kid gloves, alligator handbags and wallets, floor coverings, wines and spirits, and various miscellaneous manufactured products. In addition, there was an increased demand for many of Argentina's raw materials, to meet the needs of United States industry and agriculture. Included in this second group were such commodities as fish oils, feedstuffs, fertilizers, hides, vegetable fibres, corn glucose, wool, tanning extract, and certain strategic minerals.

For many years prior to the Second World War, Argentina had an unfavorable trade balance with the United States, owing to the fact that she was unable to sell enough of her pastoral and agricultural products to this country to offset her purchases of electrical goods, automobiles, trucks, agricultural machinery, chemicals, office equipment, and other commodities that she bought from the United States. To some extent she was able to meet this unfavorable trade situation by multilateral trade arrangements by means of which she could export her products to and get dollar exchange from other countries that had favorable trade balances with the United States. However, after the outbreak of the Second World War she lost her European markets with the result that ways and means had to be found to increase her trade with the United States and other Latin American countries to make up for her losses.


E. GEORGE DAVIS

As a result of the war and its effects on Argentina's normal trade, impetus was given to the development of her own domestic manufacturing industries, whereby many of the consumer goods normally imported from Europe and the United States could be produced within the country. This was handicapped somewhat during the war owing to the lack of a source of capital goods, as for instance machine tools, since England and the United States had both gone on a war economy. Nevertheless, with what machinery she was able to buy from abroad plus a certain amount that could be produced at home, existing industries were expanded and certain new industries came into being. Included in this group were textiles, petroleum, clothing, footwear, leather goods, prepared foodstuffs, chemicals, pharmaceuticals, and others. Today in

If we increase the standards of living of dependent peoples, we will indirectly be assisting our own peoples because export markets will expand with the expansion of consumption levels.—Evatt of Australia.

Argentina there are industries capable of producing a large portion of the consumer goods used in the daily living of the average Argentine family which has been of considerable aid in preventing the inflationary extremes that have characterized the wartime economies of most of the other Latin American countries.

Because of the abnormal wartime demand for such commodities as meats, meat products, dairy products, fresh fruit and vegetables, tanning extract, hides and leather, wool, cereals, and various miscellaneous manufactured goods, both for domestic consumption and for export, Argentine industry and agriculture have prospered. Being unable to get delivery of many of the needed capital goods during the war, dollar and sterling balances have accumulated in American and British banks, and today Argentina is in a favorable financial position for the purchases that she wants and expects to make in ever-increasing quantities from the United States and elsewhere. However, that does not mean that there is sufficient dollar exchange available to Argentina to purchase all of the capital goods and consumer goods that she needs from this country nor that the Argentine government will allow importers to buy indiscriminately from abroad. Obviously, heavy capital equipment runs into considerable money and purchases of any quantity of such items as locomotives, oil refineries, trucks and tractors from the United States will quickly consume considerable dollar exchange, and for this reason it is necessary to maintain her exports to this country at high levels. Therefore, the Argentine Government may find it advisable to control the buying and selling of foreign exchange for a while so as to insure its use for the purchase of those commodities that are considered necessary to the national economy and public welfare of Argentina, before allowing it to become exhausted in the purchase of luxury goods. If, on the other hand, ways can be found to increase Argentina's exports to this country, particularly in the field of the so-called "non-regular" products, there will continue to be enough foreign exchange available for the importation of non-essential commodities as well as needed capital goods.

At the moment there are certain difficulties, both temporary and permanent, that will have to be over-

come here on the Pacific coast, before we can expect to see any great volume of trade between Argentina and the West Coast. In the first place, many of the products produced in Argentina are also produced in the Western part of the United States. For that reason, both imports and exports of those commodities will be governed largely by such factors as availability, price, quality, and demand. For instance, although dairy products are produced in this area, if the Argentina products are able to compete in this market, in spite of the tariff and some consumer preference for goods that are "Made in the U.S.A.", then there will be some imports into this market. During the war such Argentine products as chocolate coatings, corn glucose, leather goods, woolen piece goods, feedstuffs and fertilizers, although produced in this area, found a ready market here because of the great demand and shortage of those commodities. What the future demand will be for those as well as such items as casein, linseed, corn and protein feeds, will depend largely on future industrial development in this region, but as it now looks, there is bound to be a market on the Pacific Coast for commodities of this type for many years to come.

Because of the great population increase on the West Coast in recent years, if full employment and prosperity can be maintained, this area will no doubt continue to be a large consuming center for many manufactured goods and prepared foodstuffs from Argentina, such as alligator handbags and wallets, kid gloves, woolen piece goods, candy and various other miscellaneous items. The market for these commodities will undoubtedly continue to grow provided qualities can be maintained and improved and prices can be lowered through more efficient and economical production methods in Argentina. Ability to sell many Argentine manufactured goods and prepared foodstuffs in other markets during the war, where there was greater inflation and hence higher prices being paid, tended to retard adoption of more efficient production methods, which will be necessary in order to compete when conditions return to normal and competition sets in.

Right now while the people of many countries of Europe and the Far East are facing starvation, foodstuffs, seeds and fertilizers from Argentina are in great demand. This, in turn, has caused prices of such commodities as wheat, corn, and meat to rise in Argentina, but this situation will no doubt last only for a comparatively short period of time, until the world supply and demand for foodstuffs becomes more evenly balanced. In the meantime, United Nations relief programs and purchasing agreements may necessitate the continuation for a while of certain controls on the distribution of the world supply of foodstuffs. At present, under the program of the Combined Food Board, large quantities of Argentina's foodstuffs are being purchased and shipped to the famine areas, either through government or private channels. This is over and above those amounts being reserved for her own use or for export to neighboring South American countries, such as Brazil, who in turn ships coffee, cotton and minerals to Argentina.

Because of Argentina's comparatively high living standards and industrial development, she will always be a good market for American manufactured goods, particularly those products that are not produced in Argentina at all or else in insufficient quantities to meet her needs. Included in this category are automobiles, trucks, office machinery, lumber, industrial chemicals, agricultural machinery, mining and petroleum, equipment, transportation equipment, machine tools, electrical goods, newsprint and many others.

There are excellent possibilities for greater expansion in the exportation of off-season agricultural commodities including fresh fruits and vegetables, which Argentina also produces at different seasons of the year and ships to this country. Trade in these latter commodities between the two countries will enable the people of both nations to enjoy fresh fruit at reasonable prices the year around, and will provide tonnage for merchant ships with refrigeration facilities. The same could apply to commodities like frozen poultry, dairy products, and other perishable items.

Although the West Coast has heretofore found it difficult to compete effectively with the East Coast in the exportation of heavy machinery and other manufactured goods to Argentina, with greater industrial development in the West and equalized freight rates between West Coast ports and Argentine ports, many commodities from Pacific Coast factories should find their way into the Argentine market. Much will depend, of course, on the willingness of West Coast firms to acquire the "know how" of selling to that country. In order to do that, local firms ought to acquaint themselves with the Argentine market to the extent that they have the markets in the Far East and South Pacific. They should employ travelling representatives and office personnel who not only speak, read and write Spanish fluently, but have, through experience and study, acquired a knowledge of the problems of trading with Argentina and other Latin American markets.

Many people who have not taken the trouble to study trade figures carefully are of the mistaken opinion that the United States enjoys a greater amount of trade with countries that have not advanced industrially and produce raw materials primarily, as for instance, the tropical countries of Latin America. As a matter of fact, this country normally carries on more two-way trade with the more economically-advanced countries, like Canada, Australia, England, France and Sweden. Therefore, because of Argentina's economic development, which has progressed far beyond that of most of her Latin American sister republics, instead of that constituting a competitive menace to United States industry and agriculture, there is every reason to believe that this country will enjoy a larger over-all volume of trade with that country in the years to come than before the war.

While Argentina's tariff program might reduce United States exports of certain products to that country, there will undoubtedly be a greater demand for other types of products. It is an established fact that the best markets for United States exports are those countries with a comparatively high standard of living, which the people of Argentina enjoy, and for that reason, the West Coast has every reason to look forward to future increase in trade with that country.

Selling Machinery in Mexico

By Ralph H. Linderman

Vice President and Manager
Export Division, Perfecald International

In connection with making a market analysis on machinery sales in Mexico, we soon learned that the equipment needed was primarily the same as in our domestic market, and as a consequence we divided our possible prospective markets into the following three major classifications:

I—AGRICULTURAL
II—INDUSTRIAL
III—GOVT. PURCHASES
a) Federal
b) State
c) City

Carrying this analysis a little further, and first considering agriculture, it is interesting to note that one of the contributing factors for this is that the same general type of farm products are raised in Mexico as here in the South West. Consequently, it was not necessary for us to make a great many changes in our product to successfully satisfy the demand of the Mexican market. Likewise, our analysis showed that it would not be necessary for us to change our product to meet the requirements of Industrial and Government markets.

No doubt in your own analysis you will find the same condition true for your products, although this may change, depending on the type of equipment you are manufacturing or selling. We also soon learned that sales were generally made in exactly the same manner as here; that is, through outlets in the farming centers or in industrial centers or anywhere else where a market for our products exists.

Having completed the survey and analysis of the Mexican market, the next important question was: How are you going to sell the market—by direct or indirect methods? That is, have your own export department or sell your product through local export commission agent or merchant who have established outlets in Mexico?

Our company decided to sell direct by organizing our own Export Department, through which we have established distributors, dealers and agents in the key districts for the sale of our product which is an engineered article.

Should you decide to build your own Export Department, you must be prepared to spend a certain amount of money, perhaps more so than if you were entering a new sales territory in the United States. Your domestic sales manager through your established sales organization would take care of creating a new market for your product locally. However, in order to handle your Mexico market efficiently, you must have a competent Export Manager who understands the Latin American psychology and is prepared to sell accordingly.

From our own observation, not only can pumping equipment be sold through this method, but there are many other types of machinery sold this way, even though at the start it may be slightly more expensive than operating through an export merchant or commission house. Many times the sale of machinery or equipment such as our own can be sold through an export merchant or commission house. In fact, we sell part of our equipment, that is, our packaged items using this method. The export merchant or commission house in turn selling either direct to the ultimate consumer in Mexico or to their agent, as the case may be.

The various advantages and disadvantages of the different types of export organizations were thoroughly discussed in our previous Foreign you can always change the distributors or dealers or agents as the case Trade Clinic and for that reason I will not attempt to enumerate them at this time but merely mention again the highlights.

Should you feel from your market analysis that there is not sufficient volume of business available for your product to pay for your own export department within a reasonable period of time, then engage the service of a local export organization. Be sure of one which is thoroughly equipped with the necessary contacts in Mexico and which will handle your account on a retainer fee or commission. This will immediately place your product on a more or less pay as you go basis—that is, no expenses unless sales are made.

Having made your choice to sell through the indirect method, you should check just as carefully on the export merchant or commission house through which you have decided to handle your product as you would on any other outlet in Mexico. In fact, it is my firm conviction that you should check even more carefully as you will be depending upon this export commission house or merchant for all of your sales in the Mexican market you are attempting to reach. If you are selling direct through your own Export Department, you may have one or two poor distributors, but other distributors may be outstanding. Likewise, demands. Do not misunderstand me that from these remarks I am not in favor of the export merchant, because many American specialties and other iron and steel products, particularly of the smaller size, such as hardware items, can and are successfully sold through export commission houses or merchants. On many items in the machinery field, let us use as an example electrical appliances, pumps, business machines and similar commodities, you must take into consideration the need in the future for adequate service and technical facilities of the equipment. In our own particular product, pumping equipment, this was one of the deciding factors that lead us to the organization of our own Export Department through which we established distributors and dealers and agents in the particular location where a demand for our product existed.

The distributor or dealer trained through personal contact to service and repair our equipment. In many items, and again using hardware as

an example, the service factor would not be a contributing point as to what type of method you use in selling the Mexican market.

I believe that at this time I should cite the methods of firms like International Harvester Co., Allis Chalmers, Caterpillar Tractor Co. and others who realizing the importance of their foreign markets select young men from various colleges whom they have determined to be temperamentally fitted for foreign selling. These young men are taken into their organization where they spend two to six years learning the manufacturing, operation, servicing and selling of all of the company's products. During this time these men get a thorough practical knowledge, both from instruction and experience in the United States, so that when they are sent abroad as traveling representatives in the nature of sales engineers, they can, for example, repair a binder or Caterpillar tractor, or seeder in Sonora or in any other place where the equipment is operating. It is quite obvious that men as completely equipped as these will assure the success of the firm's foreign selling at all times. I know of another company who after having selected a representative in the foreign country brings the person to his own shop and office and gives a complete picture of the company's policy and ideas as to the best way to service and sell the product. Our own company has our distributors visit our factory as frequently as possible to keep up to date on new ideas and sales methods. This makes the representative much more efficient and likewise maintains his selling enthusiasm.

Advertising

Regardless of the method of selling used in Mexico, you should set up an advertising appropriation. Depending on your product, decide whether you will use radio, newspaper, international magazines, etc. Again, our Foreign Trade Clinic has given you details on this subject and I am only mentioning it in passing. But by all means **use it.** It is as successful in Mexico as here in the United States.

Last but not least by any means, I think that we should now say a word about financing the sale or the extension of credit. Again this subject has been covered in detail in previous Clinic Meetings which I hope you have read in the published booklet which has been sent to you by the Chamber of Commerce.

Those companies maintaining their own export department and selling through established dealers and distributors in Mexico receive payment from the distributor or dealer as the goods are shipped. The method of payment from the companies' distributors or agents may be either Sight Draft Bill of Lading, Establishment of Irrevocable Letter of Credit or an open book account, depending entirely upon the credit rating of the distributor or agent.

On sales made through an export organization in this country, the manufacturer receives payment in the United States. Most export commission houses or merchants are in a position to finance their own sales, and in this method the manufacturer is assured of payment before shipment leaves the country. A great many exporters have followed the practice of asking for cash with the order or the establishment of an Irrevocable Letter of Credit payable upon completion of shipment. In depression years, when business was hard to get, our exporters, in this country found that their competition was mainly in regard to credit terms, as the European merchants sold on open account or on Sight Draft basis and in many cases extended credit for one or two years. A large amount of American export business was lost in those years because of the insistence of cash or Letter of Credit.

There are good reliable financially responsible outlets in Mexico that are entirely deserving of credit. In the sale of machinery such as our own products, we have found it necessary to use all three types of methods. It is the function of our Export Department to work in close conjunction with our Credit Department. Each sale made through a new distributor or direct to the consumer on whom we do not have credit information a check is always made by our Credit Department through various channels which have been described in previous Clinic Meetings. The terms extended to the customer or new distributor depend entirely upon his credit rating. In the case of our established distributors or dealers or agents, an up to date financial report is maintained at all times. It is a prerequisite that they furnish us with at least two financial statements per year and on demand if there is any feeling on the part of the Export Department or Credit Department that an up to the minute report is necessary.

May I suggest that on checking

John E. Cushing, president of American-Hawaiian Steamship Co., addressing the Foreign Trade Association of the San Francisco Chamber of Commerce. His address appears elsewhere in this issue. In the photo, left to right: Louis Lundborg, general manager San Francisco Chamber of Commerce; John E. Cushing; William L. Montgomery, president Foreign Trade Association, and manager, San Francisco Office, China-America Council of Commerce and Industry.

the financial responsibility of any Mexican firm you check with the other American firms who have a credit history with the firm. Let us suppose that your product is of the so-called individually engineered or tailored to fit the particular job and as a consequence can not be resold or entered into stock to be used with some other order. Under these circumstances it is obvious that such an item must be sold under some method of complete payment before shipment or at least in some manner that you will not sustain loss in case of non-acceptance by the customer. Again, this method of payment must be tempered by what competition is allowing, likewise the familiarity with the customer.

Many American manufacturers of machinery and equipment are now represented in Mexico in some particular form or other. I believe that the majority of them are represented by distributors, dealers, agents or export commission houses or merchants, with a very few following Remington Rand who have their own subsidiary.

To some extent the Mexican market for machinery and equipment is limited because of low purchasing power. Our survey and past experience shows us that population figures may mean very little. In other words, it is entirely possible that your product may not find its best market where the greatest population centers are.

Considering markets versus population, do not overlook that the Mexican Federal Government, the various State Governments as well as many of the municipalities are today one of the biggest outlets for American machinery and specialties. Very definitely your plan of representation for selling in Mexico should include these Government markets. Many outlets in Mexico make a specialty of working with the various Federal, State and municipal government agencies.

In summary, it is no more difficult to do business in Mexico than it is in the United States if you exercise the same preparation and judgment that you do in business here. Just a word of caution—don't rush in blindly—study the market and regardless of method of selling used, be sure it fits the Mexican psychology. The net returns may be a little slower in showing, but it is a worthwhile and profitable market.

Ships For Export

Commodore E. E. Brady, Jr., of the United States Navy, who is technical advisor to the Brazilian Merchant Marine Commission, recently visited The Ingalls Shipbuilding Corporation yards at Pascagoula, Miss. He is shown with Lieutenant Commander Moacyr Rodrigues de Costa, one of the Brazilian supervisors, inspecting inner-bottom sections which are being prepared for the 14 streamlined cargo vessels that Brazil ordered for its government-owned Lloyd Brasileiro steamship line.

Argentina Freed of Trade Restrictions

The way has been paved for resumption of normal trade with Argentina by removal of that nation from the list of countries to which special restrictive export regulations apply, it was announced by the Office of International Trade, Department of Commerce.

General license privileges which enable exporters to ship freely to most countries U. S. commodities that are not in short supply, are now extended to include Argentina.

Only countries remaining on the restricted list are Spain, and its possessions, the possessions of Germany and Japan, and Andorra, Austria, Bulgaria, Hungary, and Romania. No private trade whatsoever is permitted with Germany and Japan.

Loomis Appointed to World Trade Staff

Appointment of William B. Loomis to the staff of the World Trade Department of the San Francisco Chamber of Commerce is announced by Louis B. Lundborg, general manager of the Chamber.

"Promotion of the Bay Area as a leading international trade center has become a major objective of the Chamber, necessitating the expansion of the Chamber's World Trade Department to handle the additional load of trade promotion activities we have undertaken," Lundborg said.

"Addition of Loomis to the staff will help materially to round out our ability to do a constructive job in the important field of world trade development."

Loomis is a graduate of Iowa State

William B. Loomis

College where he majored in mechanical engineering. Upon graduation he joined the export department of the Gates Rubber Company in Denver where his work was devoted to developing sales of industrial rubber products in the Far East, Australia, New Zealand and the west coast of South America. While associated with this company he helped to establish representatives abroad, to supervise credits and billings and create advertising suitable for foreign markets.

In 1940, while connected with the Gates firm, he joined with four associates in organizing their own export house and export sales agency.

With the outbreak of war Loomis left the company and came to San Francisco as an engineer for the Moore Dry Dock Company. In January 1943 he joined Pan American Airways as a flight engineer in the Pacific area, where he served until joining the staff of the Chamber's World Trade Department.

Charles Kendrick, president, Schlage Lock Company, and vice chairman, San Francisco Bay Regional Board, China-America Council of Commerce and Industry. His Excellency Dr. Wei Tao-Ming, Chinese Ambassador to the United States. Photographed at Annual Meeting, April 16, 1946, of China-America Council of Commerce and Industry at Hotel Waldorf-Astoria, New York City.

FINANCING EXPORT SHIPMENTS, is the title of a very helpful export booklet put out by the American National Bank and Trust Company of Chicago. Most of the documentary and banking problems of export shipping are helpfully explained and custom laws treated. This booklet compiled by A M. Strong can be obtained by writing the American National Bank on La Salle St. at Washington, Chicago 90, Ill.

Los Angeles Will Have Far East Trade Commissioner

The Foreign Trade Association of Southern California has appointed George Spillenaar its executive secretary-manager to the newly created post of Commissioner for American-Far Eastern trade promotion. He will visit and develop American interests in the Netherlands East Indies, Singapore and China, in the interests of Southern California industries.

Navy Enlisted Personnel Have Excellent Opportunities For Careers as Officers

Rear Admiral Donald B. Beary, USN, Commandant of the Twelfth Naval District, has pointed out that men of the enlisted ranks of the Navy are an excellent and logical source of commissioned officers. In pointing out the advantages held by enlisted men, the Commandant said, "a former enlisted man understands the reasoning and needs of a sailor. Provided that he has the necessary qualities of leadership he is at a great advantage over an officer commissioned from civilian life in that he is familiar with Navy methods and fleet organization. Many of our outstanding junior officers of today were promoted from the enlisted ranks of the Navy and the Naval Reserve during the recent War. A large number of these officers show promise of going far in the Navy.

"During the war," Admiral Beary continued, "74,185 officers, or 22 per cent of our total peak officer complement, were former enlisted men who had actually served in enlisted status. At the outbreak of hostilities, the greatest potential source of Naval officers was the college-trained group. The policy changed with the increase in the number of qualified enlisted men who had gained the necessary experience. In January, 1942, only about 25 per cent of the commissions were awarded to enlisted men. By July of 1945 more than 50 per cent of the officers appointed came from the enlisted ranks."

During the war there were six ways in which an enlisted man could become an officer. These were: Direct temporary and permanent appointments from the ranks; the "V-5" aviation training program; the "V-7" program for reserve midshipmen; the "V-12" college training program; competitive examination for appointment to the United States Naval Academy.

As the Navy demobilization program rapidly brings the service to its peacetime level, the Navy Department will continue to emphasize opportunity for the enlisted man to attain and advance in commissioned rank. Vice Admiral Lewis E. Denfeld, USN, Chief of Naval Personnel, has announced that many enlisted men will continue to be appointed to the Naval Academy on the basis of competitive examinations. In the class that entered Annapolis in 1945, for example, 66 per cent of the total enrollment of 1142 midshipmen were formerly enlisted personnel of the various services.

The Naval Academy Preparatory School for enlisted men, which prepares candidates for the entrance examinations, will continue to function in that capacity. Last year more than 2000 enlisted candidates attended this school. Admission to the Naval Academy Preparatory School is by competitive examination held annually throughout the Navy. Any enlisted man possessing the required physical, citizenship and age qualifications is eligible to compete for this training.

The Navy Department is formulating a plan to continue the award of direct commissions to qualified enlisted men according to the needs of the service, and the V-5 program continues to accept applications from enlisted men for flight training. In addition a plan has been presented to Congress under which qualified enlisted men may be transferred to civilian colleges for Naval R.O.T.C. training in conjunction with a civilian college education.

Imported Rubber Will Need Synthetic Assistance

Perhaps most important of all the factors which keep John Q. from getting all his tires now is this: The unlimited use of natural rubber will not be possible for two years or more because of difficulty of resuming production in the liberated far eastern areas where most of it is produced. The first precious natural rubber to arrive in America will be reserved for truck tires, and there is a chance that truck tires will be made with 100% natural crude by mid-1946. But since rubber today is a commodity of international relations, and the world supply limited, there may **never** be an all-rubber passenger tire again. At any rate, for a long time, tires will be made with natural rubber in the carcass, and a synthetic tread, the first step being about ten per cent rubber in the carcass areas and the plies in late 1946.

That brings us smack up against the question of synthetic rubber—and right away we encounter another snag that will further delay our friend John Q's ownership of those coveted tires for spring and summer pleasure driving.

When war came there was no time for the rubber industry to design and install new machinery suited to making tires from synthetic rubber, even had materials for such machinery been available. There was not even time to convert for synthetic processing machinery originally designed and intended to handle only natural rubber, even had such conversion been practical. This conversion will doubtless come in due time; but meanwhile, as throughout the war, the rubber industry has been producing "bricks without straw"—has been manufacturing tires from synthetic rubber with machinery the efficiency of which depends upon the use of natural rubber.

At certain steps in the tire making process this machinery, when using synthetic base stocks, must be operated at appreciably slower speeds to prevent scorching the raw material and to avoid damage to the machinery itself. Production of tires from synthetic rubber consequently has been and still is slower than production with natural rubber—so much so that it takes at least one-eighth more time to make a synthetic tire than to make one of its pre-war predecessors. To put it another way, while one crew of rubber workers, using natural rubber, is turning out nine tires, another crew, using synthetic materials, will be turning out only eight tires. And if the missing ninth had John's number on it, John must continue to wait!

At this point, even John is nearly ready to admit that it will take him a little longer than he expected to catch up with some new tires—at least with a full set of them—and that when he does get them they will be certainly and largely synthetic.

These pictures demonstrate the basic difference between natural and synthetic rubber. In the picture at the top of the page are seen two rubber bands. The smaller one is synthetic rubber and the larger one is natural rubber. In the center both rubber bands are being flexed. The picture was taken when both bands were stretched to the extreme. Note that the synthetic band lacks elasticity compared with the natural rubber band. Below, the two bands are returned to their original position. Notice how the synthetic band is now practically the same size as the rubber band. This inability to snap back is a handicap in the manufacture of tires from synthetic rubber.

(Pictures through courtesy of the Sohioan, monthly employees' publication of Standard Oil Co. of Ohio)

Foreign Trade Week

That the importance of world trade is becoming generally recognized is evident from the announced programs for Foreign Trade Week throughout the country. As an example, in San Francisco most of the major business and civic organizations are devoting their regular programs during the week of May 20-25 to speakers who will tell of the jobs that foreign trade provides — or **contra,** the number of jobs that would not exist if foreign trade were cut off. Especially significant is the observance in areas remote from the port cities.

It is misleading to assume that the generally accepted 10 per cent of the country's production is the limit of foreign trade importance. To many large industries the export part of the business is a vital part in normal times. For instance, 28 per cent of tractor production goes abroad. That is an important percentage. So is 36 per cent of power-driven metal-working machinery. So is 29 per cent of tobacco, 36 per cent of sulphur, 14 per cent of automobiles, 17 per cent of agricultural implements, 46 per cent of dried fruits and 54 per cent of cotton.

Jobs

But "percents" are cold things. Jobs are otherwise.

When we say 54 per cent of cotton it means half of the men and women employed in cotton growing, half of the ship cargo space, half of the warehouse and pier facilities, half of the financing and insurance.

When we say 46 per cent of the dried fruits it means nearly half of the jobs involved in growing, harvesting, drying, boxing and shipping. On the farm it means the fruit of nearly **every other tree.**

And importing is even more important. An imported item is the **beginning** of an industrial cycle. Jobs in shipping, jobs in hauling by truck or rail, jobs in processing, jobs in wholesaling, jobs in retailing. There is hardly a store in the country that does not handle imported items. And the money we pay for imports is used for buying the products of our factories and farms.

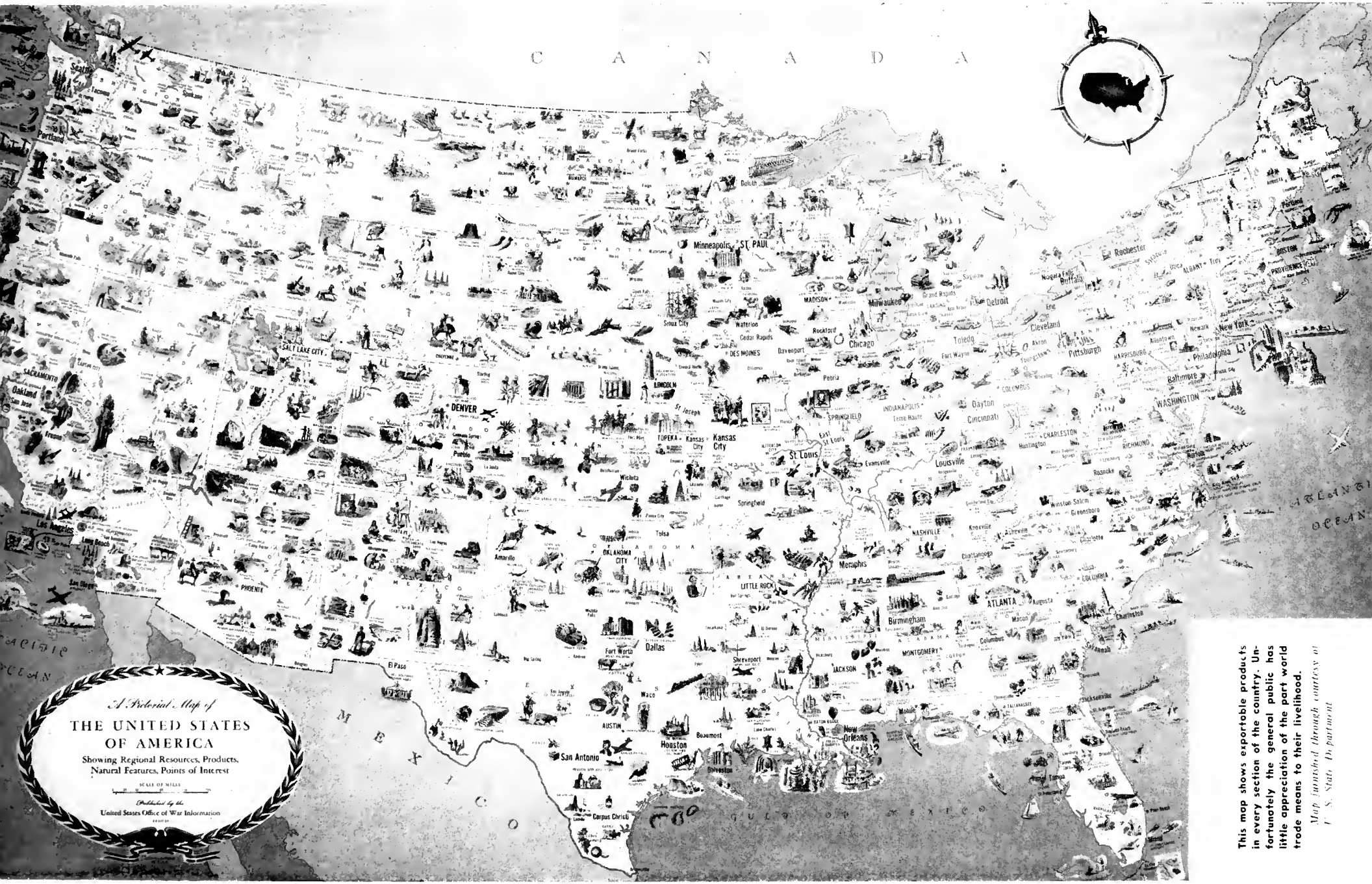
Foreign Trade is important to every one.

Foreign Trade Week is a means for publicizing that importance.

Committee Chairman Arranging Foreign Trade Week in San Francisco

Standing: M. A. Cremer, Marine Exchange; T. Douglas MacMullen, Pacific Marine Review; J. Roger Deas, City Planning Commission; Murray Blanford, General Steamship Co. (Jr. C. of C.); R. V. Winquist, General Steamship Co.; Forrest Brookman, Atkins-Kroll; Ralph Dewey, Marsman Co.; R. E. Dorton, Bank of America.

Seated: Lloyd Mazzera, Bank of America; W. J. Gilstrap, Wells Fargo Bank & Union Trust Co.; W. B. Loomis, S. F. C. of C.; Alvin Eichholz, manager World Trade Department C. of C.; Ray Waterlow, Frazar & Hansen and Chairman of the Committee. The chairman seems to be getting in some good licks for success.

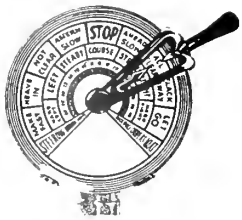


This map shows exportable products in every section of the country. Unfortunately the general public has little appreciation of the part world trade means to their livelihood.

Map furnished through courtesy of U. S. State Department

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE SEXTANT

Chapter III (*Continued*)

Errors and Adjustments of the Sextant

Adjustable Errors

1. **First Adjustment.** This adjustment is to make the index mirror perpendicular to the plane of the instrument. To do this, place the index arm about half-way along the arc, hold the sextant horizontally face up with the index mirror close to the observer's eye, and the arc of the instrument away from the observer. Remove the telescope. Now direct the eye obliquely into the lower portion of the index mirror and observe whether the reflected arc as seen in the index mirror to the left, is in the same plane as the arc seen by direct vision close outside the mirror to the right. In other words, are the true and reflected arcs in one continuous straight line? If so, no adjustment is necessary; this is an indication that the index mirror is perpendicular to the plane of the instrument. If, however, the arc appears broken where the images meet, that is, if the line of the reflected arc is seen in the index mirror either higher or lower than the true arc, then the index mirror is not perpendicular to the plane of the instrument, and the ray of light from the observed body is not being reflected to the horizon glass parallel to the plane of the instrument. To remedy this an adjusting screw is placed at the back of the index mirror which may be tightened or loosened so as to bring the true and reflected arcs into one continuous straight line. **THIS FIRST ADJUSTMENT SHOULD ALWAYS BE MADE FIRST.**

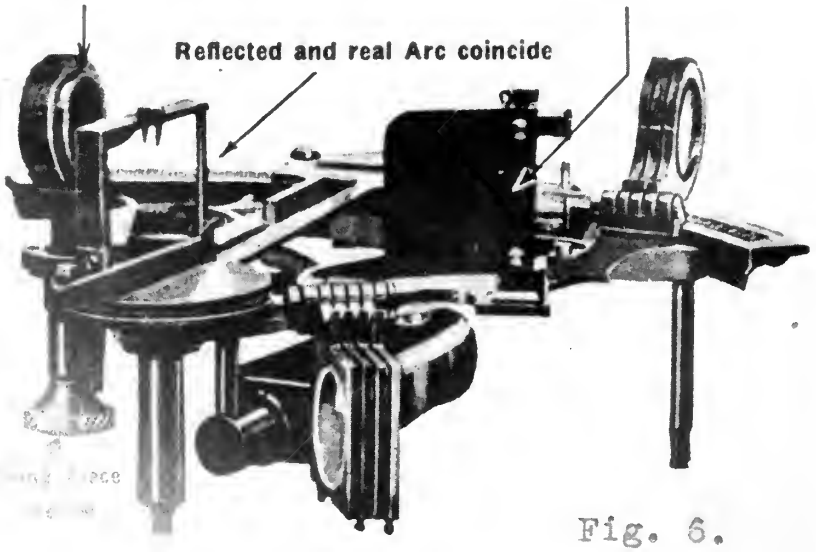


Fig. 6.

Fig. 6 illustrates how the true and reflected arcs form one straight continuous line when the index mirror is perpendicular to the plane of the instrument.

2. **Second Adjustment.** This adjustment is to make the horizon glass perpendicular to the plane of the instrument. To check this use the sea horizon as a reference point. Set the index arm on the sexttant at approximately zero (0°) on the arc; hold the sextant in a vertical position with the right hand and move the index arm slightly until the sea horizon forms one straight continuous line in the horizon glass. Clamp the index arm at this point and rotate the sextant first to the right at an angle of about 20° from the vertical, and to the left at the same angle from the vertical. If, when the sextant is rotated to the right or left from the vertical, the sea horizon remains in one continuous straight line, no adjustment is necessary, as this is an indication that the horizon glass is perpendicular to the plane of the instrument. However, if, when the sextant is rotated from the vertical either to the right or left, the true and reflected horizons "break", the horizon glass is not perpendicular to the plane of the instrument. To remedy this an adjusting screw is placed at the back of the horizon glass which may be tightened or loosened so as to bring the true and reflected horizons into one straight continuous line, regardless of the angle at which the sextant is rotated. **THIS SECOND ADJUSTMENT SHOULD BE MADE NEXT AFTER THE FIRST ADUSTMENT.**

Fig. 7. illustrates how the sea horizon should look in the horizon glass when the horizon glass is perpendicular to the plane of the instrument.

3. **Third Adjustment.** This adjustment is to make the horizon glass parallel to the index mirror, when

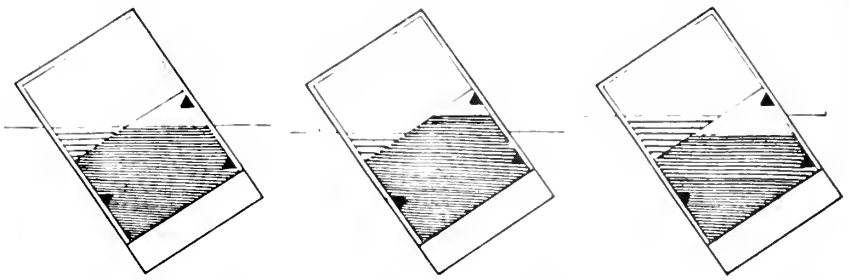
the index mirror arm is set at zero (0°) on the arc. To do this set the index arm exactly at (0°) on the arc and clamp it there. **Check this setting very carefully.** Hold the sextant in a vertical position with the right hand and direct the line of sight at the sea horizon. If the true and reflected horizons appear as one continuous straight line in the horizon glass, no adjustment is necessary, as this is an indication that the horizon glass is parallel to the index mirror. However, if the true and reflected horizons do not appear as a continuous straight line in the horizon glass, the horizon glass is not parallel to the index mirror. To remedy this an adjusting screw is placed on the horizon glass by which means it can be swung about its axis to bring it parallel to the index mirror.

However, it is well to keep in mind that the second and third adjustment screws work on the same mirror—the horizon glass—and that the two motions are dependent one on the other, so that having made the second adjustment correctly, after the third adjustment is made, it may be found on re-checking the second adjustment that it has been thrown a little out of adjustment. Thus, the adjusting screws on the horizon glass may have to be worked on alternatively before both adjustments are completed, and even so it may not be possible to eliminate both errors entirely. The best way to do this is by halving the errors.

For the above reasons—those that in making the third adjustment the second adjustment may be disturbed—it is much better to ignore the third adjustment, unless it is way "out of adjustment" and treat the error as in INDEX ERROR, which will be discussed later on.

THIS THIRD ADJUSTMENT SHOULD BE MADE ONLY AFTER THE FIRST AND SECOND ADJUSTMENTS HAVE BEEN MADE.

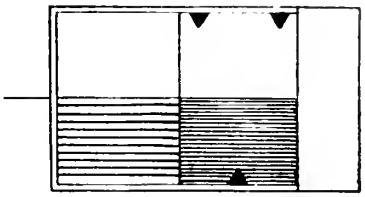
Fig. 8 illustrates how the sea horizon should look in the horizon glass when the horizon glass is parallel to the index mirror, and when it is not.



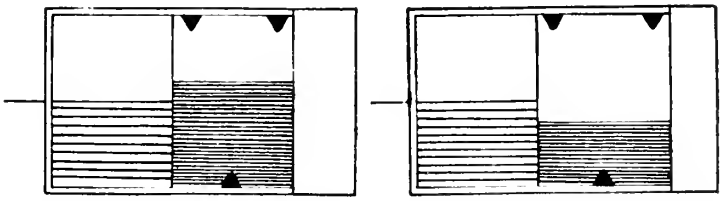
(*a*).—Horizon glass perpendicular to the plane of the instrument

(*b*).—Left edge of horizon glass leans toward the observer

(*c*).—Left edge of horizon glass leans away from the observer



(*a*).—Horizon glass parallel to index glass



(*b*).—Top of horizon glass leans toward the observer

(*c*).—Top of horizon glass leans from the observer

4. **Fourth Adjustment.** This adjustment is to make the line of sight (i. e., the axis of the telescope when "shipped") parallel to the plane of the instrument. To do this select a desk or a stand in the chart room, and place it about 20 feet from the bulkhead. Place the sextant face up on the desk and sight across its arc to the bulkhead. Have someone stand near the bulkhead and place a line on the bulkhead in the same plane as the arc of the sextant. By means of a ruler and a pair of dividers determine the distance from the top of the arc to the center of the telescope. **Move the line on the bulkhead up this distance.** This now becomes a permanent line or point of reference for future use.

Place the star telescope in the sextant with its cross wires parallel to the line established on the bulkhead. Sight through the telescope. If the line on the bulkhead falls exactly midway between the two parallel cross wires in the telescope no adjustment is necessary, as this is an indication that the line of sight is parallel to the plane of the instrument. However, if the line established on the bulkhead falls above or below the cross wires in the telescope it means that the line of sight (i. e., telescope) is not parallel to the plane of the instrument, and that the telescope will have to be tilted up or down (by means of adjusting screws on the telescope bracket) until it is adjusted.

This means of checking the fourth adjustment is the simplest of all for the reason that once the line has been permanently established on the bulkhead it is a very simple matter to check this adjustment.

THIS FOURTH ADJUSTMENT CAN BE MADE AT ANY TIME WITHOUT REFERENCE TO ANY OF THE OTHER THREE ADJUSTMENTS.

Fig. 9 illustrates how the line on bulkhead should look when viewed through the star telescope when the line of sight is parallel to the plane of the instrument, and when it is not.

(a) Telescope parallel to plane of Instrument. (b) Telescope tilted downward. (c) Telescope tilted upward.

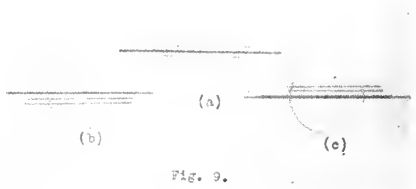


Fig. 9.

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Correction of Unsatisfactory Brush Performance

Part II

Commutator Brushes Sources Of Sparking

Sparking is so frequently the source of other operating difficulties that it is often considered a primary source of trouble. Yet sparking is only the result of some other primary fault. Sometimes the primary cause cannot be removed; for example, the necessity for operating a non-interpole machine in both directions. In such cases complete elimination of sparking may not be possible. In a majority of cases, however, the primary cause of sparking is something that can be corrected if the case is properly diagnosed and the underlying fault determined.

The source of sparking may be associated with the nature of the service the machine performs or with surrounding conditions. Operating practice, machine adjustment, mechanical or electrical faults in the machine, brush angle, and design characteristics are other factors which affect commutation.

Load or Service Conditions

Heavy overloads often result in sparking, particularly when they result in magnetic saturation of the interpoles and incomplete compensation of the voltages induced in the armature coils during commutation. Very rapid load changes have similar effect due to the lag of the accompanying change in field strength. Where such load conditions are inherent in the operating cycle, and cannot be corrected, a brush grade of high carrying capacity and the best possible commutating properties should be selected. If sparking cannot be prevented, the use of a canvas wiper, will greatly assist in maintaining satisfactory machine performance. In some cases it may prove necessary to use a brush grade having some polishing action. Low average current density, previously mentioned as a source of commutator streaking, may also lead to sparking.

Atmospheric contamination has been discussed as a cause of raw or discolored commutator surface which, in turn, may lead to destructive sparking. Humidity also has an influence on commutation. Very low humidity makes it difficult to maintain the oxide film essential to good commutation. Furthermore, the disappearance of the oxide film increases the friction of the brushes and may cause chattering with resultant sparking. Air conditioning or the use of brushes having greater film forming properties are the usual means for correcting such conditions.

Vibration will cause sparking whenever it is of sufficient severity to interfere with the contact of the brushes on the commutator. Loose foundation, pound of engine and poor belt lacing are among the external sources of vibration to which sparking may be traced. Vibration induced by other equipment, bad rail joints or crossings in traction service and like causes, if not subject to correction at the source can sometimes be counteracted by cushioned mounting of the motor or generator affected.

Operation and Adjustment

The maintenance of sparkless commutation requires a certain amount of care on the part of the operator. Any operating practices which unfavorably affect commutation should be discontinued. Unnecessary use of sandpaper and lubrication of the commutator with wax or oil are sources of sparking which, fortunately, are encountered with much less frequency than in former years. Generators which give no trouble when operated alone may show sparking when operated in parallel unless properly equalized. Methods used to correct difficulties in parallel operation include adjustment of the series field strength, elimination of inequalities in angular velocity and, sometimes, slight shifting of the brush position.

The condition, spacing and alignment of brush holders, equalization of air gaps and pole face spacing, staggering of brushes to prevent ridging of the commutator, careful seating of brushes to full face when first installed, adjustment of spring tension to a uniform value within the range recommended for the grade in use, and setting of the brushes in the position for best commutation are items which have a marked influence on commutation.

Over- and under-commutation are sources of sparking. They can usually be identified by the contact drop between the brush and commutator at several points across the brush face in the manner there described. To rapid reversal of current in the short circuited coil, a source of sparking, is frequently associated with over- or under-commutation. Over-commutation is corrected by shifting the brushes against the direction of armature rotation or by decreasing the strength or span of the interpole field. Under-commutation is corrected by shifting the brushes in the direction of rotation or by increasing the strength or span of the interpole field. Adjustment of interpoles was discussed in this section last month under "Slot Pitch Marking." Thinner brushes are sometimes used to relieve over-commutation and thicker brushes to correct under-commutation but the use of brushes that are too thin may cause sparking because of the very rapid current reversal resulting.

Sparking which results from chattering or interruption of contact be-

tween brush and commutator can often be eliminated by adjustment of spring tension or by changing the angle at which the brush bears on the commutator. High spring tension may cause high friction, with resultant chattering, while low spring tension allows contact to be disturbed by slight vibration or inequalities of the commutator surface that would not be troublesome at the correct brush pressure.

Machine Defects

Among the mechanical defects in motors and generators which constitute sources of sparking are: worn bearings, resulting in unequal air gaps and non-symmetrical field strength; unequal spacing of pole pieces; loose poles or pole face shoes; inaccurate spacing or alignment of brush holder supports; vibration, either from loose parts or from lack of dynamic balance; eccentric armature or commutator; and any of the defects of commutator surface discussed in earlier paragraphs.

Most common of the electrical faults are probably winding defects, in either field or armature windings, which disturb the symmetrical distribution of magnetic flux or load current. These may take the form of short circuited turns, grounds, open circuits or high resistance connections. Practically every maintenance shop has means for detecting and locating faults of this character. Reversal of polarity on either a main pole or an interpole is not a common fault but, when it occurs, is a source of vicious sparking and should be corrected without delay. Electrical unbalance, even though too slight to be a direct cause of sparking, may induce vibration in the machine from which sparking later develops.

Brush Grade

It is well to point out, that careful consideration should be given to other factors influencing performance, particularly those affecting commutation, before deciding to change the brush grade. Sparking is one of the first indications of an unsatisfactory condition. Since it appears at the brushes there is a tendency to think immediately of changing the brush grade rather than to seek the primary cause of trouble in load or service conditions, operating practices, machine adjustment, or possible mechanical or electrical faults. Only after these items have all been thoroughly checked should change of the brush grade be considered. Both time and expense will be saved if this practice is followed.

When the fact has been established that the wrong grade of brush is being used, the next step is to determine, if possible, its shortcomings for the service to which it is applied. Intelligent selection of a new grade cannot be made on the basis of the single fact that the grade in use sparks. The whole situation must be analyzed, much as a physician diagnoses a case of illness, and the prescription written on the basis of the symptoms observed and knowledge gained from past experience.

With electro-graphitic brushes sparking may be due to the use of a grade having a commutation factor that is too low. The use of a brush with higher contact drop will, in most cases, improve commutation. However, it has been shown that sparking underneath the brush faces is liable to occur when the voltage drop across the contact path appreciably exceeds three volts. Therefore, sparking accompanied by a high resistance glaze on the commutator indicates the need for a brush which will maintain a lighter surface film, possibly a grade with mild polishing action.

The carrying capacity of the grade selected, as given by the manufacturer, should not be less than the current density to be carried. On the other hand, at low average current density, film forming properties rather than carrying capacity should be the major consideration.

Among other factors to be considered are the peripheral speed of the commutator, the angle at which the brush is mounted, whether leading or trailing, and adaptability to the service involved and to the operation on undercut or flush mica commutator, as the case may be. It should be apparent that no fixed rule can be laid down for the selection of a brush grade to correct the unsatisfactory performance experienced with another grade. Facts must be collected, in some cases measurements made, and all factors carefully analyzed in the light of experience. That is the reason it is advisable to enlist the cooperation of the brush manufacturer and obtain the advice of his engineers who have had extensive experience in brush application.

Design Characteristics

There are many details in the design of a motor or generator which have an influence on its commutating properties. Among these are the stiffness of the main field, proportion of pole face span to pole pitch, degree of saturation in various parts of the magnetic circuit, length of gap for both main poles and interpoles, details of armature winding, average and maximum bar to bar voltage, number of armature slots spanned by the interpole flux, duration of the commutation period, brush thickness, peripheral speed of commutator, angular velocity of armature and rigidity of armature shaft. Most of these details are beyond the control of the operator but there are some, such as span of interpole flux, duration of commutation period and thickness of brushes, which can be modified when the need is indicated.

It has been observed on some interpole machines that the span of the interpole flux on the armature does not bear an integral relation to the tooth or slot pitch. Where this is the case the number of armature teeth through which the interpole flux passes varies with the angular position of the armature. This is shown in Figure 3, A and B, where the flux span is one and one-half times the tooth pitch. Such a condition produces a flutter or high frequency variation in the interpole field strength which may prove disturbing to machine performance. By beveling the interpoles at the face the flux span can be made equal to one tooth and the tooth area spanned by the flux will be the same for any armature position, as indicated in Figure 3, C and D. If the interpoles are narrow, beveling the faces may make the commutation period so short that sparking results from too rapid reversal of current in the short circuited coil. In such cases an integral ratio between flux span and tooth pitch can be obtained by increasing the interpole air gap, thus giving the flux greater spread, or by attaching shoes to the interpole faces. If the interpole air gap is increased in any manner other than the removal of non-magnetic shims, it will probably be necessary to adjust the interpole shunt or add turns to the interpole windings to offset the increased reluctance in the magnetic current.

Sources of Excessive Heating

The most frequent cause of excessive heating is overload but there are numerous other conditions which produce excessive temperature in a machine that is

being operated within its rated load capacity. When circumstances make it essential for a machine to be operated at loads in excess of its rated capacity careful attention should be given to all of these other factors. If they are properly taken care of it may be possible to carry substantial overload without dangerous temperatures being reached in any part of the machine. In extreme cases it may prove necessary to supply supplementary ventilation.

Sparking

Sparking raises the temperature of the commutator and, in that sense, is a direct source of overheating. Most sources of sparking, however, are in themselves the direct cause of the accompanying excess temperature. This is particularly true when the sparking results from heavy short circuit current during commutation. Incorrect brush position, unequal brush spacing, faulty interpole adjustment, excessive brush thickness, misalignment of brush holders, unequal air gaps and insufficient voltage drop across the brush contact are among the more common causes of heavy commutation current.

Unbalanced Distribution of Armature Current

Disturbance of the balanced distribution of current in the armature results from any lack of symmetry in the magnetic field, such as that caused by unequal air gaps or pole spacing. Unequal spacing of brushes has a like effect. Open or high resistance connections at the commutator or cross connections, insufficient cross connection and faulty operation in parallel with another machine are other sources of unbalanced current distribution. In addition to overheating the windings which carry more than their normal share of current, unbalanced distribution tends to increase hysteresis and eddy current losses in the armature core.

Winding Faults

Open circuits, short circuits, grounds and high resistance connections, in either field or armature windings, are all potential sources of excess heating. Such faults can usually be located by means available in most maintenance shops.

Friction

Excessive temperature at the commutator is sometimes caused by high friction. This may be due to the use of brushes with high coefficient of friction which are not adapted to the machine to which they are applied. The wedging effect produced by operating brushes in the trailing position at too great an angle from the radial tends to seriously raise the commutator temperature. The condition of the commutator surface has a marked influence on friction. A raw commutator has much higher friction than one with a good oxide film. For this reason care should be taken to protect the commutator from "contact poisons." Low humidity, excessive brush pressure, high ratio of brush area to total commutator area and dirty commutator surface are other sources of undue frictional heat at the commutator.

Ventilation

Since all energy losses within a machine assume the form of heat, it is essential that sufficient ventilation be maintained to remove this heat as rapidly as it is generated. Otherwise, dangerous temperatures will be reached. Ventilating ducts should be kept clean by blowing out frequently and thoroughly. In dusty locations rapid clogging of the ventilating passages is liable to occur and efforts should be made, if possible, to protect the machine from atmospheric dust.

Heating of Individual Brushes

Heating of individual brushes is sometimes indicated by the appearance of glowing or incandescent spots at the brush face or by discoloration of the shunt cable. Accumulation of copper at the brush face, raw streaks on the commutator surface, unequal brush pressure, and loose connection of shunt terminals are among the more common causes of the selective current collection from which this localized heating results. Heating of the commutator has been relieved, in some instances, by using brushes of lower contact drop.

Sources of Brush Noise

Noisy operation of brushes is usually caused by chattering although, in some cases, the frequency of brush movement may be so high and the amount of separation between brush face and commutator so slight that no visible sparking results. On some small, high speed motors with undercut commutators it is possible that an audible tone may be produced merely from the rapid passage of the slots under the brush, without contact between brush and commutator being disturbed. The frequency of slot passage at the brush edge on such motors is on the order of 5,000 per second. In most cases involving marine equipment correction of conditions tending to interrupt the firm contact between brushes and commutator will relieve noisy operation.

Commutator Surface

Practically any faulty condition of the commutator surface will cause chattering and noise. This is usually of relatively low frequency and the sound effect one of rapid vibration rather than a well defined tone. Rough or dirty commutator, high mica or mica fins, high or low bars, burned bars, and flat spots represent the more commonly encountered commutator surface defects producing chattering and noise.

Friction

Chattering caused by high friction usually is of higher frequency than that caused by surface faults and the resulting noise often has a clearly defined tone, sometimes of very high pitch. Low average current density, resulting in loss of oxide film, low humidity, "contact poisons," and brush angle are representative of the conditions which should be looked into when high friction is indicated as the probable source of noisy operation.

Brush Grade

Composition has an influence on quietness or brush operation, some grades being inherently more quiet than others. The harder carbon and carbon-graphite grades are, as might be expected, most susceptible to noisy operation, while graphite brushes, because of their softness, are usually quiet. Electro-graphitic grades are, in general, quiet in operation because of their low coefficient of friction. Should noisy operation be experienced with an electro-graphitic grade of relatively low commutation factor, when the commutator is in good condition and all factors tending to create high friction have been corrected, improvement may be effected by using a grade of higher commutation factor or greater film forming properties. On the other hand, if streaking or a raw commutator surface also appears, the primary source of trouble may be faulty commutation, atmospheric contamination or low average current density. Our June Issue will contain a tabulation of commutation troubles and their probable causes, which will conclude this series on brushes and commutators.

Report on a Boiler Casualty on C-4 Vessel

The boilers on this type of vessel are single pass, cross drum sectional header type equipped with water walls at sides and rear of the furnace, interdeck superheater and overdeck airheater.

The following conditions obtained just prior to this casualty.

1.—Only one boiler had steam pressure and was being used for port load.

2.—Tubes had been blown at 4 day intervals while lying at anchor in port, approximately 1½ months.

3.—Considerable water-contaminated oil had been taken aboard. Estimates given as to amount of water was that approximately 1,300 bbls. of water had been pumped overboard out of the original amount of approximately 5,600 bbls. and still trouble was being experienced with water in the oil to the oil burners.

4.—Fires went out due to water in the oil and could not be relit.

5.—Plant was secured with steam pressure at 250 psi and diesel oil from cold start tank at approximately 40 psi was fed to burners.

6.—D. C. Heater level was low due to stoppage of motor-driven condensate pump when plant was secured—(Note: This vessel is not equipped with a steam-driven condensate pump).

7.—When water went to bottom of gage glass, with 125 psi steam pressure the fires were cut out and reciprocating feed pump started. With 1" of water showing in the gage glass, steam pressure was down to 40 psi.

8.—Diesel oil tank being nearly empty, the settlers were opened providing fuel oil at 118° F to fuel oil service pump equipped with a 10 hp motor, which was run at its slowest speed from the 15 kw emergency diesel generator. The forced-draft blower driven by a 50 hp motor, also was running at its slowest speed from the same power source. When the steam was raised to 125 psi water went out of sight in the gage glass.

During all these operations oil had been sprayed onto the furnace floor because of insufficient pressure on the diesel oil, and insufficient temperature on fuel oil. At this time fires were shut off, oil pump and forced draft blower stopped and air duct damper closed. All these steps took place in order from 9:00 AM till 2:10 PM at which time plant was totally secured with a small fire from unburned oil burning on the furnace floor.

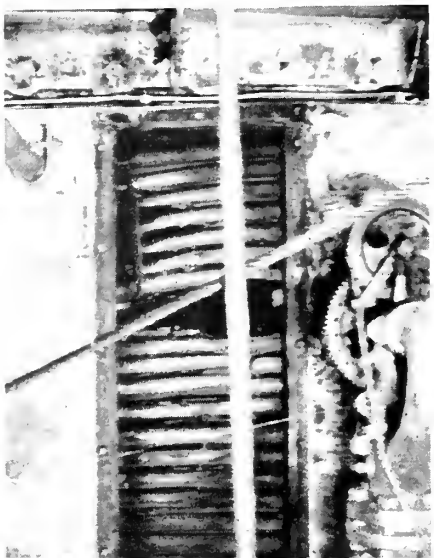
At 5:15 PM the casing adjacent to the air preheater was noticed to be red hot and molten metal was dropping onto the floor of the furnace. Assistance was then asked from the U. S. Navy. The bottom of the air heater casing being red hot, eight foamite fire extinguishers were emptied into the furnace with only temporary effect. The fire continued in the upper parts of the boiler. No attempt was made to use the CO_2 equipment because the Chief Engineer felt this would form a non-combustible atmosphere which would not cool the mass of molten metal below the ignition point of the oil vapor present in the furnace and a furnace explosion could be expected. This was concurred in by the officer in charge of the Navy fire party sent aboard the ship. At approximately 8:00 PM boiler was apparently cooling down. These are the apparent facts as stated.

Conclusion: Diesel oil at approximately 40 psi to burners was insufficient pressure to cause atomization of oil. Carbon and burning oil accumulated on furnace floor causing soot formation throughout the boiler, on all heating surfaces. Some of the lighter fractions of the oil, on striking the hot carbon would be gassified, and proceeding up through the boiler in the form of a vapor would be condensed, especially in the cooler portions of the air heater, thus forming a mixture of light oil-soaked soot. This condition was later aggravated by the use of fuel oil at 118° F. a temperature where normal commercial fuel oil will not burn properly in any mechanical atomizing oil burner. All that remains necessary under these conditions to cause a disastrous fire is for a stray spark to ignite this oil-soot mixture. This apparently happened in this case with results as shown in accompanying photographs.

Top: View looking upwards from boiler furnace, showing burned tube nest. Air heater tubes in distance.

Center: Front wall, showing slag and melted boiler tube metal running down.

Bottom: View of air heater with access door removed, showing tubes burned away.



THE AMERICAN MERCHANT MARINE

(Continued from Page 390)

handling of the problems involved in the reconstruction period upon which we are now entering.

His Majesty's able new Minister of Transport was at pains to tell us in London again and again that with his government, socialization stopped at the sea coast. Coal mines, yes, railroads, yes, banking, maybe, but offshore shipping, never.

Across the channel, however, the French chambers have already made the initial moves toward complete nationalization, and unless the coming elections change the complexion of France's government, it looks as though her merchant marine would be wholly a government affair—at least as far as ownership and profits are concerned—in spite of the desperate resistance of her shipping industry.

The Scandinavian countries are all following one pattern to a greater or lesser degree. There the governments have said to their shipping industries, "We require so and so much by way of imports. You take the full responsibility for seeing that those programs are fulfilled. Beyond that my children, send your ships forth into the world and get every dollar you can lay your hands on." Holland seems to be moving toward a somewhat similar course, but finding it harder to get started.

Japan, Germany and Italy are, of course, no longer in the picture, and the Soviet merchant marine, which is definitely becoming a factor to be reckoned with, represents the extreme of nationalization or, if you prefer, socialization.

Here at home and in Canada, your guess is as good as mine, but happily the present trends seem to head down the British road. I would like to return to our own situation a little later rather than enlarge upon it now.

Beyond all this are two other interesting phenomena to be reckoned with. There is a perfectly proper but nonetheless most complicating desire on the part of numerous other governments to set up shop in the maritime field and to enjoy the luxury of merchant marines under their own flags. The easiest way to enumerate them is negatively. Bolivia, Switzerland and Paraguay may lack the urge, but I would not be too sure even of them. All these nations are talking of ships under their respective flags as real instruments of national policy and not of their flags as corporate disguises or conveniences.

Finally, in a vague and nebulous way, you run across people who are thinking of a future when all merchant shipping will fly one flag and be disposed and directed by one international body to serve the common needs of a united world. It may sound on the fantastic side, but you will most certainly hear more and more of it as time goes on, and many of us here may live to see the day when the school children of the world will be competing for the honor of designing the merchant shipping flag of the United Nations. That body already has made provision for machinery to deal with world shipping problems and not illogically,—since control of the seas has not in the past been one of the lesser factors that go to the breeding of war.

All in all, it does not look as though we were moving toward an era where greater freedom of private shipping would be the rule. On the contrary, the straws in the wind seem to point toward a strengthening of those governmental policies and activities which view shipping as one of the major tools in national and international affairs.

Before I come to what I think all this means to us as shipping people, you may be interested in the attitude of the other leading maritime nations toward our merchant marine, as far as an admittedly hurried observation can piece it together.

First and foremost, for the immediate future they are afraid and consequently suspicious. Our tonnage preponderance is so vast that it overwhelms them to think what we might do with it if we should elect to follow the familiar paths of history, and act tough.

Whenever the subject was mentioned, there was a tendency to play down the security functions of merchant shipping—to say that the idea of its being an essential arm of a great sea power might be outmoded—and to stress the economic functions—with the old familiar refrain, "He who can do it the cheapest should have the job to do." In that connection, there was also the talk of internationalization, which I have previously mentioned.

Even our modest "fifty-fifty" formula was more or less taboo as a subject for discussion. Nobody liked any set formula that savored of percentage divisions of that type. Why, I just do not know.

There was, of course, constant reference to the bareboat charter, of our tonnage to non-citizens, and we can expect all sorts of moves to get that legalized. Obviously, the shipbuilding nations do not want to buy our standardized, war-built ships except as a stopgap against construction programs of their own, and chartering is, of course, a cheaper and more effective stopgap than purchase.

In fairness, its proponents make a strong case. The great bulk of ocean cargoes today are for the relief and rehabilitation of suffering people. Most of the other maritime nations have a surplus of officers and crews. All of them can run ships more cheaply than we can. If we charter to them, the dollars so saved could be spent in the purchase of more goods for relief.

I express only my personal opinion when I say I am opposed to bareboat charter, in spite of the undoubted merit of the arguments in favor of it. I have spoken of the ambitions of the many previously non-maritime governments to create merchant marines of their own. It is hard to see how we could charter to one and refuse another. It does not seem sensible that we should deliberately add another major complication to the confused and difficult shipping situation of today.

Furthermore, our own enlightened self interest seems worthy of occasional consideration. If we embark on any wholesale charter program, what becomes of our officers and crews who would otherwise have manned the ships which did the jobs? What happens to our repair yards and ship service organizations when the chartered ships repair and service abroad? And, after all, the freight rate savings are more or less fictitious since the United States must still carry a large proportion of the movement, and the level of rates must therefore reflect American costs.

For the long pull, I think the other nations do not particularfly fear us as permanent competitors on a large scale, unless our whole world policy should take an aggressive turn. They are confident that their costs will always be lower than ours and that on a lean market they can always underbid us for cargo. They feel, prob-

ably with justification, that our present subsidy policy would fall of its own weight if it were extended to support a greatly increased merchant fleet. Finally, they consider that they have the same substantial advantage which they enjoyed in the 1920's, of individual against standardized construction, which works more and more in their favor as time goes on.

Curiously, they recognize our right to a substantially greater offshore fleet than we have ever had before. They appreciate that we cannot compete without some offsetting form of subsidy, and yet they honestly seem to regard the subsidy provisions of the 1936 act as highly discriminatory and unfair to them. Again I just can not tell you why.

And now, I would like to say a word on what all this may mean to us and to ask you to consider most earnestly two matters which seem to me of real and immediate practical importance.

I am not going to attempt anything by way of crystal gazing. I do not know what our national policy is going to be; what is going to happen to the United Nations; nor in any small particular where we are headed from here.

But in two matters I truly believe we can and should take steps to prepare ourselves for whatever lies ahead. They are difficult steps, but possible of accomplishment because others have long since accomplished them.

Cost factors aside, I believe we can build ships and run ships as efficiently as any of our foreign competitors, with the possible exception of our Scandinavian friends. In liner operation, I think we can more than hold our own when it comes to the refinements of service—either passenger or freight. Our officers and crews have proven over and over again these past few years that in courage, resourcefulness and seamanship they need acknowledge no superiors. Our genius for technical innovation and improvement ranks on the highest level.

Where we are weak, and woefully weak, is in our relations with each other, and equally in our unescapable contacts with our government—which is, after all, composed of men very like ourselves.

Compared to the integrated and highly polished pieces of machinery which are the industry organizations of Britain, Holland and Scandinavia, we are still in the era of sail. Because they are human beings, they cannot be free from internal bickerings and frictions, but sit in meeting with them and you learn what a united front really means. When they talk to their governments, when they collectively bargain with their unions, the voice that speaks is the voice of an industry spelled with a capital I. That sort of thing carries weight and real authority. Better yet, it makes for industry self-respect.

There seems to be some curious inherent quality in us that gives us the urge to take on one of our own gang rather than an outsider. Worse yet, we seemingly prefer to take him on in front of an audience, and the bigger the audience the better. We must, we simply **must,** learn more of the ways of give and take, of looking for common ground and of presenting a united front. If we cannot do it, then for the nation's sake, we had better stand aside and let someone else do it who can.

We suffer again by comparison with our friends from overseas in the matter of relationships with those government departments who together with the industry, mean shipping in the national sense. If you have called yourself a shipping man all your life, you cannot help a little thrill when a man whom you know to be just a plain shipowner stands up before the representatives of eighteen sovereign governments and says, "When I speak, I speak for Norway," or another gentleman of the same ilk casually tosses out, "To that proposal, Sweden says NO." Imagine how far one of us would get trying to play that role for the United States.

Here again, our reactions are inherently different from theirs. In the best American tradition, we damn Washington's every move. We pretend to believe it is peopled solely by some strange race of lotus eaters, who could probably never get jobs elsewhere, certainly never meet a payroll, and who spend their brief working hours devising new projects for the squandering of taxpayers' money. Yet we lean and lean hard on Washington when it suits us to do so.

We really know better than to behave as we often do, but we are in the clutch of habit, and bad habits are notoriously hard to break.

I have been fortunate enough to come to know many of our government shipping people through intimate daily association in the war years. For the most part, they are good run of the mill Americans—conscientious and hard working. While I do not always agree with what they do, I can testify that they generally do it because they think it is right.

They are mindful of the dignity of the United States, and of the solemn oath they have sworn to uphold it. But they are continually harassed by budgetary limitations and entangled in the bureaucratic procedures which are, after all, only the checks and balances of the democracy we have just fought to preserve.

They deserve our support, our cooperation and our respect. We should do more to give it both for their sakes and our own. We and they must learn to pull together as industry and government do abroad or we shall fetch up with a sorry American merchant marine. Again I feel, for the nation's sake, we must change our habits of mind, or let someone do it who can.

Where there's a will, there's a way. Give us the will to a united industry, standing with its government, and the way will open ahead of us on a true course, and steaming full and down.

CYCLOIDAL PROPELLER

(Continued from Page 402)

periodic load changes on the propeller blades and the hull plating, which causes the ship to vibrate. This characteristic is inherent in the screw and cannot be eliminated or modified. The cycloidal blades, however, do not approach or recede from the hull as any point on a blade remains equidistant from the hull. This completely eliminates the vibration producing impulses.

An important mechanical feature of the cycloidal propeller is the accessibility of its blades without drydocking the ship. A blade removal or replacement while the ship is afloat can readily be accomplished. Thus, if a blade or blades are damaged by flotsam or beaching, they may readily be replaced by spares. It is important to note that a cycloidal ship is operative in propulsion and control if all blades but one were swept away. A bent blade does not destroy its proper function in propulsion but only decreases its effectiveness.

THE REBER PLAN

(Continued from Page 403)

damming the streams to prevent flood run off and feeding the water into the gravel beds gradually to raise the water level in the irrigation wells. The trend is toward smaller fresh water additions to the south bay basin, and larger summer flow of fresh water into the north bay basin; which, of course, would be equalized by the "fresh water canal" if the Reber Plan was installed.

Engineers who have investigated this plan and its ramifications report that there is not enough water running off from the Sacramento-San Joaquin Rivers to maintain the northern and southern lakes in a fresh water condition. Starting with a large part of the area above the barriers covered with salt water it is very doubtful if these lakes would ever be fresh. If they were fresh and subject to the same inflow of sewage, chemical waste, and garbage dumping as now exists these lakes could not safely be used as a source of water even for irrigation. The enforced cleaning up of this situation would tremendously add to the cost of the plan.

Many industries both on the northern and on the southern ends of the bay have located on their present sites because of free access to deep salt water. The total investment of these industries runs into billions of dollars. Some examples are: the U. S. Navy with yards at Hunters Point, Mare Island, Naval Base at Oakland; and other installations; the shipyards and terminals and many industries on the Oakland estuary and inner and outer harbors; all large San Francisco Bay shipyard and dry dock installations; all the sugar refineries; all the steel mills; and all the present port facilities of Oakland, Alameda, Berkeley, Richmond, Redwood City, San Mateo, San Jose, Stockton, Vallejo, Sacramento, Martinez, Crockett, and many other towns.

It is claimed that the creation of new reclaimed land by this plan would far more than pay for the cost. However, it can be shown that this plan destroys the value of present sites to a tremendous extent and perhaps to an extent much greater than the value of the new lands created. Much of this new land to be created by the Reber Plan would without this plan gradually be reclaimed under existing plans of port development projected by the various cities affected. These plans would make such land of greater value than would the Reber Plan because they preserve open access to deep salt water and maintain the values of present investments.

Much of the allure of living alongside a fresh water lake disappears when that lake is a shallow body of water resting on mud of great depth. That is something very different from the clean, clear, cold fresh water lakes of the mountain and forest regions. Shallow fresh water mud bottom lakes at sea level are very apt to become pest holes and magnificent breeding grounds for mosquitoes and other insects. Salt water is a much more healthful medium under such conditions.

From the maritime industry viewpoint this plan introduces much expense and many uncertainties. Locks are expensive to operate and cause expensive delays. This expense is always borne by the traffic that passes through the locks.

Every ship repair plant on the bay capable of hull repairs to large vessels is cut off from free access by this plan.

All the great canals in the world were built for the purpose of making navigation possible to some interior point, or for shortening the distance between points. The Reber Plan canal makes the navigable distance between the Golden Gate and points on the upper and lower bay longer and more congested and cuts off from the water approach a number of points that are now open to navigation. This canal passes under the San Francisco-Oakland bridge at a point where the clearance is rather low for large seagoing vessels.

Confining the tide to a limited portion of the bay will probably produce tidal surges that are dangerous to shipping at the docks.

The only advantages to shipping suggested by the proponents of the plan are (1) a constant level basin in which to load and discharge cargo (2) fresh water which (if the ship remains long enough) will clean the barnacles off her bottom. We doubt that advantage No. 1 would be sufficient to pay for the lockages, as for

MEASURED MILE

As the SS. Mount Whitney, Vancouver C-4 cargo ship, hit full speed in its measured mile test on the Columbia, a camera on the bank recorded this picture of its grace and symmetry. The Mount Whitney was delivered to the American-Hawaiian lines through the Maritime Commission and WSA February 21 for intercoastal service.

No. 2 we know that ships' hulls have to be dry-docked annually and are always fairly clean when in constant operation. If ships stayed long enough above the locks to drop all the barnacles the cost of delay would more than offset any reduction in fuel costs due to a clean bottom.

To the maritime interests therefore the installation of the Reber Plan means additional port costs, expensive delays, and in general a disagreeable nuisance.

We rather confidently expect and fervently hope that the Reber Plan will remain a plan. We like San Francisco Bay as it is.

ADMIRALTY DECISIONS

(Continued from Page 421)

thing, the result of the use of the lawyer's tongue, his pen, and his head for his client, and the court goes on to say that that sort of thing is pretty well described (although they do not adopt the phrase as a label for their concept) as the "work product" of the lawyer.

Of course it would be quite obvious to the layman that pictures of the winch in this case would be relevant, but it is quite conceivable that a lawyer, through his legal training and knowledge exercised in behalf of his client, might also obtain and direct the taking of photographs of other things which the average layman would not consider relevant and would not know were important in the case, and, yet, which might be the turning point of the whole case.

The court indicates a great deal of doubt as to whether the photographs come under the "privilege" as described in the opinion of the Circuit Court of Appeals but the court concludes that they come within the dictum of the Circuit Court of Appeals which deals with tangibles such as the piece of a machine which hurts someone. The court restricts its decision so that a future case might very well hold that photographs taken by a lawyer or under his direction and supervision may be cloaked by the guard of "privilege." The court finally concludes that the particular photographs are not entitled to the "privilege."

This decision puts considerable responsibility upon the shoulders of counsel in that some statements obtained from witnesses as well as photographs taken at the time of the injury, which may be in part beneficial and in part detrimental, might very well be called up for examination by adverse counsel prior to trial upon the order of the particular court in which the case is at issue.

Liberal Construction of Public Law 17

On Law and Motion day of various district courts of the United States, it is a common thing to hear arguments upon exceptions filed by counsel for various respondents in personal injury actions, where Public Law 17 has not been complied with in suits against the United States or there is a failure in the allegation in the libel respecting the compliance with that law.

In **McInnis** vs. **United States,** the Circuit Court of Appeals, 9th Circuit, a District Court Admiralty decree was appealed following the court's dismissal of the libel.

In that case, a seaman brought suit under the Suits in Admiralty Act, the libel alleging employment aboard the SS. Hobart Baker and personal injuries aboard the same vessel during the course of a voyage in the Pacific. The libel included two separate causes of action; namely (1) claim for injuries because of the insecurity of the gangway, and (2) claim for maintenance and cure.

In the absence of wartime legislation, the libel showed a right of recovery under 46 U.S.C., Sec. 742 and Sec. 741 of the Suits in Admiralty Act, since the Hobart Baker was operated as a merchant vessel by the United States. The question here is whether the seaman has been deprived of that right because of a claimed non-compliance with the provisions of 50 U.S.C., Sec. 1291, respecting his filing a claim for his injuries.

It was agreed that the libelant filed a claim with the agent of the War Shipping Administration and that it was disallowed. It was contended by the government that the claim did not sufficiently comply with the following section of the General Order No. 32 of the Administration:

> Section 304.24. Claim. Contents. The claim need not follow any particular form but it shall be in writing. It shall contain such particulars as are reasonably necessary as a basis for the allowance or administrative disallowance of such claim, and should include, with respect to the seaman in question, his home address, date of birth, place of birth, certicate of identification number, as well as all of the facts and circumstances leading up to and surrounding the happening of the event out of which it alleged the claim arose.

The first question is whether a claim filed and administratively disallowed because not fully satisfying Section 304.24 is a claim "administratively disallowed" within the provisions of 50 U.S.C., Sec. 1291.

The court was of the opinion that such a disallowance of such a claim permits the maintenance of this action. Such legislation concerning seamen's injuries and "maintenance and cure" has always been construed with extreme liberality in their favor. It was not contemplated that seamen in wartime voyages in foreign or domestic parts would have to leave the ship and seek and, if found, employ admiralty proctors to make out their claims for such injuries. The court does not believe that Congress intended that an inartificially drawn claim deprived a seaman of his right of recovery under the Suits in Admiralty Act.

The court specifically sets forth the allegations of the seaman's claim which, while not in complete form, certainly advised the War Shipping Administration and/or the world of the facts on which the claim is based. The court takes the view, of course, that the only reason for Public Law 17 was to give the United States prompt notice of existing claims against it and thereby afford the United States an opportunity to take any and all steps necessary to properly defend the claims. As it is conceded this was the object of the legislators in putting Public Law into force, we must assume that the court reached the proper decision in this case. In any event, it is certainly worth keeping in mind in order to avoid loss of considerable time.

The decree dismissing the libel was reversed.

Inasmuch as the court has taken this position in this district, it would appear to be useless to except to a libel where the only ground of the exception is that notice of claim is technically incomplete although it contains all of the facts surrounding the accident and injury.

The Probolog

There has been an urgent need for a long time for a reliable, non-destructive method of determining the internal and external condition of metal tubes in heat exchange equipment in the industrial and marine engineering fields, and at the same time providing a comparative record of the condition of each individual tube which would eliminate all guesswork and place exchanger maintenance on a logical, scientific basis.

The Shell Development's engineering department in cooperation with the refinery engineers of the Shell Oil and the Shell Chemical's instrument department are responsible for the development of a handy, compact piece of electronic equipment known as the Probolog which when inserted and drawn through condenser tubes of non-magnetic metals, will detect and record quantitatively all types of irregularities such as pinholes, cracks, corrosion and erosion pits, differences in wall thicknesses, and differences in chemical composition. Since it inspects the tubes from the inside, it requires no preparation of the equipment before inspection other than the removal of the exchanger head. It may be operated either as an indicator or recorder, and the record is of such a nature that it can be conveniently retained for direct comparison with those of other tubes or with those of other inspections of the same tube at different lengths of service.

The Instrument

The Probolog consists of the following parts:

One or more interchangeable probes of diameters to fit standard sizes of tubing.

A mechanical probe puller usually synchronized with the chart drive of the recorder so as to insure a reproducible record.

An electronic recorder, equipped with a continuous strip-chart, but also incorporating a neon blinker which may be used as an indicator when a record is not required.

The Probolog may be employed in several ways depending on the particular application and the data sought. For inspection of tube bundles during a routine power plant shutdown the following two-step procedure is favored somewhat:

(a) using the instrument first as a visual indicator, with the chart drive and probe puller cut out, a rapid preliminary survey is made of all the tubes. The neon light is set to flash whenever a signal exceeding a specified minimum intensity is transmitted by the probe and the operator explores the tubes as rapidly as he can draw the probe through. Those tubes which are shown by flashes of light to contain a defective area are marked for further inspection, and the remainder passed as satisfactory.

(b) a second inspection of the marked tubes is then made using the strip-chart recorder and the probe puller synchronized so as to draw the probe through the tube at a standard rate, say ten feet per minute. A permanent record is thus obtained of the internal condition of each suspected tube, in which each defect is not only shown graphically but is located along the tube. The record of a faulty tube consists of a series of deflections from a central line (at which the pen is originally set by testing a tube known to be in good condition) and the magnitude of each deflection is proportional to the extent of the particular defect. Relatively little experience is required for proper interpretation of these records, and an objective basis is thus provided for the retention or rejection of each partially corroded tube.

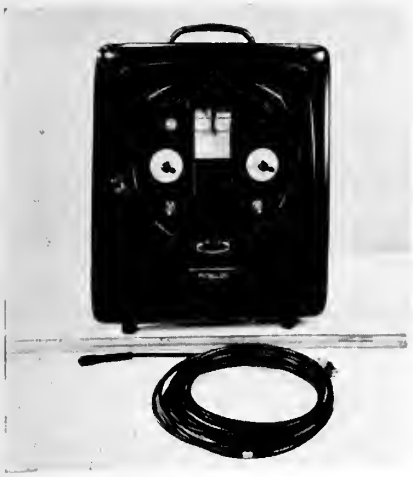
Electronic recorder, ½" probe with long flexible cable and sample tube with perforations used for demonstration. Record of tube detect is shown on strip chart. Bulb to left of chart is Neon blinker used in rapid qualitative inspection technique.

Limitations

The present instrument is designed specifically for the inspection of non-magnetic tubes including copper, brass, monel, Admiralty metal, copper-nickel, aluminum, magnesium, and austenitic stainless steels. For basic reasons, it is unsuitable for the examination of steel tubes although a modified instrument adapted to magnetic metals is at present under development.

The standard commercial model requires 110-volt, single phase, 60-cycle alternating current as a power source although it may be adapted to any special situation. No other outside connection is necessary.

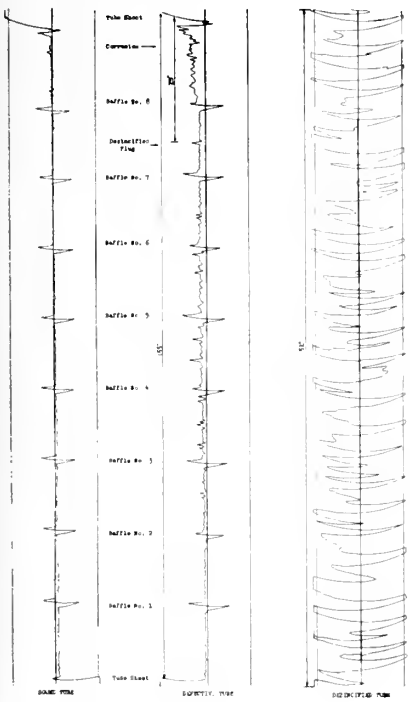
Metallic baffles and tube sheets appear on the record as defects, causing a wide swing of the pen. Since these deflections are of a large order



The Shell Probalog is seen here in action at a plant. Readers will readily identify the mechanical puller, the insulated wire to which the probe is attached, and the electronic recorder.

of magnitude, however, and occur at regular intervals, proper allowance may be made and the record is not obscured. When records of several tubes are made consecutively on a continuous strip of recorder paper the wide deflections caused by the terminal tube sheet actually serve to separate the logs of individual tubes. Scale and other non-metallic deposits are without effect on the record, so that the bundle need only be cleaned to the extent necessary to allow passage of the probe.

These records made by the Shell Probalog shaw how the electronic device reveals damage. Note the regular line drawn when a tube is sound.



The Marine Demonstration

The justification for an instrument of this kind has been fully demonstrated for some considerable time in oil refinery plants where it has repaid its cost many times over in terms of savings in heat exchanger tubes saved from the scrap heap. In order to introduce the Probolog to the marine engineering fraternity the Shell Development Company staff recently gave a demonstration of its use in the marine field. This demonstration took place in the engine room of the ship Trinity Victory in the San Francisco yard of the Bethlehem Steel Company on April 12, where the tubes of the main condenser were thoroughly investigated by the use of the Probolog. Those attending the demonstration included several members of the shipbuilding company's engineering staff, a number of U. S. Navy Yard officials in the Bay Area, and some local shipping companies' port engineering staff members. All present seemed deeply interested and considerably impressed by the demonstration and the findings resulting from the use of the Probolog.

The Shell Development Company, Inc., at 50 West 50th Street, New York City, will be pleased to supply any information on the Probolog upon request.

Chart Program of Hydrographic Office

(Continued from Page 430)

"curves" or hyperbolic lines of position printed on them.

Between April 1943, and November 1945, two and one-half million of these charts were made. In one month, May 1945, over 350,000 were printed. These loran charts and tables are among the special charts produced during the war which will continue to be of increasing importance in the future to both mariner and aviator.

The North Atlantic, the Atlantic Coast of North America, the Aleutians, and the main routes across the Pacific are now well-served by loran stations. The Pacific Coast of North America will soon have complete coverage.

Nautical Charts

The construction of regular Hydrographic Office nautical charts continued as usual, despite the many other special charts that were called for. In fact, with many more ships of all kinds on the seas, the demand for regular nautical charts increased. These include general charts and harbor charts showing soundings, shorelines, landmarks, aids to navigation, and other information of value to navigators.

The famed Pilot charts of the Navy were the basis for the rubber raft and the waterproof "handkerchief" charts for aircraft, developed during the War. They show ocean currents, winds, and surface temperatures for each month, the factors in which navigators at sea are most interested. The waterproof charts stowed in the handles of paddles on life rafts were used for various other emergency purposes such as collecting rainwater, as a protection against weather or exposure to the sun, and as a sail or distress signal. Using a surface pilot chart base, the upper air pilot charts show atmospheric conditions over the oceans at four different levels. The United States Weather Bureau supplies the information on which these charts are constructed. These charts will increase in importance not only to the Navy, but to private enterprise as transoceanic air becomes more common.

Other nautical charts include magnetic variation charts, which show compass variation for all parts of the world, and gnomonic charts, useful for obtaining great-circle courses and distances. Polar projections are published for use in higher latitudes.

The wartime problem of keeping naval and merchant ships informed of rapidly changing conditions has been enormous. Now, the Hydrographic Office is in the midst of the task of again revising these nautical charts as areas are swept of mines, harbors rebuilt, dangers removed, and navigational aids restored. Most merchant ships will have to be supplied with complete new sets of charts.

(To be continued)

During the war the San Francisco distribution depot dwarfed its parent office in activity, issuing as many as 30,000 charts a day to Navy and merchant ships.

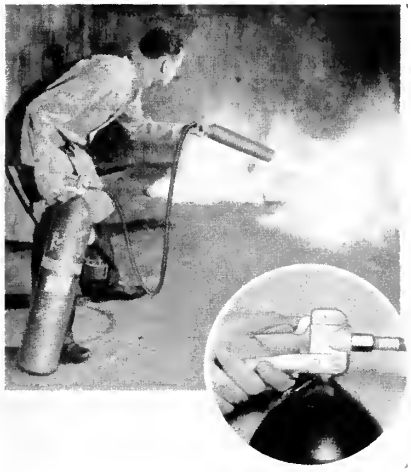
Navy ships drew 1,173,840 charts and 19,549 publications during the war. Maritime ships, during the same period, drew 1,130,853 charts and 84,508 publications.

Keep Posted!

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Trigger-Touch Fire Extinguisher

Randolph Laboratories, Chicago, have produced a new trigger-touch 15 lb. CO_2 fire extinguisher that is carried and operated with uninterrupted, single-sweep action. Grasping the unit by its arched-steel handle, the operator removes the extinguisher from its bracket, carries it with one hand only while the other is free to remove obstacles and open doors en route to the scene of action.



During fire fighting, the operator can grasp the nozzle handle with his free arm and aim it at the base of the flames. One touch of the thumb-trigger discharges a penetrating, snowy blanket of carbon dioxide gas, smothering an eight quart gasoline fire in nine seconds under official Underwriters' Laboratories fire test. The release of the trigger automatically stops the flow which saves the remainder of the charge for another occasion.

Truck and wall bracket models are provided for both vehicle and factory installations. The long-range hose and nozzle keeps the fire-fighter at a safe distance from the heat of the blaze, permitting easy access to overhead, side-wall or engine compartment fires.

Turco Hydro Steam Cleaning Unit

The Turco hydro steam unit, manufactured by Turco Products of Los Angeles, is a unit which utilizes your own steam supply and gives you the same powerful cleaning action as produced by steam cleaning plants costing a lot more.

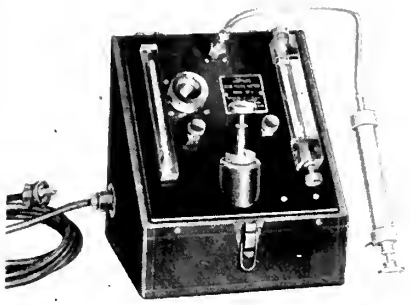
The hydro steam unit is portable and weighs only 28 pounds, with quick couplings that permit fast connection. Any steam line maintaining 80 to 150 lbs. pressure with a ¾-inch valve outlet is all that is required for connecting the unit. The manufacturers claim that this unit is safe, easy to operate and has no moving parts, pumps, pressure tanks, motors, electrical connections, toxic or explosive cleaning agents to cause danger.

Three manual controls vary the temperature, quantity of solution and nozzle pressure to handle the needs of the job at hand. A wide variety of Turco specialized compounds can be used through this unit to clean anything from delicate aluminum surfaces to heavy construction equipment caked with grease and dirt.

Alnor Precision Dew Point Indicator

The Alnor Dew Point indicator, Model 8, is an improved instrument for simple rapid determination of dew point, relative humidity, grains moisture per lb., and latent heat of any non-corrosive gas. It has many uses in air conditioning and refrigeration work; in connection with controlled atmospheres in furnaces; in the chemical industry; in the petroleum industry, paper making, and the production of compressed gases.

Its operation is simple and easy, and an outstanding advantage of the indicator is the fact that the indication takes place in an enclosed observation chamber under conditions



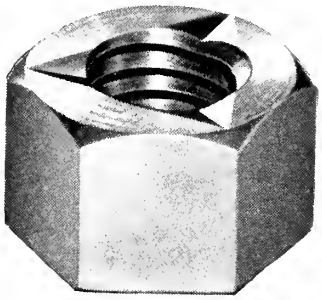
which can be controlled and reproduced. Condensation takes place suspended in the air or gas sample and the end point or vanishing point may be accurately observed, reducing errors due to the human element, and permitting consistent determinations by two or more observers. This instrument does not require an external coolant.

The instrument is a complete unit, readily portable and not requiring external cooling means or auxiliary apparatus. This Model 8 can measure the dew point of high pressure gases through a pressure reducing valve.

Note that the Model 8 Alnor indicator is accurate below 32 deg. F. as well as above, that determinations take at the most a few minutes, and that observation of fog and vanishing point is plain and accurate, without variables found in observing condensation on a mirror.

New Low Cost Lock Nut

The Grip Nut Company of Chicago is now offering a new lock nut for general industrial use called the Gripco Lock Nut. The nut is a semi-finished, one piece, self-locking unit of standard dimensions, and is not affected by oil, water or chemicals. It requires no lock washers or cotter pins, and a wrench is all that is needed to apply or remove it. The patented, triangular deflections on the top of the nut provide a controlled friction lock. The nut is free-spinning until the bolt threads contact the deflected threads near the top of the nut.

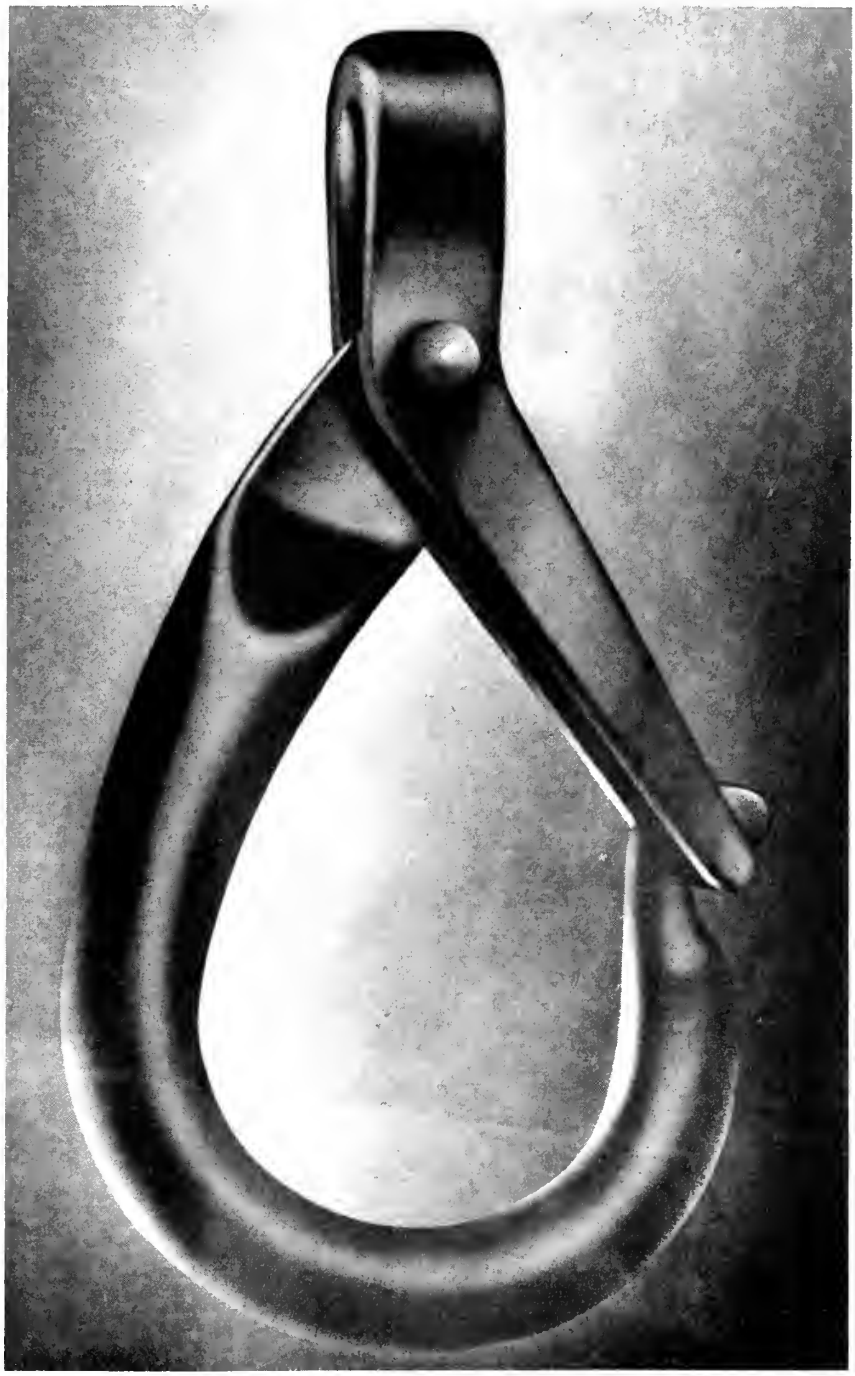


ACLC Safety Hoist Hook

American Chain Ladder Company safety hoist hook is not merely built but engineered for utmost safety. The dangers which often threaten life, limb and load do not happen when ACLC safety hoist hooks are used.

Makeshift mousing gives place to automatic mousing. It is an ancient practice to "mouse" a hook by passing several parts of rope around the hook. This "mousing" provides a measure of support to the hook and a precaution against the sling jumping the hook. At its best, however, this device is unsatisfactory due to various causes, such as stretch of the rope. Its application consumes time and it is entirely impracticable for regular handling of loads, such as loading and discharging cargoes.

Snagging can not occur because there is no protruding point in the way. Hook straightening and load slippage are avoided because the pat-



ented shoulders and lip lock the load in perfect alignment.

The ACLC safety hook automatically engages and disengages as the load is applied and released. Entirely automatic and simple in operation, it provides just as rapid handling and a higher degree of safety than the common cargo hook.

"Insalize" Now Available

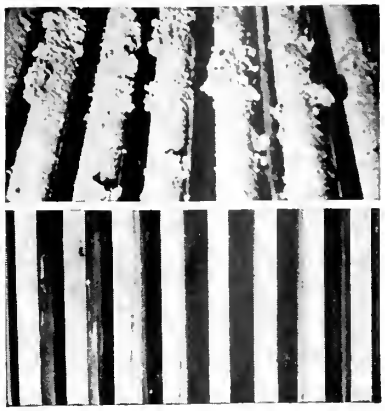
Long deyayed by war-time shortages of essential ingredients, the Lumanize Products Company, Chicago, announces that their universal liquid insulator, "Insalize," is now available. Its high dielectric strength and great resistance to moisture, heat, acids, alkalis and oils, have the effect when applied to bare or insulated ignition and electrical systems, of eliminating corrosion and of preventing current leakage.

"Insalize" has the property of

eliminating corrosion on electrical connections and at battery and starter terminals; of correcting open shorts in armatures and fields of electric motors; of insulating coils, distributors, spark plugs, armatures and wiring; of reducing radio interference; and of assuring waterproof and leakproof insulation against water, condensation and fog which normally account for much starter trouble and faulty motor performance.

Chemical Compound Minimizes Manual Cleaning

The Gamlen Chemical Company, of Pittsburgh and San Francisco, offers a product named Gamlenite, which removes hard slag and other combustion deposit from tubes and other boiler metal surfaces, and from furnace refractory walls, by chemical means. Gamlenite is a powder which



Upper view shows typical hard combustion deposit on boiler tube section. Lower view illustrates boiler tube section after application of gamlenite.

is blown into the furnace while it is in regular operation. It forms a dense non-poisonous vapor which reaches all parts of the furnace and firesides of the boiler metal. Its use minimizes the necessity for taking the boiler off the line to do the cleaning job manually.

Gamlenite exerts a reducing action, breaking down hard combustion deposit into a soft powder which is carried up the stack by the draft. It also Gamlenizes the boiler metal, which provides maximum resistance against corrosion, and greatly retards re-accumulation of further combustion deposit.

DEHUMIDIFICATION

(Continued from Page 411)

moisture and corrective measures taken. This instrument will contribute much toward reducing the cost of maintaining the Inactive Fleet in future years.

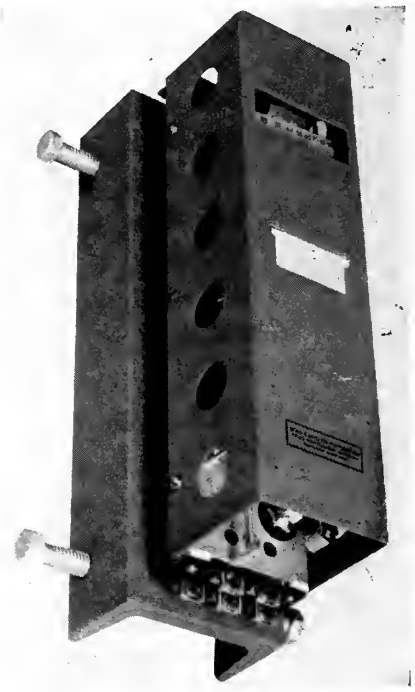
In conclusion, it can be said that Dehumidification, as carried out by the above procedure, is an economical means of preserving a costly investment in valuable ships. The installed equipment cost is less than one cent per cubic foot of ship's volume in the majority of cases. The power cost will run well below 15 cents per 100,000 cubic feet of volume per day with power at one cent per kw hour. The attendant Dehumidification power cost for a Destroyer having a volume of approximately 250,000 cubic feet will be about $110 per year on a $7,000,000 investment. A 35,000-ton battleship, costing from 90 to 100 million dollars, would have an attendant Dehumidification power cost of $1,550. Therefore, it is obvious from these examples that the economy of dehumidification as a preservation measure is attractive to the taxpayer. In addition, preservation with dry air will provide an excellent means of preserving American sea power in a state of readiness for any and all emergencies.

The Bendix Central Station records the temperature, humidity and time as well as the code number of the particular Measuring Unit at which the measurement was made. In addition, it starts or stops the dehumidification apparatus. This control is based on the average of the readings from the individual Measuring Units, automatically computed by the Central Station.

The relative humidity is printed within a range of 10% to 90% plus-minue 5%, and the temperature from 0 to 120° F. plus-minus 3½°. When these records have been printed for the first Measuring Station, the seven other stations report, one after the other, so that a complete record of all eight stations is available every fifteen minutes. Also, records may be printed continuously, once each 12 hours, or at those times when they are desired.

As each Measuring Unit reports the local humidity condition to the Central Station, the readings are added and, after the eighth station has reported, this total is averaged. If this average is obove a selected value, such as 30% R.H., the electrical circuit to the dehumidification mochinery is energized. If below, no action is required. This "control by average" instead of by individual station is an economy factor and is a fully automatic function.

The Recorder-Controller operates on a voltage of 100 to 125 volts, 60 cycles, A.C., and includes a transformer for use on a 440-volt input. The average power requirements do not exceed 200 volt-amperes. Manufactured by the Friez Instrument Division of Bendix Aviation Corporation, Baltimore 4, Maryland.

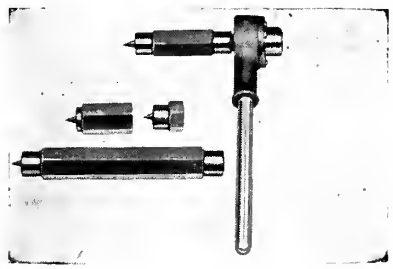


"Liberty" Ratchet Drill-Driver

Development of the new "Liberty" ratchet drill-driver is announced by Techtmann Industries, Milwaukee, Wisconsin, national distributors, manufactured by the Liberty Tool & Machine Co.

Designed for drilling between studs and joints or restricted spaces in buildings or other structures, this tool gives positive feed at each turn of the drill bit. The compact head allows centering of holes within 1¼ inches of the nearest obstruction. Any standard wood bit can be used. Steel drills can be used with an adapter chuck.

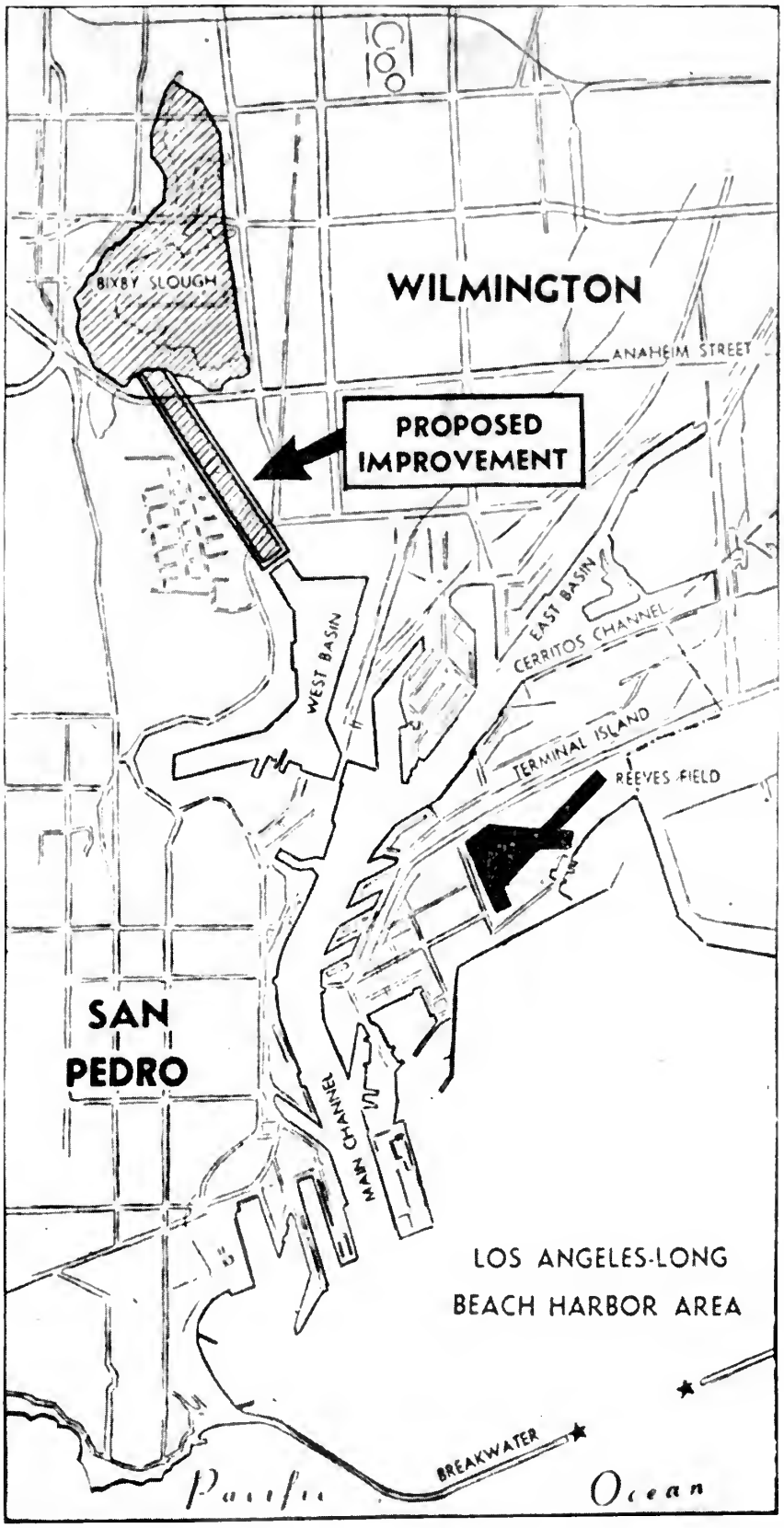
The thrust of the lead screw is carried directly to the drill shank by a solid shaft. Large wearing surfaces hardened to a depth of .010 inch insure long service under severe conditions. If necessary, any part can be readily replaced. The



ratchet is fully enclosed in a strong, semi-steel head, providing protection against dirt. A long lead screw in combination with 1", 2" and 8" extensions allows use of the ratchet drill-driver over a wide range of dimensions. In actual use, holes up to 3" diameter have been drilled without difficulty.

Although intended primarily for use on wood members, steel plates or beams can also be drilled by reducing the feed, which can be done by revolving the lead nut in the same direction as the drill.

Proposed Extension of Los Angeles Harbor Uptown



Upper left shaded section of adjoining map shows facilities that would be added to Los Angeles Harbor if Army Engineers who are now studying the plan finally go ahead. Bixby Slough is at present below sea level, separated from the harbor by higher land through which the suggested canal would cut. A hearing will be held by the Army Engineers soon.

KINMONT OCEAN-GOING HYDRAULIC DREDGE

(Continued from page 399)

plant. It consists of four individual Diesel generator sets, with total horsepower of 3750, composed of two sets of 1500 hp each, one set of 500 hp and a small set of 250 hp. These four sizes of Diesel generator sets shall be considered only as an example, as any other arrangement of different horsepower can be selected depending on requirements. In the example it is easy to note that various combinations of horsepower can be obtained by cutting out one or two of the generating sets. The small 250 hp is sufficient to take care of all needs during shut-down time, including the use of hoisting units. In case the dredge is equipped with "Kinmont Propelling Device" for self-propulsion at sea, the power plant described above takes care of this arrangement to perfection. The electric current characteristics and electric control equipment will not be discussed here. Each case shall be treated individually. The same applies to bunker capacity, fresh water system, sanitary system, lighting system and all auxiliaries.

Dredge Propulsion at Sea—In most instances dredges are towed when making sea trips. All "Kinmont Type Hydraulic Dredges" can be equipped with "Kinmont Dredge Propelling Device," making them self-propelled at sea. As this device is not included in the original installation, it will be described in a separate publication called "Kinmont Dredge Propelling Device." It gives a full description of how it works and of how easy it can be installed on any Kinmont type hydraulic dredge. Dredges of other makes can be fitted with our propelling device. We will be glad to make a survey of existing conditions and submit our proposal accordingly upon request.

Preparation of the Dredge for the Sea Voyage—It is well known that it is always a considerable job to get the dredge ready for a sea trip. It is a costly procedure requiring time and a lot of unnecessary work, consisting of boarding up sides and ends of the [illegible] above the Main Deck, also [illegible] it water tight. The towing [illegible] the dredge had to be made extra strong, as it acts as a breakwater. Also, there are a number of other items which have to be made "seaworthy." Most of this is eliminated on "Kinmont Dredges." The dredge hull, as previously described, has a regular shipshape appearance, with a high bow which is made totally enclosed for the sea trip. The Main House has regular Marine type portholes, all water-tight. The spud frame can be lowered. (See paragraph on spud frames.) The digging ladder can be dismantled in the middle and the outer half laid across the forward end of the dredge, over the top of the Pump Hatch, on special pedestals provided for this purpose, then secured in place. The remaining after half of the ladder is raised out of the water high enough and secured to a bridge frame (lower part of the "A"-frame). This takes care of all the principal preparations for the sea trip. If the dredge is equipped with "Kinmont Propelling Device," then the latter is attached in its place and connected to a drive. The dredge becomes a "ship" and can go to sea under her own power.

SLEEPING SHIPS

Like slumbering giants, seven huge ore freighters of the Pittsburgh Steamship Company fleet lie in their winter berths at Monroe, Mich., awaiting the opening of the Great Lakes shipping season. These vessels, which represent the most modern type of ore carrier, have a maximum total single trip capacity of better than 115,000 gross tons of iron ore. The steamers IRVING S. OLDS, ENDERS M. VOORHEES, BENJAMIN F. FAIRLESS, A. H. FERBERT, SEWELL AVERY, LEON FRASER and WILLIAM E. COREY are being conditioned for another busy season and will soon be engaged in the transporting from the head of Lake Superior of the red ore which will be converted into steel for automobiles, refrigerators, stoves and thousands of other items which the American consuming public demands. Above, bow view; below, stern view.

On the Ways—

SHIPS IN THE MAKING

Above: Left to right: Alden G. Roach, pres. of Consolidated Steel Corporation; Mrs. Fairless, sponsor; Mrs. Roach, matron of honor; and Benjamin Fairless, president of United States Steel Corp.

WIFE OF U. S. STEEL HEAD SPONSOR OF CONSOLIDATED SHIP

The SS Twilight, seventh of a fleet of ten huge C-2 cargo vessels being built under contract with the U. S. Maritime Commission for assignment to private shipping operators, was launched from Consolidated Steel's Wilmington, California, shipyard recently The sponsor was Mrs. Benjamin Fairless, wife of the president of the United States Steel Corporation. Mrs. Alden G. Roach, wife of the president of Consolidated Steel Corporation, served as matron of honor.

The big turbiner, displacing 14,000 tons with an overall length of 460 feet and a beam of 63 feet, and her nine sister ships are the largest merchant vessels ever built by a Southern California shipyard. The design includes comfortable accommodations for eight passengers, besides the space for cargo.

The Twilight on the ways prior to launching.

Two other C-2 launchings recently took place at this yard: On March 28th the eighth of this fleet, SS Wild Ranger, was launched. The sponsor was Mrs. Keeble, wife of the Purchasing Agent for the Union Pacific Railroad Company; and on April 17, the Crest of the Wave, the ninth of this fleet slid down the ways after being christened by Mrs. E. H Weaver, wife of the manager of Purchases at Union Oil Company of California.

The Messenger on her trial run after completion at Consolidated Steel Corp. This C-2 was launched at Wilmington on October 20, 1945 and is one of the 1297 vessels launched from all of Consolidated's combined operations. The Twilight (above) is a sistership.

TURKISH NAVAL OFFICIALS STUDY INGALLS' METHODS

Lt. Muzaffer Utkan and Lt. Sherif Oskay, of Turkish Navy, at Ingalls Shipbuilding Corporation yard in Pascagoula, Miss., where they recently completed a study of shipbuilding methods. They spent several months at the yard.

Left to right: E. A. Elliott, general assistant, Lt. Utkan, Lt. Oskay and W. D. Pelan, general superintendent of the yard.

CARRIER CORP. MARINE INSTALLATIONS

Three new 18,000 ton Delta Line passenger liners under construction at Pascagoula, Miss., will be air-conditioned by Carrier Corporation of Syracuse, N. Y.

Orders placed with Carrier call for equipment to cool all passenger staterooms, public salons, officers' deck, promenade deck, hospital space, mess rooms and crew's quarters. The new vessels, slated for the New Orleans-Central America run, will operate almost entirely in tropic temperatures and the air-conditioning is intended as a bid for post-war travel business.

(Continued on page 80 Ad)

The Richmond-San Rafael auto ferry El Paso on drydock recently at Bethlehem Steel Company's Alameda repair yard. Repairs to the vessel included scraping and repainting the underwater body, repairing rudder, checking and relining stern bearings and overhauling sea valves.

The Catalina Leaves San Francisco Bay

After 43 months of service, one of the busiest troop carriers in Army history, the ferry boat Catalina, has laid down her dark gray mantle of war, her job done after carrying 820,000 soldiers. She has left the Bay Area to return to her peacetime haven at San Pedro, having been declared surplus to the needs of San Francisco Port of Embarkation and the Army Transportation Corps by General Groninger. She reverted through the WSA to her owners, the Wilmington Transportation Company, to be refurbished for her Catalina Island run.

The biggest week for the "Cat" was her last when she carried 12,764 Army men. Assigned originally to ferrying Pacific-bound soldiers between Camp Stoneman to ships along the San Francisco waterfront late in 1942, her monthly totals were exceeding 30,000 by January, 1944. As the Catalina was the last contact with continental transportation for departing soldiers, so was she the first such contact for many of the returnees. In her last Army months she divided her time carrying veterans and overseas-bound men on the Stoneman run.

Passengers on her final run, from San Francisco Port of Embarkation to San Pedro, were the Port's Water Division Superintendent, Colonel John R. Reilly, and his Marine Superintendent, Commander Albert T. Berry, USNR, who turned over the ship to the WSA.

Skipper since her heavy operations started in November, 1943, Captain Howard J. King, former Sacramento River pilot, turned his ship over to its pre-war master, Captain E. L. Musetter. Captain Musetter joined in the trip from San Francisco.

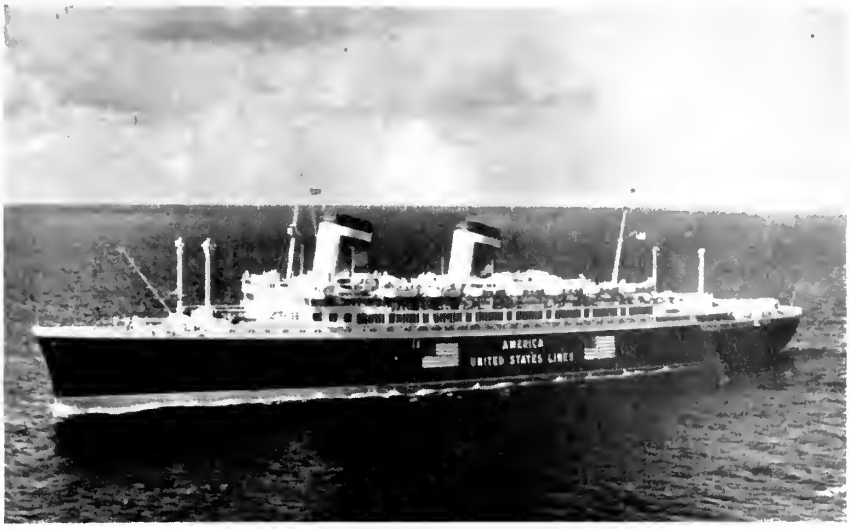
The Catalina, with its two 1800 hp engines, has more power than a Liberty ship and cruises at 15 knots. Built in 1924 by the Los Angeles Shipbuilding and Drydock Corporation at San Pedro, she measures 301 feet over-all with an over-all beam of 54 feet 8 inches. Her troop capacity for the upper San Francisco Bay run was 2500. Her civilian crew of 39 officers and men was augmented by an Army radar operator.

First Lady of U. S. Passenger Liners In Dry Dock

The America, former U.S.S. West Point, has been at Newport News Shipbuilding and Drydock Company since February 28 undergoing a reconversion job, estimated to take six months. It was anticipated that the work would be completed sooner but delay in delivery of some materials may make it necessary to use the entire six months.

The vessel is to be restored as near as possible to its original condition. The murals are being retouched and repainted. The decorative scheme will be changed in the cabins in accordance with materials available.

No contract has been signed but cost is estimated to run about $5,500,000 for shipyard repairs, and $1,500,000 for materials purchased by the yard for the Maritime Commission. The cost of reconverting is expected to be considerably higher and will result from so-called extras; new wiring, new plumbing, and other changes or replacements necessary to meet American Bureau of Shipping and Bureau of Marine Inspection and Navigation standards.



The America, proud flagship of the United States Passenger Lines.

U. S. Maritime Commission photo

Veteran Troop Ships Shed War Paint

The old SS George Washington and the SS Argentina, veteran troopships and former transatlantic passenger liners, have shed their war paint for gayer peacetime colors at Bethlehem Steel Company's Brooklyn Yard.

Built in 1908 as flagship of the North German Lloyd Lines, the George Washington was seized by the United States during World War I. Later she carried President Woodrow Wilson to the Peace Conference. She was operated by the United States Lines until 1927 when she was relegated to the laid-up fleet and her career appeared finished. In 1942, she was restored to service and carried thousands of American fighting men to and from the war fronts. Now her career may be extended as an army troop transport.

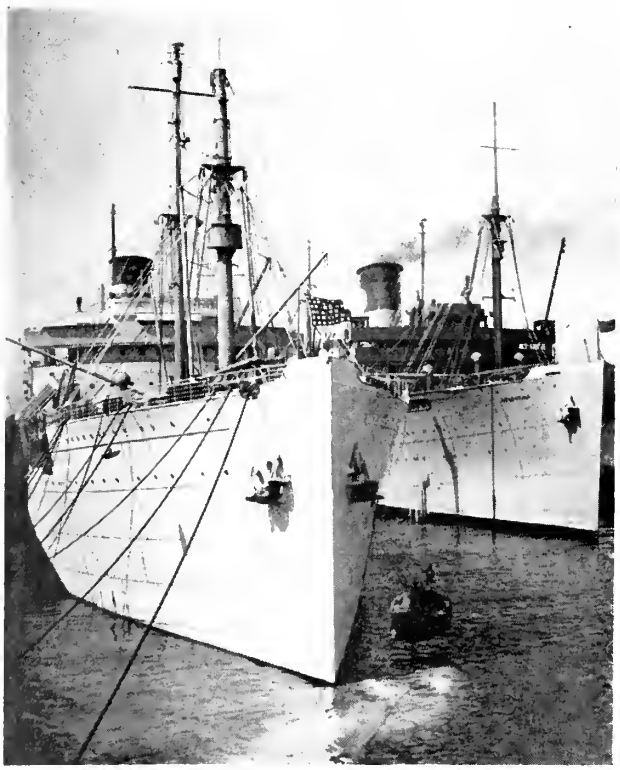
The Argentina, originally named the Pennsylvania, was built in 1929 and converted by the Bethlehem Brooklyn yard to a "good will" liner for the South American run in 1938. When World War II broke out she was converted to a troop transport by the Bethlehem Hoboken yard, and she carried thousands of troops to and from the war zones. More recently she brought hundreds of British-G.I. wives to this country. The gaily painted smokestack, seen in the accompanying photograph, bears the symbol of her operators, the Moore-McCormack Lines.

Fourth Grace Combination Liner Launched

The 14,950 ton combination passenger and freight Grace liner, the Santa Luisa was launched on April 2, from the yards at Wilmington of the North Carolina Shipbuilding Company. She is the fifth of the nine new vessels of this type the company has sent down the ways.

The previous four, all sisterships, were the Santa Barbara, Santa Cecilia, Santa Margarita, and Santa Maria. The Santa Luisa is the second in the Grace fleet to bear this name. The first Santa Luisa, operated in the '20s and early '30s was in the New York to West Coast ports run to South America.

Fred L. Doelker, vice president in charge of Pacific Coast activities for



On the left is the old SS George Washington with the SS Argentina alongside. Both vessels are veteran troopships and former trans-Atlantic passenger liners.

Grace, announced that the Santa Luisa is a modified C-2 type. She has accommodations for 52 passengers, and will carry 9000 tons of freight including 100,000 cubic feet of refrigerated cargo.

Like her sistership the Santa Luisa is the last word in passenger appointments. She will, when completed, be assigned to one of the schedules of the Caribbean and west coast of South America routes.

With these nine combination carriers and an equal number of new freighters building or in stages of completion along with the return of the luxury liners Santa Rosa and Santa Paula from war service, Grace will have a total of twenty modern ships to give double the number of pre-war sailings in both its Caribbean and west coast of South American routes, Doelker announced.

Hall System Aboard Post-War Ships

A recent tabulation by Bull & Roberts, New York, who supervise Hall water conditioning in the marine field, develops the fact that of new vessels acquired during 1945 by American shipowners for post-war operation, 59 per cent of the 73 vessels are covered by Hall system contracts.

Left to right: H. D. Collier, chairman of the board of Standard of California; J. H. McEachern, manager of Standard's marine department; and J. L. Hanna, vice president, at the re-christening of the J. H. McEachern.

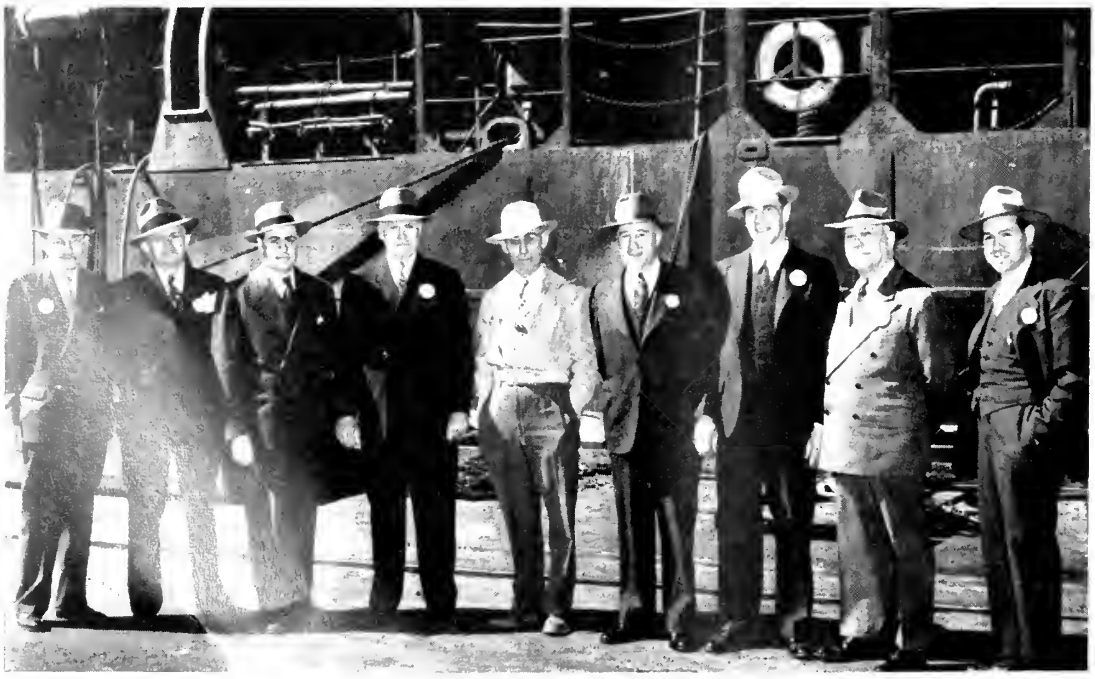
STANDARD TANKER RENAMED FOR McEACHERN

In a colorful ceremony at Standard of California's Richmond Long Wharf recently the J. A. Moffett, one of the company's tankers, was re-christened the J. H. McEachern, in honor of the manager of Standard's marine department. McEachern, widely known in U. S. shipping circles, has been with Standard for 33 years.

Newly-painted in her peacetime colors and gaily dressed with international code flags hung out on her rigging, the ship was christened by Vice President J. L. Hanna, who smashed a bottle of champagne across the new name on the bow.

Among those participating in the event, first of its kind held at Richmond, were H. D. Collier, chairman of the board of Standard of California, Captain J. A. Rumsey, port Captain, and Captain Hugo H. Bleumchen, the ship's skipper.

Immediately following the ceremony, the vessel, loaded with diesel fuel, stove oil, and Chevron gasoline, sailed for Juneau and Ketchikan, Alaska.



The occasion of the visit by J. H. McEachern, head of the Marine Department of Standard Oil Company of California, and members of his staff, was to watch the operation of the newly installed Vacu-Blaster at Basalt Rock Co. yard.

Left to right: M. H. Jaehne, Standard Oil Co.; B. A. Young, Standard Oil Company; E. F. Brovelli, Basalt Rock Company, Inc.; J. H. McEachern, Standard Oil Company; A. G. Streblow, president, Basalt Rock Company, Inc.; George Sutherland, United Engineering Company; Link Hawley, Vacu-Blast Company; Captain John A. Rumsey, Standard Oil Company; Mr. Nielson, Vacu-Blast Company.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

Left to right: Mrs. E. C. Rechtin, E. C. Rechtin, manager of the San Pedro yard, Mrs. Nell Youens, secretary to the General Manager W. M. Laughton. At right, Mrs. Cyrus, "Cy" Cyrus, marine superintendent, Union Oil Company, Carl Morabito, manager, Martin Ship Service, and Mrs. Morabito.

Festivities Mark End of Ship Program

In the strip across the bottom of the page. Left: Ted Warne, De Boom Paint Co.; Miss Virginia Doak, Mrs. Irving Sicotte, and Irving Sicotte, general office manager, San Francisco yard of Bethlehem.

Right: Joe Hare, War Shipping Administration; Miss Margaret Davis, head nurse of the San Francisco yard; Fred Archbold, chief surveyor, Lloyds of London; Miss Virginia Doak, San Pedro yard.

U. S. Navy tug Acoma, launched by the San Pedro yard of Bethlehem Steel Co. early in the year.

The Marine Room at the Hilton Hotel, Long Beach, Calif., provided the setting for a gala buffet dinner and dance celebrating the completion of the building of four powerful diesel-electric tugs for the Navy by Bethlehem Steel Co., Shipbuilding Division. The four sponsors of the vessels acted as co-hostesses in entertaining the more than 200 guests gathered together for the festive occasion, several of whom came from as far as San Francisco.

The completion of the four tugs, Acoma, Arawak, Canarsee and the Moratoc mark the completion of new construction at the San Pedro Yard and writes "finis" for a wartime record that boasts of the completion of twenty-six destroyers, four major conversions and an average of two vessels repaired and returned to service for each working day of the wartime years. Future activity of the yard will emphasize repair and conversion work.

COMMANDER ALEX M. RAMSAY, USNR, has returned to the Fireman's Fund Insurance Company as marine surveyor after serving three and one-half years in conversion and repair of naval transport vessels for the Port Directors Section, 12th Naval District.

Left to right: Miss Virginia Doak, Mrs. Marian E. Burhorn, sponsor of the Moratoc, Mrs. Dexter Selby, Mrs. E. B. Powell, sponsor of the Canarsee, Mrs. Kathleen Saunders, Mrs. W. J. Courtiour, sponsor of the Arawak, Miss Helen Harrington and Mrs. W. A. Harrington, sponsor of the Acoma.

Left to right: Merle Cunningham, W. J. Courtiour, Superintendent of Repair, San Pedro Yard, Mrs. W. J. Courtiour, Harvey Freeman, Mrs. Harvey Freeman, Mrs. George Baker, George Baker, Engineer of the City of Long Beach, Mrs. Ira Henry, and Ira Henry, local manager for Hammond Shipping Company.

At top: Marian E. Burhorn, secretary to E. C. Rechtin, dances with Fred Archbold, of San Francisco, chief surveyor for Lloyds of London. Below: Enjoyment of the festive board is obviously anticipated by Dan Doebler, marine superintendent of the Texas Company.

Admiral Stedman Returns to United States Lines

Rear Admiral Giles C. Stedman, USNR, former commodore of the United States Lines fleet, recently relinquished his post of superintendent of Kings Point Academy and returned to civilian life and to the post of vice president and Far East manager of United States Lines. ***(This picture taken before he was made Rear Admiral.)***

Rear Admiral Giles C. Stedman, former commodore of the United States Lines fleet, who recently relinquished his post of superintendent of the U. S. Merchant Marine Academy and returned to civilian life, has been made a vice president and Far East general manager of the United States Lines, it was announced by John M. Franklin, president of the shipping company.

In his new post Admiral Stedman will be in charge of the American Pioneer Line service to the Far East. He leaves shortly for a preliminary survey trip to the Philippines and China.

Except for the tour of active duty with the Navy, just completed, Admiral Stedman has served continuously with the United States Lines since 1922, and during the 24 years has become an outstanding figure among American shipmasters. During the war years he rendered distinguished service in the Navy, both at sea, as executive officer of the U.S.S. West Point, which he had commanded before the war when it was the America, largest U.S.-built liner. During the past four years at Kings Point,, he was charged with the responsibility of formulating and developing a comprehensive system of training to qualify cadets for commissions in the Naval Reserve and officers' posts in the Merchant Marine. When he took up his post there the Academy was virtually a blue print. Today it has an $8,000,000 plant with permanent buildings, lecture halls and laboratories, and offers a curriculum comparable to Annapolis and West Point.

A veteran of two wars, Admiral Stedman went to sea at the age of 19 in a Coast Guard Cutter and trained for the merchant service at the Massachusetts Institute of Technology. He received his first command, the American Merchant, in 1931 at the age of 34 and it was in this vessel that he won acclaim for his skillful handling of the difficult rescue of 22 men from the foundering British freighter Exeter City. For this he received the Navy Cross and a number of other American medals as well as British decorations for valor. Among his other numerous awards is the Gold Medal of Valor from the Italian government for his participation in the rescue of 28 men from the sinking steamer Ignazio Florio. In 1928 the French government awarded him the Medal of Merit for planning the course of the Transatlantic airplane flight of the French aviators Lefvre, Assolant and Lotti, and in 1939 he received a British government citation for the rescue of survivors of the torpedoed British ship Olive Grove.

He has commanded all of the company's luxury liners, including the Washington and America and was made commodore of the fleet in April, 1940, shortly after taking command of the America.

A specialist in navigation from the early days of his sea career, Admiral Stedman has instructed aviators in the subject and assisted in charting their courses. He has contributed articles in navigation and seamanship to scientific and general publications in this country and England and has written numerous articles devoted to promoting a greater appreciation and support of the American Merchant Marine and improving conditions for personnel.

Born in the seaport town of Quincy, Mass., Admiral Stedman received his early education in the public schools of that city. He holds honorary degrees from Colgate University and St. Mary's College, and is an American representative of the Honorable Company of Master Mariners of London.

Harang Represents Wing in Northern California

L. J. WING MFG. CO., NEW YORK, N. Y., manufacturers of heating, ventilating, combustion equipment and turbines, announce the appointment of Harang Engineering Co., 840 Lake Street, San Francisco as representatives for Northern California.

Edward A. Harang, until recently a U. S. Navy officer, heads the firm and will be joined by his brother, Richard A. Harang, as soon as he is released from the U. S. Navy, where he is serving as an engineer officer on a submarine. Before the war, Edward Harang spent approximately seven years as a sales engineer on the West Coast with headquarters in San Francisco and is well known in engineering circles.

Cruise

CALIFORNIA STATE

Captain Martin, right, received aboard the Chilean training ship in Valparaisa harbor.

The midshipmen and officers of the California Maritime Academy returned from a training cruise on board the Golden State, which took them to Central and South America west coast ports, and lasted for considerably over three months.

The Golden State left her home port at Vallejo on January 10 and after a couple of short stops at Long Beach and San Diego she proceeded to Acapulco, Mexico, where she dropped anchor for a five-day stay.

The next port of call was the Canal Zone where the midshipmen had six days packed with experiences of a varied nature. They negotiated the passage of the canal on board the U. S. Navy's aircraft carriers; partipicated in all kinds of sightseeing tours of the Zone; and enjoyed the renowned hospitality of the Propeller Club of Panama, while attending their dances and social functions.

A dinner and dance given by the American Legation and staff at Valparaiso was the high light of the visit to that port. The generous hospitality shown by the officers and cadets of the Peruvian Merchant Marine Academy at Lima was much appreciated by the California middies.

While in Panama the ship's crew of midshipmen won a citation from the War Shipping Administration for the energetic part they displayed in extinguishing a fire on board a United States ammunition vessel.

Throughout the cruise regular

Below, Left: l to r; Denny McLead, Bud Corlett, Rushton Backer, Dick Miller and George Dickinson, at the Cathedral where Pizarro's remains are kept in Valparaiso.
Center: l to r; Merritt R. Nickerson, Dale S. Amsberry, Daniel O. Yee, and Jackson B. Hargis. All these middies are from Sacramento, Calif.
Right: l to r; R. H. Brown, Bob Alford, W. Froelich, Wm. Davies, D. Buck, Kenneth Chamberlain, Bob Lawrence, all of San Diego, standing before the statue of Grau, the Naval hero of Peru, in Callao.

of the Golden State

MARITIME ACADEMY IN VALLEJO

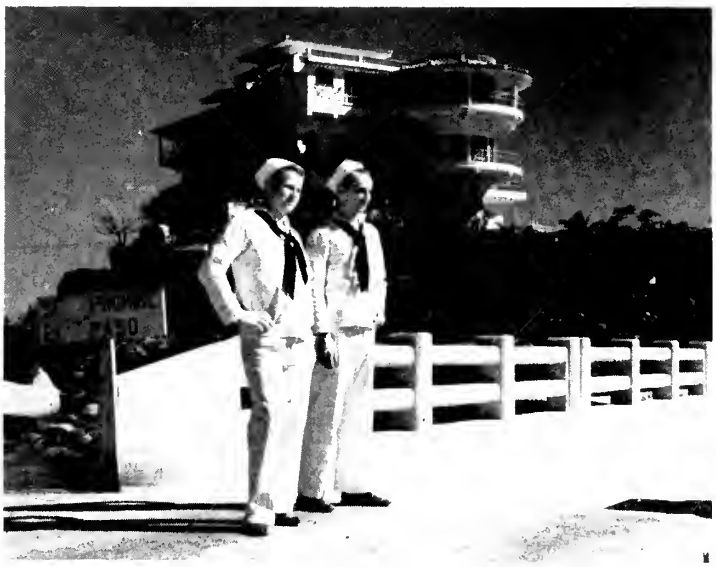
classroom studies were continued and the midshipmen stood all the watches and operated the ship, which returned to its base at Vallejo on April 19.

After a short leave the midshipmen will resume the regular schedule of studies on May 6.

The Golden State passing through the Golden Gate at the start of her cruise.

●

C. B. Harrison, right, and Carlton Clendenny of Santa Barbara, left, near the beach in Acapulca. Avilla Camacho's brother's summer home in the background.



Chilean cadets and California Maritime Academy cadets aboard the Chilean training ship at a cocktail party in Valparaiso.

At right, Albert Bergum of Las Angeles posed with a Llama in the Andes while in Callao.

Below, right, left to right (All S. F. Bay Area men), Curtis B. Harrison, Donald J. Wilson, John W. Wieland, Ralph B. Hoyt, William F. Schill and Robert M. Whalen, at Las Bovedas in Panama City.

G. E. WIRE RECORDER VISITS THE MARS

Lt. M. W. Englund and Lt. G. M. Valentine of the Public Relatians Office, Naval Air Transport Service, get a demanstratian af G. E.'s magnetic wire recorder from G.E. Electronics representatives Frank P. Barnes (left) and W. C. Walsh of San Francisca. The Tribune Station, KLX, in Oakland, recently purchased this recorder, which the day it was taken aboard the Mars (in background) recarded interviews and later rebraadcasted them ta KLX listeners.

Around Lloyd's S. F. Office

Fred Archbold is senior Lloyd's surveyor for the Pacific Coast, after thirty years service with Lloyds. For three years he was in Japan at the end of World War I and the remainder on the Pacific Coast in San Francisco and Los Angeles.

J. F. Robertson, Lloyd's man at Los Angeles, has been transferred to the Seattle office to relieve "Bill" Smith, who is retiring.

Frank Boomer of Vancouver, is succeeding Robertson in the Los Angeles office.

Eric Marlborough, Lloyd's surveyor, was recently appointed to the San Francisco office after wartime service with the British Admiralty at Eastern and Western Canadian ports. During his wartime assignments he saw service at Marseilles, and in Convoy duties Greenock, Scotland and Halifax, Nova Scotia.

Left to right: Roger Murray, S. F. manager, and R. H. Morse, Jr., vice president in charge af sales, of Fairbanks Morse.

At left, Fred Achbald, senior Lloyd's surveyar for the Pacific Caast, is shown talking with Eric Marlboraugh, recently appointed Lloyd's surveyar. Picture taken at United Engineering at Alameda yard.

BND

F-M Executive Makes Brief Trip to Coast

While on one of his periodic trips to the West Coast branch houses a brief visit was paid to the Seattle and San Francisco territories by R. H. Morse, Jr., vice president in charge of sales of Fairbanks, Morse & Co. Accompanied by Roger M. Murray, manager of the San Francisco branch of F-M, Mr. Morse attended the April meeting of the San Francisco Propeller Club, and the West Coast Diesel Engine Manufacturers' meeting.

PERSONALITIES ON THE PACIFIC COAST

Robert William King, passenger traffic manager for General Steamship Corporation.

General Steamship Appoints

H. S. Scott, president of General Steamship Corporation, announced the appointment of **Robert William King** as passenger traffic manager for the company, and of Leslie W. Roberts on controller.

King returns to the steamship business after five and one-half years of military service, two and a half years of which were spent overseas in the Pacific. His participation in the war was unique in that after the landing of the 7th Division at Attu, he was detached and sent to the Amphibious Forces commander's staff. Although a Lt. Colonel in the Army, he served for the most part on a naval staff and participated in seven amphibious landings under Admiral Turner. After the battle of Okinawa he was ordered to Washigton for duty on the staff of Admiral Ernest J. King and served as Army Liaison Officer between Admiral King's staff and the War Department. He was awarded the Bronze Star by the Navy and Oak Leaf Cluster by the Army for his work with naval gunfire in amphibious assault operations.

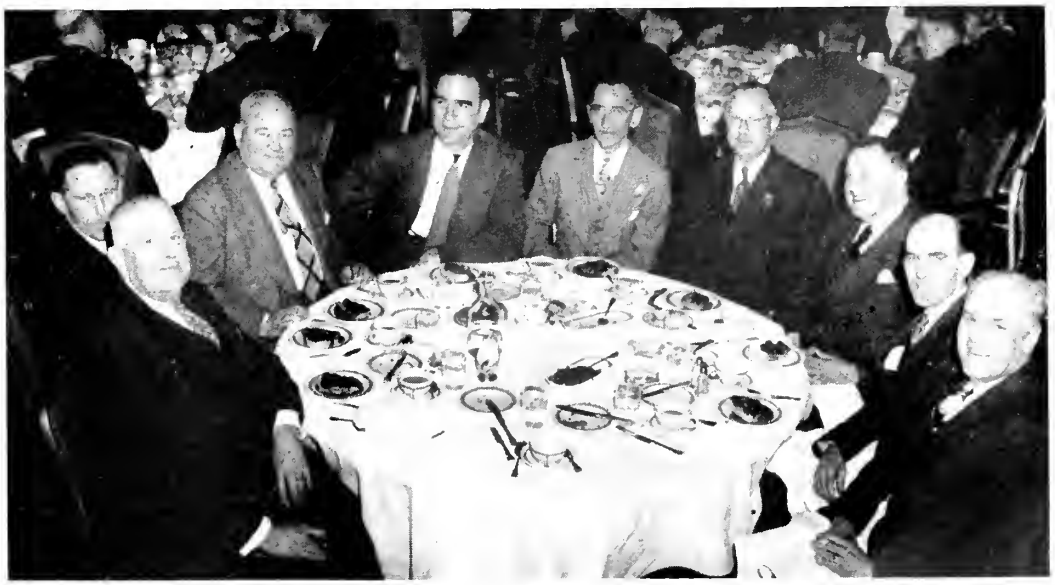
Prior to the war, Mr. King was traveling passenger agent for the French Line on the Pacific Coast. Until the reopening of the French Line's passenger office, General Steamship is acting as general passenger agent and Mr. King thus resumes his affiliation with this line. In addition, he will have supervision over passenger bookings on the Delta Line, Pacific-Australia Direct Line, Pacific Island Transport Line, Westfal-Larsen Company Line for all of which the company acts as general passenger agent.

The position which Roberts takes over as controller at General Steamship was made vacant through the transfer of Delmon M. White to Los Angeles, where he assumed executive duties with Los Angeles Tanker Operators, Inc., some months ago. For the past four years, Roberts served as head field auditor of the U. S. Maritime Commission in San Francisco.

Bataan Blockade Hero Named WSA Port Captain

Captain John Anton Mattson, for several years in charge of Officers' Upgrading School at the Maritime Service Center, will take up his new duties as port captain for the War Shipping Administration with headquarters at 220 Bush Street, San Francisco.

Captain Mattson was given a presidential citation for "services to his country above and beyond the call of duty." He was awarded the Merchant Marine Distinguished Service Medal on May 8, 1943, for running a cargo of vital war materials from Australia through the Japanese blockade to General MacArthur on Bataan.



U. S. Maritime Commission and General Engineering and Dry Dock table at a recent San Francisco Propeller Club luncheon meeting.

Around the table, left to right, are: Charles J. Nolan, U.S.M.C.; next to him, is unidentified gentleman; F. H. Fox, Godfrey Waters, Peter Mesquita and Al Wanner, all of General Engineering; Harry Taylor, retired; Paul N. Mulvany and R. P. Straugh, both of U. S. Maritime Commission regional office in Oakland.

USMS APRIL 1946 GRADUATES AT ALAMEDA

Section 6041 - D: First row, l to r: William Wilson, Herbert Shim, Carl Larkin, Jock Francis, Lt. (jg) Merlin McKee (s.o.), Lee Elliott, Ed. Rutledge, Wm. O'Shio, Jos. Suazoe. Second row: David Cochran, Ivan McBee, Chas. Schultz, John Whitley, Daniel MacDonald, Ed. Davis, Kent Bowman, Alex Mays, Norwood Jones, Henry Wolfe. Third row: Howard Sparks, Frederick Merrill, Terry Cassidy, James Meeker, Fred Simpson, Guy Kermabon, Madison Smith, Chas. Bressler, Thomas Blazak, and Phillip Haon.

Section 6042-D: First row, l to r: Harry Brown, James Colivas, Wm. Edwards, Clarence Fowler, Lt. (jg) Chas. Handley (s.o.), Alden Franek, August Johansen, Ray Williamson. Second row: Robert Lond, Robert Martin, John Eddelman, Lowell Hamel, John Story, James Mitchell, Harry Davison, Archibald Crofts, William Wilburn, Ischar Harper. Third row: Edgar Lodeau, Don Rice, Ernest Hensinger, Carl Jewell, Giles Gibson, Diedrich Stackelbeck, Robert Lawson, Hermann Aberham, Grant Sarver, Laurence Brandon. (William Crabbe, absent.)

Section 6043-D: First row, l to r: Richard Hoskins, Robert Bickel, Joe Morris, Hall Newhall, Raloh Dapper, Lt. Comdr. Boyd McCandless (section officer), Morris Jacobsen, Dale Wallace, Paul Ludwig, Frank Rose, Gerald Tapper. Second row: William Davis, Preston Pope, Thomas Murray, Robert Leech, Robert Sanders, Clyde Brown, Joseph Sanford, John McDonnell, Charles Bell, Robert Johnson. Third row: Ernest McCoy, Walter Seiferle, Roelof Vorenkamp, Robert Goodwin, Jacob Parkhurst, Clinton Hanger, Edward Smith, Bertrand Welsford, Robert Thrasher. (J. O'Brien, absent.)

Bottom row, left group: Section 6041-E: l to r: Deane McGowen, Donald Gallagher, Robert Burgstrom, Peter McCowin, Lt. Richard Juhre (s.o.), Jesse Hobson, John Henry, Marcelino Taboada, Eugene Larson. Second row: Allen Ford, Ernest Johnson, William Bennett, William McCormack, Lorn Dunham, Stephen Philpott, Curtis Steele, Clarence DeCamp, Herman Warren, Cecil Davis. Third row: Herman Wilson, Walter Mace, Walter Hundon, Norman Dean, Frank Knarnschild, Harry Clarke, William McFarland, Garnet Cottelt, Eugene Berry, Eugene Payne. (Lloyd Anderson, Howard Zahn, absent.)

Right group: Section 6042-E: First row, l to r: Geo. McSweeney, Alphonse Jacques, Philip Osborne, Fred Wenzel, Geo. Long, Ensign William Shaw (s.o.), Fred Becker, Richard Wecker, James Bannan, Charles Clayton, William Faust. Second row: George Davis, William Diel, Emmett Potter, Fred. Waite, Wayne Peplinski, James Billings, Donald Joice, Edward Smith, Herbert Zanger, Norman Tharp. Third row: Jos. Olesiak, Edward Thomas, Gerald Parks, Ralph Trammell, James McLaughlin, Dale Holl, Christopher Hong, James Bryan, Stanley Dutkowski, Charles Gillet.

Pacific MARINE REVIEW

NEWS FLASHES

NEW SHIP LINE ON THE PACIFIC.

Articles of incorporation have been filed in Sacramento by the Pacific Transport Lines with announcement of plans for plying between San Francisco and the Philippines. Three freighters with limited passenger accommodations are planned.

Officers of the Company are Richard A. McLaren, president, and Charles R. Blythe, J. B. McCargar, Brayton Wilbur and Walter Dillingham, directors. Paul I. Fagan also is interested.

McLaren has been vice-president of Williams-Dimond.

* * * * *

BIDS OPENED ON TWO 670 FOOT PASSENGER LINERS.

On April 25th, the Maritime Commission opened bids on two proposed vessels for the Moore-McCormack Company for its South American run. The vessels are to be 670 feet long, and are of P3-S2-DA1 design with a speed of 28 knots.

Low bid was submitted by Federal Shipbuilding and Drydock Company, Kearny, New Jersey. At $22,035,000 and under an adjusted price alternative $16,950,000. These prices are for each of two vessels.

Other bidders were Newport News Shipbuilding and Drydock Company, $23,200,000, and on the adjusted price basis $17,400,000.

Bethlehem Steel Company, New York, $25,400,000 and $19,598,000.

New York Shipbuilding Corp., Camden, New Jersey, $26,770,000, and $23,297,000.

* * * * *

1947 MARINE EXPOSITION IN SAN FRANCISCO.

Roger Montgomery, President and Manager of the Maritime Exposition heretofore held in New York on Maritime Day, announces that the 1947 show will be held in San Francisco and that the Civic Auditorium has already been leased for the event.

* * * * *

SHIP-TESTING PLANT OPENED TO PRIVATE INDUSTRIES.

The Navy's huge experimental and ship-testing plant at Carderock, Maryland, has been made available to shipping companies and shipbuilders. In addition to tests and experiments in design and structural mechanics of ships, there are facilities for testing effects of underwater explosions, vibration, structural strength and many other procedures including speed tests.

* * * * *

AUSTRALIAN SHIPYARDS ON PERMANENT BASIS.

The shipbuilding industry in Australia, which was revived during the war to meet construction and repair demands, will be kept in operation in peacetime to provide work and to strengthen the Nation's sea power. An extended program of river freighter construction is already under way. 9000 ton river freighters are the first on the list.

* * * * *

WESTERN SHIP SERVICE COMPANY.

The Ferro Street Wharf, heretofore used by the Navy at Oakland, has been leased to the Western Ship Service Company, ship scaling service firm.

MATSONIA RETURNING TO PEACETIME SERVICE.

The Matson liner Matsonia is now undergoing quick conversion at San Francisco and will be ready for its first peacetime sailing for Honolulu via Los Angeles on May 23. The Matsonia carries 548 passengers at a one-way fare of $110.00.

Matson's three larger liners, Lurline, Mariposa and Monterey, will, upon completion of their war service, be extensively overhauled and reconverted at an estimated cost of $6,000,000 each. The work will probably be done at San Francisco, or East Bay yards.

* * * * *

LOS ANGELES EXPANSIONS.

The Byron Jackson Company, 2301 East Vernon Ave., Los Angeles, has acquired the Patterson-Ballagh Corp., 1900 East 65th Street, manufacturers of oil well drilling tools and specialties.

Earle M. Jorgensen Company, 10510 South Alameda Street, Los Angeles, is adding a warehouse and office building at an estimated cost of $250,000.

* * * * *

J. D. & A. B. Spreckels Company, San Francisco sugar producers, has purchased 37 acres in the Long Beach Harbor area and and plans a development program costing $2,500,000.

The Times-Mirror Company, 202 West First Street, Los Angeles, will erect a 10 story building adjoining the present location at an estimated cost of $2,800,000.

* * * * *

URUGUAY RECONVERSION OPENED FOR BIDS.

Plans and specifications for the restoration of the S.S. Uruguay have been prepared by Joslyn & Ryan, Naval Architects of San Francisco. Bid opening is tentatively set for May 31.

* * * * *

BIDS OPENED ON THREE 650 FOOT LINERS.

On April 15, the Maritime Commission opened bids on three P3-S2-DL1's which are 650 foot twin screw turbine driven passenger and cargo vessels for the American Export Lines' Mediterranean service. Four bids were received, the lowest of which was from Bethlehem Steel Company, New York, at $19,900,000, each.

Other bids were as follows:

Federal Shipbuilding and Drydock Company	$25,300,000 each.
Newport News Shipbuilding and Drydock Company	26,500,000 "
New York Shipbuilding Corp.	29,438,000 "

Each bidder offered alternative prices but in amount they were in the same order as above.

On April 29 the Commission announced its approval of the Bethlehem bid.

* * * * *

ARMY ENGINEERS' HEARINGS ON LOS ANGELES IMPROVEMENTS.

On June 20, at Room 301, Long Beach City Hall, the Army Engineers will conduct a hearing under Congressional instructions for determining the advisability of improving Bixby Slough for the purpose of providing an inner harbor closer to the City of Los Angeles. Also on the question of extending the existing breakwater.

On June 12, at the same place as above mentioned, the Army Engineers will conduct a hearing on the question of establishment of harbors for light draught vessels along the Coast from the Ventura River to the Mexican border.

* * * * *

HIGH PRICES PAID FOR BRITISH SHIPS.

Although the British Government is offering its surplus ships at prices approximately 10 per cent lower than those set by the U.S., the first ships sold under the British disposal program have brought prices somewhat higher than the average established under the U.S. Ship Sales Act. A British ship sales tabulation published in the Liverpool Journal of Commerce indicates that 110 vessels have been sold for about $78,000,000. This is approximately $13,000,000 more than the vessels

would have brought at the base price. However, since some proportion of this added price probably reflects spirited bidding for the more desirable types, it is doubtful that this level will be maintained. In all, 131 deep sea tramps of all types, including 10 motor ships, had been sold, chartered or subchartered under the British disposal program up until the end of last month.

* * * * *

MARITIME COMMISSION IS TESTING CARGO HANDLING GEAR.

As a step toward modernizing cargo handling the Maritime Commission has approved contracts with the Lakeshore Engineering Company, Iron Mountain, Michigan, and its associate the Wellman Engineering Company, for constructing and testing experimental traveling crane-type overhead cargo-handling gear. The total involved in the contracts is $146,649.00. The equipment will be tested on a C-3 cargo vessel for the Maritime Service Training School and will be a further development of the type already tested on the S.S. Sea Hawk with considerable success.

* * * * *

POLAND MAY BUY AMERICAN SHIPS.

The Polish Vice Minister of Shipping and Foreign Trade is reported to be in Washington negotiating the purchase of United States tonnage to replace heavy losses in the country's merchant marine.

* * * * *

ITALY PURCHASING 50 LIBERTYS.

The negotiations for the purchase of 50 Liberty ships by the Italian Government are understood to have advanced to the point where terms may be announced. The total price is said to be $26,500,000 with ¼ in cash and the rest in 20 annual payments, part of which will be in the nature of shipping service. The vessels will be pro-rated among Italian ship owners.

* * * * *

STANDARD OIL TO TRANSPORT OWN PRODUCTS.

The Standard Oil Company of New Jersey has announced the acquisition of its own fleet for operation in New York Harbor area and has purchased six tugs and 19 barges with capacities up to 30,000 bbls. Heretofore the company has contracted with outside carriers for delivery of its products to terminals, dealers and consumers.

* * * * *

NEW SQUARE D PLANT IN LOS ANGELES.

The Square D Company has acquired property in Los Angeles for a new West Coast division plant for the manufacture of electrical control and distribution equipment. The site is 6¼ acres facing on Valley Boulevard and will expand present facilities by 60 per cent.

* * * * *

UNITED AIR LINES SELECTS SAN FRANCISCO FOR SYSTEM-WIDE REPAIR BASE.

In order to concentrate all its airplane maintenance work at San Francisco, tripling personnel and quadrupling facilities, United Air Lines will increase its present facilities at the San Francisco Airport to an eventual 500,000 square feet and 6000 employees.

* * * * *

NAVY TO USE KAISER'S VANCOUVER PIERS.

The Maritime Commission has approved the application by the Navy for the use of the outfitting pier and other areas at the Vancouver, Washington, yard of the Kaiser Company for the temporary lay-up of small craft. The arrangement is temporary.

STEEL PLATES FOR THE NETHERLANDS.

The Netherlands' government is purchasing 40,000 tons of surplus steel plates from U.S. government agencies and will ship the material to Holland for the construction and repair of ships.

* * * * *

FRANCE BUYS INGALLS CARGO BARGES.

A contract for the construction of 25 diesel propelled cargo barges has been awarded by the French Supply Council to the Ingalls Shipbuilding Corporation, Decatur, Alabama.

* * * * *

FRANCE ORDERS CARGO VESSELS FROM TAMPA COMPANY.

The Maritime Commission has approved construction by the Tampa Shipbuilding Co., Inc., Tampa, Florida, of six cargo vessels and also for the converting and completing of five ships for the French Supply Council at a total cost of about $18,-000,000.

The six new vessels are to have a length of 371'10" and 3770 tons d.w.

There will be two 1200 hp Nordberg 4 cycle supercharged diesel engines connected through reduction gear set and electrical couplings to each propeller shaft and an additional non-reversing engine providing auxiliary service, but which can also be used for transmitting its power to a propeller shaft, making a total of 7200 available hp.

A combustion Engineering Lamont type open head boiler will be installed and used for generation of electrical power at sea, a Combustion Engineering oil fired boiler being provided for use when inadequate exhaust gas is available.

* * * * *

BETHLEHEM STEEL COMPANY TO BUILD 4 MORE ORE CARRIERS FOR ORE SS CO.

Bethlehem Steel Company has decided to build in its own yards and without Government subsidy aid four more large ore carriers for the Chilean service of the Ore Steamship Co., it was learned on good authority recently. The Ore Steamship Co., a Bethlehem subsidiary, had sought a Government construction subsidy on the second four of its eight new carriers, and when the Maritime Commission asked for public bids the Sun Shipbuilding & Dry Dock Co. submitted the low one. It is expected that the subsidy application will either be withdrawn or allowed to lapse, unused. The first four ships were built at Sparrows Point, Md., without subsidy aid.

* * * * *

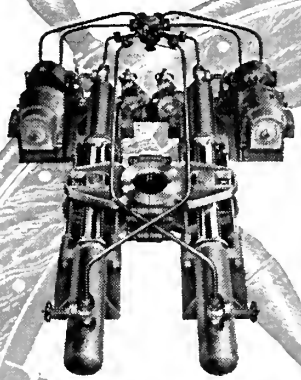
MARINSHIP YARD FINDS PEACETIME USES.

When on May 17 the Maritime Commission takes over the Marinship plant for Marinship Corporation, plans for its continued operation will be ready.

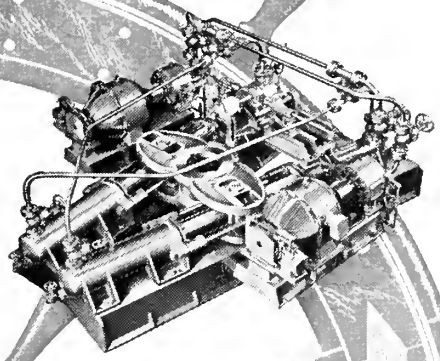
In addition to yard maintenance and surplus property handling, the Army Engineers will use the plant as a depot for overseas supplies and headquarters for construction activities in the Pacific. Parts of the plant will be available to private industry, especially contractors, engineers and architects working in Pacific Area.

It is expected that use by Army and Maritime Commission will last five years.

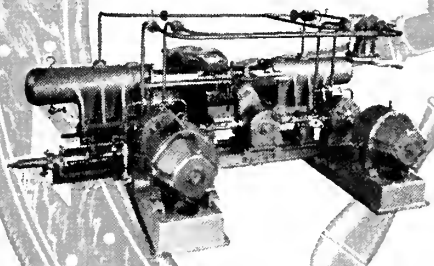
Improved Æ Steering Gears for 1946



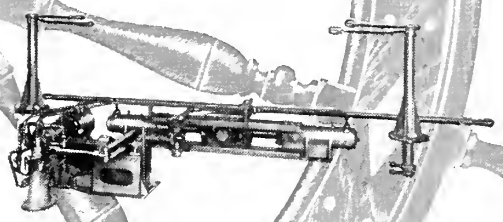
DOUBLE OPPOSED RAM STEERING GEAR—Electro-Hydraulic. Rapson slide type. Two pumping units which can be arranged for independent or combined operation. Available in various sizes and arrangements.



DOUBLE OPPOSED RAM STEERING GEAR—Compact design permits use in limited space. Pumping units operated from pilot house without the use of shift-over valves. Especially adapted to very large vessels.



SINGLE OPPOSED RAM STEERING GEAR—Rapson slide type—with either one or two pumping units. Shafting, telemotor or electric transmission. Either plug or piston type shift-over valves can be supplied.



ELECTRO-HYDRAULIC STEERING GEAR—Opposed ram, inland waterways type. For twin or for multiple rudder vessels . . . Single or dual prime movers. Any type control from gear to steering stations.

Ask about quiet, compact electric types for passenger and passenger-cargo service.

Long a leader in careful manufacture and constant improvement of steering gears, Æ again moves *forward* in 1946. From among the great variety of Æ steering gears, we present these advanced designs of the electro-hydraulic type. Contact us at once for complete Æ steering gear information.

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Pacific Coast Representative: Hough & Egbert, Inc., Robert Dollar Building, San Francisco 4, Cal.
Alexander Gow Inc., 557 Central Building, Seattle 4, Wash.
Gulf Coast Representative: Sintes Sales Engineers, 332 So. Diamond Street, New Orleans 13, La.

The "Romantic Aspects of Travel"

The April meeting of the Women's Organization for the American Merchant Marine was interesting and thought-provoking. Guest speaker was C. Merrill Halverson, former Major in the Army who handled Army public relations in France, and before the war was a world travel and advertising consultant. He discussed with the ladies the "Romantic Aspects of Travel," and left several thoughts to be carried out in future projects for the club.

He pointed out the need for beautification and modernization of steamship pier facilities to compete with the comforts of the lounges in air lines and railroad terminals. There is also a need in leading foreign ports for a group of American steamship companies, possibly aided and abetted by the Women's Organization, which did such a fine job with Davy Jones' Locker canteen, to establish canteens overseas for the recreational pursuits of crews of our merchant marine. In foreign ports the waterfront dives are no place as a steady hangout for our boys . . . and one can not always be sightseeing, particularly after many visits to these ports. So something comparable to USO clubs, sponsored by steamship agencies, full range. It is an idea to increase ship travel and offer a convenient

Major C. Merrill Halverson

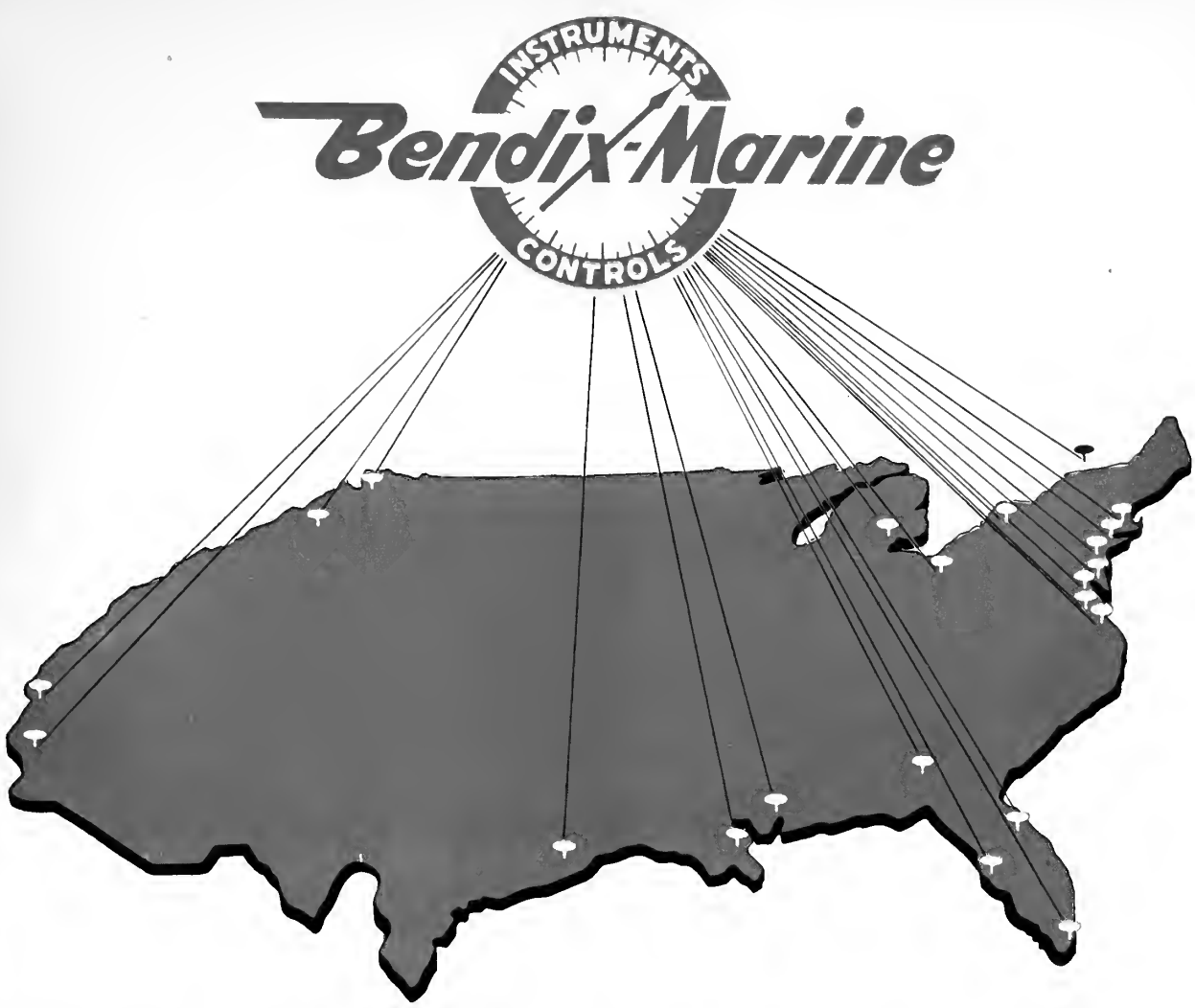
would be an asset to the well-being of the merchant marine.

The third idea Mr. Halverson put over concerns the romantic aspects of travel. Here is where the Women's group along with the public relations and advertising departments can run plan whereby the average person can save for travel through his local bank. It will work the same way the local banks now bid for business on the "Buy $1000" plea, but instead the pleas will be, "Buy a Cruise!"; "Start Today Planning for Your Cruise in 1948!"; "A Few Dollars Each Month Will Make That Childhood Dream Come True! The Taj Mahal . . . Suez . . . They Are All Yours for $2.98 Each Week!" Needless to say, the Organization is behind this project 100 per cent.

Another guest who spoke briefly on Maritime Day activities was Frank DiMarco, publicity director for the S. F. Propeller Club for the observance of National Maritime Day.

At the regular meeting nominations for 1946 officers were announced as follows: Mrs. Harry W. Parsons, president; Mrs. J. F. Johnston, first vice president; Mrs. Claude B. Mayo, second vice president; Mrs. Alfred Pittman, treasurer; Mrs. Duane Tweeddale, corresponding secretary; Mrs. George A. Patterson, recording secretary; Mrs. David Currier, historian, and Mrs. L. G. Rummel and Mrs. Byron O. Pickard, auditors.

For the new board of directors for three years, Mrs. Henry F. Grady, Mrs. Frazer Bailey and Mrs. Frank E. Short. For two years: Mrs. James S. Hines, Mrs. E. N. Babb, Mrs. Paul Cronk and Mrs. Earle Carder. For one year: Mrs. Hugh Gallagher, Mrs. Charles Wheeler and Mrs. D. J. Lillevand.



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NEW YORK (Metropolitan Area)—Bendix-Marine Sales and Service, 60 East 42nd Street, New York City. (General Sales Office, Norwood, Mass.)

PHILADELPHIA—Marine Equipment & Supply Co., 116-118 Walnut Street, Philadelphia, Pa.

WASHINGTON, D. C.—S. King Fulton Inc., 805 Main Avenue, S. W., Washington, D. C.

RICHMOND, VA.—Curtis Marine Co., 15 North 7th St., Richmond, Va.

BALTIMORE, MD.—Curtis Engine & Equipment Co., 104 Light Street, Baltimore, Md.

NORFOLK, VA.—Curtis Marine Co., 550 Front Street, Norfolk 7, Va.

JACKSONVILLE, FLA.—The Gibbs Corporation, Foot of Flagler Street, Jacksonville, Fla.

MIAMI, FLA.—J. Frank Knorr Inc., 528 N. W. 7th Street, Miami, Fla.

TAMPA-ST. PETERSBURG, FLA.—D & D Yacht Sales and Service, 134 Beach Drive North, St. Petersburg, Fla.

MOBILE, ALA.—Marine Specialty Co., 6-8-10-12 South Water Street, Mobile, Ala.

NEW ORLEANS, LA.—Gulf Engineering Co., 916-30 South Peters Street, New Orleans, La.

HOUSTON, TEXAS—Gulf Engineering Co., 307 M & M Building, Houston, Texas.

LOS ANGELES, CALIF.—Bendix West Coast Sales & Service, Bendix Aviation Corporation, 11600 Sherman Way, North Hollywood, Calif.

SAN FRANCISCO—Tourney Electric & Engineering Co., 115-117 Steuart Street, San Francisco, Calif.

SEATTLE—Pacific Marine Supply Co., 1223 Western Avenue, Seattle, Washington.

PORTLAND—Oregon Marine Supply Co., 235 S. W. First Avenue, Portland 4, Oregon.

SAN DIEGO, CALIF.—Crofton Diesel Engine Co., Foot of G Street, San Diego, Calif.

DOMINION OF CANADA—Aviation Electric Ltd., 3483-5 Park Ave., Montreal, P. Q.

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Rapid Growth of the Marine Instrument Company

Like many other industrial and marine plants, the Marine Instrument Company has concluded a very heavy schedule of wartime commitments. During the period of the late war this company found itself many times faced with what looked like impossible tasks. In their never ceasing effort to do their part to keep the delicate and vital instruments of our Army, Navy, and Maritime vessels in first class running order, they were very often forced to work around the clock.

A large percentage of the company's facilities were given to the servicing, repairing and calibrating of instruments for Submarines as a sub-contractor for the Bethlehem Steel Corp. San Francisco Yard. This work was carried out with a high priority and the Marine Instrument Company is very proud of the record of efficiency established by them in performing this vital service. Instruments were taken care of on Navy surface craft such as Destroyers, Cruisers, Carriers, etc., as well as Transports and Cargo Vessels. The company found themselves hard pressed at times in their efforts to take care of their regular industrial customers and at the same time do their part toward the war effort.

A. H. Tresch, superintendent of Marine Instrument Co.

The concern is comparatively young, having been organized less than four years ago. Originally starting out with a "Three Man Shop" with Joseph Benoit, Charles Peabody and Al Tresch at its head it now has a staff of 22 qualified technicians. All of these men are specialists on various types of instruments, and they are prepared to do work in plants or aboard vessels as well as in their laboratory. The company now occupies a three story building which consists of a well equipped shop together with a sales department and a complete stock of specialized instruments.

The co-owners of the company, Messrs. Benoit, Peabody and Tresch are now beginning to realize their life's ambition, in operating an industry that has a combination sales and service department. The company having enjoyed an enviable reputation for service work, has recently entered the sales field. As well as representing some well-known manufacturers, they have stocked their shelves with a choice line of well-known tachometers, pressure, vacuum and compound gages, thermometers, fire extinguishing equipment, electric meters, diesel protective equipment and many other instruments. It is their intention to handle any instrument problem, whether it concerns repair, replacement or the furnishing a customer with advice on the installation of new equipment.

ROBERT S. ATKINS

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AT

150 SUTTER STREET, SAN FRANCISCO

May 19th to 25th, 1946

Pillsbury & Martignoni Expand Staff

Captain A. F. Pillsbury of Pillsbury and Martignoni, consulting engineers, and marine surveyors of San Francisco, announces the return of Walter Martignoni to the company. Martignoni recently relinguished his position as Pacific Coast director of the Maintenance and Repair Division of the War Shipping Administration, and is now on the East Coast on the firm's business.

Captain Jack H. Healy, USNR, long a well-known figure in San Francisco shipping circles, joined the company as a marine surveyor in April.

His early sea experience was acquired with the old Pacific Mail Lines, and later he spent nine years under the Matson Company's flag, leaving his position as captain of the S. S. Makua to become a marine surveyor with the Board of Marine Underwriters of San Francisco.

During the war, among other duties he acted as Planning Officer for the Assistant Industrial Manager of the U. S. Navy at San Francisco, and recently was made an Officer of the Order of the British Empire.

Jack H. Healy, former Captain, USNR, joined Pillsbury & Martignoni as marine surveyor.

Another recent appointment to the company as marine surveyor is Francis X. George, who has been well known on the San Francisco waterfront for fifteen years. He was for many years chief engineer with the Grace Line, and recently was Principal Surveyor for the War Shipping Administration, for the four Kaiser Yards at Richmond.

Francis X. George, marine surveyor with Pillsbury & Martignoni.

THE MARINERS CLUB OF CALIFORNIA

THOMAS A. SHORT
President
FLETCHER MONSON
Vice-President
FELIX V. BILLIG
Secretary-Treasurer

Announces its 17th Annual Spring Frolic to celebrate

MARITIME DAY

NATIONAL MARITIME DAY MAY 22

WEDNESDAY, MAY 22, 1946

at the — PALACE HOTEL — Gold Ball Room

COCKTAILS AT 6:00 P.M. — DINNER AT 8:00 P.M.
SPECTACULAR SPECIAL STAGE & FLOOR SHOW!

The Mariners Club is proud to sponsor this climax to San Francisco's gala celebration of National Maritime Day. Set your course by the above chart and tie-up at the Palace for another great party on the good ship "MARINER". No speeches or ceremonies—just "relax" with the gang and have fun!

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PAT MARTIN
EDWARD McCARTHY
JOE GISLER
GEORGE E. SWETT
LOUIS ETS-HOKIN
WILLIAM LEAHY

DICK GLISSMAN, MASTER CEREMONIES

West Coast Merchant Marine Alumni Association

Graduates of the U. S. Merchant Marine Cadet Corps of the Academy at Kings Point, and Junior Divisions of the Academy, assembled in the new California Room of the Palace Hotel March 27, for the purpose of establishing a Pacific West Coast Regional Unit of the U. S. Merchant Marine Cadet Corps Alumni Association.

The pertinent business on hand was the approval of a constitution and by-laws for the regional club, election of regional officers, and adoption of a resolution requesting a charter from National Headquarters of the Association. Present plans call for monthly meetings of the membership in the Bay Area for social, professional, and recreational advancement.

The Alumni Association is incorporated under the laws of New York to advance, influence, and assist in the development of the Cadet Corps; to promote good fellowship among its alumni; and to strengthen the bond between the Cadet Corps and the Alumni.

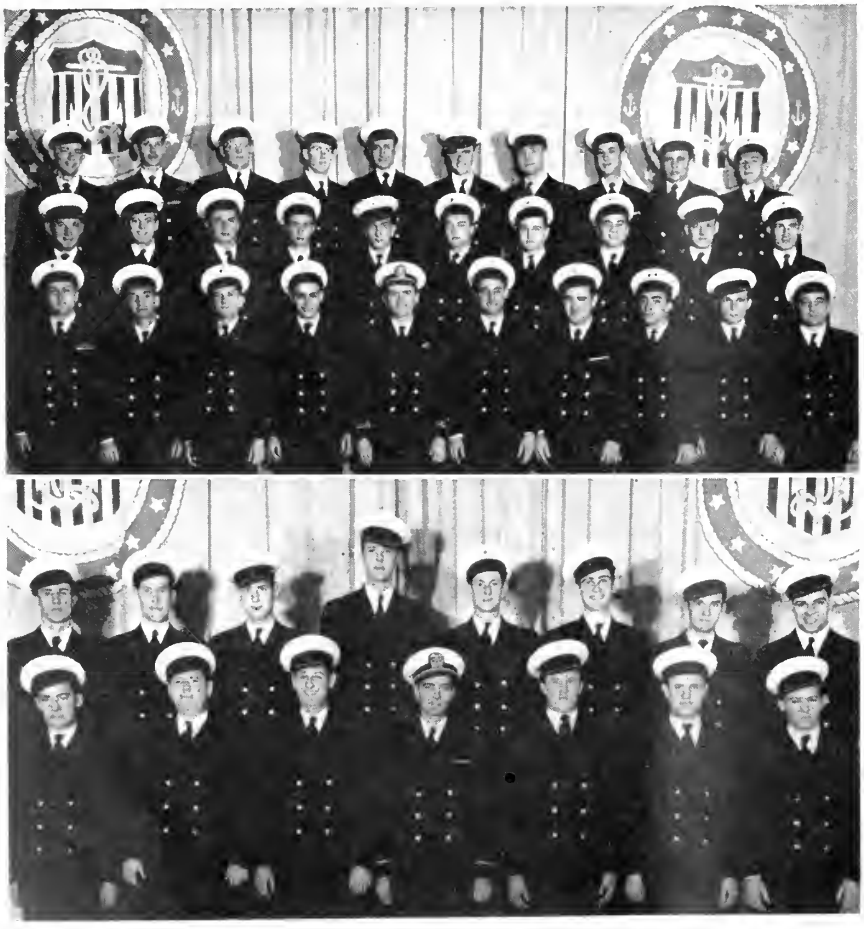
Approximately 1500 of the graduates reside on the Pacific Coast and over 600 live in the San Francisco Bay Area. All 7500 Kings Point graduates are serving or have served as commissioned officers in the U. S. Maritime Service or U. S. Naval Reserve, and are licensed by the Federal Government to serve as officers in the American Merchant Marine.

Temporary officers are: R. C. Olund, San Francisco, regional director; E. A. Meyer, San Francisco, chairman, Executive Committee; C. C. Gross, San Mateo, vice chairman; J. W. Keast, San Francisco, secretary; E. V. Salerno, San Francisco, chairman, Public Relations Committee; G. Conradie, San Francisco, chairman, Membership Committee; M. Knobloch, San Mateo, chairman, Entertainment Committee.

J. L. Kochka, educational assistant for Accrediting to the Supervisor, U. S. Merchant Marine Cadet Corps, gave a short talk on the significance of his present work. He is engaged in evaluating the entire Cadet Corps training program to bring it to the level required to allow the Academy to be accredited for the purpose of granting a B. S. degree in marine transportation. Mr. Kochka is also chairman of the Middle States Association of Colleges and Secondary Schools.

A film, "Leaders of Tomorrow's Merchant Marine," depicting the entire training program, entertained the membership prior to the business meeting.

USMS OFFICERS' SCHOOL AT ALAMEDA ENGINEERING GRADUATES, CLASS OF '46



Top, Section 6043-E: First row, l to r: Harold Burd, Swan Bolin, Leander Lyons, Cloude Wheeler, Lt. (jg) Theodore Hansen (s.o.), Sheldon Claar, Joseph Machado, Johnny Kogapacis, Joseph Hensley, John Birch. Second row: Bernard Hein, Jesse Lester, Harry Hempelman, Cjaude Swift, Ralph Montfort, Robert Drum, Vernon Davenport, John Johnson, Ennis Wilson, Joe Dreutzer. Third row: Ellis Kindelon, Delvin Strickfodden, Max Korvell, Joseph Comyns, Robert Norton, Charles Wallace, James Childs, William Terrell, Rolph Littlefield, William Dubbe.

Next: Section 6044-E: First row, l to r: Igor Javrotsky, Howard Treece, Robert Nunes, Ensign Joseph Swaim (s.o.), James Evarts, John Bass, Norman Crowell. Second row: Terrence McGovern, Richard Gustafson, Argus Dilbeck, Del Shepherd, William Holshouser, Glenn Brundage, Jack Roades, and Kenneth Matti.

Ted Warne of De Boom Paint Co.

De Boom Paint at L. A. Harbor

Ted Warne, until recently coordinator for ship repair and conversion in the Los Angeles Harbor area, is now distributor for De Boom Paint Co., with offices at Berth 179, Wilmington, California.

Ted's many friends will recall him as manager of the training division at Calship. Warne has had broad experience as a contractor and manufacturer of industrial and construction coatings.

Mackay Radio to Sell Commercial Type Radar

In a joint announcement by Warren Lee Pierson, president of the American Cable & Radio Corporation, and L. K. Marshall, president of Raytheon Manufacturing Company, it was stated that the Marine Division of the Mackay Radio and Telegraph Company, a subsidiary of ACR, had been named as a sales organization within the United States for Raytheon's commercial type radar known as the Mariners Pathfinder.

The agreement between the two companies also provides that Mackay Radio will install and service the Raytheon equipment which Mackay Radio sells to steamship companies and shipyards with its existing field engineers who are being especially trained for the purpose by Raytheon.

Mackay Radio operates marine service depots in most important cities on the Atlantic, Gulf and Pacific Coasts as well as Honolulu and has a world-wide service organization through affiliated companies. Mr. Pierson said that Mackay Radio had its radiotelegraph and direction finder equipment on hundreds of ships at present, and that the radio stations of over 1500 U. S. merchant ships are licensed to and maintained by Mackay Radio.

Raytheon has played an important role in carrying forward the radar program for the armed forces and this experience is now useful in the manufacture of maritime radar equipment. The association of Raytheon will be helpful to both companies and will make available to ship operators one of the most modern safety devices with the maintenance service of a well-known and established organization.

Raytheon will continue its own sales and service organization.

Highlights at the
NATIONAL MARINE EXPOSITION

NEW ENGLAND TRAWLER EQUIPMENT

The New England Trawler Equipment Company has announced that its booth at the National Marine Exposition will display models of its small electric and gasoline hoisting equipment. Three to five h.p. electric hoists will be shown, and gasoline types will be displayed in three and six h.p. self-contained units. The company is the well-known manufacturer of deck machinery and deep-sea fishin gequipment.

BATH TO EXHIBIT SHIP MODELS

A full model on 1/4" scale of a latest type super-destroyer, and a similar one of a fast cargo ship will head the display of the Bath Iron Works at the NME. Half models of various types, sailing yachts, diesel and steam yachts, trawlers, and many others will also be shown. In addition, the exhibit promises a collection of photographs of interiors and exteriors of new and historic interest.

NEW CLEANING UNIT TO BE SHOWN

Space No. 87 at Grand Central Palace this month will feature an extensive array of materials used on shipboard and in shipyards for rescaling and cleaning, demonstrated by personnel of Oakite Products, Inc. To be introduced will be the new OAKITE VAPOR steam cleaning unit for use in connection with overhaul and repair work in shipyards and basins.

ROGER E. MONTGOMERY

Propeller Club of the United States
Port of New York

Roger E. Montgomery is president, National Marine Expositions, Inc., under whose management The National Marine Exposition, sponsored by The Propeller Club of the United States, will be held annually alternating each year between the East and West Coasts.

The 1946 show has attracted over 200 exhibitors to three floors in New York's Grand Central Palace. The 1947 show will be held in San Francisco's Civic Auditorium.

The program for this year's celebration has been assigned to a different association for each day of the week, and selection has been made in such a manner as to mark the progress of the industry, starting with the architect. The line-up runs:

Monday, May 20: Naval Architects' Day

Tuesday, May 21: Shipbuilders' Day

Wednesday, May 22: National Maritime Day

Thursday, May 23: Steamship Day
Friday, May 24: Foreign Trade Day

Saturday, May 25: Navy and Coast Guard Day

Singer Dennis Day will fly east to appear on the program throughout the week.

The new 75-watt automatic radiotelephone with remote control unit. Shown receiving its final laboratory check.

Radiomarine Exhibit

The Radiomarine Corporation of America has announced that advance experimental working models of radar and loran will be unveiled at their NME booth. These will form part of a complete line of Radiomarine's equipment to be displayed, including lifeboat radios, automatic radio alarm, radio direction finders, and radiotelegraph transmitters and receivers.

On display for the first time in the East will be a new post-war developed automatic 75-watt radiotelephone designed especially for use on vessels sailing on the Great Lakes and inland waters, such as the Mississippi River.

Another feature will be the presentation of the new model ET-8030 lifeboat radio, whose antenna will be carried aloft by a large helium-filled balloon. This will effectively mark the location of the company's exhibit, as will the strategic positioning of Radiomarine's 15-foot radar tower.

The modern designed lifeboat radio Model ET-8030, consisting of transmitter and receiver, a built-in hand-driven generator power supply unit, a telephone handset, a telegraph key, and 300 feet of antenna wire attached to a balloon or kite.

Distress Kit Now Available

A handy waterproof distress signal kit now available for small boat owners and yachtmen. Made by the Van Karner Chemical Arms Corporation of heavy-gauge steel it has a complete assortment of VK distress signals with instruction for use in any emergency, day or night. The Van Karner firm have announced that these kits will be on display at the NME.

SHORESIDE PERSONALITIES

HOWARD P. STEVENS has been named head machinery inspector for the Maritime Commission at Oregon Shipbuilding Co., returning to the yard where he started his wartime work for the Commission in 1941. Later he was transferred to Swan Island where he served during the construction of all of 153 T-2 tankers.

Mr. Stevens served as first assistant engineer on the luxury Grace liner Santa Rosa, when this vessel operated between California and New York via Latin America. His home was formerly in San Francisco.

FRANK L. HARDY, West Coast assistant freight traffic manager for Grace Line, is expected home shortly after an extensive tour of South and Central America on Grace Line business.

C. A. Warden, newly appointed assistant to the manager at Crane Co., San Francisco branch.

TO SUCCEED AUSTIN W. SPERRY, CHARLES A. WARDEN was promoted from sales manager to assistant to the manager at Crane Co., San Francisco branch. He will also continue to direct sales. He started with the company at San Francisco in 1912, and, after handling various positions in the warehouse and office, was assigned a sales territory in 1925, was promoted to assistant sales manager in 1935, and was made sales manager in 1938.

W. R. GIBSON, well-known consulting engineer and manager of the North West Filter Company, located at 122 Elliott Avenue, West Seattle, has opened an office in Vancouver, British Columbia, to handle the business of the Hall Laboratories, consultants in boiler water conditioning. Gibson also represents the Hagan Corporation and the Hall Laboratories, Inc., in the northwest region.

CAPTAIN RAY HATFIELD of the Army Transportation Corps, now on terminal leave, has rejoined the Los Angeles staff of the Luckenbach Steamship Company.

At left: This AKA is sistership to the U.S.S. Mellena which the U. S. Navy has recently given to California Maritime Academy as its new training ship.

Below: A group of Cadet - Midshipmen on tour of the Inco ruins near Lima.

Training Ship for California Maritime Academy

The U. S. Navy has recently allotted the U. S. S. Mellena (AKA-32), a combat-loaded cargo vessel, to the California Maritime Academy for use as a training ship. The Mellena will take the place of the Golden State, which returned from a South American cruise to her home base at Vallejo on April 19. She is a vessel of 400 feet in length on l.w.l., 58 feet beam, and a draft of 15 feet 6 inches. Her main propulsion unit is turbo-electric of 6600 shp. driving twin-screws.

SHORESIDE PERSONALITIES

RICHARD A. McLAREN resigned on March 15 as executive vice president of Williams, Dimond & Co., to become president of the Pacific Transport Lines, Inc. This company, whose headquarters are in San Francisco, is organized to operate a monthly passenger and freight service from San Francisco and Los Angeles to the Philippines and China. In the announcement, Mr. McLaren said it was hoped to acquire three 10,000-ton cargo passenger vessels from the Maritime Commission and to operate them without subsidy.

CAPTAIN E. T. COLLINS, well-known master of Matson ships, has been named port captain for the Matson Navigation Company in Seattle. He succeeds Edwin Wolfe who retired after 35 years in the employ of Alexander & Baldwin, Ltd., and as Pacific Northwest agent for Matson at Seattle.

William S. Gorham of Ilg Electric Co.

ILG SOUTHERN CALIFORNIA APPOINTMENT: William S. Gorham has been appointed sales engineer in the ILG Electric Ventilating Co. branch office in Los Angeles. A 1944 graduate of the University of Nebraska with a B. S. degree. Gorham entered the engineering department of Lockheed Aircraft Corp. where he remained until making his association with ILG.

GE SUPPLY PROMOTES HOWARD M. HITT, formerly district service manager for the General Electric Supply Corporation, San Francisco. Now, he is to be manager, radio sales, according to an announcement by C. W. Goodwin, Jr., district manager.

Hitt joins the company's appliance sales division, which is in charge of B. W. Reynolds, manager.

J. B. Baker, former assistant service manager, will replace Hitt as service manager.

CHARLES S. MacINTYRE, widely known in Pacific Coast shipping circles, was recently released from duty at San Francisco Port of Embarkation and was discharged from service with the rank of Colonel.

One of the original group of shipping experts to enter the Army in early 1942, Colonel MacIntyre spent several years in the South Pacific and then returned to San Francisco where he was deputy director of water division in his final assignment.

In civilian life he was an executive of American-Hawaiian Shipping Company and he is returning to that organization.

Robert E. Galbraith Resumes Engineering Activities

Upon putting his uniform away on March 18, Robert E. Galbraith resumed his engineering activities and has joined J. D. Christian, Engineers, as sales engineer.

After graduating from the University of California in 1930 with the degree of B. S. in electrical engineering, he became associated with Allis Chalmers Manufacturing Company. He entered service in 1942, serving in the Navy as officer in charge of electrical inspection, new construction, conversion, repair and installation at Bethlehem Steel Company, Shipbuilding Division, in San Francisco. For his work he received a citation for practical aid in expediting delivery of new naval vessels.

Since joining J. D. Christian, Engineers, he has been engaged in sales engineering a complete line of mechanical and electrical power transmission equipment. The headquarters of this firm are at 480 Potrero Avenue, San Francisco.

Sturtevant Reorganization

The integration of the facilities of the Westinghouse Air Conditioning with those of the B. F. Sturtevant Company are outlined in an announcement by Gwilym A. Price, president of the Westinghouse Electric Corporation, Pittsburgh, Pa.

Ellis L. Spray, Westinghouse vice president in charge of the Elevator and Air Conditioning Divisions of the corporation at Jersey City, is executive vice president of the new organization, which is known as the B. F. Sturtevant Company, division of Westinghouse Electric.

Mr. Spray said G. C. Derry, formerly vice president of the Sturtevant Company, has been elected vice president and general manager, and is responsible for the over-all operation of the business of this subsidiary, and E. B. Williams, formerly vice president of the Sturtevant Company, continues in that office, with responsibility for continued development of the power and marine activities of the new subsidiary.

In addition to air conditioning in its complete sense, the new subsidiary will carry on the Sturtevant business in forced and induced draft blowers for power plants, marine application of fans and blowers, helical flow turbines, multiple air washers, speed heaters, multivane factory heaters, air blenders, dust collectors, railway air-conditioning, and general industrial air handling equipment.

Other manufacturing and assembly activities will be continued at former Sturtevant plants at Camden, N. J.; La Salle, Illinois; Berkeley, Calif., and Galt, Ontario. The 42 offices of the Sturtevant Company will be retained and coordinated with Westinghouse distribution points and personnel.

American-Hawiian Makes Traffic Promotions

Dearborn Clark, vice president in charge of traffic of the American-Hawaiian Steamship Company, has announced the following traffic department promotions:

J. A. Stumpf, New York, from assistant to the vice president to assistant vice president in charge of rates and regulations.

W. T. Izzard, New York, from assistant traffic manager to Atlantic Coast traffic manager.

G. V. Cooley, San Francisco, from district manager to Pacific Coast traffic manager.

Myron Clark, New York, from general freight agent to assistant traffic manager.

Leonard Formosa, San Francisco, from assistant district manager to assistant traffic manager.

OBITUARIES

Captain Andrew G. Townsend, marine manager in charge of the Matson Line fleet, died at his home in Alameda, April 1.

Captain Townsend was born in Alameda, May 3, 1896. He joined the Matson organization in 1919. He received his Master's papers at the age of twenty-six and served as Captain aboard Matson vessels until 1936, when he was appointed port captain. In 1940 he became marine manager of the Matson fleet, which position he held at the time of his death.

Captain Townsend was well known in shipping circles in this area. He was appointed to the three-man Pilot Commission by Governor Warren on June 10, 1944, was a director of the Marine Exchange and a member of the Propeller Club.

He is survived by his widow and children, Mrs. Robert C. Joughin and Andrew G. Townsend, Jr., all of Alameda.

The sudden passing on April 4, of Albert H. Mortensen, 49, was a distinct shock to his friends in San Francisco and along the Pacific Coast.

Mr. Mortensen was vice president of the Interocean Steamship Company. He became associated with the concern in 1932 and had been with them ever since. Before this he was with the Yamashita (Y) Line.

His clubs were the Transportation, Commercial and the Millbrae Post of the American Legion. He is survived by his widow, his mother, and a sister.

Captain Jackson Awarded Posthumous Service Medal: Posthumous award of the meritorious service medal has been made to Captain Emel Jackson, of Bellingham, Washington, by the U. S. Maritime Commission. The award was made to his widow. Captain Jackson's vessel, the USAT Clevedon, was in an Alaskan port with 150 soldiers and other passengers aboard when an explosion in the engine room turned the ship into a raging inferno. The ship was carrying several hundred tons of ammunition. Captain Jackson ordered "abandon ship" but remained aboard with his three mates and quartermaster and moved the vessel into the stream where it exploded and sank with the men aboard. The action saved the lives of many persons and important port facilities. The ship was operated by the Pacific American Fisheries, Inc., of South Bellingham, Washington.

SHORESIDE PERSONALITIES

RAYMOND J. PRIES has been named acting traffic manager for the West Coast regional office, War Shipping Administration, it was announced by Comdr. W. Creighton Peet, Pacific Coast director, WSA and U. S. Maritime Commission. He assumed the post vacated by the resignation of Howard Middleton.

Before the war, Pries was with the American-Hawaiian Steamship Company. During the war he served as civilian chief of the traffic department of the water division, Port of Embarkation.

His headquarters are with the WSA in the Mills Building, San Francisco.

H. C. Coleman, above, is manager of marine engineering for the Westinghouse Electric.

H. C. COLEMAN IS MANAGER OF MARINE ENGINEERING for the Westinghouse Electric Corporation, headquartered at East Pittsburgh, Pennsylvania. After graduating from Ohio State University as an electrical engineer in 1916, he joined Westinghouse as a marine application engineer, specializing in diesel-electric and turbine-electric ship propulsion and electrical equipment for submarines. He has served as manager of marine engineering for the company since 1927.

For the past 28 years he has been a member of the American Institute of Electrical Engineers, and for the past 22 years, a member of that organization's marine committee. He is the author of a section on "Electric Ship Propulsion" in an authoritative publication, the Marine Engineering Book, published in 1944 by the Society of Naval Architects and Marine Engineers.

Sales & Service Representatives Of Coffin Company

The J. S. Coffin, Jr., Company of Englewood, New Jersey, manufacturers of steam turbine centrifugal pumps, control valves, and constant pressure regulators, have announced the following companies as their sales and service representatives:

The John H. Marvin Company, 1016 First Ave., S. O. Seattle, Washington, and 1231 N. W. Hoyt St., Portland, Oregon.

Cordes Brothers, at 200 Davis St., San Francisco, California.

P. Thompson Tool & Supply Company, in New Orleans, Louisiana, and

Marine Specialty Company of Mobile, Alabama.

Hough & Egbert Opens Office In Southern California

Ed. Hough of Hough and Egbert consulting engineers and marine surveyors of San Francisco, announces the opening of a new office in San Pedro to handle the expanding business of the company.

Harry N. Clegg will be in charge of the new office which is located temporarily at 123 West 8th Street, San Pedro. Clegg, who is well known on the Pacific Coast, was formerly a Lloyd's Surveyor for five years at San Francisco. Previously he was with Standard Oil of California and spent some time in the Arabian territory.

Harry N. Clegg, San Pedro Office of Hough & Egbert

Zurn Sales Appointments

Appointment of Harry Goss as regional supervisor in charge of the San Francisco office has been announced by Melvin A. Zurn, president, J. A. Zurn Mfg. Co., Erie, Pa., manufacturers of building, plumbing, drainage, marine and industrial products. Goss has been associated for a number of years with Crane Co., Plumbing Division, and during the two years before coming with Zurn, he was sales manager of a large San Francisco valve concern. He has offices at Finance Building, 530 Market St., San Francisco.

Appointment of Neal Derby as district representative in charge of the Seattle office has been announced by Melvin A. Zurn, president. Derby has been associated with the plumbing field in a sales capacity. His offices are located at 5544 Brandon Street, Seattle.

Brooks Equipment Company have recently been appointed West Coast distributors for Kindorf Cable Devices. The territory includes the Los Angeles and Seattle districts.



Left to right: E. A. Warren, R. Leggat-Weir, and P. W. Walf, all of General Detroit Corp.

GENERAL DETROIT'S APPOINTMENTS

E. A. Warren, vice president in charge of Sales for The General Detroit Corp., announces the appointment of two new executives in the sales and advertising departments. Robert Leggat-Weir has been designated assistant sales manager, and Preston W. Wolf has been appointed assistant sales promotion manager.

Leggat-Weir joined the company two years ago in the capacity of assistant to the general manager, Extinguisher Division. Previously, he was engaged in sales work of an executive nature, with the Van Dresser Specialty Corporation, manufacturers of auto parts and accessories.

Wolf joined the firm after his discharge from military service in March, 1945. He was formerly with the Manufacturers Life Insurance Company as agency supervisor of the Detroit Branch territory.

The General Detroit Corporation manufactures a complete line of Underwriters' approved fire-fighting equipment, including carbon-dioxide, vaporizing liquid, soda acid, foam, and pump type extinguishers. It also manufactures fire trucks, and allied products.

Left to right: Thomas A. Short, president of Mariners Club; Commander A. C. Meadows, USN, speaker at April meeting; Ed Hough of Hough & Egbert; and W. "Eddie" Martin Westinghouse Electric Co.

S. F. MARINERS CLUB HEARS COMMANDER MEADOWS

Commander A. C. Meadows, USN, was the guest speaker at the regular meeting of the Mariners Club of California, April 3.

The Commander, who was an officer in charge of port operational activities for the U. S. Navy at Newfoundland, North Africa, Sicily, Italy, the South Pacific and Japan, gave a vivid description of his duties and experiences in these operations. He has made fourteen round trips to Japan since his entry with the first U. S. Navy occupational forces, and was completely amazed by the extraordinary docility of the Japanese people. The self-control and obedience shown by the conquered Japanese armed forces was just as amazing.

He concluded his most interesting talk with an ardent plea for the maintenance of an adequate and well-equipped United States Army, Navy and Air Corps, throughout the post-war era.

Eddie Martin spoke of the various arrangements being made for the celebration of National Maritime Day, when the Mariners will climax their observances with the 17th Annual Spring Frolic in the evening at the Palace Hotel.

CORNELIUS AUSEMA HAS BEEN APPOINTED ASSISTANT MANAGER of marine sales for Crane Co., manufacturers of valves and fittings. Mr. Ausema started with Crane Co., in 1926 and had worked in various departments until joining marine sales in 1936. He has done an outstanding job in this department in handling the large volume of Navy and Maritime work during the war.

Mariners, do you remember? Ask Captain Cy Meek! No. 1 of a PMR series.

Veteran Shipbuilder Joins McCutcheon & Company

John Green (at left) has been appointed sales manager, Joiner Division, James McCutcheon and Co., New York City, beginning June 15.

Born in Scotland, Mr. Green began his career in shipbuilding in 1916 with Denny Brothers, Dumbarton, Scotland, and later served six years with John Brown and Co., Clydebank, Scotland. In 1930 he came to this country and has seen service in the design offices of the Bethlehem Shipbuilding Corporation, Fore River, Massachusetts; New York Shipbuilding Corp., Camden, N. J.; Gibbs and Cox, naval architects, New York; and George G. Sharp, naval architect, New York.

Since 1940 he has been successively design representative, general superintendent of outfitting, and works manager of Todd Pacific Shipyards Corporation, Tacoma, Washington. During this period at Tacoma he supervised the construction of 74 ships for the U. S. Navy, U. S. Maritime Commission and the British Navy, which included converted C-3, aircraft carriers, C.V.E.-105 type carriers, transports, tankers, seaplane tenders, and destroyer tenders.

Columbia Steel Appointment

C. T. Spivey has been appointed assistant director of industrial relations of Columbia Steel Company, William A. Ross, president, announces.

Spivey, who has been associated with the United States Steel Corporation since his graduation from Stanford University in 1937, has served in numerous capacities of industrial relations work for the steel corporation.

He started as an industrial engineer at the Pittsburg Works of Columbia Steel Company. In 1940, he was selected to direct the company's industrial relations activities in the state of Utah, and in 1943 was transferred to the Government-owned Geneva Steel Works to supervise this new project's industrial relations program. He returned to Columbia Steel last year.

Dr. Ulmer Joins Drew & Co.

Dr. Richard C. Ulmer has recently joined E. F. Drew & Co., Inc., as technical director of the Boiler-Water Treatment Division. He has been placed in charge of the technical and research aspects of the various water treating problems.

Prior to his affiliation with Drew, Dr. Ulmer was connected for nine years with the chemical division of the Research Department of the Detroit Edison Company. At Detroit Edison he worked on water treatment, corrosion prevention and lubrication as related to the operation of major power plants; his job brought him in contact with many of the nation's leading authorities on boiler water and associated problems.

Dr. Ulmer, a graduate of Ohio State University, is a member of the American Chemical Society, American Society for Testing Materials, American Socicty of Mechanical Engineers and the National Association of Power Engineers.

Martin-Parry Expands

The purchase of the American Propeller Corporation war plant at Toledo, Ohio, by the Martin-Parry Corporation of Detroit, was announced by the Government. T. Russ Hill, president and general manager of Martin-Parry Corporation, stated that E. Robert Leeder, vice president and assistant general manager of the corporation, would be in charge of the operation of this newly acquired plant and the Martin-Parry plant at York, Pa.

This new plant is one of those put up by the Government to serve as a model and guide for plant design. The production buildings cover half a million square feet and stand on 77 acres of land. A modern two-story, air-conditioned office building, completely furnished, provides ample accommodations for the executives and clerical workers assigned to this operation.

The executive offices of Martin-Parry are remaining in the Fisher Building in Detroit, where is also housed its subsidiary, Rexair, Inc., distributors of the Rexair Cleaner and Conditioner, the vacuum cleaner that utilizes a pan of water instead of a bag.

Blue Star Line Represents British Line on Pacific Coast

Max G. Linder, president of Transmarine Navigation Corporation, announced the appointment of the Blue Star Line of Seattle, Washington, as Puget Sound representative for the Stan Line, the new British Flag Transpacific freight service for which the Transmarine Navigation Corporation is managing agent. This appointment will give the Stan Line strong representation in the Puget Sound area, Linder says. Sailing schedules will be announced as soon as possible.

Linder also announced that Transmarine Navigation Corporation is agent for the Blue Star Line in the Los Angeles area, effective May 1. This line has been operating in the Pacific Coast-European Trade for the past twenty-four years and was one of the first lines to pioneer the movement of citrus fruit and other products requiring refrigeration from the Pacific Coast to United Kingdom and continental ports.

(1) New general offices and factory of the Martin-Parry Corporation in Toledo, Ohio. (2) The president's office. (3) The main entrance. (4) The accounting department. (5) The entrance foyer. The building was constructed by The Austin Company.

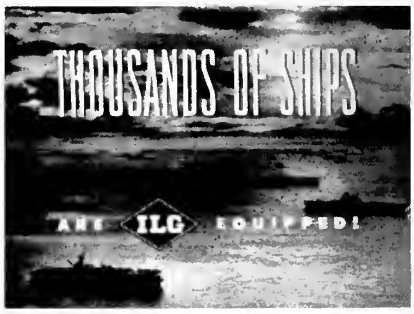
LaBOUR TYPE G PUMPS, bulletin No. 51, explains the production of this new pump which is making history. This pump will never have any packing troubles, will never require replacement of packing or tightening of the gland, for it has no packing or mechanical seal. It is an efficient, vertical, self-priming centrifugal pump retaining and improving on all of the good features of older La Bour pumps, but entirely eliminating the contact type of seal. This bulletin was recently issued by The LaBour Company, Inc., Elkhart, Indiana.

COPES MARINE TYPE BOILER FEED WATER REGULATORS, the title of catalog 10-45 issued by Northern Equipment Company, Erie, Pa., explains the advantages of Copes system of boiler feed control, with blueprints of the regulators, illustrated material and a series of photographs of Navy and Maritime Commission vessels using this system.

METAL & THERMIT CORPORATION, New York, annnounces the publication of a ten page booklet on underwater cutting and welding. The booklet describes the arc-oxygen process for the cutting of steel under water and for cutting cast iron and high alloy steels in the open air. It also gives considerable working data and procedure information. In addition, Murex electrodes for welding and for cutting light gage materials under water are covered and instructions for their use are included.

THE HERMAN H. STICHT CO., INC., of New York, has recently issued a condensed bulletin No. 1045, showing nine different types of tachometers which can be supplied by the firm. This bulletin shows a number of tachometers; including portable and stationary types, single and multiple ranges, domestic and imported Swiss.

"THOUSANDS OF SHIPS ARE ILG EQUIPPED" is the title of a new beautifully illustrated photo booklet produced by the Ilg Electric Ventilating Co., of Chicago as evidence of its supremacy as a supplier of marine heating and ventilating equipment.



Pictures of passenger liners, freighters, tankers, yachts, and tugs show how Ilg's war experience was turned toward peacetime application in the interval between 1918 and 1940. It starts at the beginning of the first world war when Ilg entered the marine field by supplying apparatus for many famous ships and also shows a group of destroyers presented to England by the United States early in World War II.

"REFRACTORY SPECIALTIES" is the title of a catalog and data booklet concerning The Ramtite Company's refractories and furnace construction. This book contains numerous cross-sectional drawings, charts, graphs, technical illustrations, definitions of terms, formulae, temperature conversion tables, properties of gases and other data, in the field of refractories and their applications. The book also presents information about plastic refractory products and their manufacture, design and construction.

THE PYRENE MANUFACTURING COMPANY, Newark, N. J., have issued a new brochure entitled, "Air Foam." This booklet describes the newer mechanical or air foam for fire fighting which, unlike the foam in use for years, is formed without chemical reaction. The booklet tells how air foam is produced either by portable playpipes or stationary foam makers. A pictorial record of the largest test fire on record—a 93-foot diameter oil tank—which was estinguished in four minutes is also shown.

GENERAL CONTROL COMPANY has recently issued a catalog and handbook on Master Switches. This handbook illustrates and describes the standard Master Switch models.

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The manufacturers named in this HOT OFF THE PRESS department will gladly furnish, without obligation to you, copies of the trade literature reviewed in these pages. For quick service, please use this coupon.

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CARRIER MARINE INSTALLATION

(Continued from page 460)

The three new passenger ships will be completed this summer.

Other recent orders received by Carrier include air-conditioning equipment for nine vessels of the Grace Line and two American President Line ships under construction at the Bethlehem-Alameda Shipyard, Alameda, Calif., as well as the ten ships being built at North Carolina Shipbuilding Co.

Refrigerated Space on Ten New Cargo Liners

Built by the North Carolina Shipbuilding Company and refrigerated under contract with the Marine Department of Carrier Corporation, are ten U. S. Maritime Commission hulls (C2-S-AJ5) each of which has 40,000 cu. ft. refrigerated cargo space divided into five compartments. The compartments have insulated double doors for access to the main hatches.

Each compartment is chilled by a Carrier cold diffuser unit, including a fan for recirculating air over cooling coils within the unit casing. Temperatures in any compartment can be controlled within the range 0 to 55 degrees Fahrenheit. The units have sheet metal supply ducts for distributing evenly all of the conditioned air delivered by the Carrier cold diffuser at relative high static pressure. This feature assures uniform temperature and humidity even when the compartment is compactly stowed with perishables.

Carrier has equipped each diffuser system with sea water spray header over each cooling coil and piping to one instantaneous sea water heater. This permits the operators quickly to remove frost and thus always obtain full capacity from the equipment.

Each hold is also provided with a separate ventilating fan, ductwork, and steam heater coil for introducing sufficient outside air to obtain proper ventilation, regardless of the type of product being transported.

Engine Room refrigeration equipment is located on an outboard platform. Here there are six multi-cylinder, reciprocating type, Carrier, Freon-12 compressors. All compressors are interconnected with six marine type shell and tube water condensers. The arrangement permits operation with any one unit as a complete spare and all compressors are interchangeable. Each compressor is V-belt driven by a 25 hp motor.

After the operators establish temperature requirements for each hold in accordance with the product which they will carry on a particular voyage, a few machinery adjustments are required. Thereafter the plant operates automatically to maintain whatever temperature between 0° F. and 55° F. is required in each of the five refrigerated compartments. The operators have resistance type electric thermometers conveniently located in the engine room. These thermometers accurately read temperature at four stations in each compartment, enabling the operators to check regularly on temperature conditions without entering the loaded compartments.

Pacific MARINE REVIEW

JUNE 1946

TO MEET THE NEEDS OF POSTWAR TRANSPORTATION

By land — by sea — by air — millions of Americans are "rarin' to go places." Innumerable tons of goods and cargo await shipment to every part of the country as well as the far corners of the earth.

To take care of these needs, America's vast transportation systems have been doing a herculean job—one that is growing ever larger.

In many phases of shipping, rope plays an important part. For nearly a century the name Tubbs has stood for highest quality—utmost dependability. When the finest Manila fiber is once more available, look for the famous Tubbs Extra Superior Manila trademark from your supplier.

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Pacific MARINE REVIEW

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A BALANCE of the *5 vital qualities* weighs the scales in favor of COLUMBIAN ROPE. Balanced Rope gains no quality at the expense of another. Balanced Rope sacrifices no quality to gain another. That's why men who depend on rope prefer COLUMBIAN!

ENDURANCE. Good rope must last! To gain long life, COLUMBIAN PURE MANILA ROPE sacrifices none of the other essentials. Fully waterproofed, stronger than required, workmanlike in appearance, flexible—for easy handling . . . here is a rope that is good rope through all of its long life! In COLUMBIAN Tape-Marked PURE MANILA ROPE, *endurance* means more than long life—it means a long working life.

COLUMBIAN ROPE COMPANY
400-90 Genesee St., Auburn, "The Cordage City," N. Y.

Pacific MARINE REVIEW

Why Do Cities Neglect Their Ports?

It is time that American city governments—and state and national governments—awakened to the importance of their ports and shipping facilities.

The recent Maritime Day and Foreign Trade Week observances were splendidly managed and the interest was widespread. But the impetus came from the industries concerned. City governments take their shipping business for granted, and go about wooing new loves.

The nation's two major port cities, New York and San Francisco, are the focal points for world commerce, and as such they head up not only the industrial livelihood of their own peoples and those of wide supporting areas, but also the industrial future—and **present**—of the whole country.

New York—and every New Yorker—has a stake in every ship that enters or leaves the harbor, and Pittsburgh and Chicago and Omaha are only slightly less concerned.

San Francisco—and every San Franciscan—depends in some measure on harbor traffic, and Salt Lake City and Denver need the port's service. For this harbor's traffic of 30,000,000 tons a year ties the city with all the world. While New York boasts of an all time high of 800 ships in port, San Francisco is host to 1500, hundreds of them awaiting shipyard services.

San Francisco and New York took a wartime pride in knowing that through their ports sailed Victory. But they give little peacetime thought to protecting the shipping industry, which attracts prosperity from all about. In San Francisco most of the ship lines sailing the Pacific have their homes, as do the banks, insurance companies and trading firms on which they depend.

As is the case with New York all activities on San Francisco Bay are the concern of San Francisco. For not only does the city boundary take in Treasure Island and Yerba Buena Island and Red Rock to the north, but it includes the entire width of the Golden Gate to the Marin shore. The city itself can contain the fleets of the world, and the ships and cargoes and passengers enter or leave no mean port. Surely the city's interest in the port should be great enough to see that its waterfront is made attractive and safe; that its shipping is encouraged and praised for repeatedly pulling itself up by its own bootstraps after being bowed down with the weight of its own troubles—and the nation's; that the 30 day limit on pier leases be removed; and that some part of the enthusiasm that goes into the development of air facilities be reserved for the protection and fostering of maritime welfare.

When the port is closed all the people are hurt. —T.D.M.

The Matsonia as she pulled away from Pier 32, San Francisco, on May 20 with a capacity passenger list.

Matsonia in Passenger Service

Famous Matson Liner, Reconditioned, Opens Regular Luxury Passenger Service Between San Francisco-Los Angeles and Honolulu

It was quite a thrill on May 20th to once more inspect an American passenger liner being made ready to open regular traffic to Honolulu with 548 passengers on May 22nd. The Matsonia is a sleek beautiful craft with the lines of a racer and her interior decoration and equipment are luxurious and complete. She is the same vessel now in every respect that she was pre-war.

In conversion to troopship status the fine paneling and most of the features of her interior decorations were simply covered with plywood protection and troop berths or other troop facilities erected inside these plywood bulkheads. Thus: the fine old English oak paneled smoking room became a hospital and the adjoining bar a dispensary; the main lounge became a troop dormitory housing 216 men; the Crystal Club

Upper: The Matsonia's smoking room, fitted out with hospital beds during wartime service.

●

Right: The same smoking room as it appeared on the eve of departure in peacetime service.

became the transport's chapel; and the Pompeian swimming pool became a troop dormitory with more than 90 berths.

War Record

She was chartered to the Maritime Commission on November 21, 1941, cleared her first wartime voyage December 16, 1941, and made 33 voyages in all, steaming a total of 328,301 miles or an average of 9949 miles per voyage. During these voyages she carried a total of 163,732 troops and passengers, served 6,528,524 meals. Her longest wartime voyage was from San Francisco to Aitape, New Guinea, 20,590 miles round trip in 66 days. She was the first large transport to call at the Solomons. She is still in wartime gray on the hull exterior, but her lanai suites and all her passenger sleeping accommodations are in gleaming whites, pastel green shades, and color schemes accentuating cool comfort. The beautiful mahogany-and-white dining saloon features spotless linen, sparkling glass and silver and Lenox china in the Matson pattern.

In restoring the commissary department on Matsonia there were replaced: 13,304 pieces of silverware;

Right: A glimpse of one of the Matsonia's famed lanai suites.

●

Lower: This looks like the bar, but the bottles you see on the shelves are medicine bottles. The bar room served as medical dispensary during wor service.

14,406 pieces of glassware; 16,448 pieces of chinaware and crockery; and 131,330 pieces of linen and blankets. In refinishing interiors and exteriors of superstructure 2300 gallons of paint were used.

She was returned to Matson by U.S.M.C. on April 11th and as soon as preliminary surveys and calculations could be made was turned over to United Engineering Company to be restored as promptly as possible. At 12 noon, May 22nd, she cleared for Honolulu. The job cost approximately $400,000.

Chief Steward Charles L. Cristian was a very busy lad for the 24 hours prior to getting away. He managed to have delivered aboard huge quantities of food, including: 21,210 pounds of fresh beef; 46,620 pounds of other fresh meats and fish; 24,400 pounds of poultry; 28,200 pounds of potatoes; 33,000 pounds of fresh vegetables; 8700 pounds of frozen vegetables; 4200 dozen eggs and 2400 gallons of fresh milk. This list illustrates one small phase of the benefits derived by a port city wherein is located the headquarters of a great steamship line and indicates that there will be no rationing for the personnel and passengers aboard the Matsonia.

The service just started by this splendid liner is called by Matson an "interim service" but it will have all the modern touches including ship-to-shore radio-telephone service for passengers.

Matson Navigation Company plans to completely reconvert its famous triplets Lurline, Mariposa and Monterey at a cost of approximately six million dollars for each vessel. These ships will when refinished be, as they were before the war, the American flag queens of the Pacific Ocean merchant marine.

Matson's forward program, as outlined by President F. A. Bailey, includes heavy commitments for rehabilitation of the passenger steamships, purchase of an entirely new fleet of about twenty new cargo vessels, construction of a bulk sugar terminal at Hilo, Hawaii, repairs and improvements to the Royal Hawaiian Hotel at Honolulu, and building an additional wing on the Matson Building in San Francisco.

Matson is pressing its application before the Civil Aeronautics Board for a certificate to operate planes in conjunction with its steamers over its regular steamship routes between San Francisco, Los Angeles, Portland, Tacoma and Seattle and the Hawaiian Islands. A decision is expected momentarily.

Captain F. A. Johnson

Frazer A. Bailey
President of Matson

The Matson freighter program calls for purchase of sixteen C-3 cargo ships and four vessels of the Liberty type, the latter for carriage of bulk cargoes to Hawaii from the Pacific Northwest. With the new ships Matson will be able to give a cargo service to Hawaii surpassing anything heretofore provided.

The Hilo bulk sugar terminal, representing an investment in excess of $1,000,000, will be used for the storing and shipment of bulk sugar to mainland refineries from the Island of Hawaii. This plant is expected to be in operation early in 1947 and will permit substantial economies in the handling costs of sugar with resulting lower transportation rates.

Improvements and repairs totaling

A corner of the main dining room just before sailing time.

approximately $1,000,000 are being made to Matson's Royal Hawaiian Hotel in Honolulu. The work should be completed late in 1946. A seven-story addition to the Matson Building in San Francisco will cost approximately $850,000.

Matson lost eleven cargo vessels to enemy action or marine casualties attributable to war conditions. Ten others were requisitioned for title by the Government for war purposes and three were sold to other purchasers. The Matson passenger liners came through unscathed, and saw service in every war theater in the world as troop transports, achieving a record unexcelled by any other American steamship company using its own equipment.

While it is impossible at this time to estimate when private-operation cargo service can be resumed in the Hawaiian trade, Matson hopes to be able to do so soon after the middle of the year. Meanwhile, it is making operating and economic studies of a post-war cargo service to Australia and New Zealand, in addition to the Oceanic customary passenger ship service to that area, and application has been made by Matson to the United States Maritime Commission for the reestablishment of these routes.

The pre-war Malolo, now the Matsonia, entering Honolulu Harbor.

Bon Voyage!

Grace Line Charters Twenty Ships

President R. Ranney Adams of Grace Line.

Grace Line is chartering from War Shipping Administration twenty C-2, C-1 and N-3 cargo vessels totaling 160,000 dead weight tons. This interim fleet will maintain a fast scheduled service along Grace Line routes pending final return from War Shipping Administration of the company's own tonnage, and the delivery of nine new combination passenger-and-freight ships from the builders.

Until Grace Line's post-war passenger-and-freight services are put into effect with a new fleet of twenty "Santa" ships, this chartered tonnage, supplemented by the company's own cargo vessels now gradually being released by WSA, will be employed on the following routes:

Between U. S. Atlantic coast ports and the west coast of South America, seven C-2's will operate on a 16-knot schedule providing weekly service from New York to Panama, Colombia, Ecuador, Peru, (Bolivia) and Chile. In addition, two other C-2's will offer monthly sailings from other Atlantic coast ports, as well as New York, to west coast ports of South America. Vessels used in this service will be Grace-owned "Santa" freighters plus the chartered C-2 Alden

Vice President Fred L. Doelker of Grace Line.

Artist's conception of Grace Line's new combination possenger and freight ships.

Besse. Of the company-owned ships, the Santa Leonor is alread operating under the Grace house flag and seven other "Santas" are expected to return from WSA control by the middle of June. During the coming summer, six of these ships will be replaced by the new combination passenger-and-freight ships now being fitted out for service at Wilmington, N. C.

Seven C-2's will operate between U. S. Pacific Coast ports and west coast ports of Mexico, Central and South America providing fortnightly sailings in this service. All vessels on this route will be chartered and consist of ships operated by Grace Line during the war period when the line was acting exclusively as agents for WSA.

Services to the Netherlands West Indies, Venezuela and north coast of Colombia will employ nine chartered C-1 vessels providing three sailings each week from New York. As the company's reconversion program progresses and new ships are delivered, this tonnage will be replaced by the cruise liners Santa Rosa and Santa Paula plus three new combination passenger-and-freight ships—the first of which is expected to be launched at Kearny, N. J., in June.

The C-2

Service from New Orleans, Houston and other Gulf Ports to the west coast of South America will be maintained by two chartered C-1 type vessels providing a sailing approximately every twenty-eight days.

In addition to the above routes, one N-3 coastal type vessel will maintain the company's long-established feeder service between west coast ports of Central America and Cristobal, C. Z., offering trans-shipment facilities at Panama to and from Europe as well as the U. S.

Acquisition of the twenty vessels will be made under WSA's interim ship-charter policy on a bareboat basis. Grace Line has already taken delivery of twelve of these ships and arrangements have been completed to have the entire interim fleet in operation by midsummer.

Chart Program of the Hydrographic Office

By Rear Admiral R. O. Glover, USN

Hydrographer of the Navy

PEACETIME PRODUCTION

To meet the demands of naval operations, air action, and amphibious assault, wartime chart production at the Hydrographic Office skyrocketed to many times its peacetime level. From a pre-war average of 1,000,000 charts per year, the Hydrographic Office increased its output to over 45,000,000. New charts were developed at the rate of nearly 1,000 per year as compared with 60 in pre-war years. Hydrographic Office charts, other than combat charts, were used by all vessels of the United Nations in transporting men and materials to every fighting front in the world. In normal times the work of the Hydrographic Office had been carried on by 200 civilian career men. At its peak during the war the personnel numbered 1,800 including officers and enlisted personnel of the Navy in addition to an enlarged civilian staff. Work was organized on a 24-hour basis with three shifts of workers.

In our May issue Admiral Glover dealt with wartime production. The peacetime program is described herein.—ED.

Oceanography

Before the war, oceanography in the United States was regarded as a luxury which the Government could ill afford despite the fact that its practicality had been amply proved in connection with the fisheries of northern Europe. At the onset of the war, the only oceanographic information regularly available to the Fleet was small scale temperature and current charts based on records from ships' logs. With the technological advances developed just prior to the war and during the war, a knowledge of oceanography became essential in submarine warfare, in air-sea rescue, in amphibious operations, and in the design and performance of underwater ordnance.

To provide the necessary oceanographic information during the war for the Armed Forces, an Oceanographic Unit was set up in the Hydrographic Office to act as a coordinating agency for an extensive oceanographic research program. This unit, with a staff of six oceanographers, edited, published and distributed oceanographic information in the form of charts and manuals. Many of these publications were based on research carried on under contract at the Woods Hole Oceanographic Institution and at the University of California in the Division of War Research, in the College of Engineering, and at the Scripps Institution of Oceanography. In addition, this unit prepared the oceanographic chapter of the Joint Army and Navy Intelligence Studies, as well as numerous short reports for the Joint Chiefs of Staff and detailed tactical reports for use in the field.

With the aid of a Governmental Advisory Committee now being formed, the Hydrographic Office will serve as the coordinating agency for oceanography in this country, much as the Weather Bureau does for meteorology. It is hoped thus to provide the most economical means of procuring oceanographic information for the agencies concerned.

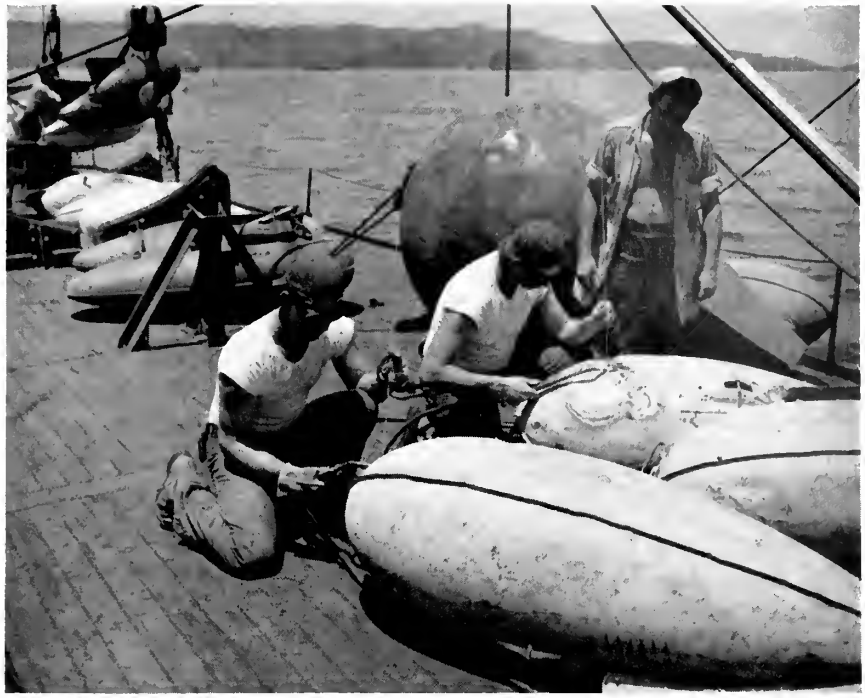
If oceanographic information is to keep abreast of technological development, it will be necessary to take observations throughout the world using new techniques and devices developed during the war. Perhaps the most effective application of ocea-

U. S. S. Bowditch. Filling in for a land tint on a chart in the drafting room of a survey ship.

(Official U. S. Navy photo)

nography during the war was in submarine warfare, where the procedure for search, attack and evasion was dependent to a large extent on a knowledge of temperature and salinity distribution in the ocean in the operating area and vicinity, as well as the character of the bottom in shallow water (100 fms.). While data of this sort have been collected on a routine basis on oceanographic surveys, only a few areas such as the North Sea, the Gulf of Maine, and in the vicinity of the Japanese home islands had been adequately covered. Now in view of new techniques developed during the war, it may be necessary to re-examine these data to determine their adequacy to meet future technological developments.

Several problems which were of great importance during the war will also find extensive practical use in the post-war era. For example, for successful amphibious assaults, it was of the utmost importance to be able to forecast the sea and swell conditions in the unloading area as well as the surf conditions at the beach. As a result, methods as accurate as the meteorological forecast were developed at the Scripps Institution of Oceanography. This sort of information will continue to be useful in the construction of breakwaters and other harbor installations in the designing of ships and seaplanes, and in the development of seaplane landing techniques for rescue at sea. Furthermore, accurate wave measurements using instruments devised during the war can be used in tracking typhoons, in weather forecasting in remote parts of the oceans, and in forecasting surf on local shores, as well as in problems of beach erosion.



U. S. S. Sumner. Repairing improvised drag buoys made from belly tanks. These buoys support the wire drag net, which is of a fixed depth. This drag net is towed slowly through the water of a harbor to make sure that the harbor is free of pinnacles or other hazards to navigation.
(Official U. S. Navy photo)

With continued flights over water, air-sea rescue work will continue, and it will be necessary after further study to improve our search procedure based on surface current and wind information as well as perfecting the SOFAR method for locating survivors.

In this new program of oceanographic research, the Hydrographic Office will be continuing its tradition of service to mariners.

A tide gage. This consists of a staff gage, visible in the picture, and an automatic recording gage by which the height of the tide is measured.
(Official U. S. Navy photo)

Aeronautical Charts

The tremendous expansion of naval aviation demanded an enlarged program in the publication of aeronautical charts. These charts on various scales are published for the entire world. They include Long Range Air Navigation Charts at 70 nautical miles to the inch, Air Navigation Charts at 30 miles to the inch, and air charts designed for contact flying at 14 miles to the inch. The charts for contact flying indicate all the topographic and cultural features necessary for contact navigation.

In addition to these charts, the Naval Air Pilots and Route Manuals, which are loose-leaf books, provide even larger scale approach and landing charts of airfields and seaplane bases. These charts are, in many cases, supplemented by photographs.

Air route charts for use in plotting flights across the Atlantic and Pacific Oceans were also developed. These route charts are printed on both sides of the paper so that a record of the flight out and back can be made on one sheet.

A special project, which proved to be of great value, was the publication of small air target charts. These were aeronautical charts which contained added information about specific bombing targets. Made in small sizes, eight inches square and twelve inches square, they were excellent for handling in limited space in planes. They were similar to the approach and landing charts of the Naval Air Pilots and Route Manuals.

In meeting the great demand for aeronautical chart coverage in the Pacific Theater, photogrammetry again played an important part. Flight charts were developed from aerial photographs using the tri-metrogon method.

Aerial cameras are placed on a spotter plane and timed to give simultaneous exposures of areas reaching from horizon to horizon. These planes can photograph 20,000 square miles of land in three hours. Often

(Continued on page 146)

Digest of Carrier Opinions:

Proposed St. Lawrence Seaway Will Hurt Merchant Marine

Exhaustive hearings have been held by a subcommittee of the Senate Foreign Relations Committee on a joint resolution (S. J. Res. 104) to authorize an agreement with the Canadian Government for construction of the proposed Seaway. Some time ago, the subcommittee ordered a favorable report to the full Foreign Relations group on the proposal, but the report has been withheld pending receipt of printed copies of the hearings. These have been received, and the report is to be presented by the subcommittee at a scheduled executive session of the full committee, which may or may not take action at that time.

Lykes Bros. Steamship Co., Inc., in a letter dated April 26, signed by J. T. Lykes, president, declared, in response to the Bailey query, that the proposed seaway would be decidedly detrimental to Southern ports from which that company exclusively operates. Lykes Bros., according to the letter, has no plans to send ships into the Great Lakes.

"Because of the high cost of building American ships and operating them," Mr. Lykes informed Senator Bailey, "they cannot compete with foreign-flag ships unless subsidized. For American ships to enter the Great Lakes trade, they would need to be subsidized just as they are on the high seas. Would Congress authorize such a subsidy when the Great Lakes seaway would be in fact a competitor of the domestic transportation lines in the United States?

"Then there are 15 ship locks to pass through.

"Foreign-flag ships would go into the Great Lakes during the open water season. For the most part these would probably be tramp ships which do not, as a rule, conform with the rules and regulations applying to regular liners, which would mean disturbance to the economy of the regular liners and to the domestic carriers.

"Thus the opening of the Great Lakes seaway would in fact be a subsidy in favor of foreign-flag ships and against the United States merchant marine.

"The transportation system of the United States is organized to use existing and developed seaports and domestic transportation, which would be disturbed by the Great Lakes seaway.

"The railroads which would compete with the seaway would need to lower their rates not only for the seven months of navigation, but year around, thus again giving the East and West drift of commerce an advantage over the North and South drift, on which much money is being spent."

The Robin Line (Seas Shipping Co.) in a letter dated April 12 from Arthur R. Lewis, declared that that line has no plans to navigate the St. Lawrence with any of its vessels.

"The vessels which we own and will operate in commercial service," it was declared, "are so large and could not safely navigate the proposed 27-foot channel when fully laden. This condition is true of a very great majority of commercial vessels under the American flag today. The proposed seaway might be helpful to foreign shipowners who have vessels of medium size and use comparatively shallow draft. The majority of American shipowners seem to be opposed to the proposition since they anticipate that the seaway would be used by foreign-flag vessels with a consequent reduction in freight available to American-flag vessels using the major seaports of the United States."

After declaring that it does not appear the proposed seaway would offer any great savings to shippers and that it is economically and commercially unjustifiable, the Robin Line reminded Senator Bailey that there are very conflicting views as to the volume of freight which might move on such a waterway.

"If it should be used to the extent which its advocates visualize," the Robin Line official said, "other forms of transportation would undoubtedly suffer and the shippers using the waterway might find themselves unable to secure adequate transportation for their products during the months in which the proposed seaway would be closed to navigation."

Pointing out that one consideration overlooked by many of the proponents of the Great Lakes-St. Lawrence project is that, in order to accommodate the volume of ocean-going traffic which is contemplated, it would be necessary to construct very extensive and costly harbor improvements at ports on the Lakes, Mr. Lewis added:

"I have seen no figures which convince me that the proposed seaway would not constitute a direct drain on the Treasury of the United States nor that the gains to the national economy would in any degree offset this drain."

Frank J. Taylor, president, American Merchant Marine Institute, Inc., transmitted to Senator Bailey a memorandum dated February 26, addressed to Senator Hatch, Chairman of the Foreign Relations subcommittee (and previously made public), vigorously opposing construction of the St. Lawrence Seaway. Attached to the Taylor memorandum was a further statement by Cornelius H. Callaghan, Port of New York Authority, which also has been previously made public.

William K. Jackson, vice president, United Fruit Company, in his letter to Senator Bailey on April 8, declared:

"As indicated in your letter, the project calls for a usable channel of 27 feet deep. This will prevent the use of vessels drawing more than

24½ feet. It is my understanding that less than 8 per cent of the total American merchant marine has this light draft and, of course, practically all of this light draft tonnage is already in use in other trades. It therefore seems highly doubtful that the St. Lawrence seaway project can have any material advantage to the American merchant marine. It seems more likely that any ships using the seaway would be foreign-flag ships. The operation of small ships under the American flag, because of the highly increased cost of wages and other costs, is becoming more difficult. The St. Lawrence seaway, in my opinion, would be wholly unattractive to American-flag operators.

"It also seems to me that the whole project would only serve to divert traffic from existing steamship terminal and transportation facilities to other facilities. There is nothing to indicate that it would create new traffic. This, of course, would be very damaging to the tremendous public and private investment in existing waterway terminal and transportation facilities.

"One of the principal arguments in favor of the waterway is that it might reduce the ocean rates on grains and other bulk commodities moving from the Lakes area into foreign commerce, and that this would be of benefit to the farmers of the Middle West. I suggest that the freight on these commodities is paid by the foreign purchasers and it is doubtful whether a slightly lower freight rate to these foreign purchasers would be of any value to the shippers of the Middle West.

"This company does not plan to navigate the St. Lawrence seaway."

The Moore-McCormack Lines, Inc., in a letter from Albert V. Moore, president, dated March 30, stated:

"No plans have been made by the company to utilize the St. Lawrence seaway. The position of the American steamship operators has been ably presented to the Senate Foreign Relations subcommittee by the American Merchant Marine Institute, Inc., and the Maritime Association of the Port of New York, copies of which statements are attached for your convenience. We endorse the position taken by these two associations."

After informing Senator Bailey as to the pre-war scope of operations of Moore-McCormack Lines, Mr. Moore continued:

"Of the 16 vessels which were taken over by the Government (only a part of which have been thus far returned for private operation) and seven additional C-3 vessels which are now in the course of construction, and three other vessels which we plan to build in the immediate future, there is but one — a C-1 vessel— which could navigate safely the 27-foot channel of the proposed seaway.

"Of course, all these ships could load to a depth which would permit them to traverse this seaway, but it would mean they would have to complete this loading at Montreal and other St. Lawrence ports, in order to give them full cargoes, thereby further building up Canadian commerce and commercial activities.

"As ship operators, we are opposed to the construction of this proposed St. Lawrence seaway, for we do not believe the construction of such seaway would be to our interest or to the interest of the country. It is our opinion that such a seaway, if constructed, would be of particular value to foreign operators of small vessels. The division of traffic between the interior points and the Atlantic seaboard ports would militate against the maintenance of a strong and efficient American merchant marine."

Basil Harris, United States Lines, in his reply of March 28 to the Bailey query, stated that the proposed waterway would be too shallow for use by offshore steamship lines, and referred to the seasonable operations along the Great Lakes-St. Lawrence River. After adding that the canalized section at many points would be dangerous, navigation extremely hazardous, and that ships would menace each other when passing, he said:

"As to the economy of the navigation, there can be none because in its broadest aspects the seaway discriminates against this Nation's merchant fleet. Into the merchant ships constituting this, our American taxpayers have poured more than fifty billion dollars. It is plain that the seaway would help reverse the American policy of 'fostering' an American merchant marine. You might ask why, and my answer would be because only about 8 per cent of our merchant ships could use it and many of those ships are already obsolete. . . . The preponderance of ships able to navigate the canalized river would be foreign (more than 70 per cent). Most of the traffic would move in tramp ships, none of American register, and to the great detriment of our regularly operated American lines.

"In turn, how can the American steamship companies on the East Coast afford to give virtually daily sailings to Europe during 12 months in the year when for seven months cargo would be diverted from the East Coast and carried in foreign tramp ships paying crews subnormal wages? Rate structures built up through the years would be shattered."

Mr. Harris added that the seaway definitely will not provide savings to shippers, that it is not proving attractive to shipowners, and that the United States has no plans to navigate the waterway.

The Alcoa Steamship Co., in a letter dated March 26, informed Senator Bailey as follows:

"We have no plans for using the proposed seaway. If the seaway is used to any considerable extent for overseas shipping, the vessel operators, port facilities, and the railroads serving the United States North Atlantic ports will suffer the disadvantage of a peak during about five months of the year and a slump during the balance of the year resulting in higher costs and less efficiency. Conceivably, an increase in ocean and rail rates would follow. Such a prospect would certainly discourage modernization and improvement of the facilities at Atlantic ports.

"Considering the capital required for construction of the canal, the handicaps of seasonable operations and the adverse effects on the railroads and North Atlantic ports, we doubt very much whether the project can be considered an economical one."

H. W. Warley, president, Calmar Steamship Corp., in his letter of March 21 to Senator Bailey, declared:

"We have no plans to navigate the St. Lawrence seaway with our own vessels and are unalterably opposed to the proposed St. Lawrence seaway for the following reasons."

Here Mr. Warley pointed out that vessels using the seaway would only be able to load up to a draft of 24 feet and that Calmar's vessels load over 28 feet, while the ships they propose to operate in the future will have a draft of over 27 feet. He also hit the proposition of maintaining dock facilities for only a few months out of the year, such facilities to remain idle at other times. The proposed project,

the Calmar official said, would provide little, if any, savings to shippers because of the necessity of vessels loading such part cargoes and incurring miles of extra steaming, having to secure a great deal higher rates for cargoes loading at Lake ports.

"The proposed St. Lawrence seaway has no attraction to the ship operator," he added, "both from the standpoint of economy and from the standpoint of business. The proposal for the construction of a seaway through the Great Lakes - St. Lawrence River is in my opinion economically unsound and highly detrimental to the best interests of the American merchant marine."

The American South African Line, Inc., in a letter to Senator Bailey from James A. Farrell, Jr., president, dated March 20, reminded the Senate Commerce Committee head that the standard American ships would not be able to transit the waterway, referring specifically to the C-3 type. Mr. Farrell also pointed out that homeward cargo from South and East Africa is mainly manganese and chrome ore, weight cargo, and added:

"For a ship of the C-3 type, approximately 58 tons of cargo are required to change the draft one inch. This means that, if one of our ships were to be loaded for the passage through the St. Lawrence, she would carry 3498 tons of cargo less than her capacity. This is not economically justified.

"With the high cost of American ship construction and operation, as opposed to foreign flag lines, I do not believe it would be sound policy to construct smaller ships, specifically for this trade. The St. Lawrence is considered safe for navigation only seven months of the year. If special ships were designed and constructed for this trade, they would not be able to compete with our present vessels during the balance of the year, inasmuch as their cost of operation would be about the same but carrying capacity would be so much less.

"If our ships were to go to the Great Lakes ports, we should have to add a considerable sum to our cost per voyage, resulting in a greatly increased cost to the shipper. This increase would consist not only of the expense of vessel operation for a longer time per voyage than at present, but we should also have to include the cost of maintaining branch offices or agencies at each of the ports of call for the entire year.

"In view of the foregoing I wish to repeat most emphatically the St. Lawrence Project would not be attractive to American South African Line nor do I believe it would be attractive to the vast majority of American ship operators."

The Grace Line, Inc., in a letter from its president, R. R. Adams, dated March 21, declared:

"I believe it entirely correct to say that the shipping companies are practically unanimous in their opposition to the St. Lawrence waterway plan insofar as that plan would contemplate development of ocean - going traffic as contrasted with that part of the proposal relating to the development of electric power. . . .

"Replying more specifically to the questions raised in your letter regarding this company's possible interest in operating its vessels through the proposed seaway if it is constructed, I have to advise you that Grace Line has nearly completed a construction program of 18 new vessels, not one of which could safely navigate the proposed seaway without leaving unfilled some 15 to 20 per cent of their cargo capacity. Your familiarity with shipping matters will enable you to understand without further explanation that no vessel can compete in international trade unless it is able to take full advantage of its size and capacity."

After referring to the normal peacetime operations of Grace between the Atlantic, Gulf and Pacific ports of the United States, and countries in Central and South America, the Grace letter added it is inconceivable to that company that there would be any economy in the transportation of goods originating in and destined to the Great Lakes area via the circuitous route of the St. Lawrence waterway and thence along the entire Atlantic seaboard on the water routes leading to the South.

In a further letter from the United Fruit Company, dated March 19, and signed by J. J. Kelleher, vice president, it was stated that it appeared the proposed 27-foot channel would preclude something over 90 per cent of the American merchant marine, a good part of which was constructed during the war period, and over 80 per cent of the world's tonnage, from using the seaway. In any event, Mr. Kelleher pointed out that because of the winter freeze the St. Lawrence would be navigable for only about seven months of the year, adding:

"Under these circumstances, even if the seaway project should become a reality in the future, it is most unlikely that this company's vessels will ever make any use of it."

Theodore Brent, president, Mississippi Shipping Co. (Delta Line), in his letter of March 20 to Senator Bailey, pointed out that interests in the Mississippi Valley have generally opposed the projected waterway, on the ground that it would divert import and export traffic from the Mississippi River System which has already been improved by the Government at heavy expense. He added that he has not actively opposed the waterway project personally because "I have grave doubt that a large two-way traffic could be practically developed."

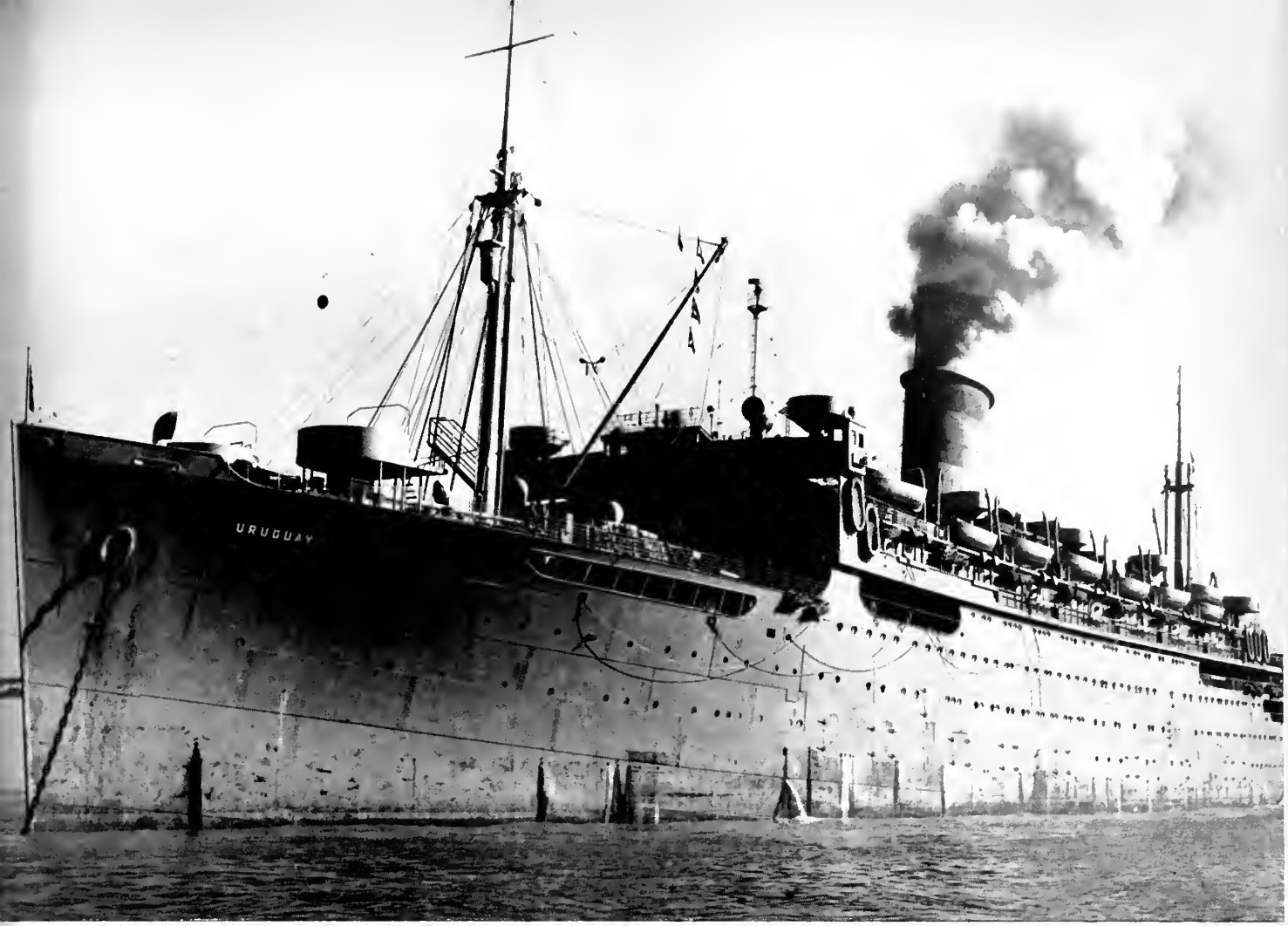
If the seaway were constructed as planned, the Mississippi Shipping Company president said in his letter, it would enable Lake boats to carry both American and Canadian grain down to Montreal and shift the transfer point from Buffalo 500 miles farther toward the sea. That would be the big exportable surplus, Mr. Brent said, which might attract ocean ships into the Great Lakes. However, in the reverse direction, he added, the Canal would be available to merchandise from Western Europe and "little else," expressing his doubt whether Middle West distributors of this limited type of freight, when divorced from the great distribution through Atlantic and Gulf ports, would give a paying two-way traffic for many ocean-going ships.

After referring to the fact that the standard C-2 or C-3 ships, Liberties and Victories, could not safely be loaded to full draft and navigate the channel, he said:

"The fleet of the Delta Line is made up of standard C-2 and C-3 ships. We operate between Gulf ports and the East Coast of South America. The St. Lawrence seaway would offer no inducement to us.

"The barge rates on the Mississippi River from New Orleans offer the cheapest entrance to the port of Chicago of any we know. It is our judgment that the cost of operating deep-sea ships through inland passages of 2250 miles with the time spent in passing through 15 locks would be more expense than the single cost of one transfer from ship

(Continued on page 148)



Conversion of Transport Uruguay

In February, 1928, the ports of California gave a great welcome to a beautiful two-stacker twin screw turbo-electric liner named after their State, and then the largest electric drive liner in the world and the largest passenger ship built in an American shipyard. The first of a fleet of three built at Newport News Shipbuilding and Dry Dock Company for the Panama Pacific Line of the then International Mercantile Marine Company, she typified the great future then envisioned for intercoastal passenger and cargo trade via the Panama Canal.

As then arranged, the California had a capacity for 8000 d.w. tons of cargo and luxurious accommodation for 400 first class passengers and 350 tourists. Her public rooms and promenade decks, her interior decorations and provisions for sanitation and for cuisine were then tops and have been exceeded in few liners of her size. With her sisters she carried on a large trade in both passengers and cargo for a period of ten years. During the latter part of this period the Panama Pacific Line was running deeply in the red. Then these vessels were taken off this run, changed into single stack ships, rechristened, and put on a run between New York and East Coast of South America under Moore-McCormack, the S.S. California becoming S.S. Uruguay.

On the entry of the United States into the late war these fine steamers were drafted into transport service. Their fine passenger accommodations were largely ripped out to make way for troop quarters, standee bunks were erected in the hold spaces, mess kitchens were installed and much permanent ballast took the place of cargo in the holds. The hull and machinery were driven to the limit and there was little opportunity for voyage repairs or maintenance.

Now the United States Maritime Commission must put these vessels into first class seaworthy condition and must restore all the luxurious

hotel accommodations before returning the ships to private operators.

This is a big job, and the Commission retained Joslyn and Ryan of San Francisco to prepare plans and specifications for the work. Bids are now being called for on these specifications for the Uruguay. When finished she will be substantially as shown in the inboard profile and general arrangement plans herewith.

The work involves: the removal of all military features from hull; the replacement of a considerable number of damaged structural members; the installation and decorating of staterooms and public rooms for 247 first class and 86 tourist class passengers; the installation and equipping of galleys and pantries for serving these passengers; the installation of quarters and mess and recreation rooms for officers and crew totaling 407 persons; the complete overhaul of the propulsion machinery; the complete overhaul of auxiliary machinery; the complete overhaul of lifesaving and navigating equipment; and the installation of a complete hospital, a complete laundry, a print ship, a carpenter's shop, a tailor's shop, a steward's joiner shop, photographic rooms and a post office. This is a large order and is practically equivalent to rebuilding a large part of the ship.

Since there are quite a number of such conversions pending or already under way it is interesting to note as standards in the specifications the names of well-known American firms specializing in marine equipment.

For instance, on the pages covering galley equipment we find:

Edison-General Electric or equal specified for ranges, broilers, fryers, bake ovens, egg boilers, waffle bakers, and griddles;

Hobart or equal specified for electric mixers, potato peelers, meat choppers and coffee mills;

Griswold or equal hot plates;

Sterling or equal silver burnishers;

Colt Autosan or equal dish washers;

Hamilton Beach or equal glass washers; and

U. S. Slicing Machine Co. or equal bread slicers.

An interesting item which illustrates the advance in the conception of safety at sea during the past ten years is the emergency generator installation. The two emergency 15 k.w. gasoline drive generators which have served for practically the life of the vessel are to be removed and a 75 k.w. diesel driven emergency generator installed in their place.

Albert V. Moore
President Moore-McCormack Lines, Inc.

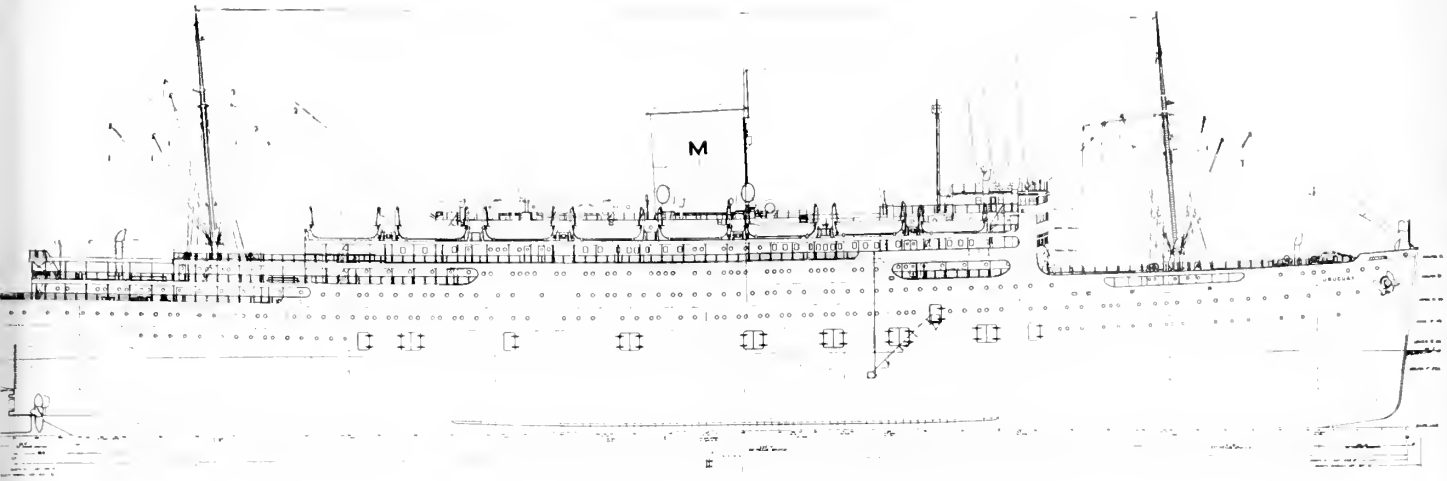
Another interesting side light on increasing costs of American operation of such vessels is that in the total process of first alteration, conversion to transport and reconversion to passenger liner, the crew complement has increased from 350 to 407 and the passenger capacity has dropped from 750 to 333. Space allotment to each crew member and crew requirements for sanitary, messing and recreation space have risen tremendously.

K. C. Tripp
West Coast manager
Moore-McCormack Lines, Inc.

The crew of 350 in the original turbo-electric liner California occupied the forecastle on "C" deck, the portion of "D" deck forward of the dining room foyer, and the portion of "E" deck forward of frame 67. In the reconditioned Uruguay as shown on the general arrangements plans herewith the crew occupies all of that space plus the after end of "D" deck from frame 159 to frame 189, all of "C" deck aft of frame 177, frame 145 to frame 155 starboard on "C" deck, and frame 149 to frame 163 starboard on "B" deck, thus taking very sizable blocks out of both tourist and first class stateroom space. A British cargo-passenger liner now building for the Orient Line has approximately the same dimensions as the Uruguay. She is designed to take care of 1700 passengers, 600 of first class, and requires a total crew of only 500.

One of our illustrations shows the main galley and its auxiliary compartments. This will be all electric, except for the steam kitchen, and will reflect the most modern developments in marine galley equipment. The whole compartment is to be air-conditioned and ventilated in such fashion that no cooking odors are permitted to reach the first class dining saloon, just forward of the galley, or the tourist dining room just aft of the galley. Between the galley space and the tourist dining saloon are two nicely appointed smaller dining rooms—one amidships and one on the port side.

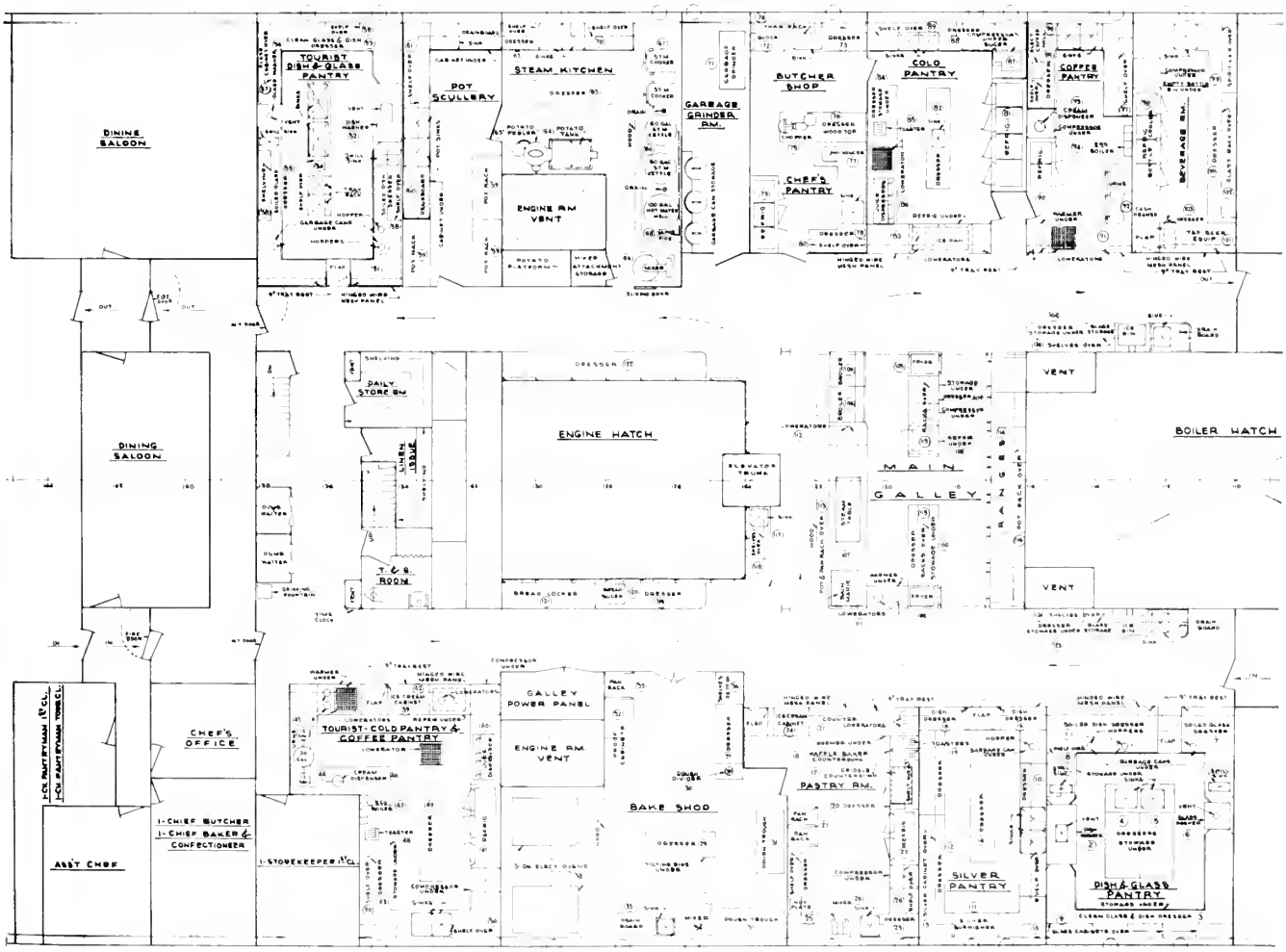
Note in the galley plan the free access for waiters and the free passages into and through and out of the galley from both the first class and the tourist class ends. Also note the very convenient arrangement of

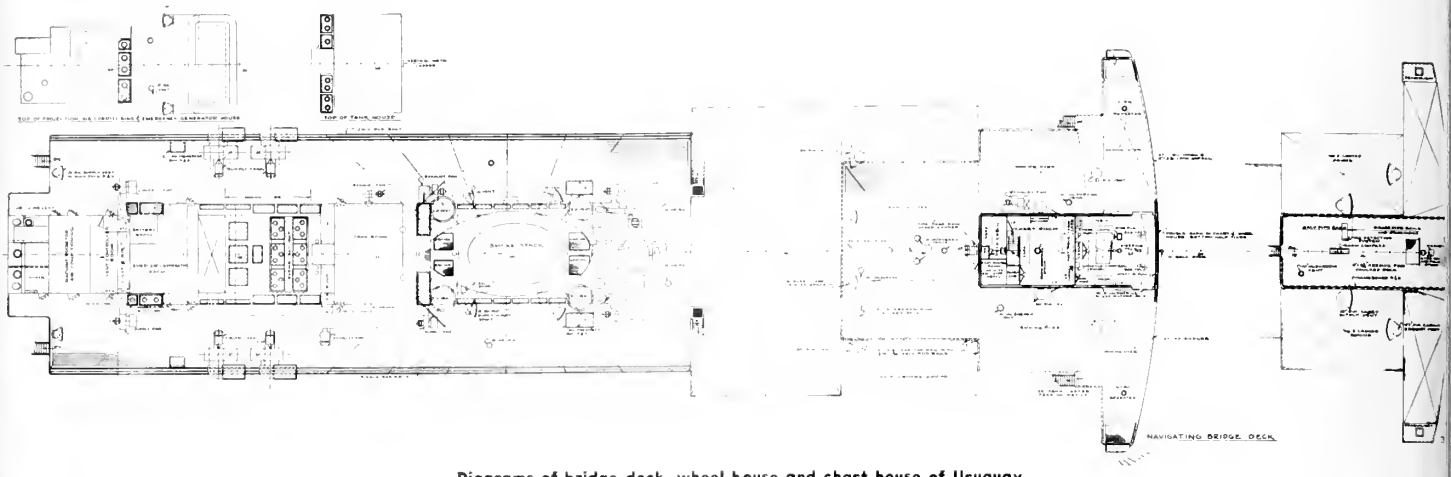


Outboard profile of Uruguay. For inboard profile, see folded insert.

●

Diagram showing arrangement of main galley, as well as various bakeshops and pantries.





Diagrams of bridge deck, wheel house and chart house of Uruguay.

special compartments port and starboard. A comparatively large space is devoted to the bakeshop and pastry room and these compartments are equipped with: dough troughs; electric dough mixers; two 3 deck electric bake ovens; ice cream cabinets; refrigerator; pastry mixer; waffle baker; and griddle.

The dish and glass pantries for each class are complete with large dresser and shelf capacity for soiled dishes and glassware and with electric dish washers and electric glass cleaners of ample capacity to serve the full complement of diners.

One very interesting item in this space is the garbage disposal unit. In its special compartment this unit comprises a number of covered garbage containers and a garbage grinder. This latter reduces all garbage to a pulp which is washed overboard by a stream of salt water. The grinder is then washed and dried ready for the next batch. This may be hard on the sea gulls but is much more sanitary and much less objectionable from the passenger viewpoint.

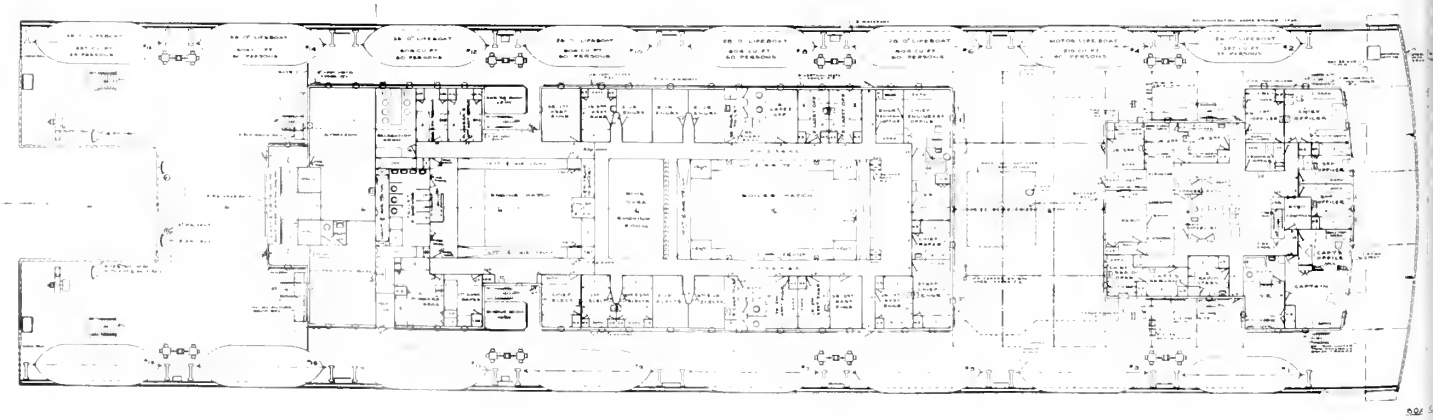
When finished the Uruguay and her sisters will be very fine examples of American intermediate class passenger and cargo liners. Their passenger accommodations will feature the spacious comfort and simple elegance that has characterized American marine interior design and decoration trends for the past 20 years.

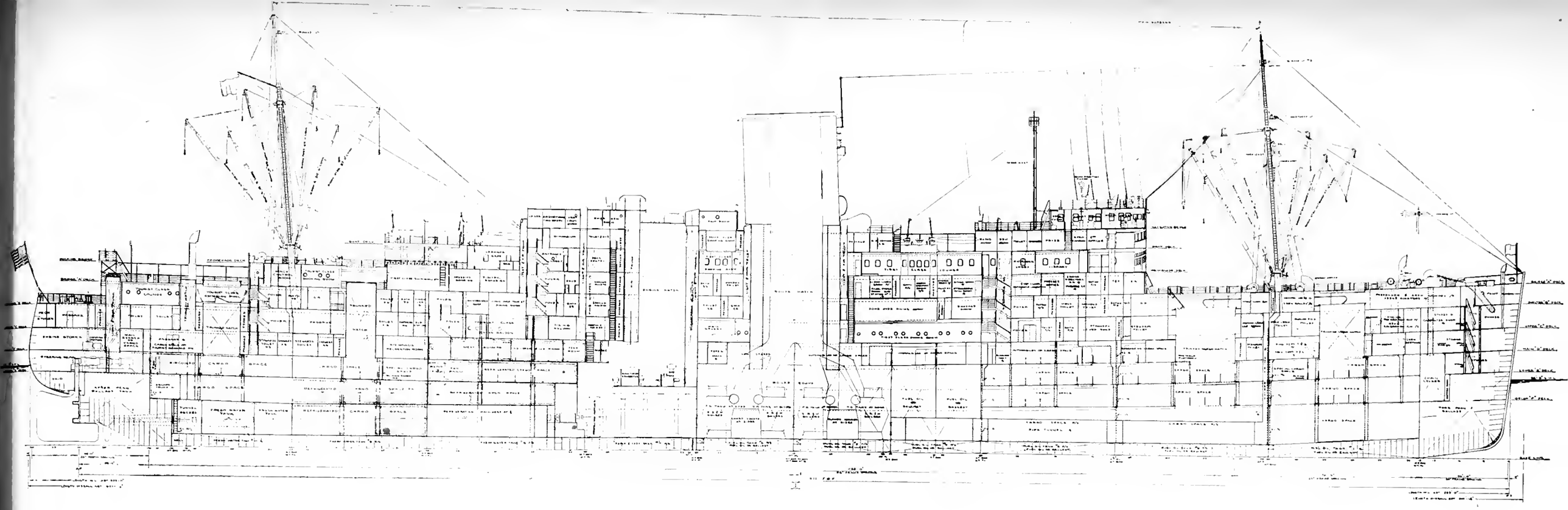
Propulsion Machinery

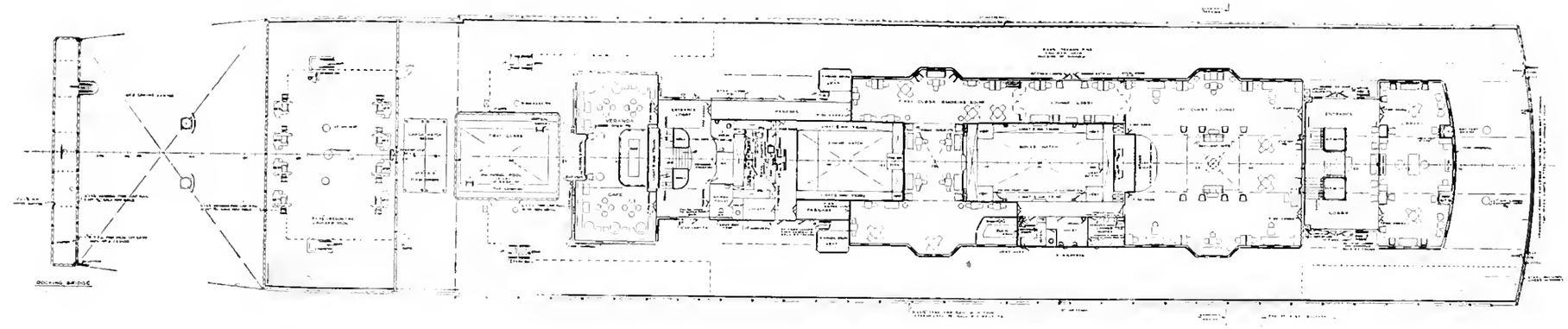
Their power plant comprises two General Electric turbo-generating sets each electrically connected at 3700 volts to a General Electric 8500 shp, 120 rpm, motor that drives by direct connection one of the propeller shafts. The turbines are supplied with steam at 275 psi 100° F. superheat, by 12 Babcock and Wilcox water tube boilers.

This plant drives the vessel with almost unbelievable smoothness and practically complete absence of vibration. In addition to this smoothness of machinery and propeller operation the hull lines of the Uruguay are very "kindly" in a sea way. The writer well remembers coming up on this vessel from San Diego to San Francisco on her first trip intercoastal. On retiring in a first class stateroom on "A" deck we filled a glass with water and placed it on the small table beside the bed. We could feel no vibration from the machinery and there was no movement of the water in the glass, which was brimful. In the morning the glass was still brimful after 185 nautical miles of ocean had passed under the keel. The most comfortable ship on which we have traveled.

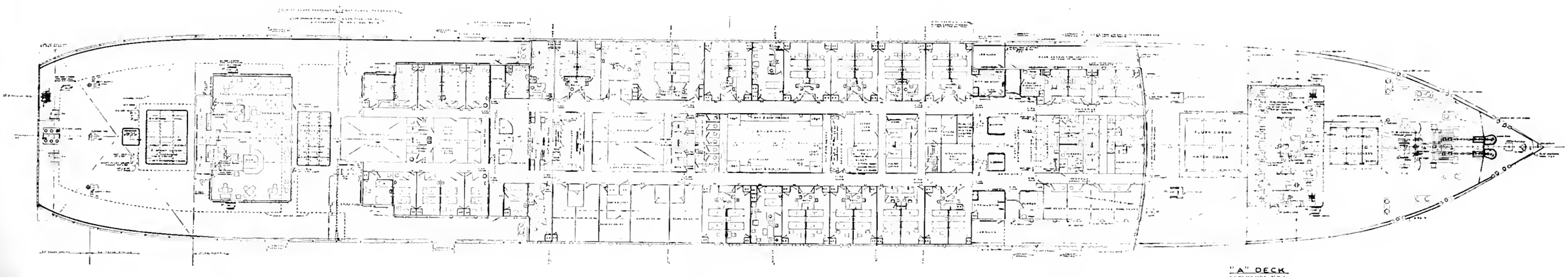
Diagram of boat deck.
On folded insert, inboard profile and arrangement plans of principal decks and machinery.







PROMENADE DECK



"A" DECK

'B' DECK

'C' DECK

'D' DECK

'E' DECK

Cycloidal Propeller

In our May issue we published an article on the Cycloidal Propeller. Further tests described herewith bring us up to date on this device.—Ed.

Tests conducted this month (May 7, 1946) on the Navy LSM 458 equipped with the revolutionary new cycloidal propeller opened a new age in marine navigation, according to unofficial naval reports. Two Navy admirals described the feats of the 900-ton craft as "unbelievable" and "fantastic" during the test maneuvers held in Puget Sound near Bremerton, Washington.

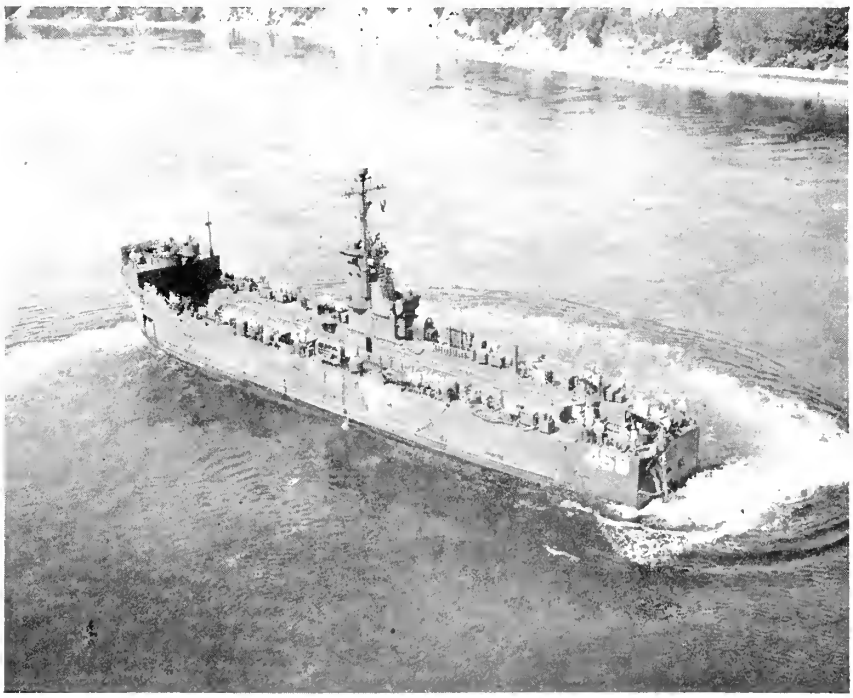
The propeller, invented by Prof. Frederick K. Kirsten of the University of Washington, enabled the craft to execute hitherto impossible maneuvers. These included a merry-go-round turn in which the ship turned completely around on its own axis. One excited signalman exclaimed when he saw the maneuver, "She turned on a dime and gave back nine cents change!" The ship came to a dead stop from a speed of nearly 14.5 knots per hour in her own length in just a few seconds. The most bizarre effect of all was the "crab walk" executed by the ship through the use of the new propeller. In this demonstration, the ship stopped several feet from a wharf and then moved **sideways** into its berth.

The cycloidal propeller was designed and built by the **Pacific Car and Foundry Company of Renton,** Washington, and installed by the **Everett Pacific Shipbuilding and Dry Dock Company of Everett,** Washington. It was built under the supervision of Thor O. Henrikson, chief engineer of the Pacific Car and Foundry Company, with Kirsten as consulting engineer.

The new cycloidal propeller also achieves 25 per cent greater efficiency and is applicable on all types of ships.

Upper: Equipped with the revolutionary new cycloidal propeller, view of the Navy LSM 458 in the process of executing a 360-degree turn without forward motion during recent tests in Puget Sound near Bremerton. The propeller also makes it possible for ships to move sideways and to come to a crash stop in a few seconds.

Lower: Completing a full 360-degree "merry-go-round" turn using the bow as a pivot.



Globe Wireless Ltd.

Reestablishes Communication Circuits

By Brigadier General W. P. Boatwright

Radio History on the Pacific

1920 Radio rates San Francisco to Shanghai 78 cents a word, 58 cents to Manila.

1923 Robert Dollar thought he should do something to cut down these rates.

1925 Robert Dollar bought out Simpson Radio Corporation, Seattle.

1926 Dollar Co. was given exclusive use of a band of short wave lengths between U. S., Hawaii, Philippines, and China for experimental point-to-point operation and to ships at sea anywhere for marine operation.

1927 Dollar interests arranged with Heintz and Kaufman of San Francisco to manufacture marine and commercial radio communication equipment under the Simpson patents.

1928 Dollar erected transmitting and receiving stations at Mussel Rock, 15 miles south of the Golden Gate, and placed receiving and transmitting equipment on the round-world liner President Taft. This equipment was carried by the Sir Hubert Wilkins North Pole expedition and by the Byrd Antarctic expedition, keeping both of these explorers continually in touch with the press of the world.

1929 After an experimental round the world trip and the necessary adjustments, the Mussel Rock station kept continuously in touch with the ship on the entire voyage.

1930 Robert Dollar, at the age of 86, acquired ownership of Heintz and Kaufman and was the pioneer in the use of short wave commercial radio communication, having erected stations at Los Angeles, Portland, Seattle, New York, Guam, Honolulu, and Manila, with instantaneous communication to any Dollar ship anywhere from any office. Then Globe Wireless Ltd. was incorporated.

1932 Robert Dollar passed away.

1934 Globe Wireless Ltd. pioneered in radio-mail service with radio rates of 13 cents a word to Manila, 5 cents a word to Hawaii.

1941-5 Globe Wireless was taken over by U. S. Army as a network of military communications.

1945 Honolulu station reopened as a commercial unit.

1946-January 2 Globe Wireless Ltd. acquired from the International Business Machines Corporation United States and foreign patent rights for the manufacture and use of Radiotype. San Francisco-Manila circuit and the San Francisco-Shanghai circuit are open this month (June).

Thus under the guidance of that "grand old man" of American Shipping, Captain Robert Dollar, and of his son R. Stanley Dollar, short wave commercial radio communication has been developed as a world-wide communication network.

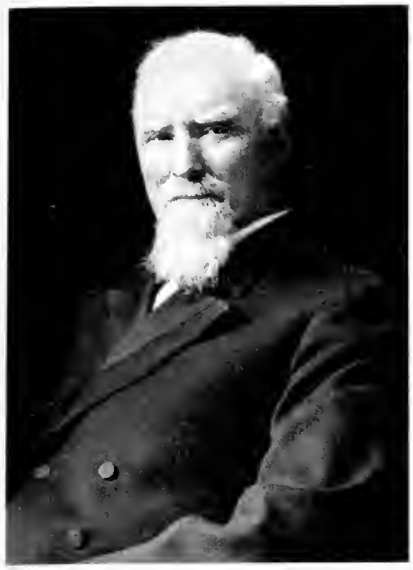
When operation of Dollaradio began in 1928, experimental radio communication on wave lengths between 15 and 50 meters was producing some amazing and phenomenal results. Reliable communication was possible over five times the distance and with one-tenth the transmitted power required for even fair to poor communication on the intermediate wave lengths, between 600 and 2500 meters, which at that time were used for ship-to-shore operation. These short wave lengths were also found to be remarkably free from atmospherics or static interference, which was always so prevalent on the conventional higher wave lengths.

Receiving and Transmitting Equipment

The first transmitters and receivers employed by the organization in those early pioneering days, although rather crude by comparison with present-day standards, were the best that could be built. In retrospect their performance was truly remarable.

The transmitters were all of the self-excited oscillator type, employing the Simpson circuit, with two large triode tubes operating with a self-rectified 350 or 500 cycle A.C. plate supply. The transmitting tubes were of a unique design in that they contained no grid elements as such, but incorporated two Tantalum plates with the filament suspended between them. One of these plate elements, being mounted in very close proximity to the filament, functioned as a grid. These tubes were known as the Type 255 Gammatron, and were manufactured by Heintz & Kaufman Ltd. They were very rugged and able to withstand over a kilowatt and a half of plate power for many thousands of hours of continuous

(The author is Vice President, Globe Wireless Ltd.)



Upper: Captain Robert Dollar, known the world over as the "Grand Old Man of the Pacific," was the founder of the Dollar Steomship Line, the Robert Dollar Co., and Chairman of the Board, Heintz & Kaufman Ltd.

Lower: R. Stanley Dollar, President of Globe Wireless Ltd., the Robert Dollar Co., and Chairman of the Board, Heintz & Kaufman Ltd.

detector, being the highly sensitive device that it still is, gave excellent results.

With the development of the screened-grid tube new receivers were designed which incorporated a stage of tuned radio frequency amplification ahead of the autodyne detector. With ever-increasing activity on the short wave bands as time passed, interference between stations operating on the same or adjacent frequencies or wave lengths also increased. The new receivers, with their tuned preselector stage, tuned antenna circuit, electrostatically shielded from the preselector grid circuit, provided the necessary selectivity to cope with the growing interference problem. These receivers proved so satisfactory that many were still in use as late as the beginning of the war in 1941.

Federal Regulation

It was not long after experimental operations began that it became quite apparent that practically all long distance radio communication, ship-to-shore and point-to-point, would be done on the short waves, and the problem of interference became very real as many new stations and ship installations appeared on the air. Federal rules and regulations relative to the maintaining of transmitter frequencies (wave lengths) within closer tolerances were laid down and strictly enforced.

Transmitters were modified and redesigned from time to time as the art developed. Temperature controls and air blowers were incorporated in order to maintain better frequency

Upper: Brigadier General Walter P. Boatwright, Vice President of Globe Wireless Ltd., in charge of all operations: communications and manufacturing.

Lower: Walter S. Lemmon, Vice President of Globe Wireless Ltd., and developer of Rodiotype, the automotic electronic typewriter device for radio and wire transmission of written communications. *(Affiliated Photo—Conway)*

Airplane "Stars and Stripes" being prepared for flight across Antarctic polar ice cap by Admiral Richard E. Byrd. During this flight two-way communication was carried on for 30 minutes with the Dollaradio station at Mussel Rock.

duty. The transmitters produced a smooth, musically modulated signal, not only pleasing to the ear of the receiving operator but also, by virtue of its side-bands, almost entirely free of rapid, or selective, fading — so noticeable and objectionable in signals of the pure A-1 or C. W. type.

The first receivers employed were designed to incorporate the Simpson circuit in a regenerative or autodyne (oscillating) detector, followed by 1 or 2 stages of audio frequency amplification. Since the problem of interference had not yet arisen (very few stations were operating on short wave at that time), the oscillating

KTK marine room, Mussel Rock Station, Globe Wireless Ltd., 1934. Map on wall shows daily positions of 19 passenger vessels, Dollar Steamship Line.

stability. Finally the same original transmitters were systematically rebuilt. The self-excited oscillator gave way to the quartz crystal controlled oscillator, buffers, doublers and final output amplifiers. Power was increased to 3 kilowatts. (Incidentally a very low power for commercial transoceanic service.) Directive antennas were installed and tried with great success and improvement in the speed of service. Two 10 kilowatt transmitters were built by Heintz & Kaufman Ltd. in 1935. One was installed at the Mussel Rock station and one at Manila. A marked improvement in service resulted.

Operations at this time were all carried on at the receiving station, located only 1200 feet away from the transmitting station, in which as many as eight transmitters were operating simultaneously, with most of the outgoing signals beamed directly in a line with the receiving station and antennas.

With expanding activity, addition of circuits, increased power, etc., it soon became apparent that a new receiving station more remote from the transmitters was needed.

In 1936 a new station was built, high on the Cahill Ridge, between the Spring Valley Lakes and Half Moon Bay. This became known as Globe's Skyline Station, and was equipped with modern, highly selective, superheterodyne receivers; directive antenna arrays for each point of communication; teletype circuits to the San Francisco offices; and landline control circuits to the Mussel Rock transmitting station.

By means of a device and system developed by the late Hans Otto Storm, then Globe's Chief Engineer, receivers were tuned remotely from the various operating positions in the San Francisco office. The device was known as the "Syndec Remote Receiver Tuning System" and proved quite effective in providing the receiving operator with a means of quickly adjusting his receiver to compensate for frequency drift or adjacent channel interference. Receiving operations were shifted from Mussel Rock to Skyline on a Sunday, without a moment's interruption of circuits.

In 1938, diversity reception (two or more separate antennas and receivers tuned to the same incoming signal) was added on the Manila circuit. Electronic re-keying or repeater relays were installed in San Francisco, making it possible for Manila and New York to communicate back and forth instantly; the signal from Manila or New York actuating an electronic relay which, in turn, controlled the Mussel Rock transmitter directed toward and being received by Manila or New York. This system speeded traffic over the busy New York-Manila circuit by several minutes otherwise lost in transfer time.

Neil D. Brown, Vice President in China, Globe Wireless Ltd., and B. J. Yoh, Director, Chinese Ministry of Communications, Shanghai Area, on October 27, 1941, sign 15-year contract for Globe Wireless International point-to-point service between China and the United States.

Post-War Development

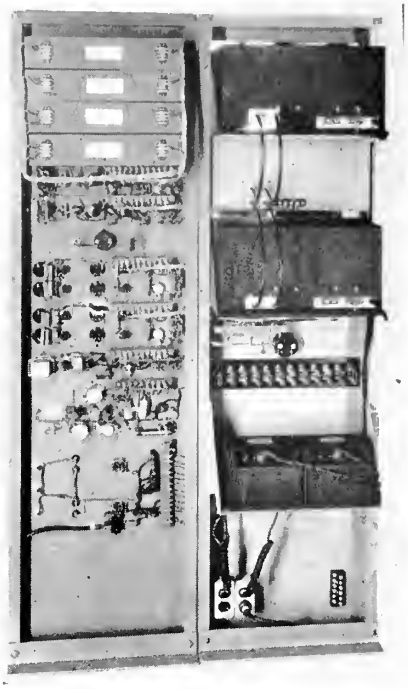
When Globe Wireless Ltd. resumed operations in 1945, most of the pre-war radio equipment, with the exception of transmitters, was rendered obsolete as a result of great strides and improvements in both ap-

First Dollaradio station built at Mussel Rock in 1928. Communication was maintained between this radio station and the S. S. President Taft of the Dollar Steamship Line on its voyages across the Pacific. Also nightly contact was made with the Admiral Byrd expedition at Little America.

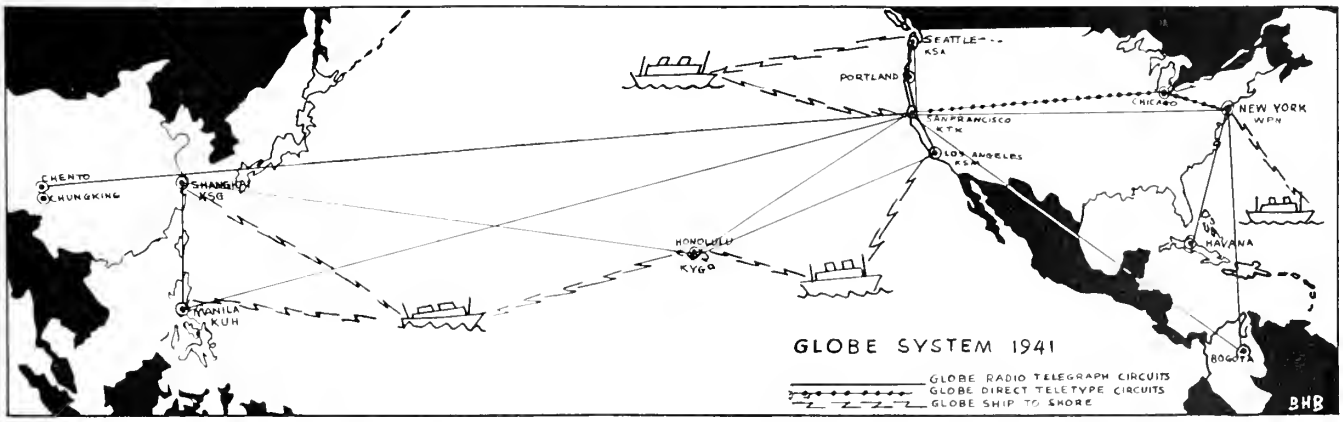
paratus and technique made during the war.

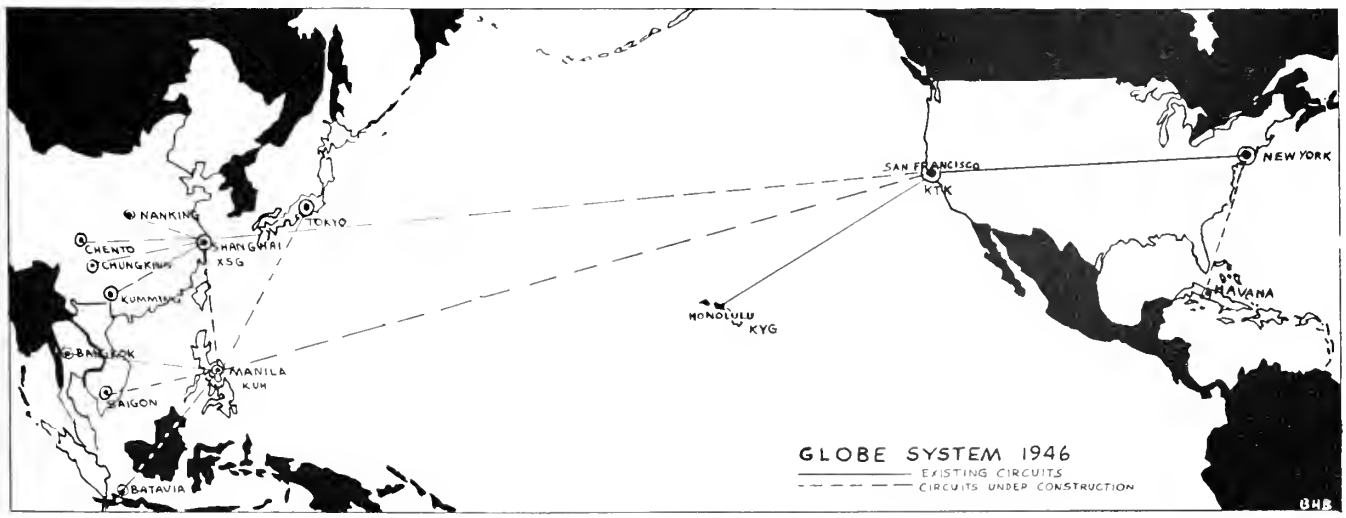
The neutral signal for "make and break" system of high speed radio telegraphy was rapidly being superseded by the system known as "carrier shift" or "frequency shift," in which the transmitter, rather than being started and stopped rapidly to produce dots and dashes of Morse characters or automatic pulse type signals, is made to shift its constantly ON carrier slightly, from one frequency to another, to produce such characters. These two frequencies are usually from 75 to 850 cycles apart, depending on the application.

By this system, selective fading at the receivers is greatly overcome, since the two frequencies (called MARK and SPACE) do not, as a rule, fade at the same given instant.



Rear view, carrier shift diversity equipment for point-to-point overseas reception, Shanghai, China, station, Globe Wireless Ltd., to be used in cooperation with the Chinese Government Rodio Administration.





Koeno Point Transmitting Station, Globe Wireless Ltd., situated on northwest coast, Island of Oahu, 40 miles from Honolulu. From this station the first word of the tidal wave on April 1, 1946, was flashed to San Francisco.

Such carrier-shift signals are received by means of electronic terminal equipment consisting mainly of band-pass filters, limiting amplifiers, mark and space filters, discriminators and rectifiers, a diversity signal mixer and a tone keyer, operated from two superheterodyne type radio receivers, the frequency of which is controlled by common high-frequency and beat-frequency oscillators, usually quartz crystal controlled in order to maintain the high order of stability required for high speed operation.

These oscillators are adjusted so as to produce two audio output frequencies from the carrier shifted signal being received. Both of these audio signals pass through the acceptance or band-pass filter in one channel of the terminal, after which they are amplified and limited by the limiting amplifier and introduced to the input terminals of the Mark and Space filters, which are in parallel.

One frequency (the MARK, say) finds its way only through the MARK filter, which is tuned to its frequency, and the other through the SPACE filter. The two signals of different audio frequencies are then rectified, after which they actuate a tone keyer which produces a constant level make and break tone signal of the desired frequency or pitch. This signal is fed over a land-line to the message center, where it is again rectified to Direct Current pulses which actuate the Radiotype machines and are converted into printed messages at the rate of over 100 words per minute.

Globe Wireless Ltd. now has installed the finest carrier shift terminal equipment together with new and modern transmitters at stations in San Francisco, New York, Honolulu, Manila and Shanghai.

Radiotype Equipment

The Globe Wireless Ltd. circuit from San Francisco to Honolulu, for the handling of public messages and press dispatches, is now in full two-way operation with Radiotype, the high-speed electronic typewriter method recently acquired from International Business Machines Corporation.

In New York, at 42 Broadway, Globe has a Communications office and a laboratory to be used in research and development. The executive offices in the Chrysler Building are in charge of Walter S. Lemmon, a radio engineer of long standing. As General Manager of the Radiotype Division of I. B. M., he directed the development of these automatic sending and receiving typewriters, over a period of more than ten years, into the fastest method now in existence for the automatic handling of written communication. Mr. Lemmon has also been a pioneer in the television field, and some years ago invented the "single dial" radio control now universally used in millions of home radio sets.

The acquisition of I. B. M.'s interest in Radiotype by Globe Wireless Ltd. is a most significant step for the communications company. Globe now is in a position to install direct-typing Radiotype machines not only over its own international circuits but is able to make them available for the offices and factories of a number of industries. This is of the utmost importance to the world's business community.

Many applications of Radiotype in business fields still remain to be explored. But wartime uses and post-war surveys have convinced the Globe engineering staff that this equipment is ready now to enter into the operations of such concerns as public utilities companies, municipal and state protection departments, airlines, railroads, manufacturing firms having widely separated plants; press associations, newspaper "chains" and the major banking houses with branches at various points. All such businesses and institutions will require new facilities for the more rapid interchange of vital information, of a nature that will cut down rather than increase their burdens of paper work which now absorb so much industrial effort. New communication facilities annihilate distance. Radiotype, when put to work with them, greatly reduces the factor of time. The forward thrust of modern business demands both of these economies, as well as the method to effect them.

Radiotype provides the method for the speeding up of point-to-point interchange of a wide variety of intelligence. The machines can be employed not only for the handling of ordinary messages and letters, but for many of the printed forms upon which the scattered units of large enterprises depend to integrate and record their day-to-day performance.

In public utilities, for example, Radiotype is capable of sending and receiving weather reports, load logs, construction orders and numerous other forms. It has the further advantage of supplying at the same time and in a single operation permanent printed records of such mat-

ters, to guard against errors and loss of documents. This transmission can be accomplished simply and economically, since many companies already have the carrier current or other equipment through which the machines can operate, over private telephone, electric light and even high-tension wires. With little or no modification of existing facilities, Globe's terminal equipment merely plugs into the PBX switchboard, taking the place of a telephone extension set. Somewhat similar installations would apply to almost any type of company having private communication lines, or considering their installation, for operation either by wire or radio.

Radiotype Machines

Each terminal unit includes a receiving printer, a transmitting printer, a perforator and an automatic reader for reading and transmitting automatically the message which has been punched in a tape. With this combination of units, messages may be transmitted and received simultaneously.

For one primarily interested in high speed communications it is desirable to have a punched tape produced at the same time a typewritten copy of the message is obtained at the transmitting end. The punched tape can then be fed into the automatic reader and transmitted over the air at high speed. The printer at the receiving end will operate at a speed of 100 words per minute, printing the message on a sheet form ready for delivery. This gives each circuit a capacity of 6000 words per hour.

Radiotype will not only operate at a speed of 100 words per minute, but is also provided with a standard keyboard, and if desired may be provided with any length of carriage up to 24 inches. Thus any type of form may be employed and information other than strictly communications can be readily transmitted and received.

For communications work, machines printing all capitals are provided. Competitive types of printers have only 31 keys. This requires continuous shifting of the type basket in order to print the required letters and numerals. These shift impulses occupy approximately 20 per cent of the circuit time. Furthermore, with this type of printer, should the shift impulse fail to register when transmitting ciphers, the whole message after that point may be lost and has to be transmitted again.

The Radiotype has 42 character keys. Therefore, all letters and numerals can be printed without shifting. This feature saves the 20 per cent of transmission time lost when using other types of printers, and also eliminates one serious source of errors, particularly when transmitting ciphers.

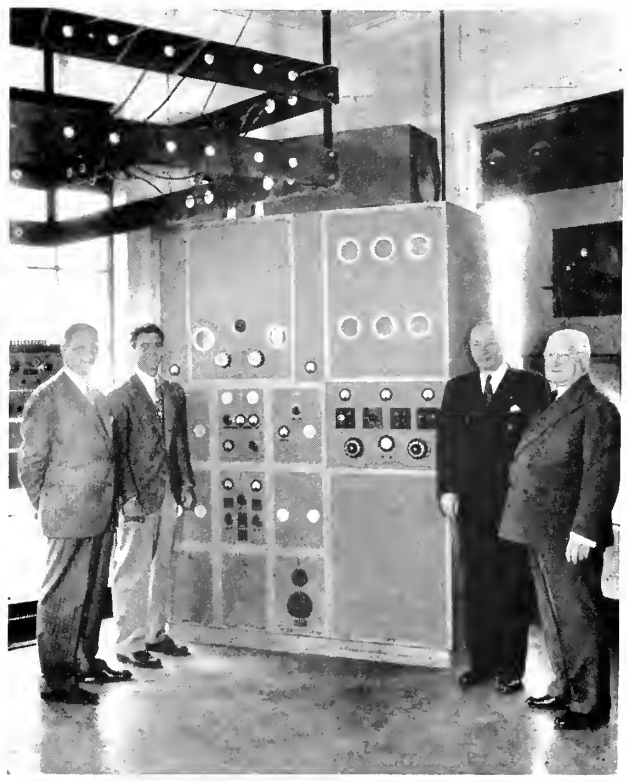
The machine has a standard keyboard and may be readily operated by any typist. As the typist operates the transmitting Radiotype, a written record is obtained, as with any standard typewriter. Simultaneously, this transmitting machine, in conjunction with its associated equipment, produces blocks of 1800 cycle tone. Each tone block may be considered as being divided into seven equal parts electronically by a sweep circuit, the first pulse being the start-stop pulse, and the remaining six in various combinations of presence and absence, transmitting the respective characters. These signals become DC at the keyer for keying the transmitter.

In operating Radiotype with carrier shift transmitters over long distances there is a noise reduction unit associated with the printer which will reproduce perfectly with noise levels many times higher than that of the signal level.

At the receiving end, the signal from the radio receiver is fed into a line amplifier associated with the Radiotype terminal equipment, and thence into an electronic timing device, which in turn actuates the keys of the Radiotype receiver.

The message is printed at a speed identical with that of the transmitting typist, if direct transmission is used, or at a speed of 100 words per minute, if automatic transmission is employed.

At present these Radiotype machines are being manufactured at the Endicott factory of International Business Machines Corporation, but plans are being formulated for their manufacture at the Heintz & Kaufman plant in South San Francisco.



Officials of Globe Wireless Ltd. inspect a 10-kw transmitter at Mussel Rock Transmitting Station preparatory to reopening of the Manila and Shanghai Globe circuits. Left to right: R. H. Andersen, Vice President; R. Stanley Dollar, Jr., Director; Brig. Gen. W. P. Boatwright, Vice President in charge of all operations: communications and manufacturing; and R. Stanley Dollar, President of Globe.

Insect Control on Ships

(DDT—Dichloro-Diphenyl-Trichloroethane)

By Dr. W. A. Simanton

Ships of all types, large and small, acquire a sizable crew of insect pests, often before they hit the water. This unbidden population can maintain and expand itself so readily that operators of vessels, from luxury liners to fishing smacks, soon face the problem of combating insects to protect passengers and cargo, as well as maintaining sanitation for crew and stores. By the proper use of new insecticidal products it is possible today to keep these annoying and destructive pests under control without prolonged tie-ups or constant vigilance.

Experiments demonstrating the high degree of control obtainable were performed at San Francisco on the S. S. William Kieth, a Liberty ship operated by the Matson Lines, and the S. S. Catawba Victory, a new ship operated by Oliver J. Olson and Company. Treatments were made by the C. J. Hendry Company with Shell Ship-Tox, a residual type DDT spray developed in laboratories of Shell Oil Company, Incorporated. This insecticide contains 5 per cent DDT and a small percentage of binder in petroleum insecticide base. It has the property of starting the paralysis of most insects within a few minutes after they are hit with the spray. The paralysis proceeds rapidly and culminates in the death of the insect within a few hours. The action of the insecticide does not, however, stop with the destruction of the insects directly sprayed. After the liquid dries to an invisible film, the DDT is held firmly on the surface, thus rendering treated areas toxic to insect vermin that later emerge from crevices and attempt to migrate. Shell Ship-Tox bears the following certification:

> "No. 189 11 October 1945
> Certificated for use as an article of stores on board vessels. This certification covers only hazard in the use of this product. The efficiency of this product is not passed upon.
> U. S. Coast Guard."

Application of the undiluted insecticide was accomplished with portable electric sprayers of two types. The larger, a 3/5-hp model which projected the spray 12 feet or more, was used in holds and large storerooms. The smaller 1/8-hp type was more convenient for spraying bunks and lockers in cabins. In all cases the spray was applied as a coarse mist to surfaces until they were slightly wet. Fogging of the air was avoided. All storerooms, pantries, mess halls, galleys, toilets, showers, cabins and gunners' quarters were treated by spraying exposed bulkheads and decks. In quarters, the exteriors of lockers, as well as bunk springs and undersides of mattresses, were also treated. In mess halls, the undersides of tables and seats were sprayed. Before treating pantries and galleys, the only precautions necessary to take were to shut down the stoves, put away foods and cover utensils.

The quantities of insecticide applied and the time required for complete treatment of each of the two vessels were as follows:

	S.S. WILLIAM KIETH		S.S. CATAWBA VICTORY	
Area	Gals.	Man-Hours	Gals.	Man-Hours
Hold 1	6	3	4	2
2	8	5.5	5.5	3
3	6	3	7	3
4	7	5	8	3.5
5	4	2	7.5	3.5
Above deck	9	18.5	6	14
	40	33.0	38.0	29.0

Insecticide and electric sprayers used in treating Matson Lines vessel.

These figures indicate that an experienced crew of four men, operating two sprayers, can treat an average cargo ship in one day. Because much of the spraying was done in confined quarters, operators wore goggles and respirators and followed the protective measures established for DDT sprays.

The degree in insect control obtained can be best expressed by a summary of observations made on each ship before and after treatment. The S.S. William Kieth, having just returned empty from a 10-month voyage to South Pacific points, was inspected prior to treatment and found to harbor a variety of vermin. Holds were infested with thousands of large American roaches, flour beetles and weevils, as well as a few spiders and miscellaneous stored products insects. In the crew's quarters, mess halls and storerooms, small German roaches and flies were the most abundant, although a few weevils were also present. As is often the case, these vermin were not easily apparent on casual observation because they hide in crevices, behind battens, under lockers, etc. During treatment the fast moving vermin, such as roaches and spiders, were easily seen. A few hours later the decks were covered with thousands of dead insects. Approximately 2000 dead American roaches were seen in each hold and as many as 24 dead German roaches were observed in each of several cabins.

After treatment, the S.S. William Kieth sailed to Manila with a general cargo, thence to Yokohama with Red Cross supplies, including candy and chocolate, and was subsequently decommissioned in Japanese waters in January, 1946. Chief Officer W. F. Lewis observed the efficiency of the treatment throughout the six months' voyage. No insects of any kind were seen in holds, storerooms or cabins, and only occasionally was a small German roach observed in the pantries. The chief officer reported that

The author is an entomologist with Shell Oil Company, Incorporated.

insect infestation had ceased to be a problem on the vessel.

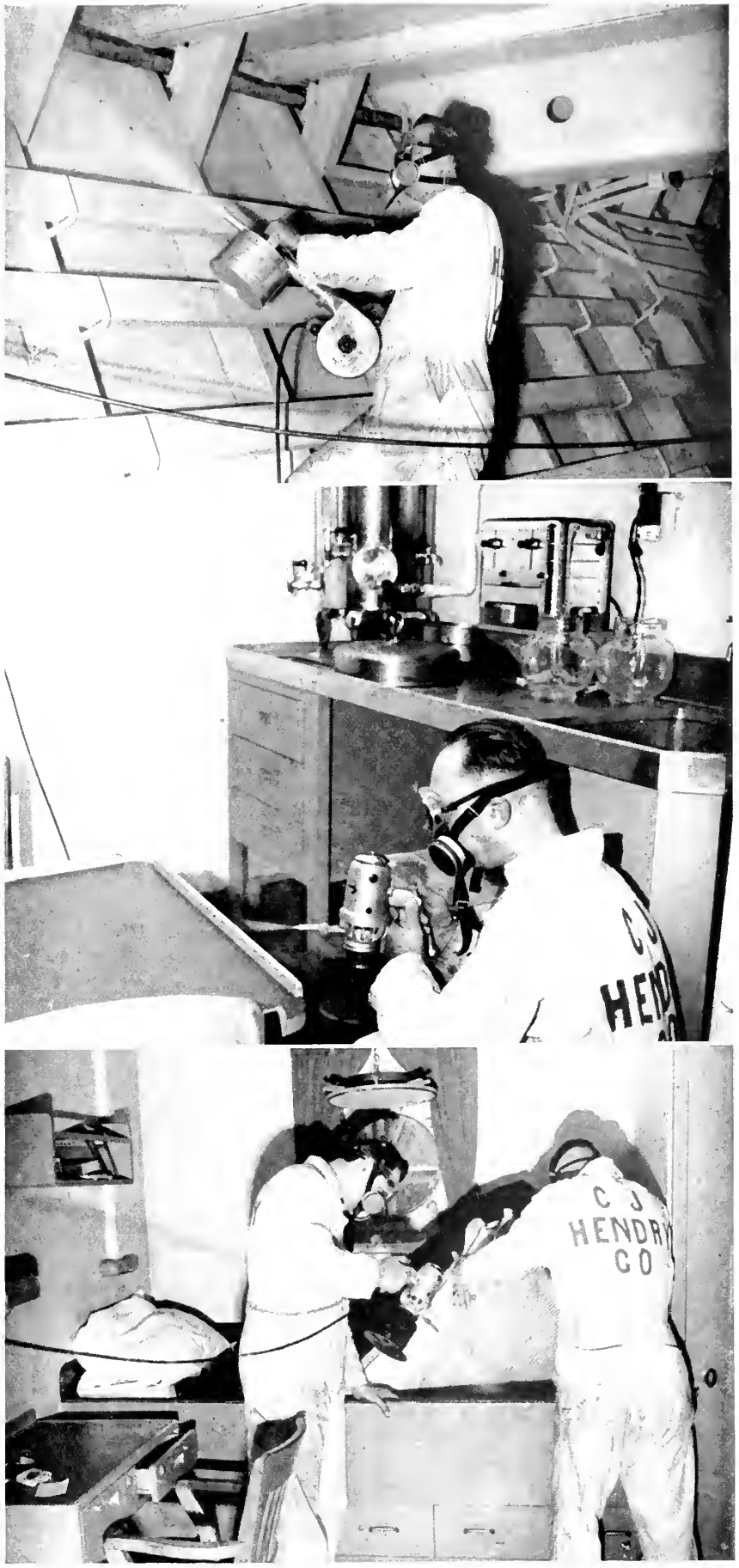
The S.S. Catawba Victory, being a new ship, harbored practically no insects at the time of spraying. The treatment was made to determine whether a new ship could be kept free of insects during an extended voyage. After treatment, the ship logged the following calls, arriving at New York February 16, 1946, with a cargo of tea, jute, burlap, rubber and manganese ore:

Sailed	Date
San Francisco	8- 4-45
Ulithi Carolines	10-10-45
Okinawa	12- 8-45
Manila	12-14-45
Singapore	12-18-45
Calcutta	1- 9-46
Colombo Ceylon	1-20-46
Suez, Egypt (SBE)	1-29-46
Port Said	2- 1-46

Arrived	Date
Ulithi Carolines	8-21-45
Okinawa	10-14-45
Manila, P. I.	12-10-45
Singapore	12-17-45
Calcutta, India	12-22-45
Colombo	1-12-46
Suez	1-29-46
Port Said	1-30-46
New York	2-16-46

Captain Grant advised that no insect problems were apparent in any part of the ship during the three months prior to taking on stores at Manila. At that time quantities of flour and other foodstuffs already infested with weevils were brought aboard. This infestation was so serious that the stores were jettisoned. A repetition of this occurrence followed restocking at Singapore. On arrival at New York, six months after treatment, an examination of the ship by the U. S. Public Health Service and entomologists of Shell Oil Company, Incorporated, revealed no insects present in holds, pantries, galleys, mess halls or living quarters.

Various military and public health officials concerned with ship sanitation have conducted similar experiments with DDT insecticides. The port surgeon at Fort Mason has stated that it has been their policy to retreat vessels, if possible, every three or four months, and, when this is done, insects as pests aboard ships are negligible.



Top: Treating No. 1 hold using 3/5-hp electric sprayer.

Center: Spraying undersurface of table with Shell Ship-Tox.

Bottom: Applying DDT spray to bunk in officer's cabin.

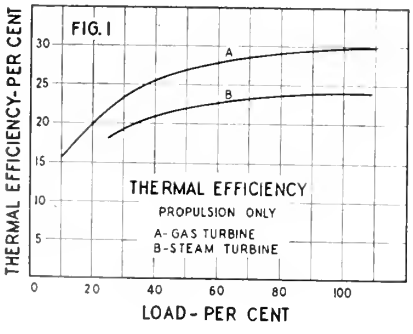
A Marine Gas Turbine Installation

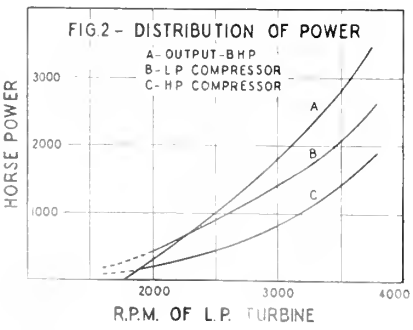
By Charles J. Johnson

Upon request of the Maritime Commission, the Federal Shipbuilding and Dry Dock Company undertook the preparation of plans and material orders for a proposed installation of an Elliott gas turbine. Subsequently work was increased to include preparation of specifications and performance of all work involved in effecting a complete installation in a Liberty Ship Collier, known as the EC2-S-AW1 type. The vessel to be used for the installation was built by the Delta Shipbuilding Company, and is equipped with a standard Liberty ship reciprocating engine installation, which will be entirely replaced with the gas turbine plant.

Efficiency and Performance

Before proceeding with a description of the proposed installation I wish to point out that published values of thermal efficiencies of gas turbines are in most cases not directly comparable with thermal efficiencies of steam turbine installations without adjustments to comparable conditions. Published gas turbine efficiencies are usually based on low heat values of fuel, often without a statement to that effect, whereas marine engineers in this country always use high heat values in their calculations. I have noted also that the efficiencies of gas turbine units, exclusive of independently driven propulsion auxiliaries and cooling losses, are sometimes used in comparisons with complete heat balances of steam turbine plants. Such practices are misleading and are detrimental to the development of the gas turbine.





The estimated general performance of the installation here discussed for average service conditions at sea gives a fuel rate of the propulsion plant exclusive of ship's service requirements under normal conditions as .437 lb. per shp. and a thermal efficiency based on 19,600 Btu heat value of the fuel as 29.7 per cent. The average thermal efficiency of a number of steam turbine propulsion plants designed for operation with steam at 450 lbs. pressure and 750° F. temperature is 24.3 per cent. The indicated advantage in efficiency of the gas turbine over what may be termed a standard steam turbine plant is therefore 22 per cent.

We must bear in mind that the efficiencies of the various components of steam turbine plants are well established by actual service performance, whereas for the gas turbine plant we must rely on laboratory and shop tests, and certain Houdry process plant experience which can be applied. There is no marine service experience with gas turbine equipment available at this time. Moreover the over-all performance of the gas turbine is affected to a greater degree by variations in efficiencies of components than is the case of the steam turbine. For the installation under discussion, for instance, a variation of 1 per cent in compressor efficiency will result in 1.2 per cent variation in over-all efficiency, and a variation of 1 per cent in turbine efficiency will cause a variation of 1.48 per cent in over-all efficiency.

We must bear in mind also that the efficiency of the gas turbine given in the foregoing can be realized only by employing temperatures greatly in excess of steam temperatures heretofore used in either land or marine power plants. It cannot be stated that sustained satisfactory performance of the materials subjected to the high temperatures involved is assured. It is to be hoped that manufacturers of gas turbine equipment will soon be at liberty to publish complete data relating to the physical characteristics of the alloys they employ in their designs. Satisfactory materials for use under high temperatures are well worth striving for, not only to achieve improved economy resulting from higher temperatures, but also to make possible simpler power plant installations, which is an important feature of the gas turbine.

It is expected that reasonably good efficiency will be obtained at part loads. This will be accomplished by segregating the controlling and driving turbines; the provision of one stage of reheat, by means of which constant gas temperature to the driving turbine can be maintained; and by the use of a regenerator. A comparison of part load efficiencies of the unit here discussed with that of a typical steam turbine plant is shown in Fig. 1.

The division of power between the two turbines at varying rpm, that is, the power delivered to each compressor plus the useful power delivered at the low pressure turbine

(The author is Chief Engineer, Federal Shipbuilding and Dry Dock Company. Text is extracted from a paper read March 22 before the New York Metropolitan section of the Society of Naval Architects and Marine Engineers.)

coupling based on rpm, is illustrated in Fig. 2.

Fuel

Diesel fuel oil will be used for all purposes for this installation. It is understood, however, that the development of equipment which will permit the use of Bunker C oil has advanced to the point where its use can be predicted. Considerable attention is also being given to the use of coal. It is fully realized by engineers interested in the development of marine gas turbines that the use of low-cost fuel is an important factor in their successful application.

Machinery Weight

Type	Weights Dry Tons	Wet Tons
Gas Turbine	332	339
Steam Turbine	366	399
Reciprocating Engine	417	445

Improved plant efficiency and increased revolutions of rotating equipment have resulted not only in decreased weight but also in decreased space requirements. It is significant that the plant here discussed not only (as shown in table herewith) weighs less than a steam turbine installation of comparable power but the propulsion unit occupies 23 per cent less cubic and 45 per cent less floor area. It would appear, therefore, that machinery compartments of ships designed for gas turbine installations should be considerably less than permitted by existing rules, and that the economics of the situation will eventually lead to rule modifications whereby the benefit of machinery space saving can be realized.

Machinery Equipment and Arrangement

The installation herein described is considered experimental in two respects: (a) the use of a gas turbine propulsion plant in a merchant ship, and (b) the use of controllable pitch propeller. The propulsion unit is, I believe, the first installation of its type, although there are or soon will be similar installations in naval vessels. Controllable pitch wheels have been used extensively by the Navy for landing craft and on a few vessels of other types. They have also been used by European builders. In this country, however, their use on merchant ships is, as far as I know, limited to one installation on a C1-M-AV1 vessel built for the Maritime Commission. My information is that this installation is proving very satisfactory.

The arrangement of the gas turbine unit to be furnished by the Elliott Company is shown in diagrammatic form in Fig. 3. It will be noted that a two-shaft arrangement is provided, with the high pressure or controlling turbine driving the 1st stage

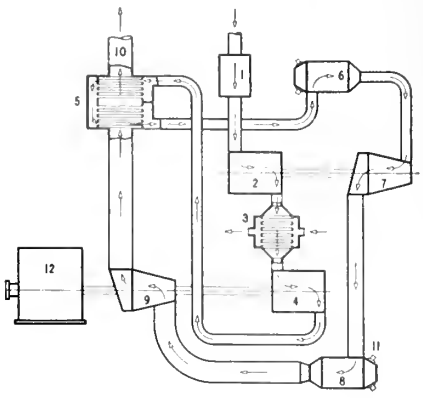
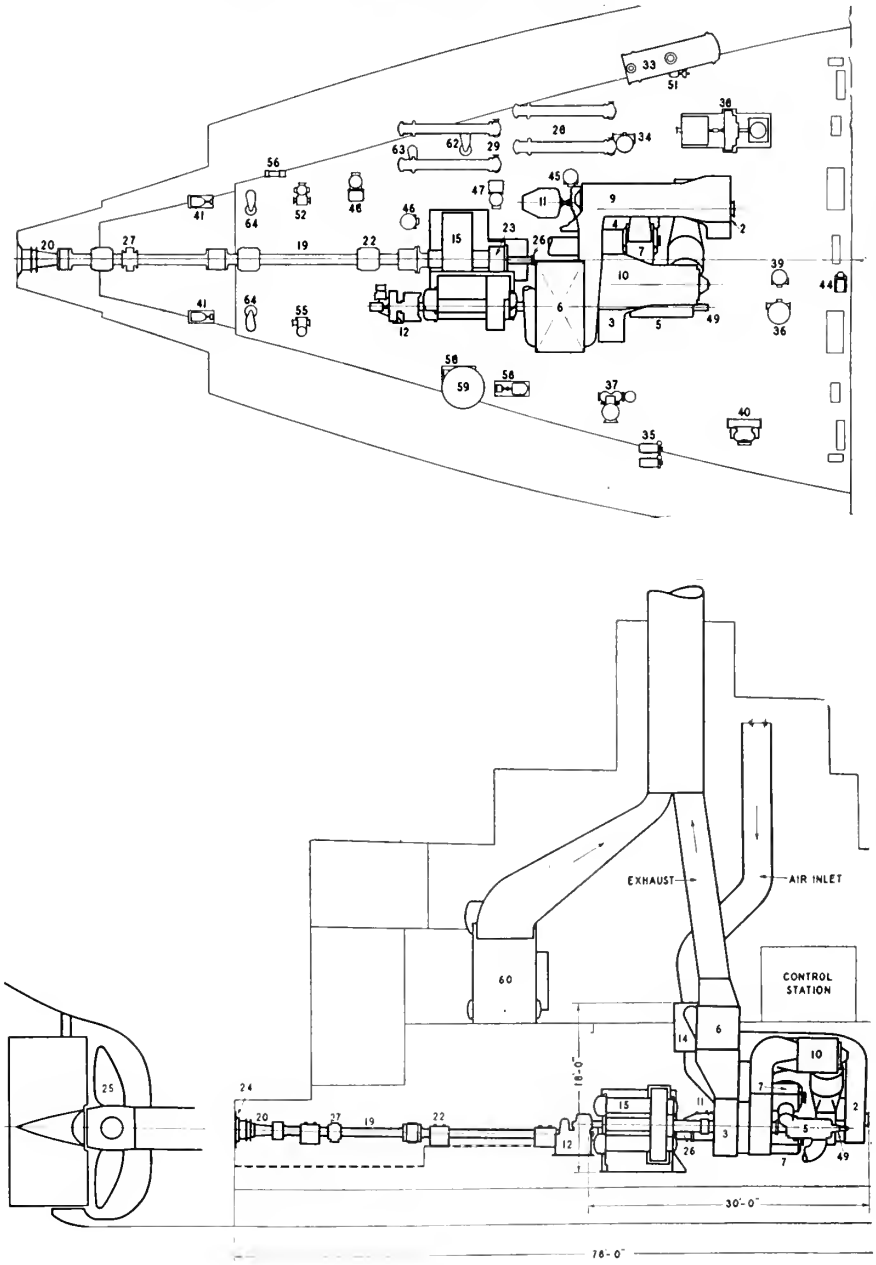


Fig. 3, right: Diagram arrongement of gas turbine. (1) Intake silencer and filter. (2) L. P. compressor. (3) Intercooler. (4) H. P. compressor. (5) Regenerator. (6) H. P. combustion chamber. (7) H. P. turbine. (8) L. P. combustion chamber. (9) L. P. turbine. (10) Exhaust to stack. (11) F. O. burner. (12) Reduction gear.

Fig. 4, below, top: Arrangement of machinery plan.
Fig. 5, below, bottom: Arrangement of machinery elevation.



or low pressure compressor mounted on one shaft, and with the low pressure or driving turbine and 2nd stage or high pressure compressor mounted on the 2nd shaft, which will also be connected to the reduction gear unit. The gas path can readily be traced. A description of the principal design features was published in Pacific Marine Review. For various conditions of operation the gas flow to both turbines and the temperature of the gas flowing to the hp turbine will vary, while the temperature of the gas flowing to the L.P. turbine will remain approximately constant.

A list of machinery equipment to be installed in the vessel, together with the salient characteristics of each equipment item, is shown in the table herewith. The arrangement of the principal machinery items in the vessel is shown in Figs. 4, 5 and 6. This arrangement has been adapted to the space allocated for machinery in the original design.

For this installation separate lubrication systems are required for the gas turbines and for the reduction gears, because of the different oil characteristics required for each. For the turbines and compressors a light oil with a viscosity of about 200 S.S.U. at 100° F. will be used. Reduction gears will be lubricated with oil of about 400 S.S.U. at 100° F., which will also be used for propeller pitch operation. Both systems will be of the pressure type. The necessity for two lubricating oil systems with necessary equipment for each system is of course an expensive complication which eventually should be eliminated.

The burners to be used in this installation differ radically from the diesel type injection used for the pilot unit. They will be constant pressure, mechanical atomizing type as manufactured by the Engineer Company of New York. Capacity control will be accomplished by varying the width of tangential slots in the whirl chamber at the burner tip and by changing the whirl chamber volume and the orifice opening. These variations are accomplished by means of a single moving rod within the burner. Test results show that the burner capacity with relation to the position of the rod is approximately a straight line for any given supply pressure. This fortunate relationship makes possible the design of a simple pneumatic type control for automati-

LIST AND PARTICULARS OF MACHINERY

Item No. No. Req.	ITEM	MANUFACTURER OR SUPPLIER	TYPE	RATING, ETC.
	HULL ENGINEERING AND FITTINGS			
1 1	Steering Gear	Struthers-Wells	Electric-Hydraulic	70 deg. in 30 min.
	All other items of Hull Engineering and Equipment will be as originally installed in the vessel.			
	MAIN PROPULSION MACHINERY			
2 1	Main Turbine—HP	Elliott	Reaction	2540 bhp max.
3 1	Main Turbine—LP	Elliott	Reaction	5172 bhp max.
4 1	Air Compressor—LP	Elliott-Lysholm	Rotary-Displacement	Capacity max. 24,366 cffa/min., inlet pressure-0.26 psi, discharge pressure 27.64 psi
5 1	Air Compressor—HP	Elliott-Lysholm	Rotary-Displacement	Capacity max. 24,366 cffa/min., inlet pressure 27.14 psi discharge pressure 74.98 psi
6 1	Regenerator	Harrison	Extended Surface	Gas: 112,968 lb/hr, inlet temp. 963 F, outlet temp. 504 F Air: 110,160 lb/hr, inlet temp. 261 F, outlet temp 789 F
7 1	Inter Cooler			Air: 111,600 lb/hr, inlet temp. 310 F, outlet temp. 101 F Water: 600 gpm, inlet temp. 80 F, outlet temp. 102 F
8 1	Sealing Air Cooler	Elliott		314 cffa/min.
9 1	Combustion Ch., HP	Elliott		Oil 920 lb/hr, temp. air inlet 789 F, temp. gas outlet 1335 F
10 1	Combustion Ch., LP	Elliott		Oil 493 lb/hr, temp. gas inlet 1120 F, temp. gas outlet 1400 F
11 1	Starting Motor	Elliott		100 hp, 1750/900 rpm, 115 volt d-c
12 1	Emergency Propulsion Turbine	Elliott	Impulse	300 bhp
13 1	Intake Filter	Elliott		
14 1	Intake Silencer	Elliott		
15 1	Main Reduction Gear	Farrel Birmingham	Double Reduction Double Helical	3300 shp max.
16 1	Turning Gear, H.P. Turbine	Elliott		1 hp
17 1	Turning Gear, L.P. Turbine	Elliott		1 hp
18 1	Turning Gear Reduction Gears	Farrel-Birmingham		5 hp
	SHAFTING, SHAFT BEARINGS AND PROPELLER			
19 2	Line Shaft	Morgan Smith	Hollow Forged Steel	O.D.=13 $\frac{9}{16}$ in., I.D.=6⅞ in.
20 1	Propeller Shaft	Morgan Smith	Hollow Forged Steel	O.D.=17 in., I.D.=6⅞ in.
21 3	Pitch Control Shafts	Morgan Smith	Solid Forged Steel	Diam.=6½ in.
22 3	Bearings—Line Shaft	Federal	Ring Oiled	
23 1	Bearing—Main Thrust	Farrel-Birmingham	Kingsbury 6 shoe	Max. thrust=81,000 lb.
24 1	Stern Tube	Federal	Cast Steel	
25 1	Propeller	Morgan Smith	4 Blade, Controllable Pitch	Diam.=17 ft. 6 in.
26 1	Servo Motor Control	Westinghouse Air Brake	Pneumatic	
27 1	Prop. Hub Equalizer	Morgan Smith	Cast Steel	Diam.=14½ in.
	HEAT TRANSFER EQUIPMENT			
28 2	L.O. Coolers (Gas Turbine)	Davis	Single Pass Straight Tube	Cooling surface 207.6 sq. ft., oil flow 72 gpm, water flow 175 gpm, oil temp. 130-105 F, water temp. 85-90 F
29 2	L.O Coolers (Reduction Gears)	Davis	Single Pass Straight Tube	Cooling surface 131 sq. ft., oil flow 80 gpm, water flow 150 gpm, oil temp. 125-110 F, water temp. 85-89 F
30 2	L.O. Coolers (Diesel Generators)	Ross	Single Pass Straight Tube	20 sq. ft. cooling surface
31 2	Fresh Water Coolers (Diesel Generators)	Ross	Single Pass Straight Tube	60 sq. ft. cooling surface
32 2	Lub. Oil Heaters	Davis	Straight Tube	Heating surface 4.8 sq. ft.
33 1	Aux. Condenser	Originally installed	Two Pass	Cooling surface 700 sq. ft. Steam condensed 15,000 lb/hr @ atmospheric pressure

Item No.	No. Req.	ITEM	MANUFACTURER OR SUPPLIER	TYPE	RATING, ETC.
		PUMPS			
34	1	Circulating—Main	De Laval	Vert., cent., M.D.	1500 gpm, total pressure 15 psi, 20 hp motor
35	2	Circulating—Dsl. Gen.	Allis-Chalmers	Hor., cent., M.D.	120 gpm, total pressure 25 psi, 3 hp motor
36	1	Fire and Bilge	De Laval	Vert., cent., M.D.	400 gpm, discharge pressure 125 psi, 50 hp motor
37	1	Fire & General Serv.	Worthington	Vert., Simplex, Steam	400 gpm, discharge pressure 125 psi
38	1	Clean Ballast	Originally	Hor. rotary, geared turbine drive	2500 gpm, total pressure 35 psi
39	1	Bilge	De Laval	Vert., cent., M.D.	425 gpm, total pressure 25 psi, 10 hp motor
40	1	Fuel Oil Transfer	Worthington	Vert., duplex steam	200 gpm, total pressure 35 psi
41	2	Fuel Oil Booster	Elliott	Gear, M.D.	10 gpm
42	3	Fuel Oil Service (Gas Turbine)	Elliott	Gear, M.D.	5 gpm
43	1	Fuel Oil Service (Boiler)	Best-Quimby	Gear, M.D.	250 gph, discharge pressure 40 psi
44	1	Priming	Nash	Hyd-Vacuum, M.D.	21 cfm, vacuum 15 in. Hg
45	1	L.O. Service (Gas Turbine)	De Laval-IMO	Vert, screw, M.D.	100 gpm, total pressure 48 psi, 5 hp
46	1	L.O. Service (Reduction Gears)	De Laval-IMO	Vert, screw, M.D.	100 gpm, total pressure 48 psi, 5 hp
47	1	L.O. Standby (Gas Turbine)	Worthington	Vert., simplex, steam	100 gpm, total pressure 48 psi
48	1	L.O. Standby (Reduction Gears)	Worthington	Vert., simplex, steam	100 gpm, total pressure 48 psi
49	1	L.O. Booster	De Laval-IMO	Hor., screw, attached	15 gpm, discharge pressure 90 psi, spare pump furnished
50	2	Compressor Jacket Circulating	Elliott	Hor., cent., M.D.	15 gpm, total pressure 5 psi, ⅓ hp
51	1	Condensate	De Laval	Hor., cent., M.D.	30 gpm, discharge pressure 25 psi, 1½ hp
52	1	Boiler Feed	Worthington	Vert., simplex, steam	40 gpm, discharge pressure 200 psi
53	1	Feed Injector	Schutte-Koerting	Double tube, steam	40 gpm, discharge pressure 200 psi
54	2	Drinking & Washing Water	Originally installed	Hor., duple, M.D.	10 gpm, total pressure 60 psi ¾ hp
55	1	Sanitary	Originally installed	Vert., simplex, steam	140 gpm, total pressure 60 psi
56	1	S.W. Evap. Feed	Worthington	Hor., duplex, steam	20 gpm, total pressure 50 psi
57	1	Distilled Water Distributing	Worthington	Hor., duplex, steam	8 gpm, total pressure 15 psi
58	2	Hydraulic Oil		Hor., gear, M.D.	28 gpm, total pressure 300 psi, 7½ hp
59	1	Hydraulic Oil Tank	S. Morgan Smith	Cyl. steel plate	600 gal, 300 psi
		OTHER EQUIPMENT			
60	1	Boiler	Foster-Wheeler	"D" type	15,000 lb/hr max., working pressure 150 psi
61	2	Fuel Oil Burners	Best	Rotary cup, M.D.	50-600 lb/hr
62	1	L.O. Purifier (Turbine)	Sharples	Centrifugal, M.D.	300 gph, 2 hp
63	1	L.O. Purifier (Red. Gears)	Sharples	Centrifugal, M.D.	300 gph, 2 hp
64	2	F.O. Purifiers	Sharples	Centrifugal, M.D.	300 gph, 2 hp
65	2	Air Compressors	Ingersoll-Rand	2 stage, M.D.	10 offa/min., discharge pressure 320 psi, 7½ hp
66	1	S.W. Evaporator	Originally installed	Coil	25 ton/day
67	1	Refrigeration Compressor	Originally installed	Freon 12, M.D.	10 hp
68	2	Aux. Generators	Engine—Superior Generator—Elliott	6 cyl., vert., S.A. Solid inj. 2 wire	150 kw 120 volt, d-c
69	1	Emergency Generator	Originally installed	4 cyl., vert., S.A.	120 volt, d-c 10 kw

All necessary controls, telegraphs, fire detecting and extinguishing systems, tanks, lifting gear, etc., will be included.

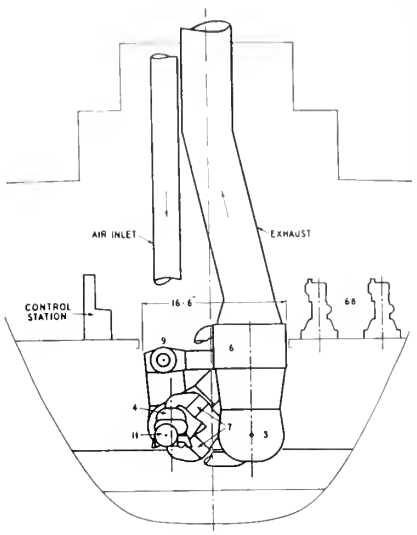


Fig. 6: Arrangement of machinery section.

cally positioning the rod and controlling combustion. The capacity range of the burner will be well above the requirements of the installation.

Two burners will be installed in each combustion chamber, one for normal operation and one stand-by. The installation will be so designed that either burner can be retracted into the cool zone, and away from the radiant heat of the chamber when not in use, or removed entirely while the chamber is in operation. Ignition will be by high potential electric spark from heavy electrodes, which will be used only when lighting off. Ignition electrodes will be arranged for retraction from the high temperature zone. The introduction and retraction of the electrodes will be controlled from the operating station.

There will be three rotary gear type motor driven pumps for supplying oil to the burners, one being a stand-by. The pressure at the burners will be maintained at 400 psi, which will be controlled by a regulating valve installed in the discharge of each pump.

Regenerator

For this installation, however, a regenerator of the plate type will be used. As shown in the arrangement, it will be located above the turbines. It will be made up of thin corrugated nickel plates arranged for counter flow of air and exhaust gas. Under maximum conditions the pressure drop on the air side will be about

.27 psi and on the gas side about .4 psi. Its air side effectiveness will be .75.

Thermal Expansion and Contraction

The exhaust ends of the turbines are anchored, leaving the inlet ends unrestrained and supported by a system of freely moving links. The upper link journals are carried on the turbine bearing housing. The lower journals are carried on the turbine base. This construction permits securing of the turbine casings to their foundations without the use of sliding feet or flexible connections. Turbine casings are supported on radial pins so designed as to allow free movement of the casing relative to the rotors. Double flexible couplings and long torque tubes are provided for absorbing the relative movement between turbines and driven machines. Spun nickel toroidal expansion joints are used in the interconnecting ducts to prevent transmission of harmful stresses to the turbine casings.

Reduction Gears

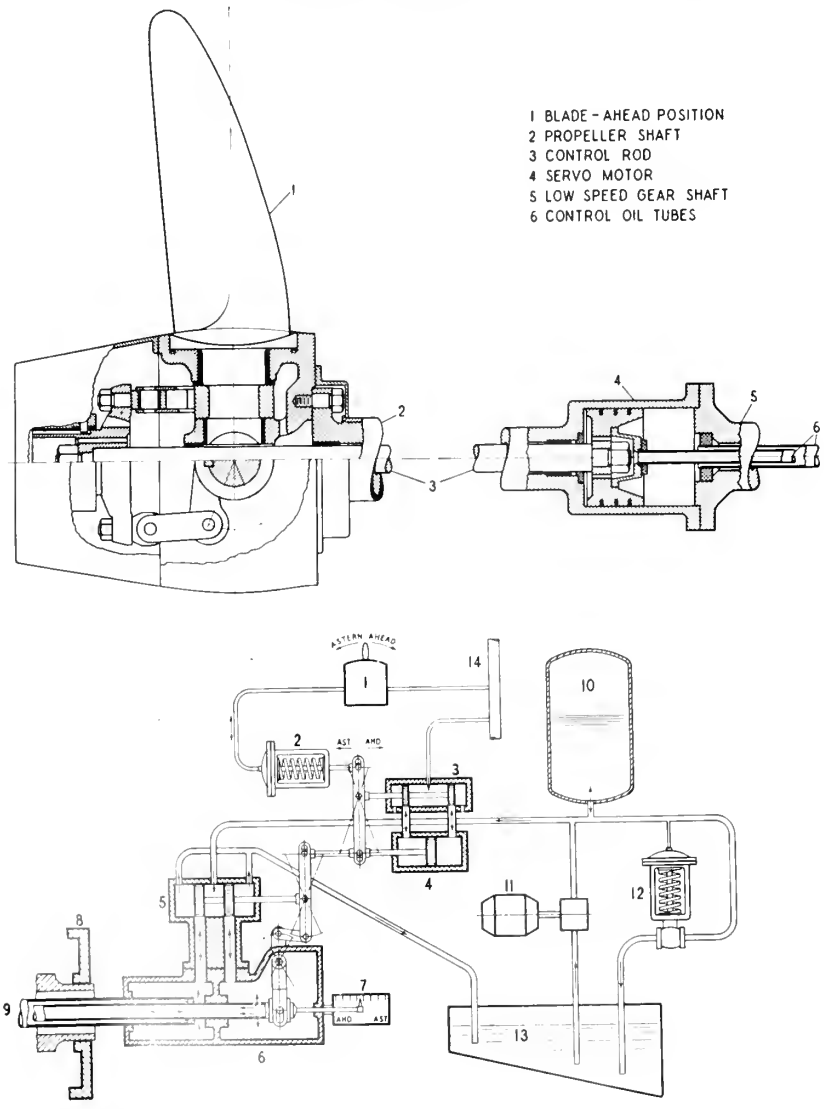
The reduction gears will be of the double reduction lock-train type, having a single high speed pinion connected through a flexible coupling to the driving turbine. The high speed pinion will drive two intermediate gears each of which will drive its low speed pinion through a quill shaft and flexible coupling. Each low speed pinion will engage the low speed gear. The shaft of the low speed gear will be hollow bored to accommodate oil pipes for transmitting oil required for operation of the controllable pitch propeller. This construction was selected as preferable to radially bored holes in the line shaft.

At normal conditions the tooth pressure per inch of face per inch of pinion pitch diameter will not exceed 60 pounds. The design will be based on the following normal conditions: 3609 rpm on high speed pinions, 675.9 rpm on high speed gears; 675.9 rpm on low speed pinions; 90 rpm on low speed gear. A motor driven turning gear will be connected to the high speed pinion.

As an emergency safety feature a steam turbine capable of developing 300 hp will be connected through gears and a clutch to the high speed pinion. This unit will be used only in case of failure of the gas turbine and will develop sufficient power to drive the vessel approximately 45 per cent of normal speed, or about 5½ knots.

Fig. 7, top: Controllable pitch propeller.

Fig. 8, bottom: Propeller pitch control. (1) Pitch controller. (2) Air control valve. (3) Air relay valve. (4) Air power piston. (5) Servo motor control valve. (6) Oil distributor head. (7) Pitch indicator. (8) Main thrust housing. (9) Servo motor supply tubes. (10) Hydraulic pressure tank. (11) Pump. (12) Bypass valve. (13) Oil drain tank. (14) Air supply line.



Propeller

Since the gas turbine is non-reversible, the use of reduction gear drive necessitated the use of a controllable pitch propeller for backing and maneuvering operations. The installation consists of a 4-bladed propeller mounted on a hollow tailshaft and connected by 2 lengths of hollow lineshafting to the coupling of the reduction gear. The control mechanism will be designed to move the propeller blades from full ahead position to full astern position in 6 seconds when the vessel is proceeding ahead under normal power. A sectional view of the propeller is shown in Fig. 7. Complete model basin tests of the propeller will be made.

The propeller blades will be hydraulically actuated and will be controlled by arms and linkage actuated by a control rod extending through the hollow shafting from the propeller hub to a servomotor piston within its cylinder in the foremost length of lineshafting. Two concentric steel tubes pass through the hollow shaft of the low speed element of the reduction gear for transmission of oil from a distributor head mounted forward of the reduction gears, to the servomotor cylinder. The inner of these tubes will be attached to the servomotor piston, and

(Continued on page 150)

The Subsidized Operators And Federal Taxes

*By Arthur B. Poole**

EDITOR'S NOTE

Uncertainty as to the future ship-construction programs of twelve steamship lines receiving operating-differential subsidies from the Maritime Commission was seen recently as it was learned that the Moore-McCormack Lines, Inc., had written the Commission withdrawing its application for construction of two new vessels for the American Scantic Line "due to the attacks which are presently being made upon the tax exemption of the funds now on deposit in our statutory reserve fund" with the shipping agency.

Moore-McCormack is understood to be the first subsidized line which has withdrawn an application for new ship construction since the issue first was raised by Representative Jackson, Washington, in an "Extension of Remarks" which appeared in the Congressional Record Appendix during the course of which Mr. Jackson asserted that since subsidy contracts were not operative through most of the war period, tax exemption for monies placed in the funds was without sanction under the statute.

The Moore-McCormack letter of withdrawal to the Maritime Commission was dated April 18, 1946, was signed by A. V. Moore, President of the company, and asserted that the company wished to "respectfully withdraw" its application filed with the Commission under Section 502 of the 1936 Act for construction of two vessels. The application for construction of the two ships was filed with the shipping agency until January 2, 1946.

Emphasizing the reasons impelling the company to withdraw the construction application, the Moore letter asserted that "we are constrained to take this action because of the attacks which are presently being made upon the tax exemption of the funds now on deposit in our statutory reserve fund and the resulting uncertainty as to the availability of these funds for the construction of new vessels."

There are three main issues involved in recent discussions over the tax status of subsidized steamship operators, which discussions were the subject of a hearing on April 26 before a subcommittee of the House Committee on Merchant Marine and Fisheries. These issues involve the taxability of earnings deposited in statutory reserve funds (a) when constituting an excess of the proceeds of a vessel disposed of, over her depreciated value computed under the Revenue Code, (b) when arising during a period while an operating-differential subsidy agreement is actually in effect, but temporarily no subsidy payments accrue because of war conditions, and (c) when arising out of the non-subsidized operations of a subsidized operator.

Section 607(h) of the Merchant Marine Act, 1936, reads in part:

> "The earnings of any contractor receiving an operating-differential subsidy under authority of this Act, which are deposited in the contractor's reserve funds as provided in this section, except earnings withdrawn from the special reserve funds and paid into the contractor's general funds or distributed as dividends or bonuses as provided in paragraph 4 of subsection (c) of this section, shall be exempt from all Federal taxes."

The tax status of deposited earnings from disposal of vessels has been under discussion in the Treasury Department at least since 1940. In 1945 it appeared to the subsidized operators that the Department was ready to recognize the tax exemption of such earnings. On April 26, 1946, however, a representative of the Department testified before the subcommittee that he did not consider the excess of vessel proceeds over tax

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base as "earnings," and therefore that such excess could not be tax exempt.

The subsidized operators believe that this conclusion of the Treasury Department is incorrect for a number of reasons, including that:

It misconstrues Section 607(h) as just quoted.

It violates the specific requirements of the law regarding the maintenance of Capital Reserve Funds.

It destroys in large part the incentive provided by Congress for increasing private investment in the American Merchant Marine.

It inconsistently assumes that Congress valued vessel investment out of certain earnings, but did not find value in vessel investment out of earnings of other nature.

The tax exemption of deposited earnings arising from war-time operations is denied in a letter dated April 25, 1946, from the Treasury Department to the subcommittee. Denial rests on the simple finding that subsidized operators were not then "receiving an operating-differential subsidy." It is true that during the requisition of their vessels by the War Shipping Administration no subsidized voyages were possible. Subsidized operators, however, deem Section 607(h) to have remained effective because, among other considerations:

Bills introduced in Congress in 1942 and 1943 specifically to terminate tax exemption during the war period and make other adjustments to the law and contracts, failed of passage.

The Maritime Commission has administratively determined the operating-differential subsidy agreements to remain effective for all purposes except maintenance of sailing schedules, and have demanded fulfillment of operators' obligations accordingly.

The fact that unexpected war conditions prevented for a brief term the normal operation of subsidized voyages does not in any practical or common-sense manner alter the position of operators as receiving an operating-differential subsidy.

The third issue relates to the exemption from tax of earnings out of non-subsidized operations deposited in statutory reserve funds by a subsidized operator. This question was decided in the operator's favor by The Tax Court of the United States in 1942.† It is not known on what grounds the Treasury Department declines to be bound by that decision. Section 607(h) provides no limitation as to the source of earnings to be rendered tax exempt by deposit in statutory reserve funds.

Arthur B. Poole
Vice President and Treasurer,
American President Lines.

The three issues just described are parts of a larger issue, the wisdom and intent of Congress in seeking by means of tax exemption to induce private investors to place funds in the American Merchant Marine and subject these funds to the obligations, rigidities, and penalties of contracts under the Merchant Marine Act. The Treasury Department opposes tax exemption as an instrument of Congressional policy. Accordingly, it seeks to narrow and counteract the scope of tax exemption.

The subsidized operator points out that the subsidies provided by the Merchant Marine Act are primarily for the benefit of seamen, shipyard workers, and other American wage earners who thus secure wages far above the levels of their foreign brethren, and that tax exemption provided by the Act is the benefit on which the operator can justify investment in an industry which has in the past produced unsatisfactory profits and which has suffered from changing and uncertain governmental policies.

Recent statements appearing in the public press have inferred that there was something improper about the tax transactions of subsidized operators during the war years. These statements are entirely unwarranted. The most that can fairly be said is that there is a conflict between the views of the subsidized operators and the Treasury Department as to the proper construction of the tax exemption statute. The problem should be recognized for what it is, a dispute to to meaning of a statute. T he statements that have been made overlook the fact that regularly filed tax returns of the subsidized operators and discussions in and with the Treasury Department over the period of at least six years have continuously made the facts known to those interested in ascertaining them.

Unfortunately, it appears to the subsidized operators that the Treasury Department is now willing to concede only a much limited validity to the tax exemption provided in Section 607(h), and that what the operators conceive to be the plan of Congress may only be maintained by means of extensive litigation. In the meantime, it is to be hoped that this tax controversy will not cause irreparable harm to the American fleet envisaged as the goal of the Merchant Marine Act of 1936.

† Docket 107931, Seas Shipping Co. (1 Tax Court 30) Decision promulgated November 17, 1942.

Wooden Life Raft Development

By Henry Garnjobst, Jr.

American Lumber and Treating Co.

The ability of life rafts aboard ocean-going merchant vessels to perform under varying severe service conditions has been analyzed as the result of an intensive test program recently completed by the U. S. Coast Guard. Directed by Capt. Gaines A. Tyler, Chief of the Research and Development Division, this exhaustive research was based on tests with both scale and full-size rafts.

Charges in Congress that use of some types of rafts showed "disregard of human life," followed by differences of opinion expressed by seamen, manufacturers and others interested in the safety of life at sea, resulted in the Commandant of the U. S. Coast Guard directing that a thorough investigation be made on all points of conflict. While procurement of life rafts in war time is centered with the Maritime Commission, the specifications for life rafts, and in fact all life-saving equipment, are by legislation under the jurisdiction of the Coast Guard at all times.

Research findings have been placed before the Merchant Marine Council of the Coast Guard by Capt. Tyler and will be used by that body as the basis on which new standards are written, officials state.

To encourage the development of new raft types, the Coast Guard shortly after the U. S. entered the war issued revised standards, embodying recommendations of survivors of sinkings and similar war disasters. While these new standards were based on recognized marine engineering principles, there was not time for extensive practical research at that stage of the war. Manufacturers had to be encouraged to develop rafts they could produce in quantity, and the specifications for materials and design necessarily had to be quite broad in scope.

In general, the standards listed certain dimension limitations, named strength requirements, and specified that the raft be either a reversible or self-righting cockpit or well-deck type, of solid or air buoyancy, capable of being rowed or sailed, launchable from skids, and equipped with specific gear and provisions.

How well these standards accomplished their purpose can be judged by the fact that 16 designs, used in the production of 18 manufacturers, had been approved by the Coast Guard at the time the life raft research program started. These included all wood and all metal and combinations of the two, each incorporating features and materials most adaptable to a particular manufacturer's facilities.

Rafts of all wood structure, enclosing solid or homogeneous buoyant materials consisting of balsa wood, cork, or other buoyant materials, were manufacturer by Michael Hallward, Inc., Swampscott, Mass.; Peterson Manufacturing Co., (E. D. Taylor design), Portland, Ore.; Flury & Crouch, Inc., (E. D. Taylor design), West Palm Beach, Fla.; Roof Structures, Inc., New York City; Craftsman Equipment Co., New York City; Royal Marine Equipment Co., New York City.

Gunderson Bros. Engineering Corp., Portland Ore., produced a raft with aluminum over plywood sheathing enclosing metal air cases. The William and Wells Co., New York City, raft was filled with balsa and sheathed with galvanized sheet metal over plywood.

Rafts of wood structure enclosing parallel longitudinal hollow plywood or metal air cases were manufactured by Colvin-Slocum Boats, Inc., Amesbury, Mass.; Bell Lumber Co. (Los Angeles Boiler Works design) Los

Fire-exposure test on full-size life rafts under way at the Coast Guard Yord, Curtis Boy, Maryland. Rafts have been placed in 30-foot tank previously filled with approximately 1300 gallons of diesel oil.

Stowage compartments are opened after drop tests to examine equipment and provisions specified to be aboard life rafts by Coast Guard regulations.

Angeles, Calif.; New England Houses, Inc., (Los Angeles Boiler Works design), Concord, N. H.

Rafts of all-metal structure consisting of a continuous semi-cylindrical air case sub-divided into water and airtight compartments were manufactured by L. A. Spring & Wire Corp., Oakland, Calif.; Weber Showcase and Fixture Co., Los Angeles, Calif.; Redwood City Boat Works, Redwood City, Calif.; Jones & Gillis Manufacturing Co., McComb, Miss.; Globe American Corp., Kokomo, Ind.; Buckler-Merwin Co., Portland, Ore.; Kearns Bros., Redwood City, Calif.

As war-shipping risks dropped with the turn of the war in our favor, and as production of rafts began to catch up with procurement, the Coast Guard decided to make further refinements in life raft design, basing improvements on practical research tests.

This research program was designed to determine the best points of each design and use these for writing new standards which all rafts would have to meet if they were to be granted approval in the future.

Known sea hazards and wartime experiences in various theaters of conflict were considered in planning the tests. It can be seen at once that various combinations of hazards could project numerous conditions of operation. By comparing actual experiences with anticipated hazards, the research was based on (1) exposure of rafts to fire, (2) sea performance, including launching, accessibility, maneuverability and beaching characteristics, (3) strength tests by dropping, and (4) strafing with incendiary and non-incendiary ammunition. Stability and freeboard were measured after strength tests and strafing.

To simulate actual fire at sea, the Research and Development Division arranged a fire test procedure at the Coast Guard Yard, Curtis Bay, Md., using a tank 30 feet in diameter. This was filled with approximately 1300 gallons of No. 2 diesel oil, making a 3-inch layer of oil on top of the water.

Full-size rafts were placed in the tank and the oil ignited. Two metal rafts, a plywood raft sheathed with aluminum and five wood rafts (including two sheathed with wood pressure-treated with chemical fire retardants), housing cork, balsa, air tanks, styrofoam and foamglas buoyancy units were tested. The oil was ignited and allowed to burn for approximately 28 minutes. While the pyrometer used would not record temperatures over 1300°F., it was estimated that the temperature created by the fire exceeded 1800°F.

After burning, the rafts were removed from the tank and examined.

Among conclusions and recommendations made by the Research and Development Division after the fire tests are these:

"It is believed that the question of fire hazard to life rafts as far as damage sustained in floating through a burning oil slick is one of degree and not too serious, since it is felt that most rafts, regardless of type, will provide a refuge after floating through an oil slick of from 20 to 30 minutes duration.

"All metal rafts in which air tanks are the only buoyancy should have a corrugated outer skin to act as an expansion medium in the event of fire, since straight metal tanks burst their seams due to the expansion of air contained therein.

"In wooden rafts the buoyant medium should be packed around the stowage containers to act as insulation for their contents in the event of fire, and so that the generated heat will not react on both sides of the raft body adjacent the metal tanks.

"In metal rafts the inside surfaces of the stowage lockers should be insulated to prevent charring of the equipment.

"Where lumber planking is used as the raft body covering and as thwarts or seat covering, such planking should be thoroughly impreg-

nated with a suitable fire retardant in order to provide a maximum protection against fire.

"Where buoyant mediums, such as cork, balsa, or foamglas are utilized such material should be packed within the frame of the raft in such a manner that destruction of portions of the outer raft covering will not allow the buoyant filler to become separated from the raft. Cork may be packed in this manner with the use of air hammers, which method could also be applied to balsa, and foamglas can possibly be installed in overlapping cemented blocks to form a tight fit prior to installing the outer covering."

Arrangements were made with the Bureau of Standards, Washington, D. C., to check results by a series of controlled fire-exposure tests made on scale-model rafts sheathed with phenolic resin-bonded plywood. These models measured 42x24x9 inches and were sheathed with 5/8-inch, 5-ply, Exterior-type Douglas fir plywood.

Plywood for two of the rafts was pressure-impregnated with Minalith fire-retardant chemical at a west coast plant of the American Lumber and Treating company. The remaining four models were constructed with untreated plywood. One raft was then covered with 20-oz. flameproofed canvas and a second raft was covered with 35-oz. flameproofed canvas. The remaining two rafts were left uncovered as untreated controls. One raft in each of the three divisions had a cork core; the other balsa.

Tests were conducted in a large gas-fired furnace heated by 16 burners projecting flames horizontally from each wall in a direction to give the gases a counter-clockwise swirling motion. The raft was mounted on a slideway at an angle similar to its position on skids aboard ship. Temperatures within the furnace and on various parts of the raft were measured by thermocouples and potentiometers. A standard time-temperature reference curve, designed to reach a recorded temperature of approximately 1000°F. at the end of 5 minutes and 1300°F at the end of 10 minutes, was followed.

Conclusions drawn from the Curtis Bay Yard fire tests on full-size rafts were generally confirmed by this work on scale models. All rafts were exposed in the furnace to fire for 5 minutes, except one Minalith-treated raft and one untreated raft. These two were exposed for 10 minutes each.

Another aspect of fire hazard was analyzed by strafing tests on 16 full-size rafts at Aberdeen Proving Ground, Md., through arrangements with the Army. Each raft, braced in position at an angle of 30° to the line of fire, was strafed with 10 rounds of .50 calibre incendiaries, 5 rounds of 20 MM incendiaries and 10 rounds of 20 MM high explosive incendiary ammunition. Each raft was hit approximately the same place for comparative results.

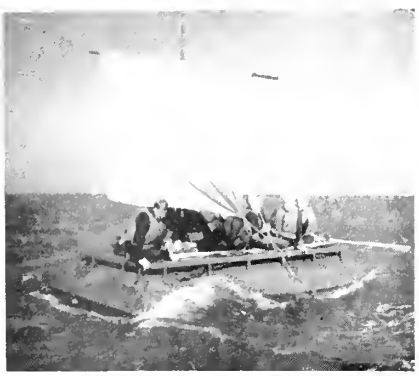
"The wooden rafts, did not fire, with the type of ammunition used and the range of fire. The conclusion is that fire hazard with respect to wooden rafts as a result of strafing is negligible."

The several wooden rafts (those utilizing solid buoyancy material) were placed in the water and a weight of approximately 3300 pounds applied for a period of 48 hours.

Accessibility, maneuverability and beaching characteristics of the life rafts were tested during a 9-day period from aboard the Liberty ship Alexander Graham Bell, anchored off Lynnhaven Roads, Va. Invitations to witness these tests, as well as others in the research program, were extended to various members of Congress, the War and Navy Departments, the U. S. Maritime Commission, War Shipping Administration, the Bureau of Standards, the National Research Council, and the manufacturers and designers of rafts.

Coast Guard comments on these tests were as follows: "After the rafts were boarded, the oars were broken out and attempts were made to row 100 yards. The tidal currents and winds prevailing in this area affected this test considerably, but it was established that all of the rafts could be rowed and maneuvered under favorable conditions. Observation was made as to the seating capacity of each raft while the men were rowing.

"The next step consisted of throwing over the sea anchor and rigging the awning. In most cases the tests with the sea anchors were ineffective due to the strong tidal currents. Following this, the rafts were returned



Top: After boarding, test crew has broken out oars on the Globe American Corp. (Kokomo, Ind.) raft.
Second from top: Raft designed by Eugene D. Taylor (seated at steering oar), Pasadena, Calif. Plywood pressure-treated with Minalith fire-retardant chemical encloses a balsa core.
Second from bottom: Raft manufactured by Williams and Wells Co., New York City, is dropped from ship during sea tests. Coast Guardsmen will board raft to determine accessibility.
Bottom: Can the raft be sailed? That is one point covered by sea tests. Raft manufacturer is Gunderson Bros. Engineering Corp., Portland, Oregon.

After strafing, the Royal Marine Equipment Co. (New York City) wood raft is still a dependable life-saving unit, as the cork buoyancy unit is practically intact.

to the ship, awnings stowed and rigged for sail. The currents prevented sailing any predetermined course, but it was observed that all rafts tested could proceed before the wind. The ability of the raft to free itself of water was also noted," officials report.

The beaching test was accomplished by using eight rafts each representing similar types and designs, rigging them for sail, and letting them sail before the wind toward the beach. The conduct of the raft during beaching was noted, and particular attention was given any characteristic which might affect the personnel aboard. Each raft was provided with a crew and sufficient ballast to approximate the required 3300 pounds.

At the conclusion of these sea tests, the Research and Development Division's recommendations included:

1. All boarding grab rails or bars shall extend around the entire raft. If side, bow or stern are curved surfaces, three grab rails should be provided.

2. All sharp corners, hooks, rivets, raised plugs, dogs, lugs, etc., should be eliminated to prevent injury to personnel while in the water and loading.

3. Inboard dimensions should be such that 20 men can stand in the well deck.

Hidden from view by the spray, this raft hit the water endwise after a 45-foot drop.

4. Rafts should have an open cockpit and all stowage compartments are to be water-tight, arranged on the inboard sides and provided with vertical doors with standardized quick-opening latch arrangement; cockpit seat should be pitched about 1 inch per foot for comfort with inboard edge slightly overlapping the vertical wall of the well deck so as to provide a grab rail for the men. Suitable drains for seats should be provided.

5. Canvas bag in which oars are lashed to the sides of the raft must be provided with quick-opening lacings and arranged so that the oars are not below the water line after launching.

6. Skids on the raft should be standardized both as to design and distance apart.

7. Canopy design should allow sides to be rolled up from the bottom, affording visibility while maintaining protection overhead.

8. Multiplicity of parts for the awning stanchions should be eliminated; awning and sail should be standardized and a square sail is recommended; all canvas should be properly marked, no sails should have booms; retaining lashings should be arranged on the cockpit for the men.

9. Scuppers should be standardized so as to empty the cockpit in at most 15 seconds.

10. All lifting eyes should be of sufficient strength to support the weight of the raft.

11. The life line should be eliminated since it serves no useful purpose and a life ring and line substituted.

12. Each raft should be provided with an instruction book. All compartments should be marked on the outside as to contents and a print of the rigging assembly and an equipment list should be secured to the raft under a water-tight covering conspicuously displayed.

13. Each raft should be provided with a pair of pliers and a combination screw driver secured in a readily accessible manner.

14. All outside welding seams should be continuous.

Strength of the rafts was determined by drop tests which specify that a raft shall be dropped into the water from a height of 45 feet in three positions—endwise, sidewise and flat. All equipment, including the required amount of water, shall be on board the raft in its proper location.

Pacific MARINE REVIEW

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Load Line Rule Amendments

Load line rules for various types of merchant vessels, including rules relating to subdivision load lines for passenger vessels, regulations with respect to life preservers dealing particularly with shipboard inspections, requirements as to boats, rafts, bulkheads and lifesaving appliances and fire prevention are included in numerous amendments of the marine inspection and navigation regulations issued by the Coast Guard under date of April 24, 1946.

Included are such changes as:

Sec. 33.6-3. Shipboard inspections —TB/ALL. At each annual inspecton of any vessel, or oftener if deemed necessary, the life preservers shall be examined by an inspector to determine serviceability. When life preservers are found to be in accordance with the requirements, the inspector shall stamp them with the word "Passed," his initials, port, and date. Life preservers found not to be in a serviceable condition shall be removed from the vessel's equipment and, if beyond repair, shall be destroyed in the presence of the inspector.

Section 43.02 Responsibility for administration is amended by changing the phrase "Secretary of Navy" to "Secretary of the Treasury."

Interim Bareboat Charter

Uniform bareboat charter form for the interim chartering program was adopted April 25, 1946, by Acting War Shipping Administrator Granville Conway, and has been designated as "Warshipdemiseout 203" April 15, 1946. The form was adopted as Supplement 3 to General 13, and amended Part 302—Contracts with Vessel Owners and Rates of Compensation Relating Thereto—Chapter III—War Shipping Administration—Title 46—Shipping—of the Code of Federal Regulations.

Ship Food Stores

General License regulations for exportation of ship food stores on freight and passenger vessels of registry of any country, except Germany and Japan, have been amended by the Office of International Trade of the Department of Commerce.

Rule for Disposal of Ballast Is Amended by WSA

Increase to six of the number of sales agents to be used by War Shipping Administration Agents and General Agents for the disposal of ballast has been made by the WSA in Amendment No. 1 to Supplement No. 1 to Operations Regulation No. 33. The new sales agents are International Selling Corporation and Wessel Duval & Company, Inc., both of New York.

In addition, the amendment adds to the regulations the clause that the "Administration must make every effort to minimize its costs with respect to ballast operations," and eliminates the statement that the sales agents had acted under a previous arrangement as agent for U. S. Commercial Company, who in turn acted for WSA.

New Type Cargo-Handling Gear Ordered by M. C.

As a step toward modernizing the loading and unloading of American cargo vessels, the Maritime Commission has approved contracts with the Lake Shore Engineering Co., Iron Mountain, Mich., and its associate, the Wellman Engineering Co., for construction and testing of experimental traveling crane-typed overhead cargo-handling gear.

Study of the problem of more scientific cargo handling nearly a year ago resulted in the Commission's Technical Division arranging with the engineering companies to proceed with the experiment. The work has now advanced to the point where testing is expected to start at a site in Akron, Ohio, in the near future Later it is planned to place the equipment, designed for the improved C-3 type cargo vessel, in one of the Maritime Service Training Schools for further testing and subsequently aboard a vessel.

"The overhead-type cargo handling gear is similar to the cranes used in foundries, machine shops and other

'heavy' industries," the Commission said. "It is designed to facilitate the handling of general cargo, an important advantage being the large increase in operative area which minimizes the work of handling cargo from the hoisting hook to its stowage position. Before final acceptance by the Maritime Commission, the gear will be tested under all possible conditions. The total cost authorized by the contracts is $146,649.

"The gear now building is a development and refinement of the type already tested on the S.S. Sea Hawk with considerable success and promise. When this freighter was last in port a study of performance of experimental gear which had been installed on her showed the crane-type of gear capable of handling cargo 15 per cent faster than the conventional-type cargo gear with masts, winches and booms.

"The gear now to be built and tested is expected to handle cargo even faster. When this is achieved it will be possible for Maritime Commission technicians to proceed with ship designs expected to reduce the total cost of cargo handling as much as $1 or $1.50 per ton.

"Attainment of this goal, it is believed, will constitute the biggest step forward in this field in at least 100 years."

"Notch-Sensitive" Plates Held Mainly Responsible For Ship Fractures

Tests made at the National Bureau of Standards indicate that the extension of fractures which occurred in some welded merchant vessels during the war was due more to the use of notch-sensitive ship plates than to faulty design or improper welding, the Department of Commerce announces.

Bureau experts point out that notches are present when ship plates are so fabricated that the stress lines meet at sharp angles. Fractures or cracks ordinarily develop in the welded surface. When a fracture extends from the weld through the plate itself the plate may be classed as notch-sensitive.

Before the war small naval vessels were successfully fabricated by welding. Difficulties were encountered, however, when attempts were made to use this procedure for larger ships.

The tests were conducted at the Bureau to determine the cause of the fracture of certain structural members designed to add to the strength of an all-welded merchant vessel in service. A Navy Board of Investigation was appointed in January, 1943, to inquire into the design and methods of construction of welded steel merchant vessels. The cooperation of the Bureau's metallurgical laboratories was requested to determine whether failures in such vessels were the result of inadequate design, improper welding or defective ship plate.

Prior to March of this year, when the Board of Investigation ceased to function, sample of plates from 45 fractured vessels had been examined by the Bureau. The investigation had two primary objects: (1) to determine why the cracks started, and (2) to find why the cracks, once started, might or might not progress almost instantaneously all the way around the vessel.

The Bureau found that defective design and defective welding were evident cause of some of the failures, particularly those noted in the earlier stages of the investigation. Measures were promptly taken to correct the design and to provide close supervision and inspection of the welding operation.

However, in many cases the design was found to be adequate and the welding satisfactory, but cracks still appeared and sometimes were long and serious.

In no case was the steel shown to be defective, according to the usual specifications, inspection and acceptance tests. The only property in the steel tested that appeared directly related to the ready extension of cracks was found in the impact value. The impact value of the test samples was established by the use of a large hammer-like Charpy machine to determine what energy the specimens could absorb. Plates in which the fracture originated and progressed were notch-sensitive, that is, they had low impact value; whereas plates in which the fractures stopped were not notch-sensitive.

The conclusions of the Bureau follow:

"Proper design and proper welding should minimize the occurrence of cracks, and the use of steel that is not notch-sensitive should prevent the propagation of the few cracks that will form in spite of all reasonable precautions.

"Specifications for ship plate in the past have not included a determination of notch sensitivity, but such a determination has been recommended for inclusion in future specifications for assemblies containing structural or geometric notches and residual stresses of high or unknown magnitude."

Ship Warrant Rules On Charter Rates and Appeals Are Revoked

War Shipping Administration General Orders dealing with the fixing of maximum reasonable rates of charter hire in which the Administration would concur as a condition to the granting of ship warrants, as well as providing the method for appealing from such prescribed maximum reasonable rates under special circumstances, have been revoked by the War Shipping Administration. The revocations were made under date of May 2, 1946.

Coastwise and Intercoastal Extension

WSA, under date of May 6, 1946, applied to the Interstate Commerce Commission for an extension until September 30, 1946, of the temporary operating authority given to the Acting War Shipping Administrator for operation in coastwise and intercoastal trades through agents, but the WSA coupled this request with one for the employment "of such reasonable measure of mixed operation, public and private," as may be found necessary by the Administrator in effecting transition from public to private operation.

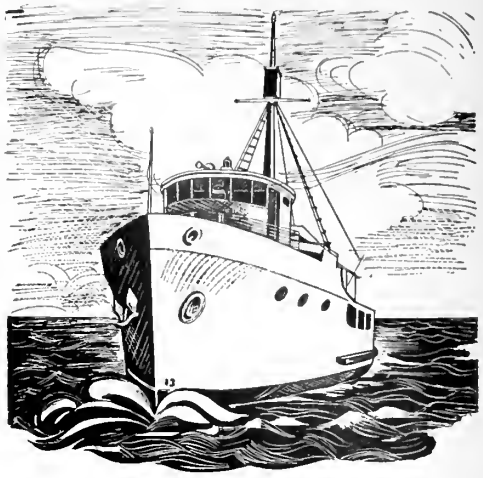
The application ends with:

"The emergency clearly still exists. We accordingly ask that your Commission grant now an extension of the temporary operating authority to the Acting Administrator until September 30, 1946. In accordance with the policy stated above, it is our intent not to seek further extension beyond that date unless your Commission finds it impossible to complete its study of the rate situation by that date.

"Since the period between June 30 and September 30, 1946, may be one of transition, there is a possibility that some private services may be commenced. In any case there cannot practicably be a clean transition from Government operation to private operation as of a specific date. We

(Continued on page 150)

Coast COMMERCIAL CRAFT



Stability of Tuna Clippers

By Gordon C. Snyder

Pacific Northwest Section
Society of Naval Architects
and
Marine Engineers

Seattle, Washington

The first meeting of the proposed Pacific Northwest Section of The Society of Naval Architects and Marine Engineers was held on May 3 in Seattle, and was attended by forty-four individuals representing a wide cross section in the marine industry in the Seattle, Bremerton, Tacoma, Portland and Astoria areas.

In keeping with the aim of the society to prepare and disseminate information of benefit to the ship designing and shipbuilding industry, a paper on the "Stability of Tuna Clippers" was read by Gordon Snyder, Naval Architect of W. C. Nickum and Sons, Seattle, Washington.

The new organiaztion will include all members of the parent society in Oregon, Washington and British Columbia.

An election of officers was held and the following were elected to guide the affairs of the Pacific Northwest Section during the next year:

President, Kenneth E. Mathews, Puget Sound Naval Shipyard, Bremerton, Washington.

Vice President, J. M. Dyer, Astoria Marine Construction Co., Astoria, Oregon.

Secretary-Treasurer, G. C. Nickum, W. C. Nickum and Sons, Seattle, Washington.

Members of the Executive Committee: W. C. Nickum, W. C. Nickum and Sons, Seattle, Washington; H. C. Hanson, Naval Architect, Seattle, Washington; F. G. Greaves, Chief Engineer, Todd Pacific Shipyards, Seattle, Washington; W. H. Watkins, Puget Sound Naval Shipyard, Bremerton, Washington.

The Pacific Coast tuna fishing vessel, commonly known as a "tuna clipper," is a highly specialized type, due to the peculiar requirements of the business of tuna fishing, and was evolved from the Pacific Coast type of seiners and trawlers, which in turn are completely different from their East Coast counterparts.

Tuna are caught with live bait, by hand-lines, usually at great distances from the vessel's home port. Carriage of bait in the live state has required tank capacity which exceeds the size of the vessel's interior, and caused the addition of large tanks on deck, aft, which, as far as outward appearances go, is the distinguishing mark of the tuna clipper. The fact that the fishing is done by hand accounts for the characteristic low profile aft, and the provision of small hold compartments and ballast tanks for trimming the stern down in all conditions of load.

Development of efficient modern refrigeration systems capable of preserving the catch for the long period necessary to transport it to the canneries has made it feasible to fish in remote waters. The trend in late years has been to larger and larger vessels with greater cruising radii, and very recently to steel in preference to wood construction, particularly in the larger vessels. At the present time the larger clippers are about 150 feet in length, with the majority between 90 and 125 feet long. They are universally diesel propelled, with power ranging up to 1500 horsepower, accompanied by large auxiliary power capacity, made necessary by the large refrigeration and pumping plant.

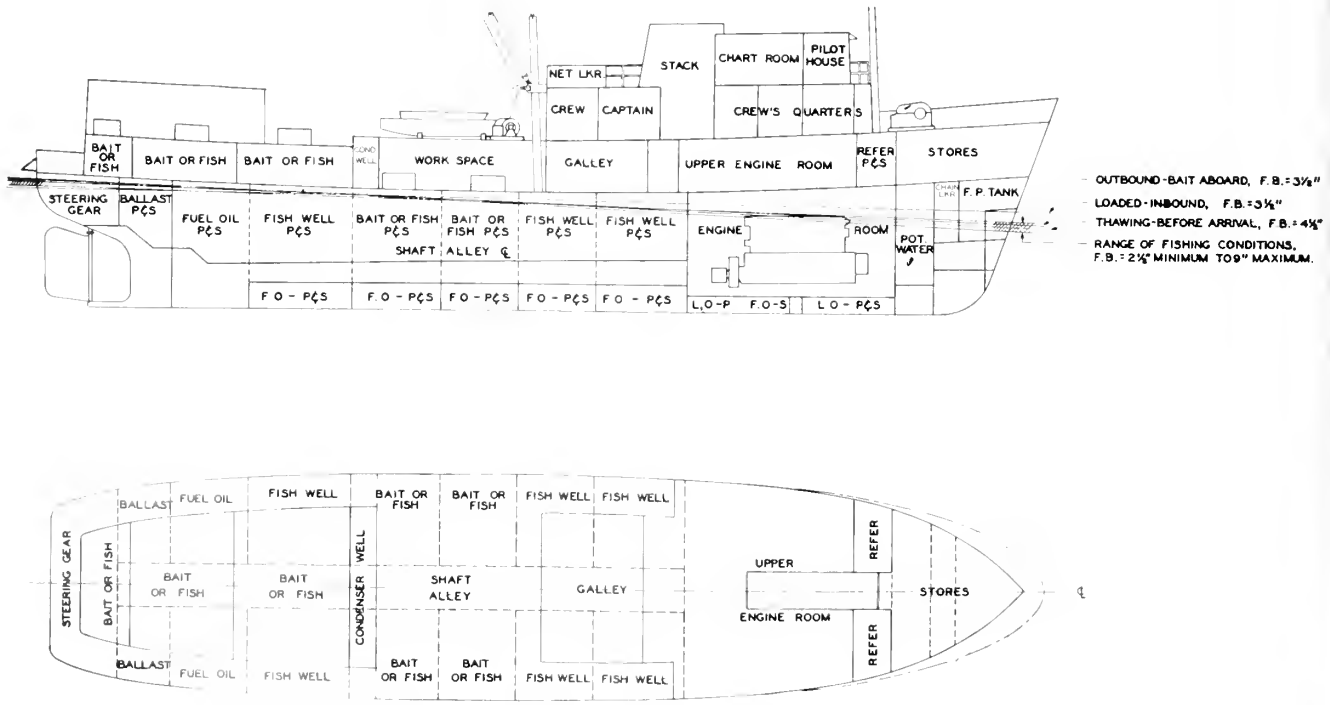
Fishing vessels of all types are free from regulatory requirements. They are not subject to any inspection in connection with design, construction, or seaworthiness, except for requirements which may be placed upon them in connection with their insurance, which are inadequate and lacking in uniformity. Practice standards in many matters relating to construction and design are low com-

pared to those for adequately regulated and engineered vessels of other types. If practicability demands that the degree of regulation be consistent with the size, number of persons carried, and value, then it can certainly be said that the larger of these vessels have surely increased in size and complexity to the extent that they do not belong in the classification which permits of no regulation or adherence to standards.

In piping installation, for example, a large modern tuna clipper would compare favorably in number of pumps, number of systems with all their attendant valves and fittings, and complexity of control and operation with a passenger vessel or tanker of several times her size. In many instances the piping system has been laid out in admirable fashion to guard against possibilities of contamination, flooding and shifting of ballast; but on the other hand, many have not; and the safety of the vessel is more than ordinarily dependent on the most exacting vigilance on the part of the engineer.

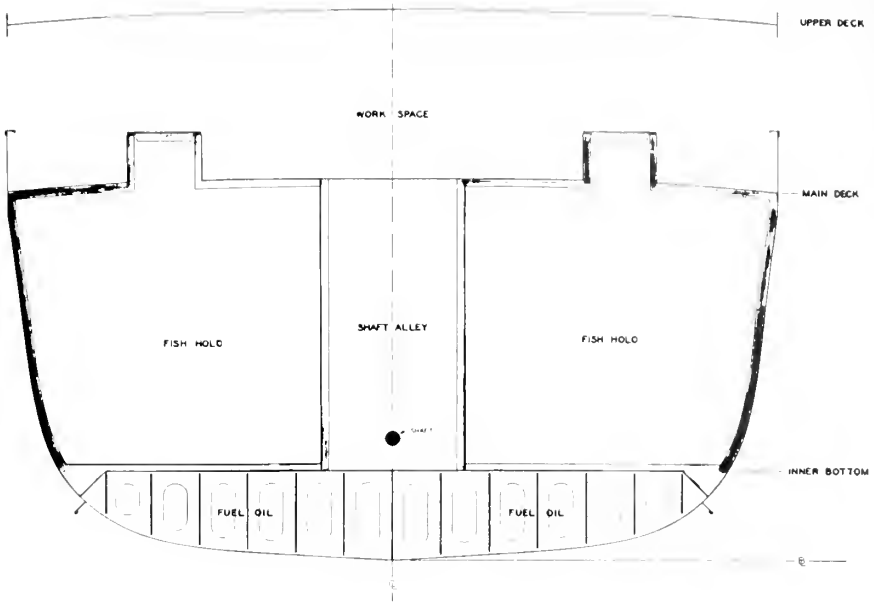
Boat building yards are highly competitive. Most types of boats are built in such numbers as to become quite standardized, and the absolute minimum of plans are ordinarily utilized in their construction. "Rule of Thumb" design generally prevails, and it may be that the evolution of tuna clippers has been too rapid for this method of design. The progress attempted from one vessel to another may have been in steps too large for safety without technical investigation. The record of losses has been too high in comparison with other types of ship. This has cost the underwriters a great deal of money, and since the majority of the casualty reports have appeared to indicate that the losses were due to capsizing or foundering, certain underwriters are requiring stability investigations of all live bait boats. Marine underwriting is also a competitive business and it has and is now the practice in many cases for individual underwriters or brokers to retain any naval architect to make such investigations. There are no uniform standards set up and adhered to by all underwriters, and the extent of investigation and accuracy of results vary widely from one case to another. These stability estimates are rarely made prior to construction, and plans, if drawn at all, are not subject to review by any authority. The number of cases of inherently faulty design from the stability standpoint which are discovered at the time of the inclining experiment are all too numerous. The entire procedure is haphazard and uneconomic and puts all parties concerned at a disadvantage.

As is readily seen (from the drawings herewith) the clipper is to all intent and purposes a tanker, the entire hold space being divided into a series of wells along each side separated by the shaft alley on the centerline. These tanks are augmented by the bait boxes on the after part of the main deck, usually three in number, which serve the same purposes as the tanks in the hold proper. All of the wells and most of the bait boxes are completely insulated and fitted with refrigeration coils on all interior surfaces. Several wells in the waist of the vessel and the bait boxes are fitted with large capacity supply and overflow piping for circulating sea water for the purpose of carrying the live bait. While bait is being carried these wells and boxes, of course, are not under refrigeration, but when the bait has been used and the wells drained, these spaces are used in the same way as the other wells in the vessel for the frozen storage of the tuna fish cargo. Usually the forward wells and occasionally a pair of after wells are also fitted for the carriage of diesel oil fuel for use on the outbound trip. When the fuel has been consumed the tanks are cleaned by washing down and scrubbing, after which they are also ready to carry frozen fish. The remaining fuel capacity of the vessel is located in the forward and after ends in tanks devoted solely to that purpose, and

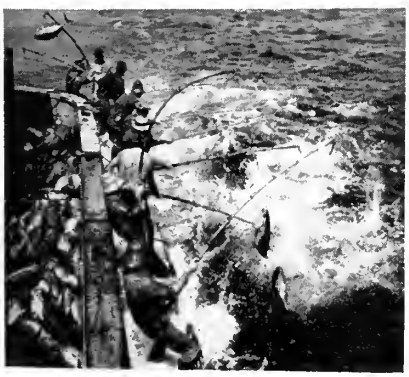


in the case of steel vessels, frequently in a double bottom.

The engine room is invariably in the forward part of the vessel, leaving the after end clear for the fishing operation. The usual arrangement is for the main engines and all or part of the auxiliary diesel generators to be located in the lower engine room, and for the refrigeration compressors and sometimes part of the auxiliaries, together with the engineer's work shop, to be located in the upper engine room on the main deck level. Pumps, air compressors, and sundry auxiliaries are distributed between the lower engine room and shaft alley. The galley is almost invariably located on the main deck aft of the engine space and the upper deckhouses are devoted to quarters.



The first operation on a voyage is to catch and take aboard the bait, which consists of small varieties of school type fish. These are caught with nets and placed in the circulating sea water in the various bait spaces until all are filled. When fish are found and the vessel has been maneuvered into the school, the business of serious fishing begins. One man is stationed on top of the bait boxes to throw live bait among the tuna by means of a dip net, an operation known as "chumming." The actual fishing is done from racks suspended outside the bulwark at about the level of the main deck around the after part of the vessel. Everyone aboard who can possibly be spared from other duties stands on the racks with short heavy poles and hauls the fish aboard as fast as they will strike at the hooks. Bringing the fish aboard consists in giving a mighty heave to throw the fish over head or shoulder into the space on deck between the bulwark and the side of the bait box, with a quick flip of the line while the fish is in the air to release the barbless hook, if possible. This process goes on until there are no more fish to be caught or until the space on deck is completely filled. Next, the fish must be stowed, which means moving them along the deck to the hatch which has been selected for filling and prepared by partially filling it with sea water to which has been added an additional quantity of salt and cooling by means of the refrigeration system. The fish are dumped through the hatch and when the well has been filled freezing is begun. First, the fish are brought down to the temperature of the brine which is circulated through the well and brine coolers usually located in the shaft alley. Next the brine is pumped overboard and the temperature of the content of the well is further lowered and held by means of the refrigeration coils. Thus the final loaded condition of the vessel ready for the trip home is with all spaces, fish wells and bait wells alike, full of frozen dry fish. The deck bait boxes are the last cargo space to be packed with tuna fish cargo. During the last day or two of the inbound trip, sea water is again circulated through some of the wells to thaw the cargo and eliminate delay in unloading.



Two factors are of great importance in the consideration of stability in these vessels: (1) the necessity for a working platform for the actual operation of fishing at the after part of the vessel practically at the surface of the water, and (2) that in a single voyage these vessels undergo changes in loading in considerable variety due to the exigencies of the business. Tuna are a large fish, ranging from perhaps ten to 150 pounds and over. They must be lifted over the bulwark into the space on deck inside, known as the "bin." Small fish are brought in with single poles, but for larger fish more poles are added to a single hook by means of bridle, so that for the largest fish as many as four poles with a man handling each may be required to heave the fish in. The fisherman must be down at or even knee-deep in the water and the rack must be on or very close to the main deck level in order to do the job. Thus, the fisherman has cogent reasons for keeping the stern of the vessel practically flush with the water.

The various wells in the ship must at times be empty, or partly full or full of any of the following: sea water at 35 cubic feet per long ton; fuel oil at 42 cubic feet per long ton or dry frozen tuna at 42.2 to 46

cubic feet per long ton. (Bait in water and tuna in brine are not appreciably different in density from sea water and are usually taken at 35 cubic feet per long ton.) With from 5 to 15 cargo compartments in a vessel, each with the possibility of being filled with any of the above cargoes, and with the contents of the wells being altered almost throughout the voyage, the number of combinations of loading probable in a series of voyages is very large. The sequence and nature of loading is dependent upon the preference of the master, and on the fortunes of fishing.

With half a load aboard, the first fish caught have been completely frozen and the brine pumped out, giving us a certain number of wells of dry frozen fish. The more recently caught fish occupy another set of wells and are in process of freezing in circulating brine. Another pair of wells is half full of cold brine awaiting stowage of the next catch of fish. No bait remains in the tanks in the hull proper, but the two large bait boxes on the after main deck contain bait. Which tanks contain the various cargoes depends on many variables and on human judgment or the lack thereof. This is the primary difficulty in determining the most desirable amount of stability in the design of tuna clippers and in analyzing and checking the stability of existing vessels. It is easily seen that unless the stability of a vessel is foolproof, which it is not, its seaworthiness is dependent on the day-to-day decisions of the operating personnel to a much greater extent than is ordinarily the case.

In general these vessels have initial stability or metacentric heights considered quite satisfactory in association with reasonable freeboard, but freeboard aft is very low.

The brief tabulation of metacentric heights and freeboards herewith is for the typical large steel clipper similar to the one illustrated. The vessel selected is better than average, from the standpoint of stability.

These figures show the margin of safety in reserve buoyancy and range of stability reduced to a value below the lowest safe limit of standards usually applied to other types of vessels.

Many tuna clippers are relatively broad sterned, such as the one illustrated. This type permits good arrangement of fishing racks and large capacity in bait boxes on deck. Buoyancy and stability build up rapidly, as this stern is loaded deep in the water. The buoyancy just under the deck also provides good lifting qualities in the stern in a seaway, resulting in a drier deck in that part of the vessel in which most of the work is done. However, it will be trimmed down to the surface of the water, and whereas the broadness of the waterplane has contributed materially to the stability so long as the deck is above the surface of the water, when the deck is trimmed under water by reason of excessive loading, or when the vessel is heeled by reason of unsymmetrical tank loading or a heavy catch of fish on one side, the loss of waterplane due to the same broadness of the stern represents a very considerable portion of the total waterplane inertia for the entire vessel. Thus, the broad fantail stern actually may defeat its own purpose.

The vessel illustrated is 130 feet between perpendiculars by 32 feet beam, representing a fairly large vessel for this class. Tonnage closures are fitted at the forward end of the bait boxes on deck, which are nominally tight and prevent large quantities of water from entering the otherwise fully enclosed midship main deck area. If these tonnage boards are in place and the vessel is assumed to be trimmed down aft with the deck flush with or under the surface of the water, from the tonnage closures aft, the loss in waterplane inertia represented by the space between the deck edge and side of the bait boxes, port and starboard and across the stern, a space about six feet wide, is 37½% of the total waterplane inertia. The height of the metacenter above the base line in this condition is 16.1 feet when the entire waterplane is intact and the metacentric height is 3.5 feet. The loss of this area reduces the height of the metacenter by 2.75 feet, making the GM 00.75 feet. In a vessel having a cruiser stern, a similar loss of waterplane area under the same conditions would cause a loss of waterplane inertia considerably less due to the disposition of the lost waterplane area much closer to the centerline of the ship.

Tonnage boards or other closures in this position interfere greatly with the fishing and moving the catch into the wells, and as a result are rarely placed in position. Not all clippers have any closures provided at this point, and not all have shutters extending from the top of the bulwark to the deck above for the purpose of making the midship space weather tight. Consequently, the illustrations just given showing the loss of waterplane in the event the after part of the deck is trimmed under should be extended in the case of the average boat to include at least a part of the clear deck space forward of the bait boxes. While it would not be usual to find this large a portion of the deck trimmed under the surface in smooth water conditions, the lack of freeboard allows seas of only average height to come over the rail and flood this space. This is particularly true of following seas which have a clear run up the deck and consequently frequently surge up past the galley. The free surface effect of this water on the deck before being cleared is practically identical to the loss of the equivalent amount of waterplane, insofar as its effect on stability is concerned. Considerable attention is now being paid to the matter of freeing ports and scuppers on these vessels, the area deemed necessary being relatively large for the size of vessel. Lightweight hinged covers of plywood or sheet metal are coming into favor, the heavy steel variety having been found unsatisfactory. The plywood covers require frequent replacement, but open easily with a small head of water and are less noisy when the ship is rolling than steel covers.

The average rolling period of the larger vessels of this type ranges from six to nine seconds for a complete roll. There are definite possi-

(Continued on page 154)

STEEL CLIPPER STABILITY

CONDITION	DISPLACEMENT	GM	MINIMUM FREEBOARD
Outbound—Bait aboard	1012 tons	3.64′	3½″
Fishing conditions	974 min.	3.38′ min.	2½″ max.
	999 max.	3.52′ max.	9 ″ max.
Loaded—Inbo	995	3.72′	3½″
Throwing—Bef rrival	982	3.31′	4½″

An Interesting "Liberty" Proposal

By O. J. Baggerud*

The "Liberty" type dry cargo carrier was the backbone of the great convoy fleets that carried munitions and provisions everywhere there was an allied army and so won the war for the allies. There are over two thousand of these vessels and what to do with them commercially is one of the problems that just now is worrying many of our best shipping and shipbuilding executives.

At the last annual meeting of the Society of Naval Architects and Marine Engineers three papers were read in which the Liberty ships and their machinery were discussed.

It was stressed that the Liberty ship came through wherever it went despite terrific punishment, that it was a popular ship and that what it lacked in speed it made up in many other qualities. It is highly maneuverable, a good sea boat, and above all, dependable.

Another quality of the Liberty ship is its adaptability as a basic design for conversion either minor or major.

The triple-expansion steam engine installed has demonstrated that from a maintenance, repair and operating point of view those responsible for its selection made a sound and rational decision. The marvelous war records of these vessels are in no small way attributable to the performance of these reciprocating engines.

One discussor proposed a method for increasing the speed and economy of the Liberty ship, retaining the main engine and boilers and practically all auxiliaries, and increasing the power to any reasonable limit desired.

This method contemplates a one-cylinder mixed pressure turbine, which in addition to exhaust steam from the low pressure cylinder of the reciprocating engine also takes steam directly from the boilers and exhaust from the auxiliary exhaust line. This turbine would be connected to the propeller shaft aft of the main engine by double reduction gears and a hydraulic coupling.

By this method it is claimed that the plant may develop about 4000 shp with no change to the boilers. However, an alteration of the superheater to give higher temperature would give a better fuel economy. The capacity of the boilers is large enough to give sufficient steam for a condition of 6000 shp. The temperature of the superheated steam can be brought up to 750° F. The speed of the ship at 4000 shp may be 14.1 knots.

The fuel oil consumption per shp per hour will be considerably below the consumption of the present installation.

The cost of the unit and installation will be far below the cost of any other known new installation of the same power. It is considered that no additional crew would be necessary.

Comparison of the Liberty ships with the faster and more economical Victory ships shows that the latter has 17 more crew members than the Libertys, which would be to the Liberty ship's advantage in figuring the operating cost. The deadweight tonnage is about the same for both vessels.

The Liberty ships were built under special survey of the American Bureau of Shipping to the highest class —A1 (E), AMS, RMC—the same as the Victory ships. The frame spacing in the Liberty ships is 30" while in the Victory ships the frame spacing is 36". That they are first class hulls is further demonstrated by the terms on which they will be sold by the Maritime Commission—¼ down, balance in 20 annual payments.

In changing from 2800 shp to 4000 shp the strength of the propeller shafting is a matter of consideration. By speeding up the engine and yet staying within the critical speed the present shafting will comply with American Bureau Rules at 4000 shp. If 6000 shp is desired new shafting of same dimensions but of better quality material will comply with the rules and may be installed without structural change. While the stern frame is strong enough at 6000 shp a new rudder stock and rudder would have to be installed.

It is proposed to use the present condenser with a top section added making it a four pass arrangement instead of the present two pass. A Parsons Augmenter will be installed to assist the present reciprocating air pumps.

All Liberty ships, on which such reinforcement has not already been installed, should be fitted with riveted stringer bars and deck seams. This installation has proved that it eliminates most of the danger from locked up stresses due to welding.

This mixed pressure turbine and engine combination has several important advantages:

(a) Power can be increased to any desired reasonable limit without scrapping the reciprocating engine and auxiliaries.

(b) Reciprocating engine and turbine with low pressure engine exhaust, auxiliary exhaust and live steam from boilers can run together at full power.

(c) If the reciprocating engine is out of commission for any reason, the turbine can run alone. In that case a blank flange can be fitted on the engine exhaust flange on the turbine.

(d) Reciprocating engine can run alone without the turbine. Engine exhaust directly to condenser.

(e) Engine and turbine can run together with engine exhaust and auxiliary exhaust, shutting off live steam from the boilers. This case may be used at times where saving of fuel counts more than speed.

(f) Thus the proposition actually provides for two practically independent power plants.

(g) The turbine will be cut out during maneuvering, astern operation and entering or leaving harbors.

(h) Torque variations of the propeller shaft will be lower than for similar drives with limited power.

(i) There is a possibility of attaching a generator to the turbine shaft, declutchable, if for any reason such a feature is desirable for port or sea operation or both. A separately

(Continued on page 154)

*The author is naval architect with Marine Design Co., Jersey City, N. J.

Admiralty Decisions

By Harold S. Dobbs
of the San Francisco Bar

Collision Blame

This subject is a lively one in the field of Admiralty and will probably reach the ears of the public again, since the Attorney General has lifted his ban on permitting the public to view or review any files pertaining to collisions or other actions involving ships. The Rules of the Road will again come into their own. In **Luckenbach Steamship Company, Inc. vs. United States of America,** U. S. D. C., S. D. N. Y., 1946 AMC 324, two actions were filed in Admiralty by way of cross libels which deal with a collision on October 21, 1942, between the Mathew Luckenbach, hereafter called Mathew, a single screw steel freighter, 450 feet long, owned and operated by the Luckenbach Steamship Company, Inc., carrying a cargo of steel and Army supplies, and the Zacapa, a single screw steam freighter, 394 feet long, owned by the United Fruit Company, but operated by the United States, carrying a cargo of military explosives. Serious damage was sustained by both vessels. The entire testimony of the actions consisted of about 470 pages of depositions.

The two vessels involved in this collision were part of a convoy of about 47 vessels bound for the United Kingdom, traveling at eight to nine knots, and in a blacked-out condition, pursuant to Navy orders. The convoy was made up in 13 columns of three to four vessels in each column. The Matthew was the fourth vessel in the third column and the Zacapa was the third vessel in the fourth column. The vessel in front of the Mathew was a whaling vessel. Stationed astern of the Zacapa was the Esso Bayway.

The convoy was proceeding at a rate of about eight or nine knots when the impact occurred. The bow of the Zacapa struck the starboard side aft of the Mathew. Both vessels were thereupon obliged to leave the convoy and proceed to Halifax for repairs.

Each of the parties herein maintained strenuously that they were in position and traveling on course. The impact occurred at approximately 5:36 a.m., Mathew time, and 5:31 Zacapa time. The Mathew's witnesses claimed that visibility was good, and that a silhouette of a vessel could be seen from one-half to three-fourths of a mile. The Zacapa's witnesses testified that visibility was good, except that a cloud formation was building up on the port side, making objects on that side obscured. A witness from the Esso Bayway testified that visibility wasn't any too good, but was something better than 500 yards.

The testimony of the Mathew's witnesses, in substance, was that a lookout was stationed on the flying bridge; that there was no lookout on the forecastle head or bow; that at the time of the collision she was attempting to regain her position, having previously fallen back; and that for 30 minutes prior to the collision the Mathew was traveling at full speed, some 11 or 12 knots; that at 5:25 a.m. the engines were reduced to one-half ahead, at 5:33 slow ahead, and at 5:35 the engines were stopped altogether. That the reason stated for slowing down and stopping the engines was to avoid coming too close to the whaler, which was estimated then to be about 150 feet away. That the Mathew's lookout sighted the Zacapa astern, coming at a right angle and approximately 120 to 150 feet away, and that the Mathew's Chief Officer, when so notified, left his station and ran to the lower wheel house and rang the general alarm. The impact occurred 45 seconds after the alarm bell was rung.

The testimony of the Zacapa's witnesses, in substance, is that a lookout was on the forecastle head; that prior to the setting of the moon, between 4:00 and 4:30 a.m., the two vessels ahead of the Zacapa could be seen; that at no time was the Zacapa's speed substantially changed, except at 5:00 a.m., when a convoy increase was ordered; and that at no time did the Zacapa change course. The Mathew was first sighted by the Chief Officer, off the port bow, and he was unable to determine the course of the other vessel, since only the funnel was visible. He ordered a hard right and rang the telegraph full astern. He soon made out the other ship and noted that this was a crossing situation with the other vessel crossing from port to starboard. He immediately ordered the rudder hard left and full astern again. The time between the hard right and hard left was estimated at about ten seconds. The distance of the Mathew, when first sighted, was about 200 feet. The collision occurred between 40 seconds to a little more than a minute from the time of sighting her. Until the Chief Officer gave the orders to change course and reverse engines, the lookout saw nothing. The Chief Officer testified that, if the lookout had sighted the Mathew one-half minute earlier, a collision might have been averted.

A witness from the Esso Bayway, stationed astern the Zacapa, testified that when the Zacapa was seen to make a sharp right, the Bayway went to the Zacapa's port and fell in behind the tanker, thus putting the Bayway in the same position that the Zacapa had previously occupied.

Mr. Zeuner, Chief Officer of the Esso Bayway, testified that it was not until later that he knew of the col-

lision, and that prior to this occurrence, at about 4:00 a.m., the Mathew Luckenbach was on his port beam.

At no time before the collision or thereafter did either vessel turn on her light, nor were any signals sounded by the Zacapa when her course was changed. The Mathew, at the time of the impact, although her engines were stopped, still maintained about five knots way.

Taking all of the testimony in the light of what subsequently happened, it is clear that one or the other of the two colliding vessels was off course and out of station. If the testimony of the Mathew's witnesses is to be believed, it would appear that the Zacapa stationed in column 4, abeam of the whaler in column 3 and ahead of the Mathew, wandered out of position, went port of its column, wandered into the third column, in which the Mathew claims she was stationed, and struck the Mathew on her starboard side aft. The probability of this having occurred is too far-fetched, in view of the evidence taken as a whole. While corroborating evidence exists to show the Zacapa substantially in her proper station and on course, no such evidence is submitted on behalf of the Mathew. In fact, testimony exists to show that the Zacapa was in line, because when the Bayway passed her, she assumed the position of the Zacapa behind the tanker. The contention of the Mathew that possibly all three, the Bayway, the Zacapa and the tanker were out of line, seems untenable. The more logical conclusion that must be drawn is that the Mathew, in attempting to regain her station, passed the Bayway and Zacapa in the fourth column and wrongfully identified the tanker as the whaler in the third column. The Court found that it was, under the circumstances, difficult to give much credence to the testimony of the Mathew's witnesses as regards her course at the time of the impact.

The primary fault appeared to be with the Mathew for being out of position. See **The Hopemount** (1943), 75 Lloyd's List L. R. 94. A further fault would be her failure to show lights or failure to take any action in respect to change of course. Moreover, the Chief Officer's leaving his post and running down to another deck to ring the general alarm, and his impression that there was no time to do anything else, is more than bad judgment. If prompt action were exercised, perhaps the Mathew's stern could have been swung away and the collision averted.

On the other hand, the Zacapa was not free from contributive fault, for failing to maintain a competent lookout, and the testimony of the Zacapa's Chief Officer in this respect makes clear the failure to provide a vigilant lookout. As was stated by the Chief Officer, if the lookout had reported a half minute earlier, and he had put the engine full astern a half minute earlier, the collision might have been averted. The Zacapa's lookout reported nothing at all, when, according to the facts, visibility far exceeded the distance between the vessels when each was first sighted. This was not the case of a vessel coming from astern, but one whose bow crossed that of the Zacapa, and the crossing vessel should have been seen by him.

As stated by the Court, in **The Buenos Aires,** 1925 A.M.C. 150, page 159, 5 F. (2d) 425:

> "The want of a competent lookout properly stationed and vigilant is a fault in a vessel as a result of which she assumes the consequential risk of a collision to which the fault contributed. **The Anna W.,** 201 Fed. 58, 119 C. C. A., 396; **The Greystoke Castle** (D.C.), 199 Fed. 521; **Graves vs. Lake Michigan Car Ferry Transportation,** 183 Fed. 378, 105 C. C. A. 598; **The Volund,** 183 Fed. 413, 105 C. A. A. 547."

In **The Paris,** 1930 A. M. C. 153, 37 F. (2d) 734, affirmed, 44 F. (2d) 1018, 1930 A. M. C. 1874 (2CCA), it was stated by the Court, 1930 A. M.C. at page 163, 37 F. (2d) at page 739:

> "The law further imposes a rigid obligation on a moving vessel to maintain a careful, vigilant and effective lookout, whose duty shall be both to observe and to report."

This requirement becomes doubly important when ships travel in convoy, close together and under blackout conditions.

The Court found both vessels at fault for failing to show lights when each sighted the other.

When confronted with a situation of special circumstances such as the imminent danger of collision, it is the duty of a vessel, even when proceeding without lights pursuant to orders of the Navy, promptly to turn on her running lights to warn the other vessel of her position and heading. **The Corozal-Daniel Pierce,** 1944 A. M. C. 778, 782, citing **The Cushing,** 266 Fed. 570, affirmed 292 Fed. 560, 1923 A. M. C. 987, and authorities in England to the same effect.

The Court failed to agree with the Zacapa's theory of the major and minor fault rule's application in the instant case because of the above faults displayed. The failure of both vessels in the respects above described places equal blame on both. Therefore, the Court concluded that the failures of the vessels in question to take proper precautions resulted to some extent in the damages caused.

The Court stated the following conclusions:

"(1) The Mathew was at fault for being out of station and off course.

"(2) The Mathew was at fault for failing to take any avoiding action and or failure to show lights.

"(3) The Zacapa was at fault for failing to maintain a competent lookout.

"(4) The Zacapa was further at fault for failing to show lights or sound a signal to indicate change of course.

"(5) The damages should be divided."

A decree was entered accordingly.

Ships for France to Have New Form of Propulsion Machinery

Interesting Arrangement of Nordberg Diesel Drive In Six Freighters Building at Tampa, Florida

By T. Orchard Lisle

In addition to the six motor vessels referred to in this article, the Tampa Shipbuilding Co. has been given a contract for the completion of five C1-M-AV1 coastal freighters for the French Government. These will be 323 feet long and 3805 gross tons, and had been under construction for the Maritime Commission.—ED.

An outstanding new engineering conception is embodied in the propelling machinery to be installed in the six steel twin-screw motor cargo ships now building for the French Government at the yard of the Tampa Shipbuilding Company, Tampa, Florida. The special arrangement of four main and two auxiliary diesel engines of equal power is as interesting as it is unique, as any pair of engines can be used for propulsive power, or all six engines—including the auxiliary units—can be utilized for ahead propulsion when desired, although under normal conditions only four engines will form the propulsion plant.

Each engine being of 1200 bhp, the aggregate 7200 bhp is a lot of power for a cargo carrier of 3770 tons deadweight capacity, and illustrates the trend for higher speeds for which the economy of the diesel engine is largely responsible. It also means considerably higher loaded speed than usually is to be found with small cargo vessels. The arrangement has been worked out by the engineers of the French Transport Mission, Washington, D. C., and the ships will operate between the North Atlantic coast of France and North Africa. The first of the fleet should be ready early in 1947.

The 36 diesel engines aggregating 43,200 hp represent a substantial post-war order for the Nordberg Manufacturing Company of Milwaukee, Wis. Each engine is of the supercharged four-cycle type with six cylinders and will operate at 320 rpm. In every ship four of the diesels will be direct reversible and the other two will be non-reversing; but all six will be connected to Farrell-Birmingham reduction gears through Elliott electro-magnetic couplings.

In the forward part of the engine room are arranged the four direct-reversible diesels parallel with each other and in groups of two, there being one pair for each propeller shaft. In the after end of the engine room are the two non-reversing diesel units connected to electric generators for supplying power for the cargo winches when in port. Electro-magnetic couplings forward of the generators can be connected or disconnected at will, so whenever these two auxiliary engines are needed for extra propelling power they transmit their load through the inboard pinion of the reduction gears to the propeller shaft. The propeller shafts run alongside the two auxiliary units but on a lower lever, making this power booster arrangement feasible and practical.

Only four engines can be used for going astern because the two auxiliary sets are non-reversing, as already stated. Losses in transmission due to the reduction gears and electro-magnetic couplings will be in the neighborhood of 3½ to 4½ per cent, so will have a comparatively small effect on the over-all economy in fuel consumption.

When at sea, waste heat from the exhaust gases will pass through a Lamont type of boiler manufactured by Combustion Engineering Corporation, and the steam generated will be sufficient to operate a turbo-generator to carry the auxiliary load. When the main engines are idling or shut down a separate Combustion Engineering oil-fired boiler will supply necessary steam.

Each ship is 371 ft. 10 in. long over-all and 346 ft. 6 in. between perpendiculars.

Because these vessels will handle special cargoes on a regular route, it is important that their schedules be adhered to as closely as possible. Consequently, a reserve of power and speed is highly desirable.

But to install high power solely for propulsion would require too large an investment. At the same time the matter of very rapid loading and discharging of cargo in certain ports had to be taken into consideration when designing the machinery arrangements. By installing two diesel-generator sets of sufficient power to handle the load of the deck winches and such auxiliaries needed to operate in port, and also making it possible to use the same engines to augment the output of the four main engines when the ship requires full speed ahead, this desired condition is met in an economical manner.

As the ship will spend more time at sea than in port it also became obvious that a heavy investment in high powered units for auxiliary purposes only is not justified. But with the simple dual arrangement adopted, reserve power and speed are provided without adding much to the initial cost.

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

Foreign Trade Week

Typical of celebrations in Pacific Coast cities, the greatest observance of National Foreign Trade Week in San Francisco's history has just served well its purpose in promoting greater world trade and fostering a better general understanding of the importance of international trade to the domestic economy of the nation.

Enthusiastic response to Foreign Trade Week speakers, broadcasts, essay contest, displays and other programs indicates the keen interest now being felt in overseas markets.

"World trade freely engaged in by all can be the only basis for world prosperity; our future is more in the hands of businessmen than in the hands of statesmen," said Mr. Eugene Sitterley, publisher of "World's Business" and "Guia," who was in the San Francisco area for National Foreign Trade Week. Mr. Sitterley spoke before the World Trade Lunch, sponsored by the Oakland Chamber of Commerce and Rotary Club, in addition to several radio talks while he was here.

A contest held in the San Francisco high schools on "Foreign Trade and the U. S. Merchant Marine" re-

Prize-winning essayists Carol Hunter and Jon Vassar boarding plane for Los Angeles.

Display of job-creating imported items in the Maritime Exhibit, Marine Exchange, San Francisco.

sulted in several hundred fine papers, from which two, by Carol Hunter of George Washington High and Jon Vassar of Mission High, were selected top winners. As an award, they were flown to Los Angeles to spend an exciting day, being feted by the Rotary Club, seeing a Hollywood movie production, and watching a national radio broadcast, among other things on a busy schedule.

The next four winners rode in the Maritime Day Parade and were guests at the Propeller Club luncheon. Ten other winners visited the U. S. Maritime Service Officers School in Alameda, where they toured the grounds and were luncheon guests of Capt. Malcolm E. Crossman, superintendent of the school.

Other features included a kick-off luncheon for the Week by the San Francisco Foreign Trade Association at the Fairmont Hotel. At that time, Dr. Chas. P. Howard, noted South American author, lecturer and missionary, delighted the foreign traders with an interesting talk on the people and problems of South America.

On Wednesday, May 22, National Maritime Day was observed in San Francisco with one of the biggest celebrations in the country. After reviewing a mile-long parade through the city, Mayor Roger Lapham spoke of the future of the merchant marine before an audience of more than six hundred, and the day was climaxed by a lively Mariners' Ball that evening.

During the entire Week, San Francisco's stake in foreign trade was presented by speakers at many clubs, radio programs, newspaper stories, and numerous window displays.

As a topping gesture, the Week was closed with a gala International Dinner at the Club Lido, at which San Francisco's consular corps were honored guests.

FOREIGN TRADE DISPLAY IN SAN FRANCISCO CLOTHING STORE

In the above window display of the Robert S. Atkins Co. there appear import and export items with cords leading to their countries of origin and the steamer routes on which they travel. Introduced into this display is the unique feature of indicating the number of jobs involved in the import or export of each commodity. The Atkins company is one of the most civic-minded of retailers, participating in community celebrations and lending their store facilities for display purposes. The Foreign Trade display was advertised in the newspapers of San Francisco and attracted thousands during Foreign Trade Week.

Post-war Foreign Trade Promotion

By Amos E. Taylor

Director, Office of Business Economics, Department of Commerce, Washington, D. C.

The conception of foreign trade promotion is one which concerns all of us. This does not imply that the problems of the individual trader are unimportant, something to be brushed aside. Anyone engaging in foreign business must understand how to proceed in developing and holding foreign markets. Obviously this can not always be done without information and aid. The problems are numerous and complex and no one should attempt to enter the foreign trade field without first giving careful thought to his product and to the permanency of demand for it; also to matters of shipping, insurance, packaging, financing, etc. These are practical matters which fundamentally concern the individual exporter or importer and those with whom he does business abroad.

Machinery and techniques are of little avail unless the conditions for a sound and sustaining foreign trade actually exist. Our experience after World War I is a firm reminder of this fact. We often heard people say, "Let's mind our own business,

Amos E. Taylor

put our own house in order, and forget about the rest of the world." The statement is catching because in our unthinking moments it sounds plausible. It is, of course, true that a sound domestic economy and a high level of domestic employment and production are essential to the development of a healthy foreign trade. Domestic measures should therefore receive our careful attention. It is because of the importance of trade viewed as a flow of goods and services on the broadest basis possible, that the second part of the statement —namely, that we forget the rest of the world—becomes just so much rhetoric.

Domestic trade and foreign trade are complementary. The proportion of our total domestic output that we export may be small but this does not mean that we can do without export. It must be remembered that the United States does not export or import as a nation, that is, as a trading entity. Under a system of free enterprise business is conducted by thousands of individual firms and businessmen. Many of these have developed important export markets which normally absorb a relatively large proportion of the country's total sales abroad. Entirely apart from what individual firms may do, there

are many particular regions which, because of the nature of their products and their geographical or other relationship to world markets, export very important fractions of their total outputs. In the case of lumber, for example, the States of Oregon and Washington in a typical year exported in terms of board feet approximately 40 per cent of the total lumber exports of the United States. The same holds true in the export of various other products from this part of the country or from the West Coast as a whole. The importance of foreign markets to your community is not as fully reflected in the percentage figure on United States lumber output finding its way abroad as it is in the actual size of your own foreign market for these products. The country as a whole gains, however, because of the total business you are able to do, whether at home or abroad.

A foreign market should not be looked upon as something mysterious or something more or less unrelated to the sum-total of all the markets for the things which we produce. It is for this reason that in looking ahead we should point our attention to the development of a national policy which aims at lifting both domestic and foreign markets to higher levels. The importance of this is clear when we note that the income derived in a particular community from the sale of goods abroad becomes the basis of purchasing power which will spread itself throughout the country as a whole. What all this means in the final analysis is that in the interest of domestic prosperity we should see to it that in all markets currencies are stable and that economic conditions are fortified against the forces which in the past have all too often thrown us into economic tailspins.

In this connection you have heard a great deal in recent months about Bretton Woods, about the British Loan, and about other measures designed to provide the trading world with more stable conditions than those that prevailed after World War I. Out of Bretton Woods have developed two important institutions—the International Monetary Fund and the International Bank for Reconstruction and Development. The language of these agreements is of course technical and may at first glance appear to be designed primarily as material for mental exercise among academicians. In plain business terms the main objectives are fairly clear. First of all, we are this time employing cooperative effort and action in order that certain objectives may be achieved on the basis of common understanding. Each member nation assumes a degree of responsibility for decision taken in behalf of all.

Under the Bretton Woods Agreements the member nations agree not to depreciate their currencies by unilateral action. They agree to remove their exchange controls by progressive steps. They agree to cooperate closely on all monetary matters. They agree, finally, to open up through the International Bank a ready flow of capital for developmental purposes throughout the world. Successful operation under these agreements is of course dependent upon genuine international collaboration. Considering the objectives, cooperation among nations is perhaps a small price to pay for achieving lasting results. As the Committee for Economic Development reported in a policy statement:

> "The efficient movement of international trade and capital will be facilitated by orderly relations among the various currencies of the world, and by the outlawing of the use of currencies and exchange devices for purposes of international economic warfare. Also, an orderly and adequate means of providing needed capital for world reconstruction and development will hasten the restoration and growth of production and trade with beneficial consequences for world prosperity and security."

The International Monetary Fund is essentially a central pool of gold and world currencies to which each member is obligated to make a certain contribution. The resources of the Fund are available to the member nations for meeting their short-run needs and for keeping their current international accounts in balance. It is, of course, essential that the exchange parties be such that exchange pressures are not likely to become continuous. The mechanism for operating the Fund is so devised that currencies can be maintained stable in relation to each other and thereby eliminate the risks and uncertainties that invariably attend fluctuating exchange rates and that often substitute speculative operations for normal commercial exchange transactions.

The Fund deals with the balance of international transactions, rather than with direct assistance to exporters or importers. Its operation should assure the orderly function of a system of multilateral payments. This in turn should make it possible for debtor countries to convert their export surpluses with other countries into the currencies in which their obligations must be discharged. In order that commerce among nations may be facilitated, stability in currency values is fundamental and the achievement of such stability is the Fund's basic purpose.

The primary objectives of the Bank are of a longer-range character. The Bank is designed to fortify and supplement the Fund. The ease with which exchange rates can be kept stable depends in large part upon the volume of world trade in which it is possible for the member countries to participate. It is therefore important that every facility be provided for the development of resources and for the effective use of manpower and sources of energy. Through the development of resources by sound methods, national buying powers will be increased, standards of living will be raised, and international markets will be broadened.

The bulk of the funds to be used for loans made through the International Bank will be raised in the private capital markets of the member countries, particularly in the United States. Private markets can play a vital part in international lending. If foreign trade is to be developed and maintained on a sustaining basis we must have a foreign lending policy which is consistent

with the development of stable economic conditions in both the exporting and importing markets.

The purposes of the $3,750,000,000 credit to Britain are in line with these objectives. The United Kingdom is normally not only the world's principal importer, but it is the most important foreign customer of the United States. Moreover, Britain is at the center of the world's greatest trading system. About one-fifth of the world's commerce normally moves in and out of British ports. The British depend largely upon exports and income from foreign investments and "invisible" trade for the foreign buying power so essential to their existence. If Britain can again function at an early date under a system of trade which will be free of all the abnormal restrictive devices which developed after 1930, American exporters will have the benefit of growing markets abroad, not only in Great Britain but elsewhere.

An immediate solution to Britain's financial problem is necessary if there is to be an early realization of the primary objectives of the Bretton Woods program. Because of Britain's crucial position in world trade and because of the wide use of the pound sterling in international commerce the financial and commercial practices of that country are of the utmost significance in determining what kind of world economy we shall have. It is necessary therefore that in the interest of our foreign trade, as well as that of the world in general, effective steps be taken at the earliest possible date towards the removal of exchange and other restrictions.

The importance of these steps becomes clearer when we bear in mind the tremendous growth of industrial output in the United States. As a result of our own expansion during the recent war and the destruction of industrial facilities in various other countries, the United States now possesses more than one-half of the world's industrial capacity. With the development of our mass production methods, the widening of markets for the products of industry, whether at home or abroad, will secure benefits through lower unit costs for all consumers, domestic and foreign. The spreading of these benefits is consistent with the goal of the fullest possible employment in every country.

One of the characteristics of business depressions is the chain reaction produced by the forces at work. A drastic reduction in the buying power of some particular group of people, or of some particular area, produces immediate repercussions elsewhere. The effect is such that eventually no segment of our national economy remains prosperous. The effect of these cyclical movements does not dissipate itself when it reaches national frontiers, but it soon assumes world-wide dimensions. The growth in economic interdependence among nations, accentuated by technological development and new methods of production, transportation, and communciation, has sharpened the effects of such changes. We can hardly contemplate the consequences with equanimity.

It is for these reasons that the slogan **World Trade Puts Men To Work** is particularly appropriate in 1946. Employment is the fundamental key to the whole post-war problem. The breakdown of the international financial machinery during the early thirties and the accompanying dislocations and pressures were soon reflected in a cumulative growth of social and economic ills, always conducive to war. Growing unemployment caused a steady deterioration in the social fabric. The United States occupies a unique position favorable to the promotion of full employment because we need not fear our foreign exchange position. This gives us a marked degree of freedom of action. At a time when we are placing so much emphasis on economic expansion and full employment, this advantage is of fundamental importance not only to us but also to the rest of the world.

Our relatively high degree of self-sufficiency also affords us an unusual degree of freedom of action in pursuing full employment policies. Although our imports bulk large, they are small in relation to our domestic business. In normal years we have been spending 5 to 6 per cent of our national income on imports. This does not mean, of course, that these imports are of no real advantage to our economy or that we could do without imported goods. They are in fact necessary. If we are to export and if we are to succeed in lifting world trade to higher levels, a corresponding rise in the value of both exports and imports will be in the interest of a sound and stable economy.

The foreign demand for our goods is also a strong support to our freedom of action in developing a full employment policy. An important part of our exports consists of goods for which international demand was expanding rapidly before the war. This demand will no doubt continue to expand in the future if world trade can be built upon a sound system of exchange and a growing volume of international commerce generally. Herein lies the real significance of the Bretton Woods institutions. The importance of the Fund and the Bank to the United States does not lie in our direct need for these institutions; it lies in the fact that our own prosperity requires the kind of world which is possible only if world currencies are stable and if world trade can expand.

In the final analysis the fundamental objectives of the Bretton Woods Agreements and the related arrangements are to make possible maximum employment throughout the world. The basic purpose is to enable the world to do business with itself, and thereby to make it possible for producers and workers everywhere to sell their output throughout the world's markets. There is nothing idealistic about this goal. It represents merely an attempt to do by practical methods those things which a stable world must do if it is to live in peace and prosperity. It is the opposite of the system which broke down in the early thirties and which led to a series of cumulative nationalistic measures that shrank world trade to lower and lower levels.

R. H. MacGillivray
Western Regional Supervisor,
Westinghouse International Co.

Western U. S. Producers Offered Foreign Trade Counsel

An offer of free advisory service to assist U. S. manufacturers in establishing or expanding their world market operations has been instituted by the Westinghouse Electric International Company, R. H. MacGillivray, western regional supervisor for the Company, announced recently.

This service is an innovation in foreign trade circles, coinciding with the increased interest now being taken in world commerce by both large and small companies in this country who see today's market as an international rather than an internal selling sphere, Mr. MacGillivray explained. The program highlights the benefits that a vigorous foreign trade can reflect on domestic economy.

Meetings now being held throughout the country constitute an introduction to the functions and responsibilities of the International Company in handling a world-wide export business, and show how these operations can be used in assisting U. S. manufacturers in their export operations.

Customers will receive a book called "The Export Market For Your Product," which sums up the vital aspects to be considered in reaching and holding foreign markets and their relationship to increased and steadier domestic employment. Suggestions are given on ways to reach foreign markets through various methods of distribution; by adapting advertising to foreign buying habits; by designing and packing equipment properly, and by meeting competition on an equitable basis by taking many other elements into consideration when planning to export.

This advisory service is available through arrangements made by the Company's district salesmen for conferences with regional supervisors or district representatives of the Westinghouse Electric International Company, or in New York with headquarters personnel.

Australia Forms Federal Export Corporation

A subcommittee of the Australian Department of Reconstruction has prepared plans for the establishment of a Commonwealth Government Corporation with a capital of nearly $3,250,000 to embark on an Australian export trade enterprise, it was reported by short wave from Canberra.

The subcommitttee's report which is being circulated to members of the Federal cabinet recommended that the organization be established as a company under company law with its share capital subscribed by the Commonwealth Government and private interests.

It is proposed that the corporation should operate as an export trading agency and establish representatives abroad to develop markets and find purchasers and handle goods for them on an agent's commission basis. It would operate in all areas in which Australia proposes to develop trade.

Begin in Orient

The report suggests that it should work initially in India, Ceylon, the Middle East, Africa, China and the Netherlands East Indies.

It adds that the proposal arises from the necessity to expand export trade and to assist Australian manufacturers in entering world markets.

The subcommittee also recommends the establishment of an export Guarantee Department of the Commonwealth Bank to assist in financing the corporation.

Coconut Oil Shipments Increase

Shipments of copra—coconut meat from which the oil is obtained—will be on the way from the Philippines in an ever increasing supply during the last half of 1946. Monthly imports of 30,000 tons will constitute an approximate total of 200,000 tons due by the end of the year. Such a volume of copra would produce about 314 million pounds of coconut oil.

Brazilian Exports Broke Record in 1945

Reflecting a continuing demand for the nation's products despite the end of the war, Brazil's exports for 1945 reached a record-breaking total of $609,875,000. This represents an increase of $73,550,050. Export tonnage also showed an increase of 355,816 tons, rising from 2,671,405 tons in 1944 to 3,027,221 tons in 1945. Nearly 50 per cent by value of all Brazil's exports went to the United States.

Silk Shipments Arrive

Japanese silk shipments are mounting rapidly. A consignment of 1,500 bales recently arrived at Seattle and 1,100 bales at San Francisco. The silk is rushed east to be sold by the federal government to textile mills. Shipments of silk are expected to increase steadily until 10,000 bales will have been delivered to this country by the middle of summer. Imports before the war averaged 30,000 bales monthly.

Mahogany Logs Due

The first mahogany logs to be received from the Philippines since 1941 are expected this summer unless shipping space tightens again. Mahogany lumber probably will not be shipped from the islands for another year. Sawmills were damaged by the Japs during the war, or have rusted beyond repair. These mills, which employ about 420,000 workers, normally shipped 42 million board feet of mahogany lumber to the United States each year.

Clothing Factories to Be Constructed in Denmark

Ten or twelve Danish apparel factories will be constructed on the outskirts of Copenhagen, according to the Office of International Trade, Department of Commerce. The factories will have a common control heating plant, and a central building with bank, post office, trade union offices, a meeting hall for workmen, and shops or offices to be rented to concerns associated with the ready-to-wear apparel industry. Another building will contain a day nursery, a kindergarten and a first-aid room.

Modern Steamship Cabin

San Franciscans viewed for the first time on May 13 a sample stateroom, an exact replica of those being installed in modern luxury liners, on display at the Marine Exchange of the Merchants Exchange at 465 California Street. The exhibit was open for inspection to ship operators, shipbuilders, naval architects and to members of the Marine Exchange and the traveling public until May 31st.

This is the first time that such modern innovations as completely passenger operated berths, fireproof and soundproof rooms, furniture which forms a bulkhead and serves two rooms at once, and engineered component parts permitting complete pre-fabrication many miles from the shipyard have been available for public inspection.

Modern labor trends make interesting the use of the Arnot Sleeper, a convertible sleeping berth which eliminates the necessity for ships' stewards opening beds when passengers are ready to retire. Four Arnot Sleepers are installed in the sample room, all concealed during the day. By pressing four small buttons, one for each bed, the luxurious sitting room is transformed in four seconds into a bedroom for four. The beds pop open, made up and ready for use and in the morning they are just as easily folded away to await the convenience of both passenger and steward in re-making them for next night's use.

Use of the space-saving Arnot Sleepers as well as the new Arnot duo-furniture which combines double-duty, fireproof furniture and fireproof bulkheads by Aetna Marine Corp. with provision for air-conditioning and ventilation ducts represents an entirely new era for the traveling public. More persons can be accommodated, due to the more efficient use of space. With greater luxury and lower fares, ocean travel will be opened to larger groups heretofore unable to consider this type of recreation at vacation time.

At a preview of the sample stateroom on May 10, Nathaniel D. Arnot, President of Arnot & Company, said "Shipowners who were previously alarmed at the imminent inroads of airlines are becoming daily more encouraged at revenue possibilities because of new competitive rates which they will be able to offer because of prefabrication and space-saving features of modern interior designs.

"Operators may expect a certain amount of sure revenue," Mr. Arnot added, "from passengers who will be influenced by the fact that modern ships will be all-weather ships, with old dangers of fog, fire and upset schedules a thing of the past."

The stateroom showed many features which were a far cry from the old fashioned ship interiors of before the war. Mattresses are constructed of foam rubber, upholstery is gay of

(Continued on page 146)

N. D. Arnot (right), manufacturer of Arnot Sleepers, who is a commuter out on the Coast from the East, working with Joslyn & Ryan installing the Arnot Sleepers aboard APL ships, shakes hands with Christian H. Lundegaard, vice president of the Aetna Marine Corp. of N. Y., who arrived in San Francisco on the day of the preview. With them are Norman A. Profitt of Pacific Sales & Equipment Co.; Michael Ryan of J & R; A. R. "Pat" Callaghan, chief engineer of Pacific Sales & Equipment Co.; and C. O. Markham, Pacific Coast manager of Arnot & Co. The Arnot Sleeper was designed by Stanley Reed.

YOUR PROBLEMS ANSWERED

By "THE CHIEF"

UNSATISFACTORY BRUSH PERFORMANCE (Continued)

AN ANALYSIS OF CAUSE AND EFFECT

AS INDICATED by the foregoing discussion, the number of primary faults from which poor brush performance may result is large. This often makes it difficult to determine the primary source of trouble in a specific case. The problem can be simplified to some extent by systematic analysis of the symptoms in the following manner.

Following is given a list of some of the more common sources of unsatisfactory brush performance. These include preparation, care and adjustment of the machine, mechanical and electrical faults, design characteristics, load, service and external conditions, and brush grade. Each item in the list is numbered for reference purposes in the table which follows.

The latter table, **Indications of Unsatisfactory Performance and Their Source,** lists in the first column some of the more common faults appearing at the brushes, at the commutator surface, and as heating in various parts of the machine. The second column gives a list of immediate causes of these faults. The numbers in the third column refer to the table of **Primary Sources of Unsatisfactory Brush Performance.** They either define the immediate cause in specific terms or give the source from which it may arise.

In many cases a large number of primary faults are listed as possible sources of a particular indication of unsatisfactory performance and the table may seem to offer little aid in the search for the specific fault involved. However, there is usually more than one indication of a faulty condition. If the primary faults usually responsible for each of these indications are noted and those selected which are common to all observed indications, the probable sources of trouble will be greatly reduced in number and the isolation of the existing fault thereby simplified. For example, more than 40 faults are listed as probable sources of sparking. However, should there be etching or burning of the commutator bars without flashovers having been experienced, the list of probable faults is reduced to 8. A tendency toward streaking or threading of the commutator would further reduce this list to No. 2 and No. 3, indicating high or "featheredge" mica to be the most probable source of the trouble.

It is impracticable to attempt to include in the tabulation here presented all indications of unsatisfactory conditions and all primary faults from which they may result. The list presented, however, supplemented by other items gleaned from experience, offers a systematic method for diagnosing a case of poor brush performance and determining the underlying cause.

PRIMARY SOURCES OF UNSATISFACTORY BRUSH PERFORMANCE

Preparation and Care of Machine

1. Poor preparation of commutator surface
2. High mica
3. Feather-edge mica
4. Bar edges not chamfered after undercutting
5. Need for periodic cleaning
6. Clogged ventilating ducts

Machine Adjustment

7. Brushes in wrong position
8. Unequal brush spacing
9. Poor alignment of brush holders
10. Incorrect brush angle
11. Incorrect spring tension
12. Interpoles improperly adjusted
13. Series field improperly adjusted

Mechanical Fault in Machine

14. Brushes tight in holders
15. Brushes too loose in holders
16. Brush holders loose at mounting
17. Commutator loose
18. Loose pole pieces or pole face shoes
19. Loose or worn bearings
20. Unequal air gaps
21. Unequal pole spacing
22. Dynamic unbalance
23. Variable angular velocity
24. Commutator too small

Electrical Fault in Machine

25. Open or high resistance connection at commutator
26. Poor connection at shunt terminal
27. Short circuit in field or armature winding
28. Ground in field or armature winding
29. Reversed polarity on main pole or interpole

Machine Design

30. Commutating zone too narrow
31. Commutating zone too wide
32. Brushes too thin
33. Brushes too thick
34. Magnetic saturation of interpoles
35. High bar-to-bar voltage
36. High ratio of brush contact to commutator surface area
37. Insufficient cross connection of armature coils

Load or Service Condition

38. Overload
39. Rapid change of load
40. Reversing operation of non-interpole machine
41. Plugging
42. Dynamic braking
43. Low average current density in brushes
44. Contaminated atmosphere
45. "Contact poisons"
46. Oil on commutator or oil mist in air
47. Abrasive dust in air
48. Humidity too high
49. Humidity too low

Disturbing External Condition

50. Loose or unstable foundation
51. External source of vibration
52. External short circuit or very heavy load surge

Wrong Brush Grade

53. "Commutation factor" too high
54. "Commutation factor" too low
55. Contact drop of brushes too high
56. Contact drop of brushes too low
57. Coefficient of friction too high
58. Lack of film forming properties in brush
59. Lack of polishing action in brush
60. Brushes too abrasive
61. Lack of carrying capacity

INDICATIONS OF UNSATISFACTORY PERFORMANCE AND THEIR SOURCE

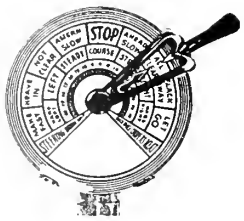
Indications Appearing at Brushes	Immediate Causes	Primary Faults
Sparking	Commutator surface condition	1-2-3-43-44-45-46-49-58-59
	Over-commutation	7-12-31-33
	Under-commutation	7-12-30-32
	Too rapid reversal of current	7-12-30-32
	Faulty machine adjustment	8-9-11
	Mechanical fault in machine	14-15-16-17-18-19-20-21-22
	Electrical fault in machine	25-27-28-29
	Bad load condition	38-39-40-41-42
	Poorly equalized parallel operation	7-13-23-34
	Vibration	50-51
	Chattering of brushes	See "Chattering or Noisy Brushes"
	Wrong brush grade	54-56-58
Etched or Burned Bands on Brush Face	Over-commutation	7-12-31-33
	Under-commutation	7-12-30-32
	Too rapid reversal of current	7-12-30-32
Pitting of Brush Face	Glowing	See "Glowing at Brush Face"
	Embedded copper	See "Copper in Brush Face"
Rapid Brush Wear	Commutator surface condition	See specific surface fault in evidence
	Severe sparking	See "Sparking"
	Imperfect contact with commutator	11-14-15-16-50-51
	Wrong brush grade	53-57
Glowing at Brush Face	Embedded copper	See "Copper in Brush Face"
	Faulty machine adjustment	7-12
	Severe load condition	38-39-41-42
	Bad service condition	46-47
	Wrong brush grade	56-60-61

Indications Appearing at Brushes	Immediate Causes	Primary Faults
Copper in Brush Face	Commutator surface condition	2-3
	Bad service condition	43-46-47-48-49
	Wrong brush grade	58-60
Flashover at Brushes	Machine condition	14-35
	Bad load condition	38-39-41-52
	Lack of attention	5-11
Chattering or Noisy Brushes	Commutator surface condition	See specific surface fault in evidence
	Looseness in machine	15-16-17
	Faulty machine adjustment	10-11
	High friction	43-45-49-51-57-58
	Wrong brush grade	54-57-58
Brush Chipping or Breakage	Commutator surface condition	See specific surface fault in evidence
	Looseness in machine	15-16-17
	Vibration	51
	Chattering	See "Chattering or Noisy Brushes"
	Sluggish brush movement	14
Indications Appearing at Commutator Surface		
Rough or Uneven Surface		1-2-3-4-17
Dull or Dirty Surface		5-44-59
Eccentric Surface		1-19-22-51
High Commutator Bar		17
Low Commutator Bar	Sparking	2-25
Streaking or Threading of Surface	Sparking	43-44-45-46-49-58
	Copper or foreign material in brush face	2-3-46-47-48-60
	Glowing	See "Glowing at Brush Face"
Bar Etching or Burning	Sparking	2-3-7-12-30-31-32-33
	Flashover	5-11-14-35-38-39-41-52
Bar Marking at Pole Pitch Spacing	Sparking	25-37
Bar Marking at Slot Pitch Spacing	Sparking	7-12-30-56-59
Flat Spot	Sparking	19-23-25-41-42-52
	Flashover	5-11-14-35-38-39-41-52
	Lack of attention	1-5-11
Discoloration of Surface	High temperature	See "Heating—At Commutator"
	Atmospheric condition	44-46
	Wrong brush grade	59
Raw Copper Surface	Embedded copper	See "Copper in Brush Face"
	Bad service condition	43-45-47-49
	Wrong brush grade	58-60
Rapid Commutator Wear with Blackened Surface	Burning	2-3-11-14
	Severe sparking	See "Sparking"
Rapid Commutator Wear with Bright Surface	Foreign material in brush face	43-45-47-59
	Wrong brush grade	60
Indication Appearing as Heating		
Heating in Windings	Severe load condition	38-41-42-52
	Unbalanced magnetic field	18-19-20-21-27-28-29
	Unbalanced armature currents	8-19-22-25-27-28-29-37
	Poorly equalized parallel operation	7-13-23-34
	Lack of ventilation	6
Heating at Commutator	Severe load condition	38-41-42
	Severe sparking	7-8-9-12-20-33-45-56
	High friction	10-11-36-43-45-49-57-58
	Poor commutator surface	See specific surface fault in evidence
	Depreciation	24
	High contact resistance	55
Heating at Brushes	Severe load condition	38-41-42
	Faulty machine adjustment	7-10-11-12-26
	Severe sparking	See "Sparking"
	Raw streaks on commutator surface	See "Streaking or Threading of Surface"
	Embedded copper	See "Copper in Brush Face"
	Wrong brush grade	56-57-58-60-61

NOTE: Acknowledgment is again made to the National Carbon Co. from whose "Modern Pyramids" this information is taken.

Steady as you go!

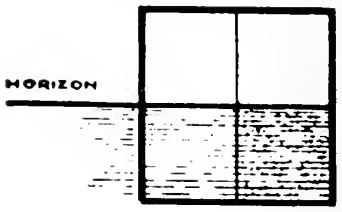
KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

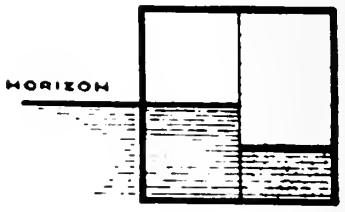
by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California



NO INDEX ERROR.

Fig. 10



INDEX ERROR EXISTING.

Fig. 11

THE SEXTANT

CHAPTER IV

The Index Error. How to Read the Sextant.

Index Error

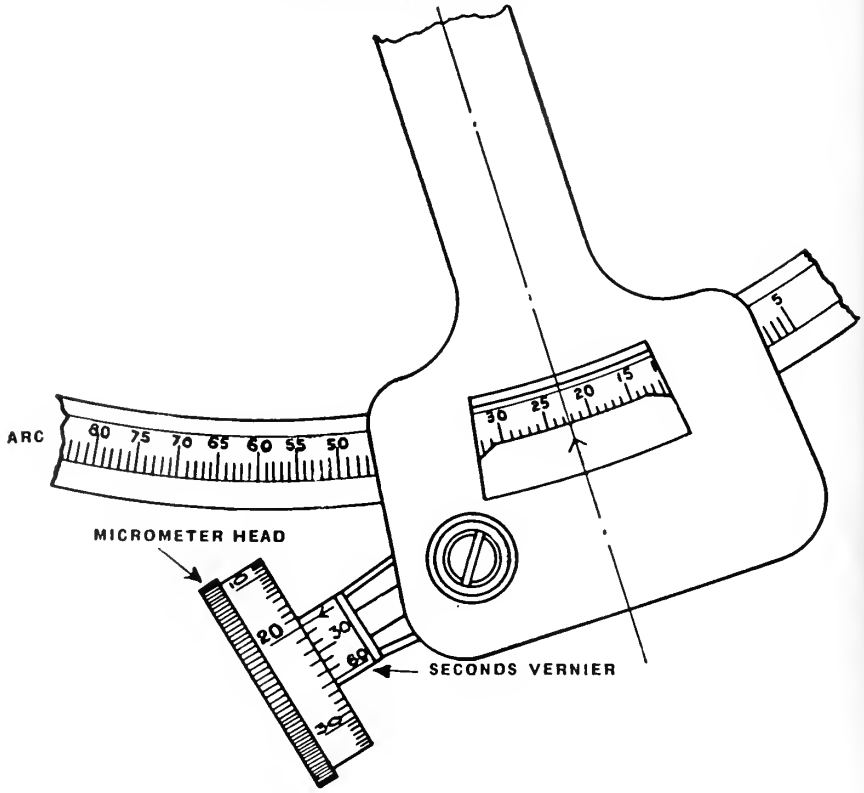
The index error (abbreviated I.E.) is the amount of error left in the sextant after the first, second and third adjustments have been carried out. As mentioned in the discussion of the third adjustment, unless the error is found to be considerable, say more than 3′, it is well to ignore the error and call it the INDEX ERROR. This error should be ascertained **each time before a sight** and allowed for.

It should be understood that whenever a sextant has an index error, this error must be added to, or subtracted from, every altitude or angle taken with the instrument, regardless of the body observed or the altitude obtained. If this correction is not made, there will be an error in the place of the begining of the graduation on the arc, although this error will affect all observed angles alike.

It will be seen by examining a sextant that the graduations of the arc are continued to the right of the zero (0°). This is called **the excess of arc.** Similarly on a vernier sextant the graduations of the vernier are also continued slightly to the right of the index.

As heretofore stated, the adjustments for perpendicularity of the index mirror and horizon glass, and parallelism of the index mirror and horizon glass are closely connected so that the disturbance of one adjustment affects the other. The adjustment for perpendicularity must be accurately made. When this adjustment has been made accurately, and the adjustment for parallelism is very close, it is advisable not to try to im-

Fig. 12: The Micrometer Sextant reads 22° 20′.



prove on the third adjustment. This small lack of parallelism of the horizon glass introduces an error, which is known as an index error (I. E.). This error may be determined as follows:

Set the index arm near zero (0°) on the arc, and bring the direct and reflected images of the sea horizon into exact coincidence in the horizon glass by moving the index arm a little either way. The index mirror and horizon glass are then parallel to each other and the vernier should be exactly at zero (0°) on the arc. If it is not, the sextant has an index error. If the zero of the vernier lies to the right of the zero on the arc, the index error is "off the arc" and must be added to all readings of the sextant. If, however, the zero of the vernier lies to the left of the zero on the arc, the index error is "on the arc" and must be subtracted from all readings of the sextant. In other words the old saying as to application of the index error is true—"When it's off, it's on, and when it's on, it's off"—when the I. E. is off the arc it must be added to, and when it's on the arc it must be subtracted from all readings of the sextant. The matter of determining the amount of index error will be discussed later.

The figures below illustrate the appearance of the sea horizon in the horizon glass when checking a sextant for possible index error. With the index arm set at zero (0°) on the arc, Fig. 10 shows the true and reflected horizons as one continuous line, therefore there is no index error. However, in Fig. 11, the true and reflected horizons do not form one continuous straight line in the horizon glass—consequently the sextant has an index error.

How to Read the Sextant

In every case after having obtained the observed altitude of the sun or other celestial body, care must be taken not to move the index arm again until the sextant has been read. Having written down the sextant reading **always check your reading again very carefully to make sure you have not misread it.** It is easy to misread it and many mistakes are made in reading vernier sextants, a source of error which has been practically eliminated by adoption of the micrometer endless tangent screw sextant.

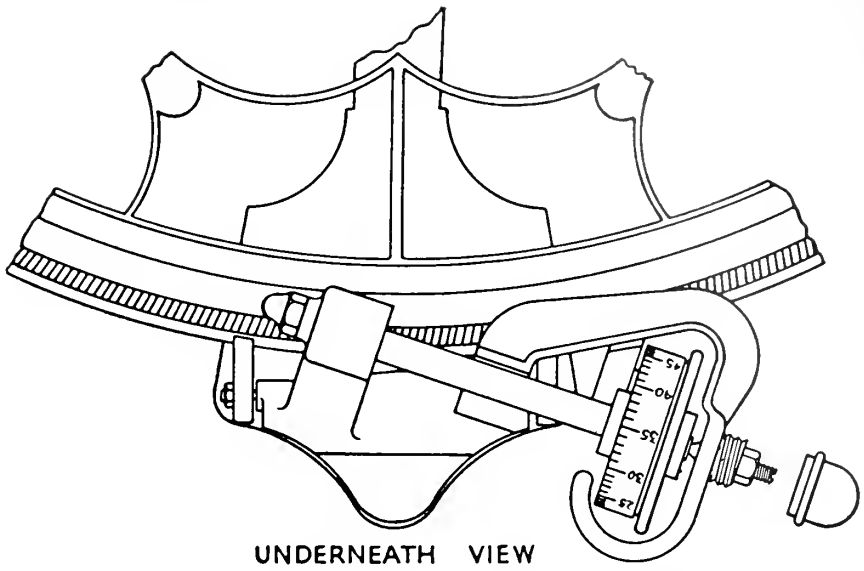


Fig. 13: Underneath view of Micrometer Endless Tangent Screw Sextant.

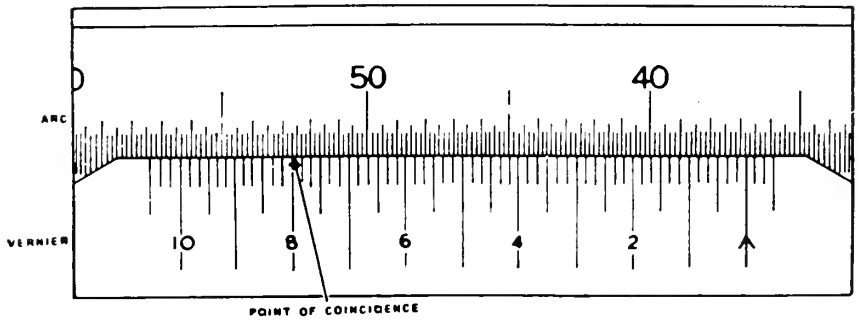


Fig. 14

The micrometer endless tangent screw sextant is so easy to read that little explanation is necessary. It has no vernier (except a simple one for seconds). Instead, it has a large micrometer head.

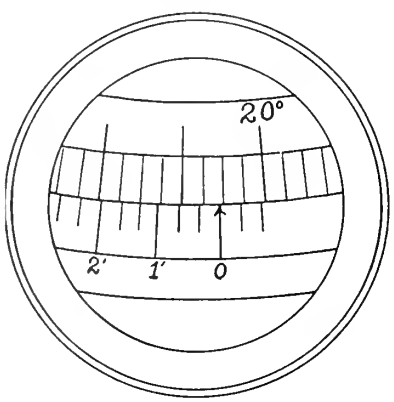
Figure 12 is a drawing of a portion of a Navy Mark II Micrometer Endless Tangent Screw Sextant, showing the arc and the micrometer head, with vernier. Figure 13 gives an underneath view of this sextant. As can be seen the arc has accurately cut teeth which engage with a worm (also accurately cut), with such a pitch and radius that one turn of the micrometer screw corresponds to an angle of one degree (1°) on the arc. The arc will be seen to be graduated to whole degrees in a legible manner, while the tangent screw is fitted with a large wheel which is divided into 60 parts and reads, therefore, to one minute (1′) of arc.

Although a seaman rarely needs to read his sextant closer than to the nearest 30″ (half-minute), a simple vernier is made fast to the micrometer head so that minutes may be subdivided to 10″ (10 second) intervals if required.

The degrees are read where the index (indicated by the arrow) cuts the arc—in this case (Fig. 12) 22°+.

(Continued from page 156)

Fig. 15



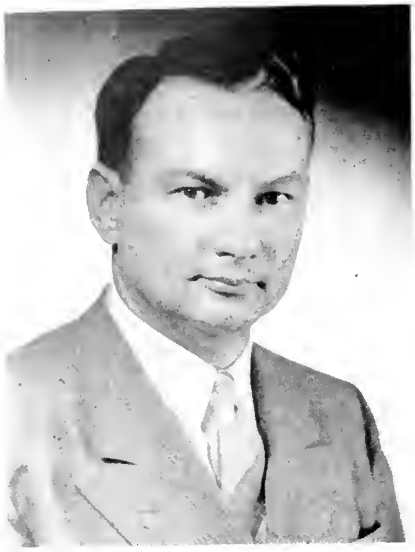
Diesel-Electric Ship Propulsion

By G. L. Crow*

The first successful commercial installation of diesel electric ship propulsion in this country was made in 1919 on an Atlantic fishing trawler, the Mariner. Thus the development and growth of this form of drive reached its present position of wide acceptance by Naval Architects, Marine Engineers and Operators in a little more than a quarter of a century. It is noteworthy that in 1922, only three years after the Mariner installation, the ferry boat Golden Gate went into operation here in San Francisco, the first of a number of diesel-electric craft to be procured by West Coast operators. This early acceptance of diesel electric drive plus the record established by local shipyards in building diesel-electric propelled craft during World War II prove the progressiveness of the West Coast Marine fraternity and its contribution to the development of this valuable form of ship propulsion.

Much has been written and published during the past twenty years about diesel electric ship propulsion and it is not the intent of the author to cover in detail that which is available in other publications or is already common knowledge. It is, however, the objective of this paper to describe the features of diesel-electric drive which should be considered carefully by the designer or operator when the type of drive is being determined for a proposed vessel.

Fundamentally, a diesel-electric propulsion system consists of means for transmitting electrically the power of the diesel engines to the propeller with all the inherent flexibilities and susceptibility to control of an electrical system. Hence, it consists essentially of one or more diesel driven electric generators connected by electric cables to one or more electric motors coupled to the propeller shaft



G. L. Crow

either directly or through reduction gearing. Means for controlling the electrical energy is interposed between the generators and the motors.

Either alternating current or direct current electrical equipment can be used for diesel electric drives, but except for a very few, all installations made up to the present time have utilized direct current machinery because of the greater flexibility and more suitable characteristics of direct current power transmission. It is possible to obtain an "infinite" number of speed ratios between the diesel engine and the propeller with direct current transmission, and this is instantly obtainable by the simple movement of the generator and motor excitation control levers or handwheels. This desirable characteristic makes possible full utilization of engine horsepower regardless of the speed of the propeller. In a multi-engine installation, the propeller speeds for different numbers of engine-generator sets in operation are as shown in Table I, assuming the propeller horsepower varies approximately as the cube of the propeller speed.

Another valuable characteristic of direct current transmission is that of torque multiplication which is derived directly from the constant horsepower, variable speed-ratio features. The diesel engine, being substantially a constant torque prime mover, will lose speed when subjected to any sizable overload. Thus, for a vessel whose operating characteristics require constant horsepower over a speed range of the propeller, torque multiplication is a "must" if the vessel is to perform at the best efficiency the work for which it is designed. The most common example is that of a tug boat.

When a tug boat runs free, the total power developed is expended in self-propulsion; when exerting a dead pull with the boat at standstill, the total power is exerted on the towline. Comparing two tug boats with equal tows and having different types of propelling systems—one in which the power developed is constant over a variable propeller speed range such as diesel-electric drive with direct current transmission and the other in which the power varies directly with

TABLE I

Number of Engines Installed	Number of Engines In Operation	Propeller Speed
2	2	100
	1	79
3	3	100
	2	87
	1	69
4	4	100
	3	90
	2	79
	1	63
5	5	100
	4	92
	3	84
	2	73
	1	58
6	6	100
	5	94
	4	87
	3	79
	2	69
	1	55

(Continued on page 146)

*The author is District Manager, Federal & Marine Section, Industrial Division, General Electric Company, San Francisco. Text is from a symposium presented on [illegible] 1948, before the Northern California Section of the Society of Naval Architects and Marine Engineers.

On the Ways — SHIPS IN THE MAKING

A DAY AT MOORE DRY DOCK CO.

Tuesday, April 30, 1946

Every dry dock on the Pacific Coast is busy these days with tremendous amounts of reconversion, repairs, cleaning and painting. The following one day schedule at the Moore Dry Dock Company, Oakland, California, indicates the use of dry dock space, and the number of ships under repair operations at this one yard.

DRY DOCK

DD#1—S. P. Derrick Barge #302
DD#1—S. P. Derrick Barge #303
DD#1—LSM-428
DD#2—W. P. Barke #2
DD#4—Michael Dekovats—To E. of 21 this P.M.
DD#4—Arcadia Victory—Due this P.M.
DD#5—Ferry Sacramento
DD#6—LSM-38
DD#7—Addie Bagley Daniels

BOOKED FOR DRY DOCKING

Gen. W. H. Gordon
W. P. Barge #1
W. P. Barge #3
W. P. Tug, Humaconna
W. P. Tug, Hercules
Colgate Victory
Celestial
USS Davison, DMS-37
Lt. Col. Ellery Niles
Col. Horace F. Spurgin
Maunalei
LST-737
Mayfield Victory
LST-753

PIERS—EAST YARD

2nd St. W—S. O. Tug #2
2nd St. W—S. O. Tug #3
3rd St. W—LCI-L-873
3rd St. W—LCS (L) 9-39
3rd St. W—YDG-9—To W. of 7 this A. M.
3rd St. W—PC (C) 1081—To W. of 5 this A. M.
4th St. E—YHB-29
4th St. E—Ocean Telegraph — Off this A. M.
4th St. E—Mayfield Victory — Due this A. M.
4th St. W—USS Davison, DMS-37
4th St. W—USS Knight, DMS-40
5th St. E—Simon Bolivar
5th St. W—Col. Horace F. Spurgin
6th St. E—Maunalei
6th St. W—Colgate Victory
7th St. E—Georgian
7th St. W—Haviside Barge #3

PIERS—WEST YARD

16th St. E—Celestial
16th St. W—Berwyn Victory
17th St. E—USS Middleton, APA-25
17th St. W—Jos. Weydemeyer
18th St. E—Gen. W. H. Gordon
18th St. W—Gen. M. C. Meigs
19th St. E—DD#6
19th St. W—DD#7
20th St. E—
20th St. W—
21st St. E—Michael Dekovats—Due this P. M. from DD#4
21st St. W—Utahan

WHARVES IN THE BAY AREA

1. Thor-I—Pier 40
2. Manukai—Pier 50A
3. Frank J. Sprague—Anchorage 9, Berth 122

Topilia—Richfield Oil Tanker—Due Martinez 5/2

Lt. Col. Ellery Niles—Due in yard 5/15

B-1. U.S.S. Admiral E. W. Eberle, just prior to launching at Bethlehem-Alameda Shipyard, Inc., June 14, 1944. The sponsor of this vessel was the wife of the Governor of California, Mrs. Earl Warren.

ARMY TAKES EBERLE

The Army Transportation Corps added the transport Admiral E. W. Eberle to its post-war fleet recently, taking possession of the P-2 type vessel in a ceremony at San Francisco Port of Embarkation's Dock Two.

Colonel John Kilpatrick, deputy superintendent of Port Water Division, accepted the ship from the Navy, which had operated it in wartime with a Coast Guard crew.

Built at Bethlehem's shipyard, Alameda, California, and commissioned January 24, 1945, Eberle traveled 90,447 miles in her troop-carrying missions in the Pacific, the Atlantic, the China Sea, the Sulu Sea, the Caribbean, the Mediterranean and the Solomon Sea. She made one run from Nagoya to San Pedro last November in 10 days, 10 hours and on the return trip from San Pedro to Japan cut two hours off that record. She will be converted to Army Transport Service peacetime standards.

DELTA LUXURY LINERS

The SS Del Sud, luxurious passenger-cargo liner being built by the Ingalls Shipbuilding Corporation, Pascagoula, Miss., for the Delta line of the Mississippi Shipping Company of New Orleans, was christened recently by Mrs. Adele K. Orgill, of Memphis, Tenn.

This 395-foot, all-welded ship is the second of three luxury liners being built for Delta.

These vessels are a modification of the C-3P type Maritime Commission design, detailed and decorated to the plans of George C. Sharp, naval architect, New York.

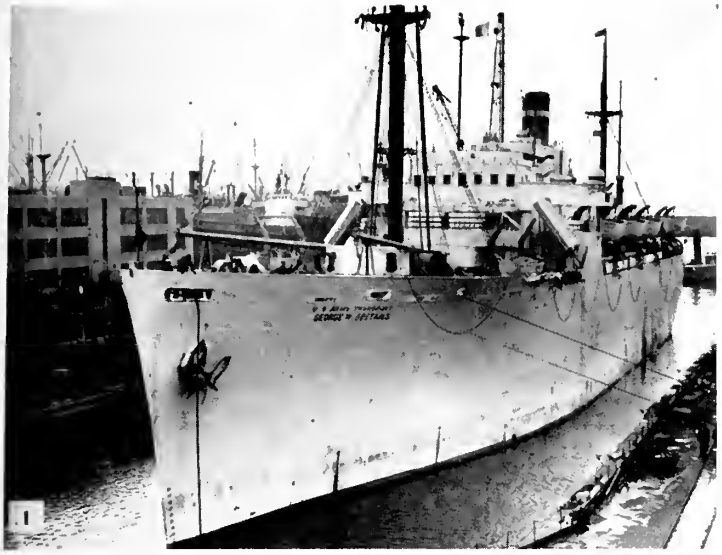
The total cost will exceed $16,000,000. The design features: use of 37.5 tons of aluminum in the stack house, lifeboats, davits and gear; air conditioning throughout all passenger and crew accommodations; bedrooms with windows commanding a clear view of the sea; soundproof glass bulkheads in the public spaces; the cargocaire system of controlling humidity in holds; the very latest in navigation equipment; an up-to-date fully equipped galley; and a beautiful outdoor swimming pool.

New Maritime Commission Head

Vice Admiral William Ward Smith, U.S.N. (ret.), who took the oath of office as Chairman of the United States Maritime Commission on June 3. He replaces Vice Admiral Emory S. Land, who retired the beginning of the year.

(3) Sponsor and party at launch of the Del Sud, the 18,000-ton luxury liner as shown in (4) just before her christening, built at Ingalls Shipbuilding Corp. for the Delta Line.

Left to right: Monro B. Lanier, president of Ingalls; Theodore Brent, president of Mississippi Shipping Company; Mrs. W. C. Chaney; Mrs. Boyd Wade; Miss Alberta Amatt, maid of honor; and Mrs. Adele K. Orgill of Memphis, Tenn., sponsor.



BRIDE'S SHIP IN FOR REPAIRS

(1) Army transport George W. Goethals, converted to carry war brides, reenters Todd Brooklyn division for repoir of damaged propeller as shown in (2) where the torches of the workers heat the damaged propeller. A quick repair job sent the Goethals back to Europe on April 29.

LAST C-2 AT CONSOLIDATED

The S. S. Golden Light, the last of a fleet of ten huge C-2 cargo vessels, being built under contract with the U. S. Maritime Commission, for assignment to private shipping operators, was launched from Consolidated Steel's Wilmington shipyard April 29.

She was sponsored by Mrs. Shea, wife of Gilbert J. Shea, President of J. F. Shea Company, Incorporated. Daughter Miss Suzanne Shea was maid of honor.

The launching of the Golden Light brings to 200 the number of ships which have slid down Consolidated Steel's ways into the waters of the Los Angeles-Long Beach Harbor, and to 1300 the number of hulls from all combined operations.

U.S.M.C. RESERVE FLEET

One hundred and thirty merchant ships, seriously damaged, overage or unneeded in current operations were added to the reserve fleet in the month ending April 15.

This raises the total moored in five anchorages to 603.

James River anchorage, Virginia, got 61, including 17 tankers, 10 Victorys and 10 Libertys.

Thirty-one were sent to Suisun Bay, California, ten of them being Liberty ships. Mobile River in Alabama gained 21, including 10 tankers. Fourteen vessels went to Columbia River, Oregon, of which eight were oversize V4 tugs built for heavy, war hauling tasks. To Puget Sound, Washington, went three ships.

Stepping the mainmast on a 17,980 ton combined passenger and cargo ship for the American South African Line built at U.S. Steel's Federal shipyard at Kearny, N.J., is one of the heaviest lifts in the construction of pre-fabricated peacetime ships. Two cranes hoist the 42½ ton mast into place. It will be lowered through the tabernacle to the step upon which it rests below decks. (A tabernacle is a piece of large pipe braced with brackets to the lower deck.)

Tide Water Associated's Flying A tanker.

New House Flag For Associated's Tankers

H. B. Haney, manager of transportation for Tide Water Associated Oil Company, Associated Division, has just announced a new house flag and stack insignia for its fleet of 14 ocean-going tankers. The design, featuring a large letter "A" with wings, is symbolic of one of the company's principal products. The motorship Flying A has been the first of the fleet to acquire the new insignia and flag.

The Flying A was requisitioned by the federal government 10 days after Pearl Harbor and has just been redelivered to her owners after four years of service with the U. S. Navy in the Pacific.

She was employed principally in distributing high octane gasoline to many of the far flung island outposts from which the attack on Japan developed. One of these islands early in the war was the island of Midway, where the M. S. Flying A delivered a full cargo of aviation gasoline only a few days before the famed Battle of Midway, regarded by many as the turning point in the war with Japan.

According to Mr. Haney, the new colors will be placed on other vessels of the Associated Fleet as rapidly as the vessels are reconditioned after their war service.

Fire Holds Up Ship Delivery

Delivery of the Scott E. Land, last C-4 cargo ship and last ship to be built on the West Coast for the U. S. Maritime Commission on Kaiser wartime contracts was delayed until about the middle of May as a result of a fire in the after refrigerator hold on April 12. Dense smoke prevented firemen from getting at the blaze. Damage was confined to platform deck hold and third deck levels.

The refrigeration installation had been completed before the fire.

SHIPYARD ATLAS

The "Atlas" appears to balance a 7-ton anchor at arm's length above his head in U. S. Steel's Federal shipyard at Kearny, N. J. This trick photograph shows one of four anchors of this size that are carried on each of the modified C-3 Maritime Commission type vessels built at Federal for the American South African Line.

Air Conditioning Aboard Ship

The air duct register control in a model stateroom being checked by Harry Martinson, a sheet metal worker at U. S. Steel's Federal shipyard at Kearny, N. J. Federal engineers are experimenting in these sample staterooms so that a moderate 70 degrees will be maintained in tropic climates at sea. Modern air conditioning registers make old-fashioned port holes useful only for sightseeing purposes, no longer for ventilation.

GEARING FOR THE PEACETIME FLEET

Stoning a burr on the first reduction gear for an 8500 shp geared turbine for the propulsion unit of a C-3 cargo vessel at the South Philadelphia Works of Westinghouse Electric Corp. Fabricated of forged carbon steel rims connected to the hub by one-piece plate centers, the gears are hobbed in air conditioned rooms to minimize expansion and contraction caused by minor temperature changes.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

A wreath of flowers was tossed from the west side of the Golden Gate Bridge by Gold Star Mother Mrs. Dorothy Arnold, whose son lost his life when his ship blew up in Italy in 1945. The wreath ceremony was in memoriam for lost seamen and tribute was reverently paid on Maritime Day by a merchant marine chaplain, who read the invocation, which was followed by "taps" and a salute fired by cadets of U. S. Merchant Marine.

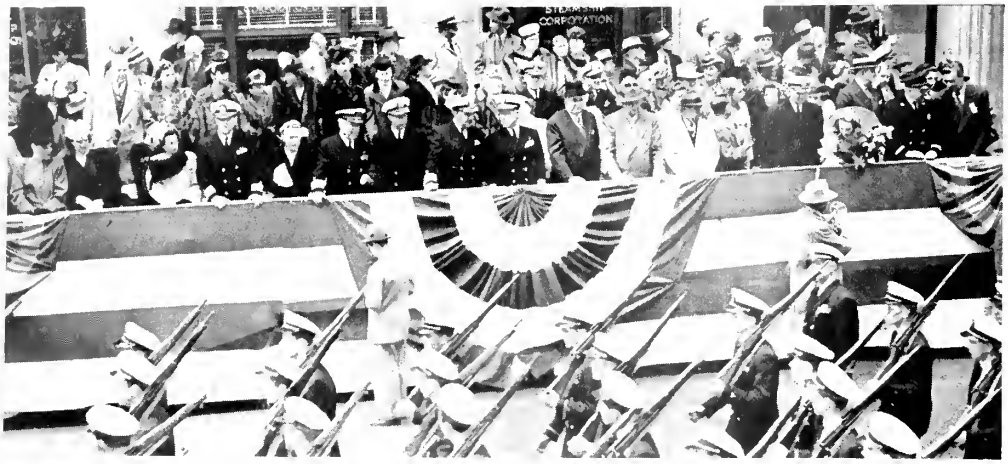
Maritime Day Queen Mrs. Dorothy Baker Willson beams from the official car at Civic Center along with Hugh Gallagher and Captain O. A. Johnson, Captain of the Clearwater Victory.

MERCHANT MARINE HONORED BY NATIONAL OBSERVANCE

San Francisco, the city that "knows how," joined wholeheartedly in the national celebration on May 22, in tribute to the courageous merchant marine who played such a stirring part in keeping America's ships and cargoes moving, during one of the most strenuous periods in American Merchant Marine history. In every seaport of the United States National Maritime Day was feted, particularly on the Pacific Coast where the wartime aftermath is still in full swing.

The observance was highlighted by a colorful maritime parade, which featured the industries' floats and marching units. Among the float entries were Pope & Talbot Co., Luckenbach Steamship Co., Matson Navigation Co., American President Lines, Port of Embarkation, with two floats; U. S. M. S. School in Alameda, Mariners Club of California, S. F. Propeller Club, Standard Oil Company of California, Shell Oil Company, American-Hawaiian Co. The marching units included the California State Maritime Academy and San Mateo Cadet Corps.

Maritime Day Queen presided throughout the parade and luncheon. In the afternooon, The Women's Organization or the American Merchant Marine held open house at Davy Jones' Locker, the Maritime Service Canteen at 1000 Geary Street. Earlier in the day, the Women's Organization sponsored a prize winning float, the S. S. Nation's Pride, in the parade. United Engineering Company built the attractive float and credit goes to J. Paul Thompson, president of United Engineering and his staff, Mr. Duncan, John Saunders and Mr. Loper for the fine job they did. Bouquets also for the fine, imaginative job of putting over a "prize winning" float to Mrs. Harry W. Parsons, chairman; Mrs. Hugh Gallagher; Mary Borden, floral designer; and Miss Barbara Boynton, of the Ladies' float committee.



Midshipmen from the Merchant Marine Cadet Corps School at San Mateo, Calif., swing smartly past shipping and maritime officials in the parade by which San Francisco celebrated Notional Maritime Day.

(Picture courtesy of S. F. Call-Bulletin)

S.S. NATION'S PRIDE, the prize winning float, sponsored by The Women's Organization for the American Merchant Marine.

Lower left: Looking down California Street as the parade passed the review stand.

Lower right: Dick Glissman as Neptune on the Mariners colorful float.

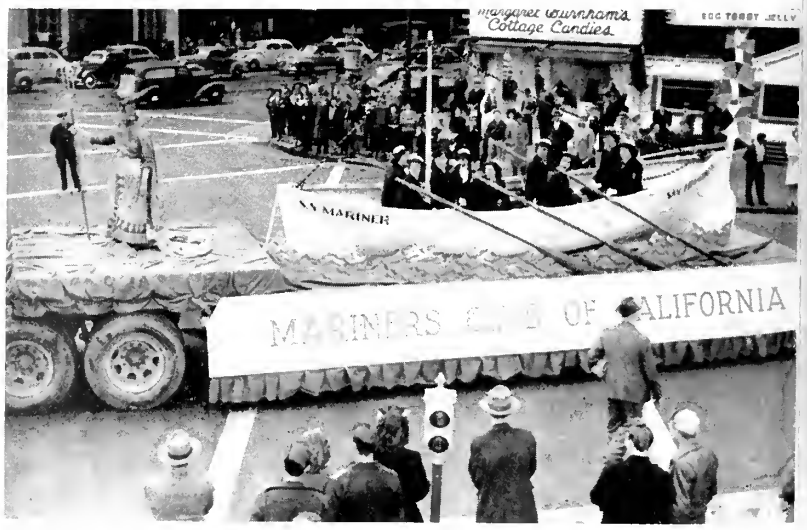
(Picture at left courtesy of S. F. Call-Bulletin)

Early Morning Tribute

Reverent tribute was paid the memories of 6000 men who gave their lives to get vital supplies through to the fighting forces overseas. The memorial ceremony was held on Golden Gate bridge at 9:30 a.m. on which occasion Captain H. J. Tiedemann presided. Earlier, observance got under way with the welcoming of the day's first American ship to enter the Golden Gate, S. S. Clearwater Victory, skippered by Captain O. A. Johnson—a fitting beginning for the festive program that included a luncheon at the Commercial Club where Hon. Roger Lapham, mayor of San Francisco, spoke, and a Mariners' banquet and United Seamen's Service dance that evening.

Lapham at S. F. Luncheon

The Maritime Day luncheon in the Commercial Club was attended by shipping dignitaries and guests, who heard Mayor Roger Lapham plead



with shipping and allied industry leaders to arouse from their "apathy" in labor and other matters and re assert their "faith" in democracy. Speaking of the Nation's uncontrolled labor troubles and the prospects of leading world peace efforts, he said, "If we can't keep order at home, can we be expected to lead the world in the fight for peace?" He accorded to labor its right to seek better wages, hours and working conditions, but scored labor leaders and unions who were seeking non-labor objectives as taking over the prerogatives of elected representatives of the people, which they are not.

Among the head table guests at S. F. Commercial Club luncheon are, left ta right: Major General Larsen, U. S. Marine Corps; Hugh Gallagher, chairman for National Maritime Day; The Honorable Roger Lapham, mayor of San Francisco; Harald Dobbs and Joseph J. Geary, behind the mike. Below, far right: Banquet scene at Mariners stag galaxy. The Mariners' Sweethearts with Dick Glisman, Frank De Pue and Joe Benoit. More pictures will appear next month. At left: Cake dedicated ta S. S. Clearwater Victary which was cut at United Seamen's Service Dance.

Right: Host at a Maritime Day cocktail party was the Western Asbestos Company. Centered in the group is President Charles B. Purcell.

Below: Ed Harms, chairman of Queens Contest, sets the crown on lavely Mrs. Dorathy Baker Willson.

Below on right: Captain Tiedemann at Davy Janes' Locker is sharing a joke wth Mrs. Frazer Bailey, Mrs. Harvey, Mrs. Frank Short, retiring Women's Organization president, and Mrs. Harry W. Parsons, incoming president.

Radio Program "Breakfast on Nob Hill" Observes National Maritime Day

At top: At the radio broadcast, Blonde Ruby Hunter and Master of Ceremonies Bill Baldwin are encouraging Eddie Martin of Westinghouse, while he tries on a "Mae West."

At left: Bill Baldwin interviews Ed Harms over the air. In the foreground at left is Mrs. Harms.

Below, left: The mike has spotted Captain and Mrs. H. J. Tiedemann and Bill Baldwin gets his interview.

Honored at the luncheon was Captain Eugene M. Olsen, San Francisco, master of the freighter Henry Knox for heroic action in the war. He received the Maritime Commission's maritime award.

At Davy Jones' Locker at U. S. Maritime Service Center, 1000 Geary Street, open house was held during the afternoon under the sponsorship of The Women's Organization for the American Merchant Marine.

A bang up banquet was thrown by the Mariners Club, a stage affair with well over 250 Mariners in attendance to watch the antics and hear the wit of Dick Glissman, Frank De Pue and Joe Benoit.

Seattle Celebrates

The observance in Seattle was sponsored by the Propeller Club in association with the maritime industries of Puget Sound. One of the features was the essay contest by the University of Washington; another was the open house held aboard a merchant vessel laying at one of the docks. On the Advisory Committee for the celebration were George Treadwell, chairman, chief engineer of the Port of Seattle; N. D. Calder, James F. Griffiths; James C. Gow, Alex D. Stewart and G. H. Wagner.

Portland Commemorates

The Propeller Club of Portland, Oregon, featured a radio broadcast at Station KGW, called the "Quiz of Two Cities" and was participated in by the members of the Portland and Seattle Propeller Clubs.

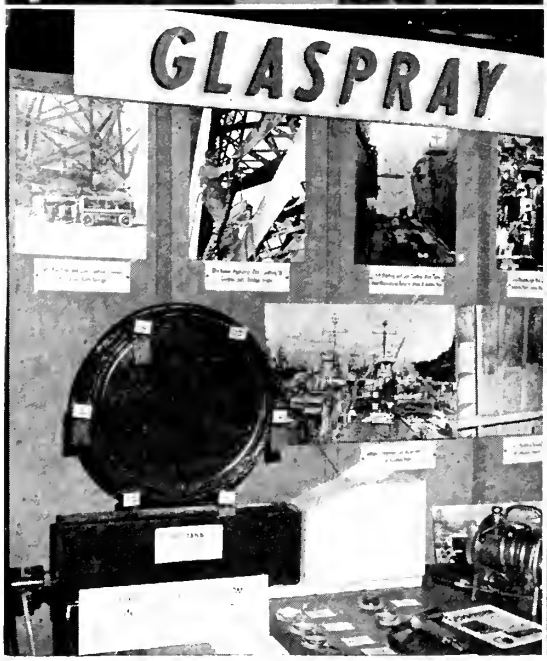
Shipping Vacuum of Japs Offers U. S. Opportunity

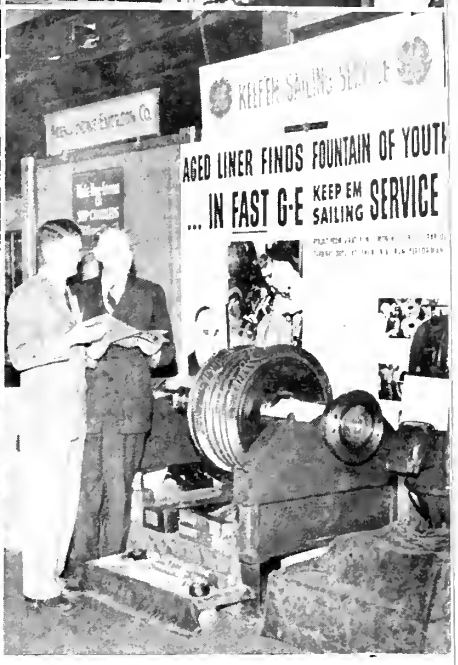
Los Angeles Maritime Day included a talk by John E. Cushing, president of American-Hawaiian and former Deputy Administrator of the War Shipping Administration, who addressed Southern California maritime circles. The destruction of Japanese shipping offers the United States a chance to establish our merchant marine on an enduring foundation in the Pacific, and someone must fill the vacuum created by the annihilation of Japanese shipping. At the present time, he said, there is not a single runner-up to American domination of sea commerce in the Pacific.

We have the ships, the officers and the crews and with the will and determination to establish our merchant marine in the Pacific on an enduring foundation—fair to others but not unfair to ourselves, we have a good chance at this market.

Cushing advocated "thinking and talking in terms of the Pacific," as the watchword of our merchant marine which he said must be regarded as a national necessity receiving the full support of the Government.

All up and down the Coast ships were bedecked with buntings and flags. The lifting of restrictions on visitors to ships in most ports permitted inspection parties to board. In San Francisco, the S. S. Golden State, training ship of the California State Maritime Academy, docked at Pier 18 for probably her last "public appearance" as she is being replaced by a new training ship, U. S. S. Mellen, formerly the Navy auxiliary attack transport, AKA 32.





Westinghouse Exhibit at the Maritime Industry Exhibit held in the Marine Exchange. W. Edgar Martin of Westinghouse explains the model to Frank DiMarca.

MARITIME INDUSTRIES EXHIBIT

On this page are a few of the baaths in the Maritime Industries Exhibit, held an the floar of the San Francisco Marine Exchange. Seen by an estimated 10,000 San Francisca businessmen, the show was prabably the most worth while feature af this city's observance af Natianal Maritime Day. Above, lower right, in the General Electric booth, "Dad" Le Caunt, veteran G. E. marine sales engineer, and J. P. Eichorn (standing at left), advertising and sales pramotion, Geargе Barr, G. E.'s marine superintendent and "dean of Bay Area installatian men," an the poster background.

Amang new marine equipment shown for the first time was an electric engine arder transmitter, feature at the Marine Instrument Company's exhibit. Below, center, its demanstrator—and inventor—Mr. Rasmussen reparted a great deal af enthusiasm an the part af many an ald-time captain and engineer who visited the booth. An important feature of the device, which Marine Instrument will manufacture, is a recarder which gives a permanent record af every signal's dispatch and receipt.

A MODEL CABIN

Solid cabin comfort aboard fast luxury liners will be installed as pictured (at left) by this Arnot designed cabin furniture arrangement that was displayed and demonstrated in the Maritime Industries Exhibit at the Marine Exchange in San Francisco. Mildred Trent, (aloft) reclines coxily in an Arnot Sleeper while her companion, Virginia Congdon, prepares to retire.

Maritime Industries Exhibit

Acclaimed by both its participants and visitors the Maritime Industry Exposition held at the San Francisco Marine Exchange from May 13 to 31, was a part of the National Maritime Day observance this year.

The Model Cabin

Leaders in the shipping industry agree that a worthwhile precedent has been set by combining the celebration of Maritime Day with the Exposition. Visitors to the exhibit exceeded 10,000.

One of the most interesting exhibits for the layman was the passenger stateroom modeled after those now being installed on the liners President Wilson and President Cleveland, soon to enter the transpacific passenger trade for American President Lines. This display, under the joint sponsorship of Joslyn & Ryan and Arnot & Company, was bound to appeal strongly to a travel-hungry visitor. But equally as essential to the all-over success of the show were the displays of Radar and Loran, radio transmitting equipment, sounding apparatus, cargo gear and tackle, chemicals, shipping publications and marine propulsion equipment as represented in the displays of General Electric Company and Westinghouse Electric Corp. Aetna Marine Corporation are installing the 2-inch insulated bulkheads, which are displayed in this stateroom of Arnot's, and which bulkheads are being installed on the A.P.L. ships now being built at Bethlehem-Alameda, along with all marine interiors on these P-2's.

Columbus would blink at the new luxury liner cabin displayed at exhibit in the San Francisco Marine Exchange, saluting National Maritime Day. Jackie Ingram sets the "brain" of the General Electric automatic blanket to her favorite sleeping warmth. The modernly equipped cabin was sponsored by Arnot Co. and Joslyn & Ryan.

A GALLANT SHIP AND CAPTAIN ARE HONORED

Left to right: Captain R. O. Demarest, marine superintendent of Sudden & Christenson, Inc., the ship's operators; Mrs. Richard W. Elkus, who originally sponsored the Marcus Daly and who officiated at the unveiling of the plaque; and Comdr. W. Creighton Peet, Jr., making the presentation for the WSA.

Above: Aboard the Marcus Daly a bird's-eye view of Comdr. Peet reading the Presidentiol Citation which was presented to Captain Opheim.

The valor and teamwork of the merchant crew and Navy gunners of the Liberty ship Marcus Daly, operated by Sudden & Christenson, Inc., in repeated combat action during the recovery of the Philippines has won the vessel official citation as a Gallant Ship. During the ceremonies, when this award was conferred, the Presidential Citation and Distinguished Service Medal, the highest award the U. S. Maritime Commission can bestow, was presented to Captain Alvin W. Opheim of Burlingame, California, the ship's former master.

The Marcus Daly's Gallant Ship bronze plaque was installed aboard the Liberty ship at Pier 56 at San Francisco on April 30, at ceremonies presided over by Commander W. Creighton Peet, Jr., War Shipping Administration's Pacific Coast director. The plaque was awarded for the part the Liberty ship played in the defense of the city of Tacloban, Island of Leyte, during the days of the initial invasion in October, 1944. For six days and nights her guns and courageous crew defeated vigorous attacks by Japanese planes in a continuous series of heroic actions. Her barrage made possible the successful landing of both troops and cargo. In the second engagement, December, 1944, on returning to the Philippines, she was again engaged by enemy bombers and suicide planes and emerged victorious, in spite of a kamikaze exploding on her forward deck —setting fire to the ship, killing or injuring over 200 troops and crew members. The record of this merchant ship (with a small crew and a smattering of guns) surpasses that of many warships—her total bag being seven Jap planes shot down.

The Marcus Daly is the fourth ship of the American Merchant Marine to win this distinguished award and the first on the West Coast. Of the 40 members of the crew who took part in the action (who will be entitled to wear the Gallant Ship service bar) 27 are Californians, and out of the 18 members of the Navy gun crew, four are from California.

The SS Marcus Daly is now under the command of Commander S. J. Valentine.

The unveiled plaque and Captain A. W. Opheim, who received the award on behalf of the ship and crew.

Below left: Following her Philippine action, the SS Marcus Daly came here for extensive repairs, including replacement of most of her bomb-torn bow.

Below right: Today the Marcus Daly, renewed and trim, stands at her San Francisco pier, ready to sail again, her grim experiences only a memory.

This photograph of the Shrine - Matson Day at the S. F. Propeller Club on May 8 was a gala affair saluting the National Maritime Industries with a Merchant Marine program. Helping to celebrate were, from left to right: Admiral Stanley V. Parker, U.S.C.G.; Washington I. Kohnke, Potentate Islam Temple; William H. Woodfield, Jr., Imperial Potentate; Hugh Gallagher, vice president of Matson Navigation Company, and chairman of the S. F. Propeller Club Committee for the Observance of National Maritime Day; A. Brooks Berlin, president of the Shrine Luncheon Club; Captain H. J. Tiedemann, U.S.M.S., Pacific District Operations Officer in charge of U.S.M.S. activities on the entire West Coast; and Albert P. Jacobs, vice president of Shrine Luncheon Club.

MATSON DAY AT SHRINE CLUB

Talking about one of the oldest seaborne services in this country, the American Merchant Marine, Captain H. J. Tiedemann, Pacific District Operations Officer for USMS, spoke to a Matson and Shrine audience on May 9 at the Palace Hotel in San Francisco. The occasion was the annual luncheon sponsored by Matson Navigation Company for the Islam Shriners. This event is always popular and over 100 Matson people attended. Chairman of the Day was Hugh Gallagher, Matson vice president.

Captain Tiedemann's theme was the past and future problems of the American Merchant Marine. He stressed the need for a large and adequate merchant marine, loyally supported by American travelers and businessmen, which will also provide jobs for over five million people in operations, shipbuilding, and allied industries; that the shipping industry must sponsor and train an efficient citizen personnel to man this fleet we must educate those outside the shipping industry to become maritime-minded—for a vital part of our national economy lies in the retention of a strong and efficient merchant marine.

Hugh Gallagher, chairman of the Matson-Shrine luncheon at the Palace.

Honored guest Imperial Potentate William H. Woodfield, Jr., gave an interesting talk on the Shrine activities of the near future, including the national Shrine convention to be held in San Francisco in July.

As a finale a distinctive stage show was given by a group of Hawaiian entertainers.

Credit for the arrangements for this luncheon goes to Hugh Gallagher, chairman, who was assisted by A. P. Wheeler and Walter R. Bradshaw, all of Matson.

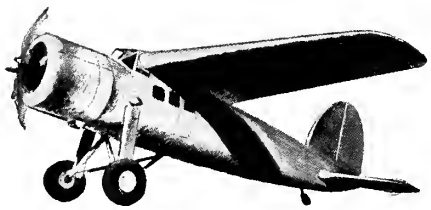
New Office in New York for Deconhill

The appointment of R. A. Murphy as district manager of the Deconhill Shipping Company at New York is announced by J. J. Coney, president of the company in San Francisco.

On May 1, the company opened a new office at the Whitehall Building, 17 Battery Place, New York City, at which time Mr. Murphy, who is well known in the tanker industry, assumed his new duties.

The company is agent for the Hillcone Steamship Company of San Francisco.

We made our record IN THE AIR by keeping our feet ON THE GROUND...



In the late 20's we shared Lockheed's thrill in their new Vega—our Finishes were on that ship. Today, Lockheed's Constellation is another air-world sensation. She, too, flies with Fuller Aircraft Finishes!

There's more. Fuller Finishes are on the Douglas DC-6, on Consolidated Vultee's Convair and on the Boeing Stratocruiser.

Our continuing leadership in Aircraft Finishes comes directly from our strict laboratory and field procedure on ALL industrial products. This: "Know the *whole* problem to get the *complete* answer."

All Fuller Aircraft Products now are available in any quantity for private use. Inventories on other Industrial Finishes are being increased as rapidly as materials permit. W. P. Fuller & Co. Factories in San Francisco, Los Angeles, Portland; Branches, Warehouses in principal Western cities.

FULLER *Industrial* **FINISHES**

FULLER PAINTS they Last

THE WEST—AMERICA'S NEW INDUSTRIAL FRONTIER

FULLER pioneered in '49; became West's largest, most skilled paint makers. We're still pioneering in '46—with NEW products for our Western Industrial frontier!

MAINTENANCE FINISHES

In the field of factory maintenance, Fuller Color Engineering *puts color to work* . . . increases production profit through better employee safety, morale. Write for new, up-to-minute book, or have Fuller representative call with data.

PRODUCTION FINISHES

Under the pressure of war needs, we telescoped years of research on the problems of Plywood finishing. Today, we feel we lead the field. Whether you're interested in sealing Plywood at a mill or in working out a finishing system in the shop, Fuller can give you the right answers.

MARINE FINISHES

Mr. Boatbuilder: See Fuller! From a plastic laminated hull down to the lowly dory, we've got a finish for every purpose. (For sea-going ships, too!)

Pacific MARINE REVIEW

NEWS FLASHES

KAISER'S RICHMOND YARD GETS BIG CONVERSION JOB.

The Army Transportation Corps, Fort Mason, San Francisco, announces the assignment to the Kaiser Yard 3 at Richmond of 8 C4-S-A1 troop ships for interim reconversion. Most of the vessels were built at the Richmond yard and include the following:

General A. W. Greely,
General D. E. Aultman,
General A. W. Brewster,
General M. M. Patrick,
General Charles G. Morton,
General H. F. Hodges,
General H. B. Freeman,
and one other.

There is about two months work on each vessel and upwards of a thousand additional mechanics in all categories will be required.

* * * * *

JOSHUA HENDY PURCHASES THEIR WAR BUILT PLANT.

The Joshua Hendy Iron Works, Sunnyvale, California, has purchased from the War Assets Administration, a cast cylinder and engine base plant which was operated by the Hendy firm during the war. Price was $1,103,295.

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ARMY ANNOUNCES ADDITIONAL CONVERSION.

It is now announced from the San Francisco Port of Embarkation that 23 vessels to be used as troop carriers, troop dependent carriers, and hospital ships will be acquired and refitted. The figure includes the 8 mentioned in the above item. During wartime the C4 vessels carried about 3,000 men on each voyage. After reconversion their capacity will be about 1,500 troops and 350 dependents.

The Army will take over four P2 transports which had a wartime capacity of about 4,300 each. They are the Admiral Hughes, Admiral Benson, Admiral Eberle and Admiral Sims.

Four hospital ships also are being refitted as troop and dependent carriers. They are the Republic, Thistle, Acadie and St. Mihiel.

Three Navy hospital ships have been turned over to the Army for hospital service and will require some alterations. These are the Comfort, Hope and Mercy.

* * * * *

EXPERIMENTAL CARGO HANDLING GEAR.

The Maritime Commission has approved contracts for construction and testing of experimental traveling crane type overhead cargo handling gear as an important element in the reduction of longshore costs. The total authorized by the contracts is $146,649, and it is expected that costs can be reduced as much as $1.50 per ton, as well as showing a 15 per cent faster loading.

* * * * *

NEW MARITIME COMMISSION HEAD.

Vice-Admiral William W. Smith has been confirmed by the Senate as a member of the Maritime Commission and was promptly designated by Presideint Truman as Chairman of the Commission. Admiral Smith takes the place of Capt. McCauley who resigned because of ill health.

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BETHLEHEM TO CONVERT P2 VESSELS.

Bethlehem Steel, San Francisco, is planning to convert 3 P2 troop ships and Bethlehem, San Pedro, will get one additional.

BIG CONVERSION JOB ON C3's.

Announced for opening during the first week of June are bids for converting Navy attack transports of the C3-S-A2 type to cargo ships for the Maritime Commission. The first bids will cover seven vessels which are now in temporary reserve. Five of them were built by Ingalls and two by Western Pipe and Steel Company, San Francisco. The vessels are the following:

Alpine, Barnstable, Mendocino, Leon, Elmore, Fayette, Knox.

* * * * *

EXTENSION OF WSA INTERCOASTAL AUTHORITY.

The Interstate Commerce Commission on May 24 extended to September 30 the temporary operating authority previously given to the WSA for coastwise and intercoastal operations.

In Congress, there is a move afoot to have the Maritime Commission (in the event of WSA termination) to continue the coastwise operation of vessels in the Alaska routes until June 30, 1947. There is agitation in Alaska for increased service and lower freight rates. There is a demand from the carriers for greatly increased freight rates and demands from labor for greatly increased costs. Hence the necessity for a continued commission operation. Without it there would be no service to Alaska. In other quarters the suggestion is made that the Navy operate Alaska service but this is not regarded as a likely development.

* * * * *

LINER BRAZIL TO BE RECONDITIONED.

Plans and specifications for reconditioning the liner Brazil before restoration to the Moore-McCormack line have been accepted from San Francisco naval architects Joslyn & Ryan. This firm received a similar contract for conversion of a sister ship, the Uruguay, each of which jobs will run to about $3,000,000.

Bidding date on the Uruguay is June 10th.

A third ship of this group, the Argentina, is still to be assigned.

* * * * *

EUROPA AND NORMANDIE UNWANTED IN U. S.

The French liner Normandie and the German liner Europa have gone begging in the U. S. ship market. Even the French do not want the Normandie but within recent days it is understood that the Italians have agreed to take the Europa. The trend in U. S. shipping, as announced by S. D. Shell, executive director of the Maritime Commission to the House Appropriations Committee will be toward one-class vessels with great speed and cargo capacity.

* * * * *

THE LINER WASHINGTON.

George C. Sharp, New York naval architect, has a contract from the Maritime Commission for preparing plans and specifications for reconditioning the liner Washington, operated by the Commission during the war as the Wakefield. Bids will be called for shortly.

* * * * *

MANY STATES CONTRIBUTE TO A SHIP.

The products of 41 states go into the building of a merchant ship and material from the seven other states is used in the ship's operation. Thus announces Frank J. Taylor, president of the American Marine Institute at the opening of the National Marine Exposition. He was emphasizing that every part of the country has a stake in the Merchant Marine, even apart from world trade operations

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CHINA BUYING NAVY EQUIPMENT.

U. S. Navy shipyard equipment now on Pacific Island bases will be used to rehabilitate shipyards at Shanghai, Tsingtao and Amoy. The Chinese Government contracted to purchase $15,000,000 worth of such equipment during May.

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$200,000,000 TO BE SPENT BY ARMY IN THE PACIFIC.

The above figure is an estimate compiled from Appropriation Committee items.

WEST COAST MARITIME SCHOOLS TO CONTINUE.

The Maritime Schools at San Mateo and Alameda which were feared doomed for a time because of lack of funds are included in WSA appropriations. So also is the Federal appropriation for the State school at Vallejo.

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ATLAS PAINT AND VARNISH COMPANY EXPANDS.

The Atlas Paint and Varnish Company of Los Angeles announces the opening of the Atlas Marine Paint Company of San Francisco with offices at 201 First Street.

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MARINE CORPS ACTIVITIES WILL BE ENLARGED AT SAN FRANCISCO.

The U. S. Marine Corps will maintain West Coast headquarters at San Francisco with about 5,000 employees on the payroll to take care of the expanded Marine Corps which will number about 100,000 enlisted men and 7,000 officers. The San Francisco depot of supply will serve Marine Corps activities along the Pacific Coast, in Alaska, China, Japan and the Pacific Island bases. Purchasing also will be done at San Francisco.

* * * * *

NEW DIVISIONS IN MARITIME COMMISSION.

Two new divisions have been set up by the Commission:

The Division of Large Vessel Sales and Charters for vessels of over 1500 tons. C. C. Cornwell will be Director.

The Division of Government Aids will handle matters related to trade routes and services construction and operation parity payments and all matters not concerned with sales and charters. Charles H. McDaniel will be Director.

* * * * *

ASK BIDS FOR PORTAL CRANES.

The Navy Bureau of Yards and Docks, Washington, D. C., is seeking bids for the conversion of two floating cranes to portal cranes. Specification number 17519. Bid opening date not set. The cranes are at Naval Shipyard, San Francisco, and Naval Shipyard, Terminal Island.

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WESTERN SHIP SERVICE EXPANDS.

The Western Ship Service, San Francisco, has acquired a pier at the foot of Ferro Street, Oakland, for the handling of ship cleaning and painting operations.

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HUNTERS POINT TO BERTH INACTIVE SHIPS.

The U. S. Naval Shipyard, San Francisco (Hunters Point), is seeking an additional appropriation of $5,000,000 to provide berthing facilities for two aircraft carriers, six large transports and one submarine tender which will make their permanent home at Hunters Point. New concrete piers will be constructed and considerable dredging will be done.

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SWEDISH PULP TO RELIEVE PAPER SHORTAGE.

The Grace Line announces that up to 700,000 tons of Swedish pulp will be brought to this country during the next six months.

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ARGENTINA WANTS SHIPS.

A general invitation has been extended to American shipyards by the "Argentine State Merchant Fleet" (Flota Merchante Del Estado) to submit proposals for the building of three passenger cargo ships and two refrigerator ships.

The ships are to be around 8,500 tons each and are described as the mere beginning of a program for expanding the Argentine merchant marine. Interested persons may write the Argentine Naval Commission, 1302 18th Street, Washington, D. C., for details.

* * * * *

CONSOLIDATED STEEL TO BUILD PIPE LINE.

Consolidated Steel Corporation, Los Angeles, will begin in September, fabrication of 214 miles of 30" pipe for the Southern California Gas Company. The contract calls for about 58,000 tons at a total value of about $6,000,000.

GREAT U. S. STEEL EXPANSION AT PITTSBURG, CALIF.

U. S. Steel, high bidder for the government-owned steel plant at Geneva, Utah, announces plans for new facilities at the subsidiary Columbia Steel Company at Pittsburg, Calif., costing about $25,000,000. Included in the new facilities will be a modern cold reduction mill for the production of cold rolled sheets and tin plate.

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PACIFIC SURPLUS NAVY PROPERTY DISPOSED OF.

The Twelfth Naval District announces that nearly all surplus Navy property in the South Pacific Area except fixed installations has been disposed of. Principal purchasers have been the New Zealand and Netherlands East Indies governments.

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BETHLEHEM EMPLOYING VETERANS.

Bethlehem Steel's San Francisco office announces that the three Bay Area yards of Bethlehem have absorbed a total of 5,080 World War II veterans to date and of these only 809 were former employees.

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TWO TANKERS TO BE CONVERTED AT SAN FRANCISCO.

The Standard Oil tankers "Bahrien" and "California Standard" have arrived at San Francisco from the Persian Gulf area and will be reconstructed at the Bethlehem yard.

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CENTENNIAL OBSERVANCE PLANNED.

Various suggestions for commemorating the discovery in California, the Gold Rush, and the Admission of California to the Union have been recognized by the San Francisco Chamber of Commerce, and the Board of Directors advocates a three-year celebration from 1948 to 1950.

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LOS ANGELES HARBOR EXPANSION.

Here are the details as announced in the press of the 15 million dollar expansion program adopted by the Los Angeles Board of Harbor Commissioners. The budget adopted totaled $15,558,693 for the fiscal year 1946-47. General Manager Arthur Eldridge reported an unencumbered balance accumulated of $12,558,693 and estimated a revenue of $2,845,000. Details of improvements and maintenance expenses follow:

Terminal expansion and general harbor improvements will need $8,748,000. The budget sets up $2,000,000 for deferred maintenance and operating revenue, $1,353,-250 for alteration and repairs, including new aprons at Berths 227, 228, 229, 261, 264, 184, 185, and 90, with $75,000 allocated for ratproofing and riprap work.

The items included in expansion and improvements are as follows:

$1,200,000 for a marine cargo terminal at Berths 179 and 180.

$755,000 for a municipal wholesale fish market and wharf at Berth 154.

$575,000 for a fishermen's wharf at the old Southern Pacific slip.

$900,000 for extension of the terminal at Berth 154.

$350,000 for dredging.

$198,000 for a new mole at Fish Harbor.

$205,000 for an industrial sewage collection system at Fish Harbor, for which the city will be reimbursed by the canneries.

$3,600,000 for combination passenger-cargo facilities and other improvements in the West Basin.

$266,418 for a new tug and replacement of the pilot boat.

$600,000 for land acquisition.

$50,000 for an industrial management survey, and economic study.

$555,243 for interest on outstanding obligations.

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BETHLEHEM GETS AMERICAN EXPORT LINES ORDER.

The Maritime Commission has approved the bid of Bethlehem Steel Company, New York, for the construction of three 650 ft. 22 knot passenger cargo ships to be built for American Export Lines. Final award is contingent upon approval of application for a construction subsidy.

Bethlehem's bid of $15,495,000 for each of three vessels includes the furnishing of all materials and delivery in 640, 746 and 854 days. The vessels are to be used in the Mediterranean service and will carry 650 passengers.

COPPER ALLOY BULLETIN

MARINE AND POWER EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared by Bridgeport Brass Company "Bridgeport" BRASS CO. *Headquarters for BRASS, BRONZE, and COPPER*

Importance of Protective Film in Extending Condenser Tube Life

The character of the corrosion film which forms on condenser tubes during service is influenced primarily by the nature of the circulating water and the chemical composition of the alloy or metal from which the tubes are made. In general, corrosion films which form on brass are more easily removed than those formed on modified brasses, aluminum bronzes and copper-nickel alloys. The rate of film removal depends upon the temperature, velocity (extent of agitation), and of course the specific properties of the corrosive medium. Hence the nature and distribution of the corrosive film—whether it is continuous and impermeable, or permeable, with physical and chemical properties markedly different from the metal being corroded—has a tremendous influence on the rate of corrosion.

Two Types of Corrosion Films

Let us consider the corrosion films which form as belonging to two different classes—the invisible (frequently protective) and the visible (frequently non-protective). In between these two extremes are corrosion films which have varying degrees of protective values.

It has been observed repeatedly that the visible films, which are insoluble in the corroding medium, usually have the following characteristics: They are permeable to water (they permit the passage of a fluid through them). They are sufficiently dense to impede the flow of fresh corrosive solution to the metal surface (this may also slow up the rate of corrosion). They may be non-uniform or discontinuous, thus permitting the corrosive solution to come in contact with metal in certain areas and partially screen the metal in others. The corrosion may be increased in certain screened areas (under or around) by the formation of concentration cells. The metal under the thicker portions of partially permeable film usually becomes pitted (anodic area) or attacked by localized corrosion. The exposed metal or those areas covered with thinner films are only slightly corroded (cathodic area). The continuous accumulation of corrosion products of the same type helps to produce deeper pits or to enlarge the area being corroded.

The properties of visible corrosion films aid in the formation of the concentration cell (metal ion and oxygen) types of corrosion. The concentration cell begins to operate when the corroding substance is present in different concentrations at adjacent areas on the metal surface.

Foreign Matter Accelerates Corrosion

The nature and distribution of sand and slime from various growths, weeds, leaves, silt, ashes, sheels, ruts, etc., are also very important contributors to cell types of corrosion. When foreign materials of this nature contribute towards localizing corrosion, the resulting attack is commonly called "deposit attack."

It is known by power plant engineers that the removal of such debris by periodic cleaning using rubber plugs, bristly brushes or high pressure water or air applied at the exit end definitely prolongs the life of condenser tubes. The water box should be cleaned regularly and the paint should be kept intact. Of course, the intake tunnel should be kept clean and if necessary the channel should be dredged. If troubled with marine growth and slime, chlorination may be used. In all instances the metal is corroded (anodic area is pitted or dezincified) where the oxygen concentration is least, viz., where the corrosion film is thickest or under deposits of foreign material which may eventually become part of the corrosion scale. Where a thin deposit covers the metal (cathodic area) and therefore the oxygen concentration is the highest, the least amount of corrosion occurs.

7500 Square Foot Surface Condenser, courtesy Allis-Chalmers Manufacturing Company

Superior Corrosion Resisting Alloys Available

In such alloys as Cuzinal (aluminum brass), Duronze IV (aluminum bronze) and 70-30 copper-nickel, exposed to clean ocean water, the corrosion films are comparatively thin and of a more protective nature. Such films adhere more firmly to the parent metal and are more readily healed when bruised. Consequently the chance of localized corrosion (pitting) is reduced.

Besides reducing corrosion, the thinner corrosion films also possess better heat transfer characteristics than the thicker corrosion films and scales. This results in greater efficiency.

It follows therefore that there is a relationship between the character of the film and condenser tube life. Since the character of this film varies with the alloy and the corrosive environment it behooves every power engineer to seriously consider the superior qualifications of the more modern condenser tube alloys.

Preventive Measures Should Be Taken

Numerous devices have been designed, built and put into practical use to remove debris, entrained gases, and other substances from corrosive waters. The simplest device is the stationary screen which is quite effective within its limits. The rotating screen is widely used and is generally more satisfactory than the stationary screen since the debris, fish, sea weed, etc., are continuously being removed automatically.

The use of a wide generous tank with ample baffles is of proven effectiveness in removing debris and entrained gases. This is accomplished by using a tank which is considerably wider than the incoming stream of water. This slows down the flow sufficiently to allow the foreign matter to settle out from the water and the gases to rise and escape. The use of such tanks materially aids in increasing condenser tube life. It follows that condenser maintenance is appreciably reduced since less debris gets into the water box and the tubes themselves.

Field Tests Strongly Recommended

Many power engineers are looking into the possibilities of these alloys through the installation of test lots under actual service conditions or as field tests so that they will have available pertinent information as to the best alloys for their particular requirements or operating conditions. Here our Technical Service Department can be very helpful in working with power engineers in the selection of the alloy which will be most practical. If you do not have a copy of our Condenser Tube Manual, write for it today.

BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • *ESTABLISHED 1865*

Turbo-Electric and Geared-Turbine Students of Officers' Training School in Alameda Visit University of California

In conjunction with their studies at the U. S. Maritime Service Officers' School in Alameda, California, each class of Turbo-Electric and Geared Turbine students make a field trip to the University of California, for a demonstration of the phenomena of alternating current in motors and generators. B. L. Robertson, Professor of Electrical Engineering, conducts this class, and we present here a series of pictures taken at one of the recent trips. Below, left: Prof. Robertson (pointing) is explaining the principles of an induction motor, a three phase A. C. revolving field, and the circulating induced currents in the rotor which cause it to revolve with no electrical connections. The rotor shown in the center of the field poles is a simple copper water-closet float, revolving on a spindle. Below, right: Here, Prof. Robertson is showing the stator windings in an induction motor. A convincing demonstration of the revolving field is given by a steel ball-bearing which rolls around the inside of the stator surface. Center: the lantern-like device is a stroboscope. A rapid blinking light directed on a revolving object makes the object appear to stand still when the light blinks at the same speed at which the object revolves. The stroboscope was used a moment later to show the slip of the squirrel cage motor in the center of the photo. Bottom left: that's just a plain beer can in the Professor's hand. By putting it on a shaft in the stator (lying on the table) the can revolves at 1800 RPM. This he calls the "Robertson Syncro-Beer-Can-Motor." At the present no patents have been taken out on it. Bottom right: Prof. Robertson uses the blackboard to show the relation between the number of cycles, the number of field poles, and the RPM of the rotor. This applies to a synchronous motor.

UP go cargo profits

G-E MARINE REFRIGERATION equipment stands a 24-hour watch over perishable cargoes . . . protecting valuable shipments against losses from heat, and humidity.

Long years of experience in equipping Navy, and merchant marine vessels have taught engineers that G-E refrigeration apparatus keeps on working even under severe conditions. These men have learned they can depend on the G-E reputation for reliability. They know, too, that G-E equipment is constructed so that repairs and replacements can be made with the least possible delay.

For all types of marine refrigeration and air conditioning from hold to galley, specify G.E. . . . *insist on G.E.* . . . for long, efficient service. *General Electric Company, Air Conditioning Department, Section 6596, Bloomfield, New Jersey.*

GENERAL ELECTRIC

Marine Refrigeration

A GALLANT SHIP AND CAPTAIN HONORED

(Continued from page 113)

Left to right: William Buderns, Lt. (jg) F. W. Folger, Lt. Comdr. J. S. Kreins, present officers of the honored ship; Captain E. F. May, president of Masters, Mates and Pilots Assn.; Captain A. W. Opheim, and Comdr. S. J. Valentine.

Captain Opheim, Mrs. Richard W. Elkus, Mr. A. B. Cahill, president of Sudden & Christenson, talking to T. A. Bedford, Jr., Kaiser Co. Inc., the builders of the vessel.

Grace Executives Retire With 50 Years Service

At the annual meeting of stockholders of W. R. Grace & Company, held May 10, it was announced that **Joseph P. Grace** was retiring as chairman of the board and **D. Steward Iglehart** as president of the company —each after 51 years of service with the company. Grace and Iglehart, who have been on leave of absence since last September, were re-elected directors. In accordance with custom, the annual meeting was held on the birthday anniversary of the founder of the company, W. R. Grace, who was born in 1832.

William G. Holloway, interim chairman since last September, was joined by those present in a tribute to Grace and Iglehart, who he said, "have each served the firm actively for more than 51 years and by their outstanding management have placed the company where it is today."

For many years outstanding leaders in American foreign trade and shipping, the two retiring officers began their careers together in W. R. Grace & Company upon their graduation from Columbia. They were trained as all around merchants under the exacting tutelage of the former's father, W. R. Grace, twice mayor of New York, who had established the Grace business in Peru in 1850.

Began Together

Their business careers of more than half a century of close friendship and business association have been marked by steady expansion and diversification of Grace trading, transportation, and industrial activity in and among the American nations and the promotion of trade and good will between the Americas.

At the directors meeting following that of the stockholders, the following, who have been serving as interim officers since last September, were elected: W. G. Holloway, chairman; Adolf Garni and Harold J. Roig, vice chairmen; Joseph P. Grace, Jr., president.

Since the above story was written, we have received word that Mr. Iglehart passed away.
—Ed.

ELECTRIC STORAGE BATTERY AWARDED CITATION

R. C. Norberg, president, The Electric Storage Battery Company, displays a Certificate for Distinguished Service to Naval Ordnance Development to L. E. Lighton, vice president in charge of Engineering, and high Exide officials and executives. This certificate was awarded for the production of the so-called "suicide battery" for powering electric torpedoes. From left to right: R. C. Norberg, H. C. Allan, secretary-treasurer; Wallace Nyce, general superintendent; S. W. Rolph, executive vice president; F. T. Kalas, vice president in charge of sales, C. F. Norberg, vice president in charge of Manufacturing; Raymond Whitehurst, sales manager; and L. E. Lighton.

General Ship Supply Distributor For Cyclotherm

General Ship Supply Company at 84-96 Clay Street, San Francisco, California, has been appointed the exclusive distributor in the Northern California district for the Cyclotherm steam generator. This automatic steam generator is equipped to operate on light oil, gas, and combination light oil and gas. They are available in different ranges from 10 hp to 200 hp.

A father and two sons, officers of Army transports, are: Joseph Sandbote, third officer of the USAT James O'Hara; Captain John Sandbote, master of transport Admiral Hughes; and Captain John Sandbote, Jr., master of the USAT David C. Shanks.

Father and Sons Follow the Sea

When planning for the future **John Sandbote** established a farm years ago in Ladysmith, Wisc., to provide a home for himself and his wife when he was finished with the sea and also to give two stalwart sons a place to work and prosper.

One part of the plan has worked out well. The farm is waiting for John's retirement from his duties as a master of Army transports operating out of San Francisco Port of Embarkation.

But John's sons, John Jr., and Joseph, did not stay on the farm. Instead they followed their father's footsteps as mariners and today finds all three Sandbotes at San Francisco Port, two of them in command of Army transports, the third as a chief officer of another transport.

John Sr., who entered Army sea transportation in 1908, has been named master of the recently-acquired P-2 class transport Admiral Hughes, a wartime Navy troop carrier. The ship was delivered to the Army, May 3, and after appropriate ceremony was set up for reconversion to peacetime use.

At the ceremony, as John took command, were Captain John J. Sandbote, Jr., master of the USAT David S. Shanks which had just finished a "bride ship" run down under, and Joseph Sandbote, third officer of the USAT James O'Hara.

now being reconverted for peacetime transportation of troops and Army dependents.

John Jr. has established his home in Walnut Creek, Contra Costa County, and Joe Sandbote has his residence, when not at sea, in San Francisco. Captain John Sr., hangs his hat in Ladysmith when his ship is in port.

U.S.M.C. Changes at Home and Abroad

A. J. Williams, Secretary of the U. S. Maritime Commission, announced the following appointments made during April: **Edward P. Cousins,** administrative analyst for Construction; **John M. Turner,** general accountant for Construction; **Leonard M. Pasqual, Jr.,** assistant general accountant for Construction; **H. R. Thomas,** assistant general accountant for Construction, and **Henry Z. Carter,** assistant general auditor for Construction.

Williams also announced the following Foreign Service Division personnel changes overseas in the United Kingdom and Northwest European Area: **Thomas Dunn** succeeded **Thomas Monroe,** former well-known Pacific Coast marine leader, as area director; **J. M. Gaffney** succeeded **Jones F. Devlin** as operational manager; **E. S. Clark** succeeded **J. M. Gaffney** as regional director, Holland-Belgium Region; and **Roy E. Salman** succeeded **Thomas Dunn** as regional director of the German Region.

Joseph S. Oppe was appointed assistant director, Tanker Division; and **Captain E. F. Ellis** was appointed district manager of the Hampton Roads Area with headquarters in Norfolk, Va., replacing G. F. Blair, retired.

Announcement was also made by A. J. Williams that the Office of Assistant Deputy Administrator for the Pacific Area is abolished and **W. Creighton Peet,** Pacific Coast Director in San Francisco will report to G. H. Heimbold, assistant deputy administrator for Ship Operations with headquarters in Washington, D. C.

John E. Cushing, president of the American-Hawaiian Steamship Company, formerly served as assistant deputy administrator until the first of January, 1946. His place was never officially filled.

AMERICAN PRESIDENT LINES BOWLING TEAM CHAMPIONS

Steamship Bowling League of Los Angeles 1945-46 Season. Reading from left to right: (front row) Louis Menning, coach; Ron De Long, captain; George Elder lead-off man. (Standing) Dick Pittenger, anchor-man and past president Los Angeles Bowling Association; Don Morgan, high average kegler, and Dick Fels, special events winner.

SHORESIDE PERSONALITIES

UNITED FRUIT ELECTS NEW DIRECTOR: At the annual meeting of the stockholders of the United Fruit Company, held on April 17 at Flemington, New Jersey, John E. Toulmin, a vice president of the First National Bank of Boston, was elected a director of the board. The new board consists of the following: T. Jefferson Coolidge, chairman; Thomas M. Bancroft, Thomas D. Cabot, Channing H. Cox, George W. Davison, Crawford H. Ellis, W. Cameron Forbes, William K. Jackson (new president of the U. S. Chamber of Commerce), George C. Lee, Joseph W. Montgomery, Floyd B. Odlum, Arthur A. Pollan, H. Harris Robson, Paul H. Saunders, Huntley N. Spaulding, Charles H. Stockton, John E. Toulmin, Edwin S. Webster, John A. Werner, Samuel Zemurray.

W. S. "Bill" Everett of Enterprise Engine & Foundry Co.

ENTERPRISE APPOINTS EVERETT: W. S. "Bill" Everett, former Lieutenant Commander in the Office of Naval Materiel, has been appointed sales engineer at Enterprise Engine & Foundry Company. His background includes several years of machine design, petroleum plant installation and general plant engineering, with Standard Oil Company of California and Colgate-Palmolive-Peet Co. A graduate of physics from California Institute of Technology, he also holds a master's degree in mechanical engineering and is active in the American Society of Mechanical Engineers, S.A.E. and American Statistical Society.

RICHARD F. GARRETSON IS EASTERN REGIONAL MANAGER of Ransome Machinery Company, Industrial Division, a subsidiary of Worthington Pump and Machinery Corp. He is in charge of sales of welding and work-positioning equipment. He joined Ransome in 1936 and is a pioneer in promoting positioning equipment.

THE APPOINTMENT OF JOHN A. BARTHROP as Pacific Coast freight manager of the United States Lines and Coastwise (Pacific Far East) Line was announced recently.

BOB GEASLIN, attorney in Washington for Waterman Steamship Corporation since 1940, has been elected vice president and general counselor of Waterman and each of its subsidiary corporations.

Geaslin served as counsel for the Maritime Commission until May, 1939. His appointment was to fill the post vacated by the passing last January of **T. M. Stevens.**

Shoreside Personalities

ALMON E. ROTH AND MAITLAND S. PENNINGTON, president and vice president, of NFAS, will represent American shipping companies in the General Council of the International Shipping Federation, to which NFAS has just been elected to membership. NFAS represents 95 per cent of all foreign, coastwise and intercoastal American shipowners. The International Shipping Federation has its offices in London.

W. H. COLLINS, vice president of the Shipbuilding Division of Bethlehem Steel Company, New York, and **F. R. Pratt,** general manager of Socony-Vacuum Oil Company, New York, have been elected members of the American Committee of Lloyd's Register of Shipping.

ROY T. LEMON is now executive vice president of the Sword Line. Well known to the Atlantic marine world, Mr. Lemon served throughout the war as general manager of the maintenance and repair organization of the WSA. Before entering the service of the Government, Mr. Lemon had been chief engineer of the Waterman Steamship Company, Mobile, Alabama, which company he had been associated with since 1923.

RAY H. TIBBITTS, who was assistant Pacific Coast War Shipping Administration director, under Commander W. Creighton Peet during the war, left the Government service to accept a position with the American Asiatic Company, whose headquarters are in San Francisco.

RE-APPOINTMENT: THOMAS A. MONROE has been re-appointed to his pre-war post as vice president and European general manager of the United States Lines, after nearly four years in the Army. He will be stationed in London.

Mr. Monroe has been with the United States Lines since 1923. He entered the Army as lieutenant colonel in 1942 and was then promoted to colonel and assigned to the post of assistant chief of transportation in the European theatre. Then an injury forced him into inactive duty. In July, 1944, Colonel Monroe was appointed WSA director of the United Kingdom and Continental Europe and continued in that position until last March.

Tom Monroe is best known on the Pacific Coast from his associations in San Francisco as head of the old Pacific Mail Steamship Company's engineering department. He makes frequent business trips to San Francisco maintaining social and business contacts that have prevailed for more than thirty-five years.

CYRIL FERNIE, agent of the Fred Olsen Line in Cristobal for 30 years, arrived in San Francisco on May 6 aboard the Johnson Line motor ship Bio Bio. He was accompanied by his wife. They were en route to Vancouver.

FRED L. DOELKER, vice president Grace Line and in charge of Johnson Line's affairs on the Pacific Coast, flew the Atlantic both ways. His trip to Europe was to confer with Consul General Axel Johnson, president of the Swedish concern, operators of a fleet of motorships in the Scandinavian-Pacific Coast trade for which W. R. Grace & Company are West Coast agents.

Shoreside Personalities

E. H. SCHULTZ elected vice president of Cargocaire Engineering Corporation at the annual meeting, according to an announcement by O. D. Colvin, president. Mr. Schultz has been treasurer of Cargocaire since 1942, and was formerly associated with Price Waterhouse & Company and Carnation Companies. He has long been active in financial and engineering affairs and is a member of the Controllers Institute of America, the Society of Naval Architects and Marine Engineers, and the Propeller Club, among others.

Henry E. Frick, former vice president of American President Lines in charge of ship construction, has been appointed vice president and director of the Aetna Marine Corporation, announces Charles E. Kahr, president.

NEW FOSTER WHEELER CHAIRMAN: At the April meeting of the Foster Wheeler Corporation board of directors, H. S. Brown was named chairman. He succeeded to the post of his brother, the late J. J. Brown. The new board chairman will continue as president. David McCulloch, executive vice president was named chairman of the executive committee, succeeding H. S. Brown.

ALFRED LOCKWOOD is now American Mail Line's assistant traffic manager in San Francisco.

F. W. "BILL" LAMBERT is now chief engineer of the C-4 carrier Mount Davis of the American President Lines. He has been serving as assistant port engineer, and went north to take delivery of the Mount Davis from the Kaiser Vancouver yards.

Back in Civies Again

After serving in the Navy as lieutenant, **J. William Harper** is manager in Singapore for the Everett Steamship Corporation of Manila. Prior to the war he was with Burchard & Fisken, Seattle steamship agents.

JOHN KRIEL is now associated in the San Francisco offices of Funch, Edye & Company, following his discharge from the Navy as lieutenant commander. He was assistant traffic manager or Moore, McCormack in San Francisco.

JAMES L. BATES, director, Technical Division, U. S. Martime Commission, notified the San Francisco offices that the Commission has approved the recommendation that the materials and inspection staff be placed under the Division of Construction.

Brigadier General Kabrich Joins Flintkote

Brigadier General W. C. Kabrich has joined The Flintkote Company as assistant director of research and is

W. C. Kabrich, assistant director of Research of The Flintkote Company, Inc.

stationed at the East Rutherford Laboratory of the company. Recently retired from the U. S. Army, after nearly thirty years of service, General Kabrich has long been actively associated with chemical research, development and engineering.

During World War II, as chief of the Technical Division, Office of the Chief of Chemical Warfare Service of the War Department, he was charged with the research, development, engineering for production and actual initial procurement of all Chemical Warfare supplies for the U. S. Army.

Under General Kabrich's direction the research and development activities of the Chemical Warfare Service expanded from a small group of about 160 technicians to a total of over 4000 individuals, with modern, well-equipped laboratories. In addition to directing the all-important research activities of the Technical Division he was responsible for getting plants into production on chemical warfare supplies, an assignment which, in some cases, required the designing and procuring of special types of machinery not available commercially.

For his outstanding services in World War II, General Kabrich was awarded the Legion of Merit and was made a Commander of the Order of the British Empire. He is a member of the American Chemical Society and the American Institute of Chemical Engineers and a graduate of the Virginia Polytechnic Institute, with the degree of Bachelor of Science in Mechanical Engineering, and of M.I.T., with the degree of Master of Science in Chemical Engineering Practice.

James L. Fee, manager of Industrial Relations.

Bethlehem Appoints Industrial Relations Head

Bethlehem Pacific Coast Steel Corporation has just announced the appointment of **James L. Fee** as manager of Industrial Relations for all of Bethlehem Pacific's operations which include three steel plants, two fabricating works and four mill depots. Mr. Fee continues as assistant to **T. S. Clingan,** vice president in charge of Mill Operations. His new duties will include the direction of Bethlehem Pacific's industrial relations and pension and relief plans. He will maintain his headquarters at the South San Francisco plant.

Mr. Fee started in 1916 as a storekeeper in the South San Francisco plant of the Pacific Coast Steel Company, now owned by Bethlehem Pacific. In the years that followed he advanced to chief of payroll, in which position he also handled cost distribution.

In 1930 when Bethlehem took over the Pacific Coast Steel Company, Mr. Fee was made management's representative. In 1942 he was made assistant to T. S. Clingan, who was then general manager of steel operations.

USS Expands In China Area

Acting on the suggestion of UNRRA authorities, who have informed the United Seamen's Service that heavy supplies scheduled for China may necessitate the use of more North China ports, USS representatives have been dispatched from its Yokohama club to seek sites for merchant seamen's clubs in the ports designated by UNRRA, it was announced by Otho J. Hicks, executive director of the service, a National War Fund agency.

Other USS representatives, Hicks said, have been dispatched from Yokohama to open a club in the Yellow Sea port of Jimsen, Chosen (Korea), where UNRRA supplies are arriving, and to supplement the present staff of the USS Shanghai club. Plans to open the port of Kobe, Japan, have practically been abandoned by the War Shipping Administration, he said, with the result that USS service in Japan will be concentrated in the leading port of Yokohama.

USS also is operating facilities for seamen in the Pacific at Manila, P. I., and Sydney, Australia. Its Calcutta, India, and Colombo, Ceylon, clubs recently closed because of decreased shipping in those ports.

Comptroller for Columbia Steel

J. E. Butler has been elected Comptroller of Columbia Steel Company, U. S. Steel subsidiary, it was announced by William A. Ross, President. He succeeds C. T. Redmond, resigned.

Prior to taking up his new duties with Columbia Steel, Butler was Comptroller of Geneva Steel Company, the Government-owned steel plant near Provo, Utah, which is operated by U. S. Steel.

J. E. Butler, comptroller of Columbia Steel Company, a subsidiary of U. S. Steel Corp.

He was associated with the Geneva Steel project through both the construction and operating phases. During construction, he was in charge of accounting for Columbia Steel Company, Defense Plant Division. Before his Geneva assignment Mr. Butler was Assistant Comptroller of Columbia Steel Company. He joined the company in 1937 after having served as Comptroller of St. Mary's College, Moraga, California.

Butler is a member of the Certified Public Accountants Association of California.

Welcome Home Boats Withdrawn

One of the most colorful phases of the Welcome Home program initiated by San Francisco Port of Embarkation for returning Pacific veterans ended when the Port Welcome Home boats went out of business.

Major General Homer M. Groninger, port commander, announced that the welcome boats which formed part of the San Francisco Bay and Camp Stoneman greetings, ceased operations April 30 on orders of the War Department.

General Groninger pointed out, however, that other features of the welcome program, including the pier greetings by port musicians, pretty girls and the general public, the super-meal at the staging areas, and the flood lighted greeting signs would continue.

"The War Department order cuts off only one part—although a very colorful one—of the welcoming activities," General Groninger said. "Since last August, when the welcome boats began operating regularly, the Cavanaugh and the Alician have carried approximately 15,000 greeters out into the Bay to meet troop ships as they came under the Golden Gate Bridge."

The order affects also the Little Audrey and the Miss Lace, which formed part of the greeting given by Camp Stoneman at Pittsburg to men arriving by ferry boat from the Embarcadero and Oakland Army Base.

Purchase Pier At Seattle

Western Canvas & Marine, Inc., of Seattle, which will include ship repairs, maintenance and conversion in its operations, has purchased Pier 59 in Seattle from the Ainsworth and Dunn estates and has leased offices and berthing space from the Port of

Seattle at Pier 66, the Bell Street Terminal.

The space taken over at the Bell Street Terminal formerly was used by the Winslow Marine Railway & Shipbuilding Company in ship conversion and repair operations and includes the way side of the terminal and the south slip. In addition to having a plant at Pier 59 for ship repair, maintenance and conversion, the firm will operate a sail loft at this terminal and will continue operations of its present sail loft.

Officers of Western Canvas & Marine include M. Ross of the Rovan Trading Company, importers and exporters, president; Clyde Philip, vice president; H. C. Van Valkenburg, secretary; Charles H. Barnes, general manager; James J. Featherstone, manager of the ship-repair division; Edward A. Black, general superintendent of the ship repair division, and Paul E. Morrison, sales manager. Featherstone and Black formerly were connected with the Winslow Marine Railway & Shipbuilding Company.

Addison F. Vars, president of Sterling Engine Company, signs the papers closing the deal whereby Sterling acquires the highspeed diesel engine-manufacturing business of National's Superior Engine Division.

Sterling Buys Diesel Business To Augment Line

Sterling Engine Company, of Buffalo, N. Y., manufacturers of industrial and marine engines, has acquired the highspeed diesel engine manufacturing business of National Supply Company's Superior Engine Division, according to announcement on April 15 by Addison F. Vars, Sterling president. The consideration price was not disclosed.

The newly acquired line brings to Sterling 20 types of Superior's A and D engines ranging from 20 to 230 hp. These include Superior's AB 2-, 4-, and 6-cylinder engines, with 4½-inch bore and 5¾-inch stroke, and the DB 4-, 6- and 8-cylinder engines, with 5½-inch bore and 7-inch stroke. The transaction includes a license for patents, drawings and designs.

This transaction gives Sterling a complete line of diesels from the smallest to 660 horsepower.

Equipment will be moved from Springfield, Ohio, to Buffalo early in July. The equipment includes besides machinery and parts, the tools, dies, jigs, fixtures and patterns, as well as all drawing and engineering data which have been accumulated over the 15-year development of the Superior line. There will be no interruption in the manufacture of the engines.

Getty President Passes

The members of the firm of H. S. Getty & Company, Incorporated, announce the death of their president, Harry S. Getty on April 23, 1946.

Cokely Heads APL Operations

Thomas J. Cokely, assistant to W. J. Bush, vice president in charge of operations for the American President Lines, has been elevated to the position of operating manager. Mr. Bush has resigned to engage in terminal operations. Mr. Cokely, a native San Franciscan, is one of the oldest employees in point of service with American President Lines, having started his shipping career 42 years ago as an office boy for the late Captain Robert Dollar. He served many years on Asiatic station and at one time was the company's general manager in the Orient.

Other Changes in APL Staff

Captain Carl Hawkins, former shipmaster and more recently the company's marine superintendent in New York, has been transferred to San Francisco as assistant operating manager.

Timothy Mullen, former port steward, becomes catering superintendent, replacing Joseph J. Robinson, deceased; **Cornelius Crimmins,** former assistant port steward, moves up to port steward; and **Capain John P. Chiles,** former port captain at New York, will assume the position vacated by Captain Hawkins.

At right: Eugene D. Flaherty, general office manager, American President Lines.

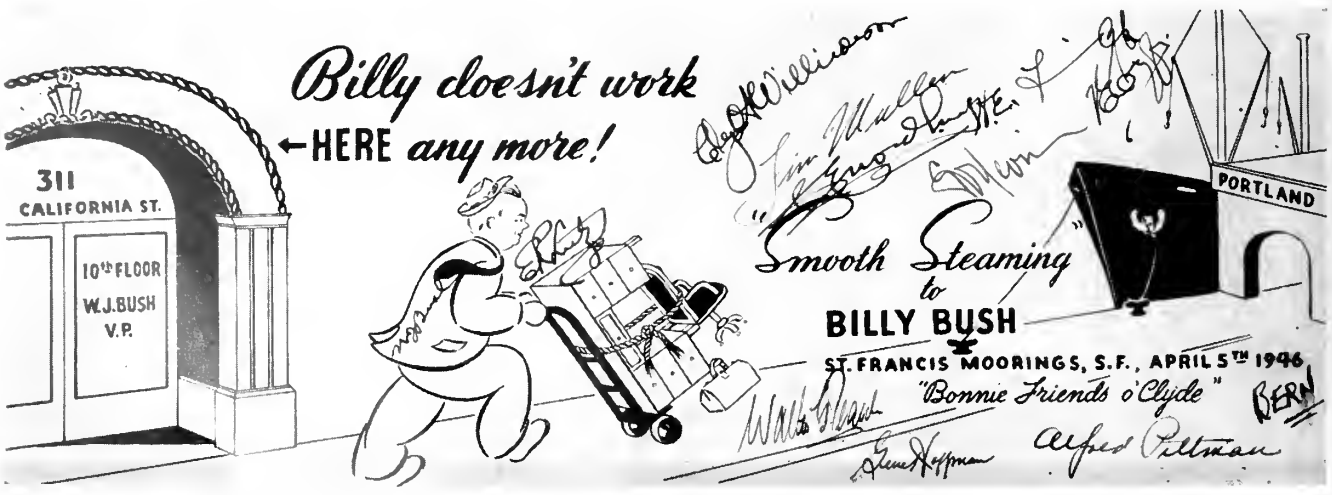
Captain Flaherty Receives Citation

Capt. Eugene D. Flaherty, USNR, now on inactive status and back with his old firm, American President Lines, has just received a citation from Secretary of the Navy James Forrestal commending him for "outstanding performance of duty as Commanding Officer of the United States Armed Guard Center, Treasure Island, San Francisco, California."

Captain Flaherty joined American President Lines in 1939 as assistant to the late Senator William Gibbs McAdoo when the latter was chairman of the company's board. Meanwhile, Flaherty served nearly four years as commanding officer of the Armed Guard Center, his responsibility being the training and installing of armed guard crews on the hundreds of merchant vessels outfitted in the Pacific during the war.

JAMES J. McELROY, president of the Oakland Port Commission, passed away at his home on April 23rd, following a heart attack suffered a month previously. He was 79 years of age.

He was well known among port officials both on the Pacific Coast and nationally.



Good Time had by Grads

Alameda School Graduating Dance

The USMS Officers School, Alameda, gave a dance for the April, 1946, graduating class of Officer Candidates at the Hotel Leamington, Oakland, April 22. A crowd of 600 attended the affair, where besides the dancing, there was entertainment, a buffet dinner, door prizes, and comic photos taken of all who wanted them. Needless to say, a good time was had by all. Upper left shows a part of the crowd enjoying the music of the station band. Lower left, Food! All during the evening plenty of good food was available, buffet style. Seated around the table left to right: Mrs. Jack Theorine, Miss Ethel Jones, Ensign Preston Pope, Miss Sally Yerkes, and Miss Betty Blome. Above: Oh, brother, what a guy won't do for a pair of nylons. Yes, sir. That's what Ensign Jesse Hobson, USMS, has in the package, a pair of nylons! He won them as a door prize, and he is so happy he is willing to kiss the Master of Ceremonies, Electrician Louis DuMoulin. Also enjoying the scene are Miss Ethel Jones, who picked the winning ticket, Bernard Sebastian, CSk(a), and Tom Jones, Mus. 1/s.

Support the American Merchant Marine Library

"It ought to be as unusual for a ship to sail without a library as for a town on shore to live without one." —William McFee.

Good books and a substantial library should be an integral part of every ship; books that can provide entertainment, relaxation, study and education for merchant seamen.

The American Merchant Marine Library Association has issued a plea for contributions to provide these books and to support ships' libraries. Fifty dollars will supply a ship with libraries for one year. Any contribution will be welcome, and checks should be made payable to Winthrop W. Aldrich, treasurer, The American Merchant Marine Library Association, Inc., 45 Broadway, New York 6, N. Y. (Contributions are deductible from Federal income tax returns.)

Necrology

Adm. Rock, Formerly Head Of Webb Institute, Dies

Rear Admiral **George Henry Rock,** former chief constructor of the United States Navy, who retired on January 1 as head of the Webb Institute of Naval Architecture, of the Bronx, N. Y., died in the Naval Hospital, Brooklyn, N. Y., after a brief illness. His age was 77.

Admiral Rock was graduated from the United States Naval Academy in 1889, and three years later received a B.S. degree in naval architecture from the University of Glasgow, Scotland. On his return he began his long career in the construction branch of the Navy as a construction officer in the Navy Yard in Brooklyn.

After serving as manager of the Navy Yard at Norfolk, Va., 1921-23, Admiral Rock was appointed assistant chief of the Bureau of Construction and Repair, a post he held until 1929. On Aug. 1, 1926, he was made a permanent Rear Admiral. He was chief of the Bureau of Construction and Repair from 1929 until his retirement from active service on Oct. 1, 1932.

From then until last January he was president of the Webb Institute of Naval Architecture, where he made his home until succeeded by Vice Admiral Samuel M. Robinson.

Larry Kristovich, able seaman, received commendation for meritorious service for his outstanding courage and disregard of personal danger contributing greatly to the eventual salvaging of the exploded Liberty ship moored alongside the SS George Luks, of which he was a crew member.

Manager Appointed For Oriental Service of Salen Line

Harold B. Godwin has been appointed manager of the Oriental Service of the Salen Line which resumed operations earlier this year with the sailing of the MS Christer Salen.

Mr. Godwin will be located in San Francisco. He was previously with the American Mail Line, Seattle, since 1940 and is well acquainted with the Oriental trade. During the war period, he occupied various positions with American Mail Line, taking a part in practically every department of that organization. Prior to 1940, he was employed with other off-shore operators in the Puget Sound district. Mr. Godwin will take over the duties pertaining to the Oriental Service which were formerly in the hands of Mr. A. H. Mortensen, who passed away in the early part of April.

Brickseal-Xzit Representative In Scandinavia

Arne B. Morch of Oslo, Norway, has been named by Brickseal Refractory Co. and Xzit Sales Company, Hoboken, N. J., as a distributor of Brickseal refractory coating, Xzit fire scale and soot eradicator, and Petroflo sludge solvent in the Scandinavian countries. He was formerly the companies' representative for Norway. After the appointment of sales agents in Sweden and Denmark, the materials will be stocked in Oslo and Bergen, Norway; Stockholm and Gotenborg, Sweden; and Copenhagen, Denmark.

Morch is a graduate of the Oslo Commercial School and has had 13 years of varied industrial experience in his native country, with an additional two years in England and Germany.

American-Hawaiian Will Deliver Boats To China

The American-Hawaiian Steamship Company has been designated the agent for the War Shipping Administration for the manning and delivery of 28 Purse-Seiners and other types of fishing craft to China for the UNRRA. Most of the boats are, at present, on the Puget Sound, with a few others scattered in Pacific Coast ports, with a range of from 65′-86′ in length.

Many of the crew members are fishermen who will stay in China as instructors to the Chinese for about one year.

Pacific National Takes New Line

The Pacific National Sales Company of Latham Square Building, Oakland, has been appointed exclusive distributors for the San Francisco Bay Area and Northern California for the Western Machinery Corporation of Portland, Oregon, manufacturers of deck cargo and topping boom winches.

Alex Johnstone is general manager of the Oakland organization and Fred W. Cook is sales engineer.

Portland Shipping Club Meet

The monthly meeting of the Portland Shipping Club was held May 15 at the Multnomah Hotel. More than fifty members attended and heard the report of the nominating committee for next year's officers. The committee recommended W. D. Hazen, Burchard & Fisken, for president; Fred Meyer, Kaappton Towboat Company, vice president; Lew Fowler, newly appointed manager of the Merchants Exchange, secretary; and E. E. Shields, manager of the Isthmian Line, treasurer. Outgoing president Dwight Morris announced that nominations will be received from the floor, and elections held, at the club's golf tournament, June 12, at The Alderwood Country Club.

Speaker of the evening was Otto Hartwig of Crown Zellerbach, who discussed labor management problems from the point of view of human relations. Mr. Hartwig stated that management must clean house before obtaining complete cooperation from labor. Later he answered questions from club members.

At right: Elmer Fern, Alaskan and Northern Canadian distributor for Brickseal Refractory Co. and Xzit Sales Co.

At left: Arne B. Morch of Oslo, Norway, representing Brickseal Refractory Co. & Xzit Sales.

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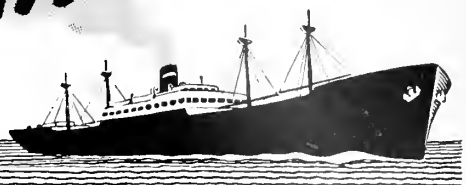

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In Texas, Galveston Ship Supply in Galveston and Houston. In Alabama, Seaboard Supply Co. in Mobile.

Todd Shipyards Exhibit at Marine Show

Todd Shipyards Corporation made a comprehensive presentation of its ship repair, conversion and building facilities, and of the company's activities in the manufacture of combustion equipment for industrial and marine use, at the National Marine Exposition, held at the Grand Central Palace May 20 to 25.

The exhibit occupied booths 68 and 69, and totaled 638 square feet. The focus of attention at the display was an encased working diorama in which models of ships, dry docks, building ways and plant facilities provided viewers with an almost instantaneous impression of the varied performances of Todd building and repair yards. Supplementing this theme was a huge globe which showed the location of Todd plants on the Atlantic, Gulf and Pacific Coasts, and how they serve vessels on the main shipping routes of the world.

The Combustion Equipment Division of Todd Shipyards Corporation occupied a large section of the exhibit area, with a model of the Todd Hex-Press variable capacity oil burner a central feature. On the walls were portrayed other models of the "Todd Line" of burners, registers and apparatus for commercial, industrial and marine application.

West Coast Man Appointed Vice President of Trumbull Electric

Announcement has just been made of the appointment of Carroll D. Hepler as vice president of Trumbull Electric Manufacturing Company, with headquarters at Plainville, Connecticut. He will continue to serve as president of the Pacific Division, in addition to his new duties.

Mr. Hepler was recently transferred to the East from San Francisco. He joined the Trumbull organization in 1928 at time of purchase by Trumbull of the A. G. Manufacturing Company of Seattle, Washington and Los Angeles, California. On January 1, 1945 he was made president of the Pacific Division of the Trumbull Company, moving from Seattle to new headquarters at San Francisco.

An electrical engineer and graduate of the University of Washington, "Curly" Hepler is well known in West Coast electrical circles. He is a professional engineer in the State of Washington, and a past president of the Washington Electrical Club.

Mr. Hepler has named Willis I. Downie as manager of the Seattle plant, C. E. Barkis as manager at San Francisco and J. W. Barry at Los Angeles.

Examination for Cooks and Bakers

Competence certification of cooks and bakers sailing in vessels operated for the War Shipping Administration is now required, Captain Granville Conway, acting War Shipping Administrator, announced Examinations will be given and competence cards or waivers issued at 949 Sansome Street, San Francisco; George White Service Center, 523 SW 3rd Avenue, Portland, Oregon; 1472 Dexter - Horton Building, Seattle, Wash.; Berths 184 and 185, Wilmington Terminal, Wilmington, Calif.; and in New Orleans, Boston, New York, and Houston, Texas.

Automatic waivers have been issued by WSA for men shipping out of ports other than those in which examining units are functioning. Examining units, administered by U. S. Shipping Commissioners, will issue single voyage waivers for men who can not wait for examination. These men will be given priority for examination on their return.

Since December 1, 1945, examination units and re-training centers have been operating on a voluntary basis. Official notification of the enforcement has been sent by WSA to general agents and the maritime unions.

The certification requirements are made under WSA General Order 53 to provide better meals for merchant crews. A required re-training of cooks and bakers will be at Government expense.

Shoreside Personalities

ELECTED TO UNITED SEAMEN'S SERVICE POST is **Howard K. Hyde,** assistant deputy administrator, of the WSA in charge of recruiting and manning, who has been elected a member of the executive committee of the USS and secretary of the corporation. Simultaneously, **O. J. Hicks,** executive director of the service, announced the election of Warren C. Evans, second national vice president of the National Marine Engineer's Beneficial Association as a member of the USS executive committee. They succeed H. Chase Stone and Samuel J. Hogan.

R. G. KENDALL, who before entering the Navy was Shanghai manager for the Everett Steamship Corporation of Manila, is now with Sudden & Christenson as assistant district manager at Portland, Oregon.

GENERAL STEAMSHIP CORP. LTD. APPOINTMENTS announced recently by H. S. Scott, president of the General Steamship Corp.: **D. M. Dysart** named vice president, Northwest District. He will co-ordinate the traffic and operating activities between the company's offices in the Northwest.

Dysart first joined the forces of General Steamship in 1932, having served as manager of the company's intercoastal service and later as manager of its Oriental Department. He has been engaged in the steamship industry for nearly 25 years.

Charles A. Reali, in charge of the South American and South Seas Departments, was named general traffic manager.

The Transpacific Department, charged with the operations of the newly created Pacific Orient Express Line, will be placed under direction of **Morse Frazier,** who also continues to serve as the manager of the company's Australian Department.

John R. Page, returned from WSA and UMA duty in London, has assumed active charge of the company's European Department, which includes operations of the American Pacific, French and Pacific Mediterranean Lines.

G. E. Hay, formerly in charge of the company's Documentation Department, has been promoted to act as assistant to Mr. Page.

Lt. Comdr. Frank L. Dwinnell, USMS

LIEUTENANT COMMANDER FRANK L. DWINNELL, USMS, who was recently appointed regional information officer for the United States Maritime Service by Commodore Telfair Knight, USMS. Commander Dwinnell's headquarters will be at the U. S. Maritime Service Center, 1000 Geary Street, San Francisco.

Keep Posted!

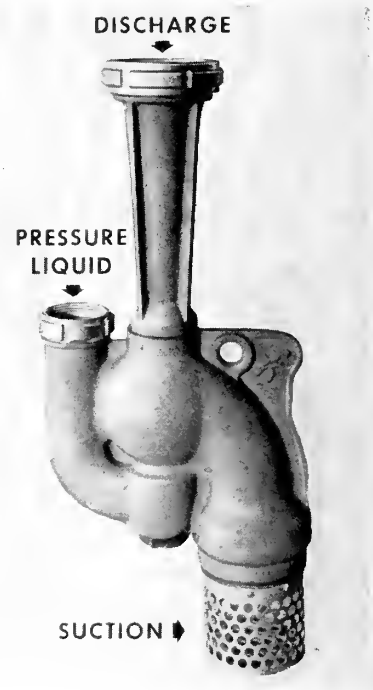
NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Handy Holder for Broken Hack Saw Blades

Designed to cut down the discard of broken lengths of hack saw blades, the Super Blade Holder distributed by A. D. McBurney, Los Angeles, also accommodates thin flat file sections. Armed with the super hack saw blade holder, craftsmen or workmen of all kinds can now find a multitude of uses for their old or broken cutting blades.

Utmost simplicity characterizes the Super. It is a single unit tool composed of a tubular handle with an extended positive grip nose for securing the working point of the blade or file. The ends of the handle are slotted to receive inserted blades. Almost any length blade can be held securely.

Many workmen make their own knives or scrapers by grinding old blades to shape. The Super is an ideal handle for these tools. In addition to saving expensive material, it simplifies many operations, such as key-hole sawing, and is perfectly suited for tool and die makers.



Versatile Jet Pump Solves Pumping Problems

Portable Eductors, widely used on shipboard by the Navy and Merchant Marine, are now available for industrial use. These Eductors, manufactured by Schutte & Koerting Co., Philadelphia, Pa., find ready use in pumping operations as they combine versatility with low initial and maintenance costs. They are of simple, sturdy construction with no moving parts and can be made of a variety of materials, including plastics, to enable them to fit the needs of special processes or conditions.

A high velocity pressure jet entrains the secondary liquid to be moved and converts the kinetic energy of the pressure liquid into static head capable of lifting water up to 75 feet. The pressure water used may be obtained from water mains, pumps, head races or similar sources. Since no foundations are required and hose can be easily coupled on, Portable Eductors, as illustrated, are readily used where other types of pumping equipment would not be suitable owing to inaccessibility, cramped space or time involved in setting up.

(Keep Posted section continued on Page 144)

KEEP POSTED

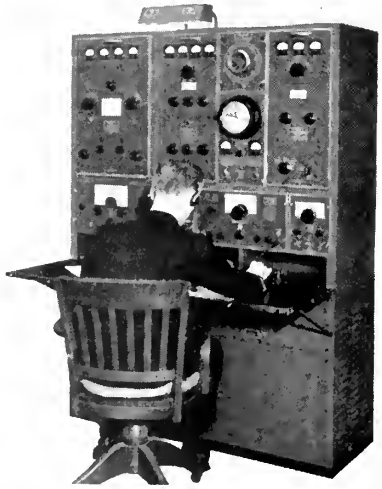
(Continued from Page 142)

Compact Ship's Radio Station

A complete ship's radio station in one compact unit, wholly developed since the war's end, was revealed at the National Marine Exposition by the Marine Division of Mackay Radio and Telegraph Company, whose engineers originated the Marine Radio Unit idea in 1941 for the Maritime Commission, and developed the present unit. The Mackay Company, an associate of International Telephone and Telegraph Corporation, equips and maintains radio installations on American merchant ships.

The new "console" combines, in one-third less space and with 15 fewer controls, functions which would require five separate pieces of apparatus in even the most modern versions of other marine radio equipment, and, in addition, eliminates ten storage batteries required of earlier all-in-one models.

The new unit is far simpler to install on shipboard than any similar



equipment because of its compactness and the extent to which it is internally wired before delivery.

All major components of the all-in-one unit feature post-war improvements in design, such as increased sensitivity of receivers, simplified tuning of the high frequency transmitter, and power supply for the main receiver and automatic alarm from ship's current rather than storage batteries. Any of the three transmitters can be switched to either main or emergency antenna by a simplified system; a control panel will mix the output of both main and high frequency receivers if desired; a circuit breaker replaces a formerly hard-to-reach fuse; and an automatic keyer will send correctly spaced automatic alarm signals in event of distress. Unlike previous Mackay marine console radio equipment, the new Mackay unit can be used on passenger ships as well as freighters, since it has a separate emergency transmitter, as required by law for passenger vessels. Older models featured a combined main-emergency transmitter.

(Keep Posted cont. on Page 158)

DIESEL-ELECTRIC PROPULSION

(Continued from page 102)

the propeller revolutions, such as a mechanical drive where the speed ratio between the engine and the propeller is fixed—it is evident that a decrease in towline pull will be very marked with the mechanical drive, because the power required to propel the boat itself at heavy towing speeds is quite small and, therefore, the loss in power is almost wholly deducted from the towline. Table II indicates clearly the margin of propeller speed and torque available with electric drive.

In the early days of diesel-electric drive comparative tests were made between two tugboats of the same design except one had installed on it a 500 brake horsepower, 250 rpm direct connected diesel engine, while the other had installed a diesel-electric direct current propulsion system capable of delivering 375 hp over a propeller speed range of 107-140 rpm. The results of these tests showed the following outstanding performance in favor of the electric drive.

1. With the development of only 65% of its rated brake horsepower, the diesel-electric tug duplicated the maximum towing performance of the diesel direct tug.
2. With the development of only 70% of its rated brake horsepower, the diesel-electric tug duplicated the dock test of the diesel direct tug.
3. With each vessel developing its rated brake horsepower, the diesel-electric tug pulled the same tow six per cent faster than the diesel-direct tug.

There is one factor in the above comparison that is not readily apparent, yet contributed to the performance of the electric drive: the increased propulsive efficiency by virtue of the slower speed propeller. A direct connected diesel engine rated 375 brake horsepower at 107 rpm, which would permit equaling the electric drive performance only at the full power, full speed point, would likely be of such size and weight as to make its installation in the same hull problematical.

All diesel engines for electric drive are the non-reversing type and nearly all of them are arranged to operate over a 2:1 speed range. This not only results in reduced engine maintenance, but along with the other characteristics of direct-current transmission described above, contributes ma-

(Continued on page 160)

TABLE II

	DIESEL-MECHANICAL Propeller RPM Percent	Propeller Torque Percent	Available HP Percent
Boat running free	100	100	100
Light Tow	90	100	90
Medium Tow	85	100	85
Heavy Tow	80	100	80
Pulling or pushing at standstill	70	100	70
	DIESEL-ELECTRIC Propeller RPM Percent	Propeller Torque Percent	Available HP Percent
Boat running free	100	100	100
Light Tow	95	105	100
Medium Tow	90	113.3	100
Heavy Tow	85	117.5	100
Pulling or pushing at standstill	77	130	100

MODERN STEAMSHIP CABIN

(Continued from page 97)

color and treated chemically for fireproofing, a radio is concealed in the wall with only the instruments in evidence, the wall paper is fire-proofed and easily cleaned with soap and water, and individual lights in each berth permit any one passenger to read at night without disturbing the others.

The soundproof, fireproof walls and ceiling, an ingenious piece of engineering, wherein prefabricated panels are snapped together to form an almost jointless surface, were manufactured and installed by the Aetna Marine Corporation who are furnishing and installing the complete interiors for the first two modern post-war passenger ships, the President Cleveland and the President Wilson, being built by Bethlehem in the San Francisco Bay Area. Joslyn and Ryan, San Francisco, well-known Pacific Coast naval architects and marine engineers, were responsible for the design and arrangement of the sample stateroom.

The same development of more efficient utilization of space, application of prefabrication possibilities and use of the guest-operated features of the Arnot Sleeper are being installed in six crack streamlined articulated stainless steel Olympians for the Milwaukee Railroad, which is the first radical departure in railroad engineering since before the war. The Arnot Sleepers are also being installed in Statler Hotels, hotels of the American Hotel System, and other hotels in the United States and Canada, where single rooms will be living rooms by day and bedrooms by night. Arnot & Company is now developing the Arnot Sleeper constructed of aluminum for giant air liners which will be delivered next year.

CHART PROGRAM

(Continued from page 53)

more than 4000 photographs were used in making a single chart.

Additional Aids to Navigation

The Maritime Security Division of the Hyrographic Office serves as a clearing house for information important to the safety of ships and aircraft. By means of teletype, telephone and radio, this division keeps in close touch with ships in all parts of the world. Reports of an urgent nature concerned with dangers to navigation, sent to Maritime Security, are disseminated immediately. Such reports include information on drifting mines, derelicts, sunken wrecks, icebergs, and changes in aids to navigation. The most urgent reports are transmitted by radio, and subsequently published in the Daily Memorandum, Notice to Mariners, Memorandum for Aviators, and Notice to Aviators. Items of a more general and less urgent nature are

published in the Hydrographic Bulletin, which is issued weekly.

Additional publications of this Office with which all mariners are familiar include Sailing Directions, Light Lists, Radio Aids to Navigation, Manuals on Navigation, Radio Weather Aids to Navigation, the International Code of Signals, Tables of Distances, and the American Practical Navigator (Bowditch).

Many of these publications were highly classified during the war and were therefore not all available to the merchant marine and the general public. The classification has been removed, and the latest information is available once more to mariners and aviators.

New books published during the war, which until recently were classified, and in which mariners will be interested, include Sailing Directions for East Greenland and Iceland and gazetteers for various areas of the world, giving names and locations of places of strategic naval or military interest which are not generally found in atlases.

Research activities are carried on in nautical astronomy, terrestrial magnetism, and geophysics. Star Identification Tables and Tables of Computed Altitudes and Azimuths are two publications resulting from research which are valuable to navigators.

Ice Atlas

Another Hydrographic Office project of great interest to all who navigate northern waters is the "Ice Atlas of the Northern Hemisphere," which will be available soon. Although it has no connection with the Hydrographic Office war activity, it was developed there during the war years. Since it is designed primarily for use by the Fleet in traversing ice areas, the average ice conditions charted show a differentiation of ice into a number of types based on the character of the ice as it affects the movement of ships. Data are given for approximately 2000 places. It is the most complete Atlas of its type, and includes approximately 100 pages of tables, charts and bibliography.

ST. LAWRENCE SEAWAY

(Continued from page 56)

to barge at New Orleans in view of the existing barge rates for a 1500-mile haul from New Orleans to Chicago."

The Strachan Shipping Co., Savannah, Ga., in a letter from R. W. Groves, partner, dated March 19, seriously doubted if the large, fast, and expensive American-flag ships would be able to compete successfully in the Lakes trade when much of their cargoes on regular runs would likely be made up of a large percentage of low-paying freight. After declaring that the ships must slow down considerably in negotiating the 15 locks proposed, and that the ships would not be able to run at full speed, Mr. Groves added:

"It also seems to me that vessels with slower speed, and perhaps these would be largely under foreign flags, would get the greatest benefit from this seaway development, because of their cheaper cost of construction and operation.

"One thing that impresses me is that at present ships that are operating in the Atlantic and in the Gulf are compelled to make a number of ports of call in order to fill, and if this traffic from the Great Lakes area, which now largely moves to the Eastern ports and to the Gulf, is withdrawn, it would make it all the more difficult for the ships serving the Eastern and Gulf ports to fill, and would perhaps mean either curtailing of service or additional ports of call. . . .

"While we have no plans to navigate the St. Lawrence with our own ships, and have made no careful study of the possibilities, it does not appear to me that this trade route will prove very attractive to American ship operators."

The West India Steamship Co. of New York, in a letter from its president, Morris Malkin, dated March 18, stated that most of the reasons for its opposition to the seaway project are set forth in the statement made in behalf of the Maritime Association of the Port of New York by Mr. Cornelius Callaghan.

The Stockard Steamship Corp., New York, in a letter from L. N. Stockard, president, on March 15, said that the present shipping facilities available to Montreal and to New York are just as economical to operate as would be the case should ocean-going ships proceed to load at Chicago and/or other Great Lakes ports. The seaway would provide no savings to shippers, it was declared, nor would it prove attractive to ship operators except possibly to a few foreign-flag lines that presently operate from the Lakes to the United Kingdom, European ports and Scandinavia during the summer season.

"We have no plans to navigate the St. Lawrence seaway and sincerely hope the taxpayers' money will not be wasted on this venture," Mr. Stockard asserted.

Edward J. Barber, Barber Steamship Lines, Inc., under date of March 14, enclosed extracts from Maritime Exchange Bulletin of March, 1944, issued by the Maritime Association of the Port of New York, and said that "for the many reasons advanced in my memorandum, I consider the project unsound economically and of no practical value commercially, and to specifically answer your question, my company has no plans to navigate the St. Lawrence seaway with our own ships."

Seatrain Lines, Inc., New York, in a letter dated March 18 from its president, Graham M. Brush, said:

"We wish to advise that we have no plans to navigate the St. Lawrence seaway and we have been very skeptical that the additional cost over and above that required for power development would be warranted from a transportation standpoint. We doubt if the difference in cost between rail transportation to North Atlantic ports, including the rehandling, and water transportation through the seaway for only portions of the year, is so great as to warrant any large expenditure for such a seaway."

In addition, the following lines, responsive to the Bailey query, transmitted letters to the Commerce Committee Chairman either opposing construction of the St. Lawrence waterway, or declaring that the project would be of no benefit to them:

Chicago, Duluth & Georgian Bay Transit Co., operators of two passenger steamers on the Lakes; Colonial Navigation Co.; American Petroleum Transport Corp.; Cargo Carriers, Inc., Minneapolis, Minn.; Eastern Steamship Lines, Inc.; The Interlake Steamship Co., Cleveland, Ohio; Marine Transport Co., Inc.; Pan American Petroleum and Transport Co.; Boland

& Cornelius—Lake & Ocean Transportation; Plant Shipping Co. of New Orleans, La.; Wilson Line, Inc., Philadelphia, Pa.; and Detroit and Cleveland Navigation Co., Detroit, Mich.

The Arnold Bernstein Shipping Company, in a letter from its president dated March 28, declared that "generally speaking," the Line favors the development of natural waterways and installation of power facilities made possible thereby. If the seaway could be operated throughout the whole year and not be closed through the winter months, Mr. Bernstein said, he would favor that project despite losses and inconveniences that may be anticipated "during the initial period of readjustment and adaptation." He pointed out that deviation of a great percentage of cargo from the Port of New York means proportionate idleness of installations at that harbor, adding that the lines serving the various world routes from New York would either lose the traffic diverted to the new seaway to new lines or will have to open branches of their services, allocating part of their tonnage to the traffic carried directly from the Lakes. While he did not feel qualified to give a more definite opinion, Mr. Bernstein said it seemed doubtful if the gain to be expected from construction of the seaway would justify the new investment and losses that New York must expect from the loss of part of its traffic.

MARINE GAS TURBINE INSTALLATION

(Continued from page 74)

will supply oil to the after side of the piston, and will move with the piston. The follow-up mechanism on the oil distributor head will be actuated by the motion of the inner tube. Oil to the distributor head will be controlled by the position of a 4-way hydraulic control valve which in turn will be controlled by the position of an air operated pilot valve. The pilot valve will be controlled from a pneumatic control system with operating valve at the central control station, as shown diagrammatically in Fig. 8.

Auxiliary Boiler

A 150 lb. auxiliary steam system will be provided which will be supplied by a boiler of the two-drum type having a maximum capacity of 15,000 lbs. of steam per hour. This system will supply steam for operating deck winches, anchor windlass, steam operated auxiliaries in the engine room, and for heating purposes. The boiler will be fitted with 2 oil burners of the rotary cup type, in the design of which will be incorporated automatic combustion and flame failure controls. There will also be fitted a small burner with automatic ignition for low capacity use.

Turbine Controls

The design of the speed governor will be based on the temperature-revolution characteristics of the turbines and on the capacity-revolution characteristics of the compressors, both of which are basically straight line functions. The control will be sensitive to variations in speed of the driving turbine. It will operate to vary the fuel supply to the high pressure combustion chamber with resulting variation of gas temperature to the controlling turbine, and consequent variation of revolutions of that turbine and of the low pressure compressor which is directly connected to it. The resultant effect of speed variations will therefore be variations in the supply of air to the system and consequent variations of gas flow to the turbines.

Since variation of air flow in the system causes variation of the gas temperature entering the low pressure turbine, and since the best efficiency can be obtained by maintaining maximum temperature at the low pressure turbine inlet, a thermostatic temperature controller for this purpose will be provided. This controller will vary the fuel entering the low pressure combustion chamber as required.

Both combustion chamber discharges will be provided with controls which will function to shut off the fuel supply in the event of temperatures exceeding predetermined limits. There will also be a temperature control on the high pressure combustion chamber which will be superimposed on the speed governor and which will reduce the fuel supply to that chamber when the gas temperature approaches a predetermined limit. The purpose of this control is to prevent the operator from increasing the load on the plant too rapidly.

An increase in speed over the governor setting will cause a decrease in fuel flow to a set minimum value. If at that setting the speed still increases, the overspeed control or trip will operate to cut off all fuel flow and open a dump valve releasing air from the high pressure compressor discharge to the atmosphere, which will stop both turbines.

The underspeed control is not a separate control but a feature of the oil burner design which prevents complete shutoff of the fuel. Its function is to prevent stalling of the unit under maneuvering conditions.

Protection against flame failure will be accomplished by means of temperature sensitive elements fitted in each combustion chamber which will operate to shut off the fuel supply in event of flame failure.

It is of interest to note that only one manual speed governor setting is required for the control of the entire gas turbine unit, once it is in running condition. Manual emergency operation of all controls will be provided.

Complete instrumentation and control operation will be centered at the operating station.

WASHINGTON DIGEST

(Continued from page 82)

accordingly ask that the terms of the authority be liberalized so as to permit of such reasonable measure of mixed operation, public and private, as the Administrator may find necessary in effecting the transfer of operations to private hands."

Export of Vessels From U. S.

A General License VMC for the export of any vessel to a destination in any country included in designated groups K or E has been granted by the Office of International Trade when transfer of such ships to a person not a citizen of the United States or the placing of the vessels under foreign registry or flag has been authorized by order of the Maritime Commission. The General License for export of the ships is mentioned in Current Control Bulletin No. 334,

with proper amendment to the Comprehensive Export Schedule No. 20.

Disposal of Ships' Garbage In U. S. Territorial Waters

New legislation to provide for the method of disposing of ships' garbage in territorial waters of the United States is expected shortly to be introduced as a result of a hearing held on the subject before a subcommittee of the House Agriculture Committee. The subcommittee, headed by Representative Pace, Georgia, heard spokesmen for the War Shipping Administration, the Army and the Navy, as well as Maitland Pennington, vice president, National Federation of American Shipping, representatives of the United States Department of Agriculture, and Dr. C. U. Duckworth, Deputy Director of the California Department of Agriculture, who spoke for various State agricultural agencies.

The bill (H.R. 1996) under consideration was regarded as somewhat too drastic in that it placed entire responsibility upon the masters of the ships for disposal of ships' garbage in such a manner as not to adversely affect livestock and agriculture adjacent to harbors. It is anticipated that the new bill will require that ships' garbage be disposed of only to authorized garbage collectors in the port with a penalty for failure to comply with the statute of $1000 assessable against either the master, the owner or the agent of the offending ship.

The subject has been under study by the interested Federal Government and State agencies, as well as by the ship operators, for more than two years.

Foreign Offers to Charter Liberties Under Norwegian Flag

Charges that Norwegian ship owners currently are offering Liberty ships for charter under the Norwegian flag at prices well below the monthly out of pocket operating costs of the same type of vessel manned with an American crew, thus presenting a serious threat to the continued existence of a favorable international shipping [illegible], shortly may be aired before a subcommittee of the House Merchant Marine Committee.

The alleged offers by the Norwegian ship operators to [illegible] vessels available on a bareboat charter basis at prices lower than those [illegible] be operated under the American flag was brought to light recently in similar letters written by Almon E. Roth, President, National Federation of American Shipping, to the Maritime Commission, on April 12, 1946, and, on April 23, 1946, to Representative Jackson, Washington, chairman of a House Merchant Marine Committee subcommittee on "International Problems and Influences Affecting the American Merchant Marine." In the letter to Mr. Jackson, Mr. Roth pointed to what he termed "the grave problem that has developed in connection with the prospective sale of Liberty and other vessels to foreigners pursuant to the ship sales bill."

War-Built Ships Available For Sale or Charter

A 72 page booklet, showing the various war built merchant ships that may be purchased or chartered under the Merchant Ship Sales Act of 1946, has been issued by the Maritime Commission and distributed to American ship operators. The document, in Part I, gives the name, hull number, type, military description, official number, owner, gross tonnage, and construction date, of war built vessels under jurisdiction and control of the Maritime Commission or War Shipping Administration as of April 15, 1946. In Part II it gives the same information for war built vessels not under jurisdiction and control of the Commission or WSA as of April 15, 1946, but expected to be transferred from time to time to such jurisdiction.

The document was prepared by the Maritime Commission's Division of Vessel Disposal and Government Aids, and is entitled "Government Owned War Built Merchant Type Vessels" (excluding ships not expected to be available for sale or charter under the Ship Sales Act of 1946).

Coast Guard and Customs Bureau Get Marine Inspection Functions Under Truman Plan

One of three reorganization plans sent to Congress by President Truman in accordance with the provisions of the Reorganization Act of 1945 provides for reassignment of various functions of the Bureau of Marine Inspection and Navigation. These reassignments are contained in "Reorganization Plan No. 3 of 1946." The reorganization plans become effective in 60 days unless, in the meantime, Congress passes resolutions opposing them.

Claim St. Lawrence Seaway Will Hurt Merchant Marine

Nineteen of the large American-flag offshore steamship companies, as well as one foreign-flag operator, and numerous Great Lakes and other small carriers have emphatically advised Senator Bailey, North Carolina, Chairman of the Senate Commerce Committee, that they do not propose to use the proposed Great Lakes-St. Lawrence Seaway, even if the construction of the project should be authorized by Congress, it was made known recently. The lines took the position that the project would not result in savings to American shippers claimed by its proponents; that the Seaway could not be safely navigated by the large standard American merchant ship, and that it would benefit only those foreign steamship companies, operating ships of shallow draft, who might desire to make use of the proposed facility.

The position of the individual American operators was made known to Senator Bailey in response to his inquiry transmitted on March 12, 1946, asking the carriers, among other things, whether they believe the Seaway would provide savings to shippers and prove attractive to ship operators. Senator Bailey also inquired as to whether the companies had any plans to navigate the St. Lawrence with their own ships.

Threaded through the replies was expression of the feeling that the opening of the Seaway would operate to the detriment of the American merchant marine, domestic overland carriers and port interests.

(See extended statements of operators elsewhere in this issue.)

Matson-Railway Express Agreement

Approval was granted by the Maritime Commission to the agreement (No. 7571) between the Matson Navigation Company and the Railway Express Agency, Inc. Under terms of the arrangement, Matson will transport the business of the express agency between San Francisco or Los Angeles and the Hawaiian Islands, but is relieved from liability in the handling of money, currency, gold coin, valuables, and merchandise on which Railway Express Agency, Inc., is to carry marine insurance as per contract between it and the transportation companies over the lines of which the traffic may pass.

STABILITY OF TUNA CLIPPERS

(Continued from page 86)

bilities of synchronism developing with the vessel laying in the trough of the sea as it frequently is during the fishing operation. It would be of considerable value if data on average wave periods in the waters most frequently traversed could be obtained, but the opportunity has not thus far presented itself.

It is apparent that the reduced freeboard characteristics of these vessels in operating conditions make metacentric height or initial stability values a criterion of their stability only up to very small angles of heel. Statical curves of stability giving the range of angles of heel which the vessel could be expected to take before capsizing would be of much greater value. However, all of the methods commonly employed for determining statical stability curves assume no change of trim while heeling. Due to the characteristic design of these vessels any heeling to a considerable angle which takes place will cause a large amount of sinkage by the stern. This change of trim would almost completely invalidate the results. In addition, the cargo consists primarily of liquids in tanks with open hatches, some of which spills out before the vessel has obtained very large angles of heel, the effects of which in statical curve calculations are exceedingly laborious to determine, but have a very appreciable effect on the accuracy of the results. For these reasons and because of economic considerations previously discussed, such investigations are rarely made. Were it possible to determine the range of statical stability for most vessels of this type, it is the writer's considered opinion that the value so determined would be found to be well below what is considered good safe practice for seagoing vessels.

The writer is unable to state whether tuna clippers characteristically roll to greater or lesser amplitude than other vessels, and also for lack of data on the true range of stability existing, how much margin of safety is ordinarily present. It is not to be denied that in spite of an undesirably high ratio of losses a great many clippers having characteristics herein described have operated successfully over a fairly long period of years. Perhaps they have been in no danger at all. On the other hand, their margins of safety may have been consistently very small, and consistent careful handling may be responsible for bringing them home trip after trip. Much serious investigation is required before we can be sure.

It is to be sincerely hoped that a program of investigation and research may soon be instituted to establish minimum stability characteristics for dissemination to all owners, designers and builders. It would also be desirable to have a uniform procedure for checking stability, preferably one which would permit of a considerable reduction in the amount of labor and expense now involved. It is suggested that a brief series of inclinations in several basic loading conditions might be found to be adequate check. This procedure, which is greatly facilitated by the case of pumping water ballast in and out of the various cargo spaces, has been tried, but it has not thus far been deemed safe to dispense with the usual calculations in addition. However, if it can be proven that certain easily obtained loadings represent the limiting conditions both as to initial stability and freeboard, there is no reason why a vessel should not be checked solely by inclining in these conditions. Calculations would thus be limited to determination of the displacement and GM.

The exercise of clear thinking, inventiveness and ingenuity can certainly produce improvements in such form as to pass the critical judgment of the fishermen. A number of suggestions have already come forth. Conveyor belts have been tried, at least briefly, as a means of reducing the labor of moving the catch from the bin into the wells, reportably without much success. Their use would have the important beneficial effect on stability of reducing the quantity of fish allowed to accumulate on one side of the deck while fishing is in progress. There may still be prospects of a more satisfactory installation of conveyors proving acceptable. Another proposal calls for a modified step in the deck in the form of a short ramp section at about the forward end of the bait boxes, making the deck aft of this point perhaps 15 inches lower than the sheer midships and forward. With this arrangement it is possible to trim the fishing racks down to the desired level and still maintain a moderate amount of freeboard midships, without, it is believed, appreciably increasing the task of moving the catch along the deck for stowage.

In summary, it appears that careful selection of proportions and distributions of weight will insure qualities of seaworthiness in clippers of the current design, which, while not measuring up to the standards of safety demanded of our seagoing ships, may be found acceptable and should be given the most serious attention in every new design. At the same time, fundamental improvements should be sought which will change the clipper completely enough to remove doubt as to its seaworthiness under the conditions in which it operates.

"LIBERTY" PROPOSAL

(Continued from page 87)

driven condensate pump would then have to be installed. For port operation the hydraulic coupling would run empty.

Studies have been made on employing the Liberty ships for different services, as collier, tanker, general cargo ship, tramp service and even as cargo-passenger ships with 100 passengers. For certain runs the ship with the increased speed is the most economical, while in other cases the Liberty ship may be used as it is, if cargo is available. When competition increases the faster ships will usually get the business.

There is no reason why the Liberty ships cannot be made more suitable for line service by fitting in a platform deck in any hold desired, similar to the Victory ships, thus obtaining three levels for cargo stowing instead of two.

Another way of increasing the cargo handling capacity of the Liberty ships, also advanced at the Naval Architects meeting, is to install three sets of winches and booms, thus providing for double-ganged service at all hatches, thereby making the Liberty ships more efficient in cargo handling than the Victory ships.

STEADY AS YOU GO!

(Continued from page 101)

The minutes are read on the large micrometer wheel where the small vernier arrow cuts—in this case 20′. The tens of seconds are read where one of the lines on the small vernier (shown to the right of the micrometer wheel) coincides with one of the minute lines on the micrometer wheel. The reading of the sextant in figure 12 is, therefore, 22° 20′.

Owing to other factors involved in taking sights, such as the vagaries of the horizon, the practical navigator realizes that it is needless to read the sextant quite so accurately; so the custom at sea in the merchant marine is to read the sextant to the nearest half minute of arc.

The Vernier Sextant

Figure 14 depicts a part of the arc of a vernier sextant showing how the vernier is arranged in relation to the arc, and shows the position of the index (or arrow) indicating zero on the vernier. In most vernier sextants, each cut of the arc represents 10 minutes (10′), and each cut of the vernier represents 10 seconds (10″). However, the markings on vernier sextants are not standard. The arc may be cut to read 10′, 15′, 20′ or 30′, while the vernier may be cut to read 10″, 15″, 20″ or 30″. **The first thing to be done before any vernier sextant can be read is to (1) determine how close the sextant can be read without making use of the vernier, and (2) how much closer it can be read by making use of the vernier.** In other words, break down the markings on the arc and vernier of that particular sextant. One quick way to determine just how the arc is cut is to note the number of minutes in the vernier; **the Vernier will contain the same number of minutes as are contained in the smallest divisions on the arc.** Therefore, inasmuch as the vernier in figure 14 contains 10 minutes (10′), it will be quite apparent that the arc in this figure is cut to 10 minutes (10′). Next, it is easy to determine just how the vernier is cut; if there is one line between minutes, the vernier can be read to 30 seconds (30″); two lines, 20 seconds (20″); three lines, 15 seconds (15″), and five lines, 10 seconds (10″). In figure 14 there are five lines between minutes, so that this vernier is cut to 10 seconds (10″).

In reading a vernier sextant keep in mind two things:

What will I get from the arc?

What will I get from the vernier?

SET IT DOWN THIS WAY:

1. From the arc: Degrees
2. From the arc: Minutes (either 10, 15, 20 or 30, depending on how the arc is cut)
3. From the vernier: Additional minutes
4. From the vernier: Seconds (either 10, 15, 20 or 30, depending on how the vernier is cut).

Once you have mastered this you can read any vernier sextant.

Now then, to read the sextant shown by figure 14.

Note that the index (or arrow) on the vernier (Fig. 14) falls to the **left** of the 36° division on the arc, which simply means that, returning to the formula given for reading a vernier sextant, we have taken care of number 1—from the arc we have 36° plus (+)—more than 36°. Now note that the index on the vernier falls **in between** the 40 minute (40′) and 50 minute (50′) divisions on the arc, which means that we have more than 40 minutes (40′) **more** than 36°, but not as much as 50 minutes (50′) more than 36°—we will have to determine exactly **how much more** than 40 minutes (40′) by referring to the vernier. This takes care of number 2 on our formula—40′ plus (+)—more than 40′. **This is all we can get from the arc**—36° 40′.

Now we can easily see that we have **more** than 40 minutes (40′), but not quite 50 minutes (50′), so we must look to the vernier to determine just what part of this ten minutes difference between 40′ and 50′ we have. Glance across this diagram and you will see that there is **only one place** where some line on the vernier coincides with some line on the arc, and that is at 8 minutes (8′) on the vernier, which is that portion of the ten minutes we have been looking for. Our formula then, is set up in this manner:

1. From the arc..... Degrees	36 (+)
2. From the arc..... Minutes	40 (+)
3. From the vernier..... Addnl. Minutes	08
4. From the vernier..... Seconds	00
SEXTANT READING	36° 48′ 00″

One more thing with reference to reading a vernier sextant. There is **only one place** where some line on the vernier coincides with some line on the arc. You may think there are several places where these lines **just about coincide**—but there isn't. If you will look at figure 15, which is an enlarged portion of an arc and a vernier, you will see that where some line on the vernier coincides with some line on the arc, you will get this sort of a picture. In other words, where there is an exact coincidence the two adjacent lines on the vernier will fall slightly **inboard** of the two adjacent lines on the arc. You will only get this picture where some line on the vernier and some line on the arc coincide.

Frank Groves Appointment

The Frank Groves Company, San Francisco, announce their appointment as distributors for Zallea Brothers & Johnson, manufacturers of "Code-Craft" equipment, including Corrugated Expansion Joints.

Zallea Brothers & Johnston have one of the finest equipped factories in the country, located in Wilmington, Delaware, and their Pantograph Chain is an outstanding improvement in the construction of expansion joints.

The Frank Groves Company will shortly have a complete stock of the sizes and types used in marine field.

KEEP POSTED

(Continued from Page 144)

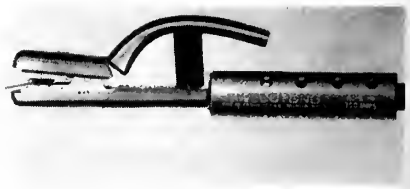
Mellaphone's New High-Powered Battery Charger

The Mellaphone Corp. of Rochester, N. Y., well known in the industrial rectifier field, having pioneered and manufactured rectifiers since 1929, has recently introduced the SC-8 Selenium plate charger, representing the latest design in a high quality single battery type charger.

It is a powerful instrument, not to be confused with "trickle" or other low amperage chargers. It is designed to recharge any 6-volt storage battery, whether it be in an automobile, motor boat, tractor or for industrial use.

The charger comes complete with cords, clips and plug, ready to use and operate on 110 volts, 50/60 cycle a.c. power. Models will also be available for 220 volts 50/60 cycle power.

Rated at 8 amperes, the charger delivers an initial charge of from 10 to 12 amperes on a discharged battery and automatically tapers to approximately 4 amperes at full charge. It is said to deliver a tapering charge which is longer lasting and which extends the battery life.



Twecotong Electrode Holder

A complete new line of manual arc welding electrode holders to be known as "Twecotong" has just been announced by the Tweco Products Company, Wichita, Kansas. The new line includes full-insulated and semi-insulated models.

The full insulated models are known as No. A-14, 300 ampere, 1/4" electrode capacity; No. A-38, 500 ampere, 3/8" electrode capacity. The semi-insulated models are known as No. B-14, 300 ampere, 1/4" electrode capacity; No. B-38, 500 ampere, 3/8" electrode capacity.

DIESEL-ELECTRIC PROPULSION

(Continued from page 146)

terially to the unequalled maneuverability of the diesel-electric drive.

Within recent years, the reversing characteristics of various types of electric drive vessels have been studied by taking oscillographic measurements of the power delivered by the prime mover and the resultant speeds during the reversal cycle. The data shown in figure 1 are the results of such tests taken on a 3,000 shp tugboat with four diesel engines driving a single screw through direct current transmission. The curves trace the change in horsepower, propeller speed, and engine speed within the first 10 seconds after the control hand wheel was moved from full speed ahead to full speed astern, and are indicative of the speed and finesse with which the full power of the vessel can be controlled.

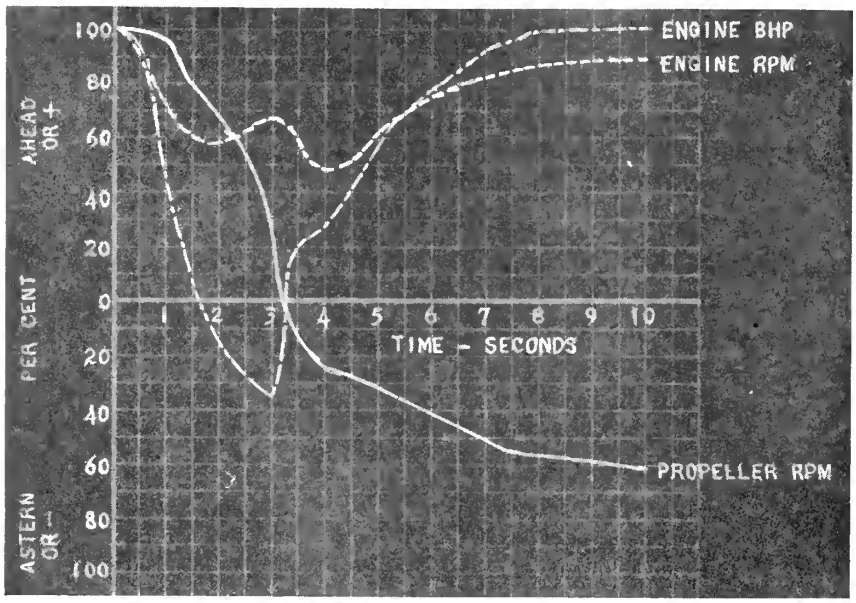


Fig. 1

It is, of course, understood that the vessel did not come to a standstill and reverse within the time shown in figure 1, but the propelling plant in less than 10 seconds was delivering its full 3,000 shp to the propeller with the propeller turning astern at 60% of its maximum rated ahead speed. (For this vessel, the full speed astern of the propeller was defined as 60% of the full speed ahead.)

It is of further interest that the operator moved the control handwheel from full ahead to stop in 1¾ seconds and on through to full speed astern in about the same length of time. The engines reached the speed called for by the controller and because the full limit on the engine governor was set to give approximately 10% above rated horsepower at rated speed, the engines delivered rated output at approximately 90% rated speed.

It has been shown that diesel-electric direct current transmission provides for the maximum utilization of the vessel's power plant whether the vessel is running free, pulling a tow, or maneuvering. There are other characteristics that further enhance its possibilities as a desirable form of ship propulsion.

Dual Use of Generating Capacity

Among the first questions the naval architect or the marine engineer should ask when considering the type of propulsion for a vessel, these are the most pertinent: What percentage does the horsepower of the connected auxiliary load bear to the horsepower required to propel the vessel? Are the auxiliary requirements the highest when the propulsion requirements are nil or greatly reduced? If the percentage is high, electric transmission is indicated regardless of the type of prime mover. Outstanding examples of the types of vessels which can best use electric drive because of the dual use of the electric generating capacity are: fireboats, hopper dredges, tankers, refrigerated fishing vessels, tenders, salvage, and repair vessels.

Better Weight Distribution and Compartmentation

While this point probably is more of interest to the naval architect, it is also of importance to the shipbuilder. A multiple diesel engine installation with electric transmission makes possible the location of the engine sets without regard to the location or alignment of the propeller shaft. Furthermore, it is not necessary to have all the engines in the same compartment or with the control. A multiplicity of units mean less weight and space per unit and this is an important item when the equipment is installed, especially to the smaller building yard with limited crane facilities. The diesel generating set today is one unit assembled on a common base by the engine manufacturers and ready to bolt to the ship's foundation without the necessity for making a further alignment.

Elimination of the Shaft Alley and the Long Line Shaft

The electric propulsion motor is a simple and reliable device and for that reason it can be installed in a compartment located remotely with respect to the regularly attended engine space and its operation checked only periodically. There is a definite advantage in placing the propulsion motor far aft in the vessel and bringing the propulsive energy to it through electric cables which require negligible space within the hull of the vessel. Many diesel-electric propelled vessels have been constructed in this manner, especially cargo carriers because the shaft alley is eliminated and the tunnel space becomes profitable cargo space. The cost of the vessel is also reduced with the omission of the long line shaft and its usual problems of setting and aligning.

Increased Reliability and Simplification of Maintenance with Multi-engine Combinations

One needs only to study the availability and maintenance records kept by the motive divisions of the railroads operating diesel-electric locomotives to appreciate the comparative ease with which diesel-electric units can be maintained and operated at a high degree of availability. The modern engine is designed for accessibility and it is not uncommon to make replacement of internal working parts on one unit removed from service

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DIESEL-ELECTRIC PROPULSION

(Continued from page 160)

while the other units continue to function. There are many diesel-electric propelled vessels in service today with four engines installed per screw and reference to table I will show the slight reduction in the speed of the vessel if one engine is removed from service temporarily for adjustment or repair.

The stock of spare parts both as to quantity and cost can be reduced for a multiple-diesel installation, not only because they are interchangeable for a larger number of units but they are smaller in size and are the results of mass production. This point is of greater importance to the operation of a fleet of vessels using identical equipment.

Control From a Multiplicity of Remote Stations Possible with Diesel-Electric Drive

In the early days of diesel-electric drive, there was a mixed reaction to the suggestion that the control of the engines could be located in the pilot house as well as the engine room. However, what prejudices there may have been, have evaporated in the favorable experiences with the control stations located outside the engine room.

Limitation of Diesel-Electric Direct Current Transmission

There are a number of special type diesel-electric propelled vessels with direct current transmission in operation today with 6,000 shaft horsepower installed per screw and this seems to approach the practical limit for direct current transmission. There is a definite limit to the maximum direct current voltage that can be used on board ship and this limit plus the high current which must be developed by direct current machines of large ratings, automatically limits the ceiling beyond which it is not practical to go. Usually a vessel having such a large shaft horsepower installation will be of the trade route type that operates in "high gear" much of its running time and therefore has no particular need of the characteristics offered by direct current transmission. The efficiency of direct current transmission is less than that of other forms of transmission and unless the desirable characteristics are required and which will compensate for the lower efficiency, it is difficult to justify direct current propulsion from an economic standpoint.

Diesel-Electric Alternating Current Transmission

The transmission of alternating current power must be premised on a fixed speed ratio between the prime mover and the driven auxiliary if the highest efficiency is to be realized. For that reason almost all electric ship propulsion systems using alternating current transmission obtain variations in propeller speed by corresponding variations in the speed of the prime mover.

Except for the "variable gear ratio" characteristics with all of its corollaries peculiar to direct current transmission, the other advantages of electric drive can be claimed for alternating current transmission with the added advantages of higher efficiency and no limit in maximum horsepower such as imposed on direct current transmission. It therefore follows that this type of drive is more favorable for higher powered vessels on trade route service.

The first large vessel to employ diesel-electric alternating current transmission, was the 25,000 ton German liner Wuppertal, built in 1937 with 7,800 shaft horsepower. It was claimed that the operating efficiency of this installation was equal to that of direct diesel drive—the advantage lying with diesel-electric transmission in the matter of weight and space. The U. S. Navy has in operation the only multiple diesel-alternating current drive vessel constructed in this country. It is a twin screw 11,800 shaft horsepower submarine tender with four diesel engines driving alternators and operating in parallel over a speed range of 4:1 to supply a 5,900 shaft horsepower synchronous type propulsion motor connected to the propeller shaft. For military reasons, the detailed performance of this drive has not been made public, although it is understood that the type of drive has proved itself to be entirely practical. Studies made prior to and since this drive went into service points to great future possibilities for multiple diesel-alternating current propulsion.

Cost Consideration

A review of the advantages claimed for diesel-electric ship propulsion would lead eventually to the conclusion that its first cost must be higher than for other forms of ship propulsion of comparable horsepower. However, a fair comparison taking into consideration all factors may show electric drive to be no more costly and perhaps less expensive if the advantages for a specific application are evaluated correctly. The naval architect, the marine engineer, or the operator when comparing elements of cost for different types of drive could therefore profitably seek the answer to these questions:

1. To what extent does the generating capacity of the electric drive when utilized on a dual basis, eliminate the use of separate engine-driven auxiliary generating units?
2. What saving can be realized during the construction of the vessel by the elimination of the long line shaft?
3. What saving can be realized through the handling and setting of smaller pre-aligned units during installation?
4. To what extent can the revenue earning space be increased and capitalized that is released by the elimination of the shaft alley and the reduction of head room in the engine space?
5. Has the proposed diesel-electric scheme been burdened with special features such as unnecessary remote control stations, elaborate cross switching schemes between motors and generators, excessive generating capacity, etc., that tend to increase the cost of the drive without contributing to its fundamental advantages?
6. And finally, does diesel-electric drive give the basic characteristics required by the application that is unattainable with any other type of drive?

A fair appraisal of the answer to these questions will do much to show why diesel-electric drive is becoming an increasingly important type of drive in the field of marine propulsion.

Pacific MARINE REVIEW

JULY 1946

Foreman of preparation room, "Slim" Bisher, old time fiber man with Tubbs Cordage Company since 1909.

MEN and ROPE

It takes fine fiber, properly prepared, spun and laid . . it takes precision machinery . . to make rope that is uniformly dependable.

But behind these are MEN—men with the "know how" of many years experience in the making of fine rope.

In every department of the Tubbs mills, men like these take pride in their work—pride in doing their share to produce a product that for nearly a century has stood for rope leadership.

It is this background of "know how"—this combination of MEN and ROPE—that is your assurance that when you specify the TUBBS trademark you are getting plus value for your rope dollars.

When finest Manila fiber is once more available, look again for this famous rope trademark.

TUBBS EXTRA SUPERIOR MANILA CORDAGE COMPANY

TUBBS CORDAGE COMPAN

SAN FRANCISCO SEAT

LOS ANGELES • CHICAGO • PORTLAND • NEW Y

Pacific Marine Review

OFFICIAL ORGAN
Pacific American
Steamship Association

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Shipowners Association
of the Pacific Coast

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CONTENTS - - - - - - JULY, 1946

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ROPE must be flexible! In any use to which you may put rope, a primary reason for its use is—Flexibility! You want it Strong . . . and you want it Waterproof . . . you want it Enduring . . . and you want it to have the Appearance that reflects quality. Yet you choose rope to do the job because you must have Flexibility!

COLUMBIAN *Balanced* Tape-Marked PURE MANILA ROPE gives you *all five!* Yet no one quality is sacrificed to obtain others. No one quality is obtained at the cost of others! To make rope that is Flexible, we do not sacrifice Appearance, Strength, Waterproofing, or Endurance. In fact, each of these qualities, in Columbian Rope, contributes to Flexibility. Waterproofing, for example, insures that this, the finest rope we can make, will be Flexible—even when wet!

COLUMBIAN ROPE COMPANY
400-90 Genesee St., Auburn, *"The Cordage City,"* N. Y.

Columbian TAPE-MARK PURE MANILA ROPE

Pacific MARINE REVIEW

Accounting Trouble

It is little short of incredible that the Maritime Commission—and the maritime industry as a whole—should be accused in the accounting furore. Scandal mongers have made the statement that "$8,000,000,000 was improperly accounted for" and imply that the money was stolen, which of course it was not. The incredible thing is that such charges are not immediately and adequately denied or explained by responsible authority.

The year under audit is 1943—mid-war. The Commission was building shipyards, and the major point in dispute seems to be the distribution of the cost of the yards to the ships they produced. In 1943 it was not possible to know the number of ships a yard would produce during the war.

The Commission was also financing the expansion of various manufacturing plants, but even a Solomon could not assign such costs to a particular ship nor to a particular engine or particular bolt. The program which the Commission conceived and brought to maturity was on a grand scale—and the results were grand. But in 1943 the cost of each job was of very minor import. We know of a Liberty ship that carried 8000 tons of ammunition about the South Pacific in support of MacArthur's advance, but we never knew the overhead costs on that ship—and never will. They were part of the $8,000,000,000 "improperly accounted for."

We are not concerned here with the merits of the dispute between the accounting office and the Commission. No doubt right will prevail. But we **are** concerned with the damage to the industry which irresponsible talk can bring about. It is important to all that the Maritime Commission and its finances have the support of Congress and the public. Means should be found for fully informing the press on this and all other matters vital to the future of the industry.

"Taxes"

"Friends and neighbors, the taxes are indeed very heavy, and if those laid on by the government were the only ones we had to pay, we might the more easily discharge them; but we have many others, and much more grievous to some of us. We are taxed twice as much by our idleness, three times as much by our pride, and four times as much by our folly; and from these taxes the commissioners cannot ease or deliver us by allowing an abatement. However, let us hearken to good advice, and something may be done for us. 'God helps them that help themselves.' "—Benjamin Franklin.

Gas Turbine for Marine Propulsion

The internal combustion turbine has been a dream of designers for many years—one might almost say for centuries. Its long delayed practical success has awaited developments in metallurgy and in compressor design.

Both of these developments are now successfully accomplished in experimental turbines and are about to be given a practical test on a ship at sea by the U. S. Maritime Commission.

A number of well-known manufacturers of marine propulsion machinery have each produced a successful experimental gas turbine and the test at sea will be to prove reliability and cost of maintenance.

In the gas turbine cycle gases impinge on the turbine blades at very high temperatures, hence the metallurgical problem.

A very large proportion of the power generated in a gas turbine is used to run the compressor hence unless that member preserves a very high efficiency the propulsion power falls off very rapidly and soon disappears. Hence the compressor design problem.

As shown in a paper read by Chas. A. Johnson, Chief Engineer Federal Shipbuilding and Dry Dock Company, before the Metropolitan Section of the Society of Naval Architects and Marine Engineers, and published in the June issue of the Pacific Marine Review, the gas turbine is considerably lighter than other forms of marine power plant and occupies 23 per cent less cubic space than comparable power in a geared steam turbine plant. The estimated fuel consumption per shp hour is 0.437 lbs for the propulsive unit alone when using oil of 19,600 btu per pound and the plant has a thermal efficiency of 29.7 per cent.

Since the gas turbine is non-reversible a variable blade propeller is used which gives complete maneuvering and reversing ability.

The operation of this plant will be watched by marine engineers with great interest. Should its reliability and cost of maintenance prove as satisfactory as its fuel economy and space and weight saving characteristics a new era in marine propulsion will be born. The possibilities inherent in the gas turbine are tremendous and the field is just beginning to be scratched.

The exhaust of the gas turbine contains sufficient heat even after passing through the regenerator to have attractive possibilities for use in producing auxiliary power.

The gas turbine is now in the same comparative situation that the steam turbine and the diesel engine enjoyed thirty-five years ago.

It is reported that thirty British marine engineering companies are financing the development of the gas turbine at a plant located at Wallsend-on-Tyne, England, in conjunction with the Admiralty. Jet propulsion engines also are being developed, and a destroyer and a coastwise vessel may shortly be fitted for testing purposes.

Matson Liner Monterey in Honolulu Harbor

After reconversion this fine liner will be back in service on the Pacific.

Our Ships Are Returning

Matson

It is no secret that the Matson liners

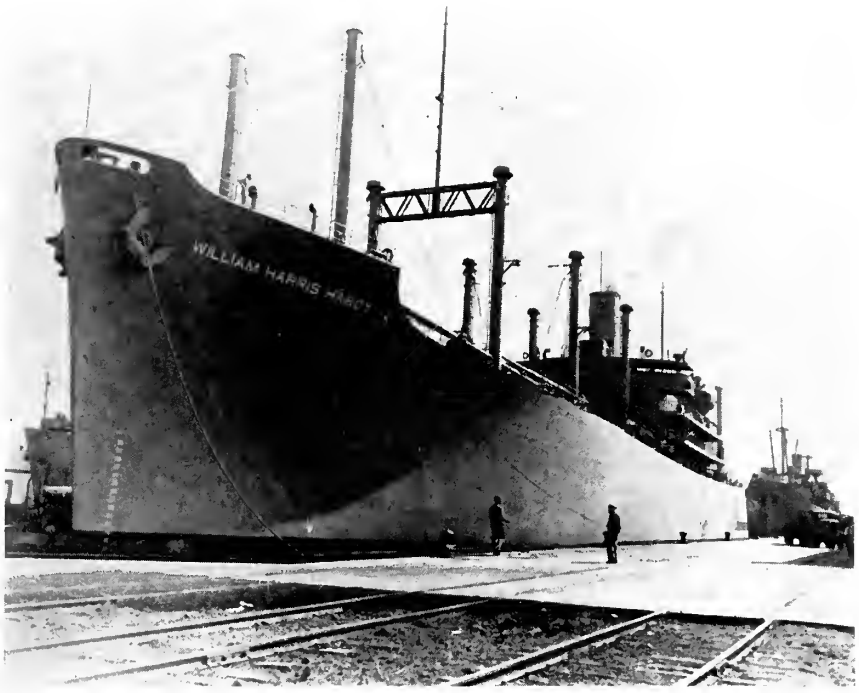
LURLINE
MONTEREY
MARIPOSA
MATSONIA

are returning to service, as are also the

MAHIMAHI
MAUNALEI
MANULANI
MANUKAI
MOKIHANA
MALIKO

But not returning are the

Lahaina—War loss, shellfire, Pacific.
Manini—War loss, torpedo, Pacific.



"William Harris Hardy"

Malama—War loss, shellfire, Pacific.

Mauna Loa—War loss, air attack, Port Darwin, Aust.

Kahuku—War loss, torpedo, Caribbean.

Kahuku—War loss, torepdo, Caribbean.

Honomu—War loss, torpedo, North Atlantic.

Olopana—War loss, torpedo, North Atlantic.

Kaimoku—War loss, torpedo, Atlantic.

Mauna Ala—Marine loss; stranded near Ft. Stevens, Columbia River.

Mapele—Marine loss; stranded, Cape Devine, Alaska area.

"Sea Centaur," one of the 16 C-3s which will probably be assigned to Matson as will the Hardy shown above.

American-Hawiian

Of this well known fleet, some will be back, some will not.

Alabaman – W. S. A.
Arizonan – W. S. A.
Carolinian—Returned Being reconoverted on East Coast.
Floridian—W. S. A.
Georgian—Returned. In service on West Coast.
Hawaiian—Returned. In service on West Coast.
Kansan – W. S. A. She will be returned
Mexican—Turned over to U. S. Government, permanently.
Minnesotan—W. S. A She will be returned.
Panaman – W. S. A
Utahan—Sold to Greeks.
Virginian—U. S. Government has title
Alaskan – Lost by enemy action off coast of Brazil.
American—Lost by enemy action Caribbean.
Arkansan—Lost, Caribbean.
Coloradan – Lost, Capetown.
Honolulan—Lost, Cape Verde Islands
Ohioan—Lost, Florida Coast.
Montanan—Lost, Arabian Sea.
Oklahoman—Lost, Capetown.
Oregonian—Lost, Greenland Sea.
Puerto Rican—Lost, Iceland.
Texan – Lost, Cuba Coast.
Washingtonian – Lost, Indian Ocean.
Illinoian—Sunk off Normandy beachhead to form breakwater.
Kentuckian—Sunk off Normandy beachhead to form breakwater.
Pennsylvanian—Sunk off Normandy beachhead to form breakwater.
Dakotan—Requisitioned for title and possession by W. S. A.
Columbian—Requisitioned for title and possession by W. S. A

"Arizonan" at Gambea Reach, Panama Canal.

Nebraskan Requisitioned for title and possession by W. S. A.
Nevadan Requisitioned for title and possession by W. S. A.

Luckenbach

Andrea F. Luckenbach Lost.
Edward Luckenbach – Lost.
Florence Luckenbach Lost.
Harry Luckenbach – Lost.
Juha Luckenbach Lost
Lillian Luckenbach Lost
Mary Luckenbach – Lost
Matthew Luckenbach – Lost
Paul Luckenbach Lost.
Lena Luckenbach – Beached at Normandie.
F. J. Luckenbach—To animal carrier.
Dorothy Luckenbach (renamed Ernestine C. Koranda)—To hospital ship.
Lewis Luckenbach (renamed Louis A. Milne)—Coonverted to hospital ship.
Horace Luckenbach—Back in service.
J. L. Luckenbach—W. S. A. has her but she is comig back into service.
Jacob Luckenbach—Back in service.
Katrina Luckenbach—W. S. A. has her but she is coming back in service.
K. I. Luckenbach—In drydock.
Robert Luckenbach—Back in service.
Susan Luckenbach—Army has title.
Nira Luckenbach—In for repairs.
Walter A. Luckenbach—In for repairs.
William Luckenbach—In for repairs.

"Wm. Luckenbach"

United Fruit

Antigua—W. S. A. still has fleet; possibly returnable this fall.

Chiriqui—W. S. A. still has fleet; possibly returnable this fall.

Veragua—W. S. A. still has fleet; possibly returnable this fall.

Quirigua—W. S. A. still has fleet; possibly returnable this fall.

Jamaica—W. S. A. still has fleet; possibly returnable this fall.

Talamanca—W. S. A. still has fleet; possibly returnable this fall.

Toloa—W. S. A. has permanent title.

Uloa—W. S. A. has permanent title.

Calamares—W. S. A. has permanent title.

Pastores—W. S. A. has permanent title.

Sixola—Lost.

Metapan—Lost.

Tivives—Lost.

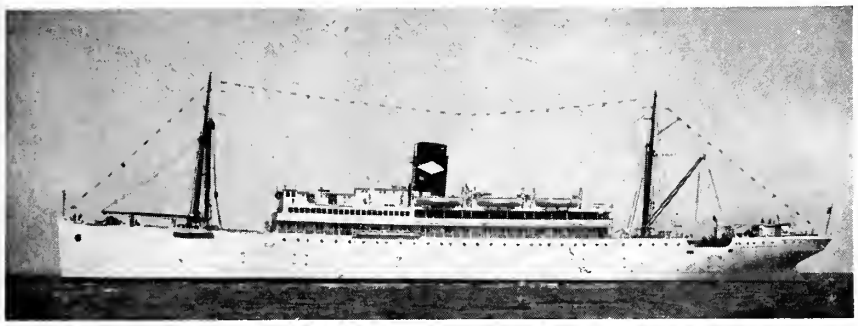
Castilla—Lost.

Tela—Lost.

Heredia—Lost.

Parsismina—Lost.

"President Taft"



"Antigua"

American-President Lines

S. S. President Pierce—Still afloat.

S.S. President Coolidge—Lost off Espiritu Santo, New Hebrides.

S.S. President Cleveland—Lost.

S.S. President Harrison—Overhauled by Japs off Woosung, seized as prize of war. Crew ran her aground and rendered her useless.

S.S. President Garfield (renamed President Madison)—Converted to hospital ship.

S.S. President Polk (renamed President Taylor)—Lost in action off Canton Island in South Pacific.

S.S. President Adams (renamed President Grant)—Lost in action in South Pacific.

S.S. President Van Buren (renamed President Fillmore, renamed S.S. Marigold)—Converted to hospital ship by Navy.

S.S. President Monroe (renamed President Buchanan)—Converted to hospital ship, permanent possession of U. S. Army.

S.S. President Hayes (renamed President Tyler)—Still U. S. Maritime Com.

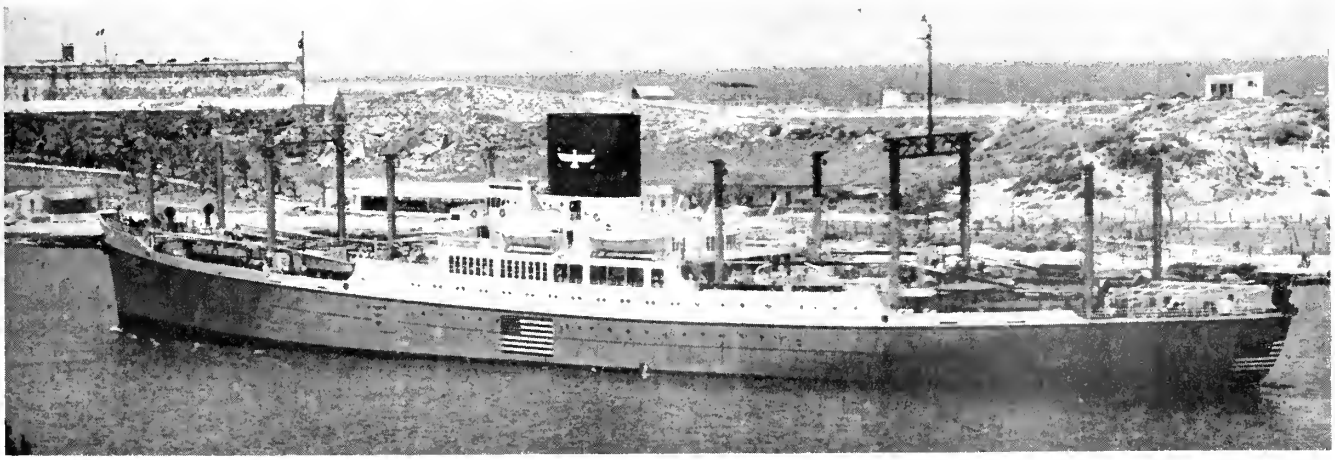
S.S. President Jackson — Permanent possession of Navy.

S.S. Ruth Alexander—Bombed in Celebes Sea off Balikpapen, Dec., 1941.

Manchuria (renamed President Johnson)—Still afloat. Returned from W. S. A. to A. P. L.; tied up in bay.

Presidents Polk and Monroe—Being reconverted

"President Polk"



"Santa Elisa"

Grace Lines

Napier—Has been returned, or is about to be.

Santa Ana—Has been returned, or is about to be.

Santa Barbara—Government has title.

Santa Catalina—Has been returned, or is about to be.

Santa Cecilia—Government has title.

Santa Clara—Government has title.

Santa Inez—Has been returned, or is about to be.

Santa Isabel—Government has title.

Santa Leonor—Has been returned, or is about to be.

Santa Margarita—Government has title.

Santa Monica—Government has title.

Santa Paula—Has been returned, or is about to be.

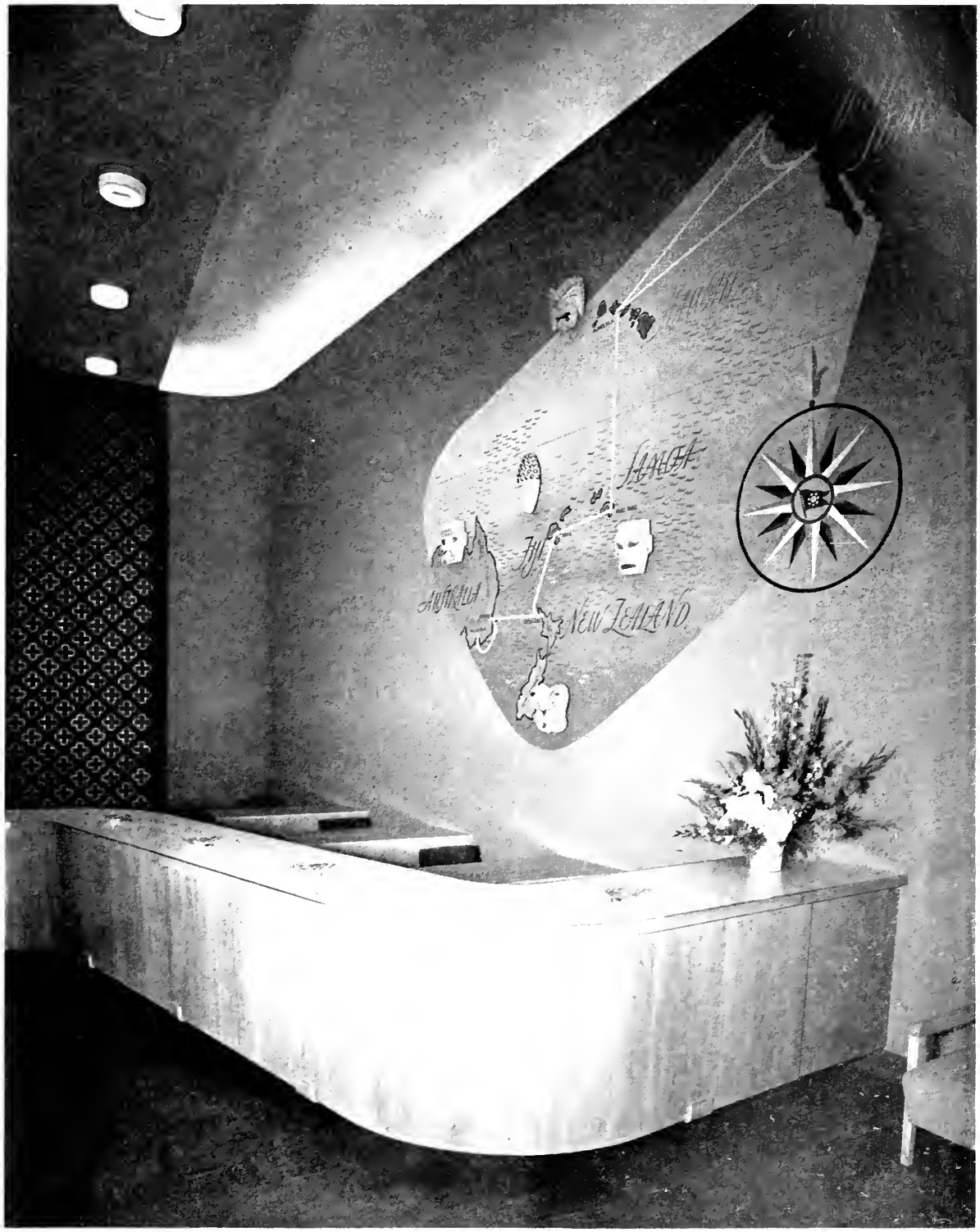
Santa Rita—Has been returned, or is about to be.

Santa Rosa—Has been returned or is about to be.

Santa Teresa—Has been returned, or is about to be.

TO THE SHIPS RETURNING, AS TO THE FIGHTING MEN THEY SERVED, THIS GREETING FROM THE HILLS AND PIERS OF SAN FRANCISCO HARBOR:

Matson's New Passenger Office, Los Angeles



Undoubtedly the most beautiful steamship office in the country, if not in the world, is the new Matson passenger office in the Pacific Mutual Building at West Sixth Street and South Grand, Los Angeles. Designed by Raymond Loewy, New York architect, the motif is distinctly South Seas. The scenes on this and the following pages may be identified as follows:

Above: Mural map showing Matson trade routes between West Coast, Hawaii, and Australia-New Zealand.
Page 48: Two views of the ticket counter.

Page 49: Attractive corner of the office, showing indirect lighting and floral decor in the top picture, while below is the West Sixth Street entrance.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MATSON

Brazilian Cargo Liners Building At Ingalls

INGALLS LAYS KEEL FOR BRAZILIAN SHIP—The keel of the Americaloide, first of a fleet of 14 identical cargo vessels for Lloyd Brasileiro, government-owned Brazilian steamship line, was laid recently at the Ingalls Shipbuilding Corporation yard in Pascagoula, Miss. Members of the Brazalian supervising commission from Rio de Janeiro, with headquarters at Pascagoula, took part in the ceremony. Left to right in the foreground are W. R. Guest, Ingalls' executive vice president; W. D. Pelan, general yard superintendent; and the members of the commission—Lieutenant Alexandcina Alencar, Lieutenant Commander Moacyr Rodriques de Costa, and Lieutenant Commander Ubaltigo Azeveda. The 14 vessels—442 feet long and with a 12,000-ton displacement—are being constructed at a cost of $37,000,000, representing the largest contract ever placed with a United States shipyard by a South American line. The Ingalls yard, with $100,000,000 worth of contracts—about a fourth of all current contracts in American yards, according to a recent survey—is the shipbuilding center of the South.

Work has begun at the Ingalls Shipbuilding Corporation yards in Pascagoula, Miss., on 14 streamlined 7500 deadweight ton cargo vessels for Lloyd Brasileiro, Government-operated Brazilian steamship line. This is the largest single contract ever awarded a United States yard by a South American country. Deliveries are scheduled during the last of 1946 and in 1947, at a total cost of $37,000,000.

In addition, Ingalls is working on three passenger-cargo ships for Delta Lines (Mississippi Shipping Company), seven modernized cargo vessels for Moore-McCormack Lines and four huge hopper-type dredges for the Corps of Engineers, U. S. Army, at an approximate total cost, including the Brazilian vessels, of $100,000,000, or one-fourth of the present U. S. merchant shipbuilding contracts.

The Brazilian ships are identical in design and specifications so that machinery and all parts, wherever practicable, will be interchangeable. Six other ships for the Brazilian Merchant Marine Commission, to be constructed at a Canadian shipyard, are being built on the same basis.

These vessels, which will travel between the ports of New Orleans, New York and Rio, with probably a European service, are single-screw ships of the shelter deck type, with a raked stem and cruiser stern. There are two complete decks and a forecastle deck, with a third deck extending from the fore peak bulkhead to the forward end of the refrigerated cargo space. A deck at the top of shaft alley will extend from the aft machinery space bulkhead to the aft peak bulkhead. There will also be a flat in way of the refrigerated cargo space forward of the machinery space. The table herewith shows the principal characteristics.

Forecastle and shelter deck will have six inches of straight camber outboard of the hatch, but no sheer. All other decks in the main hull will be flat. All decks in the superstructure will have seven inches normal curved camber in 59′ 0″. A double bottom will extend from fore peak to aft peak bulkheads and will be subdivided for the carriage of fuel oil and fresh water with a minimum of free surface effect.

Streamlined to a great extent, the ships will be equipped with six holds, one of them refrigerated, and deep tanks for carrying vegetable oils. The teardrop stack will be false, products of combustions being emitted from the central mast. There will be eight complete transverse watertight bulkheads.

The machinery will be amidships, with three holds forward and three aft. Deep tanks will be arranged in holds Nos. 3, 4, 5 and 6. Refrigerated cargo space is to be located on the two reefer flats in No. 3 hold, clear of the square of the hatches.

The main turbine and gear unit will be of the cross-compound, double-reduction type, consisting of one high pressure turbine and one low pressure turbine and one double reduction gear connected to the turbine with flexible mechanical couplings.

The ahead turbine and gear will be designed to deliver 6000 shp at about 92 rpm at point of best economy with steam pressure of 440 psig and 740° F. total temperature at the throttle and will also be designed and nozzled to operate continuously at

PRINCIPAL CHARACTERISTICS

Length—over-all	**443′ 6″**
Length—b.p.	**424′ 0″**
Breadth—molded	**59′ 0″**
Draft—designed (winter North Atlantic) molded	**25′ 0″**
Depth—molded to shelter deck at side	**38′ 8″**
Height—second to shelter deck at side	**9′ 6″**
S.H.P.—maximum designed	**6600**
Complement—(exclusive of spare berths)	**51**
Total general cargo capacity	**404,000**
Refrigerated cargo capacity, about	**16,000 net cu. ft.**
Total capacity deep tanks, about	**2550 tons**
Speed—designed	**17½ knots**
Total displacement—full load	**11,790 tons**
Total deadweight	**7,534 tons**
Minimum cruising radius at full power	**10,000 miles**

6600 shp at about 95 rpm. The exhaust condition will be 28½″ Hg. at point of best economy.

An astern turbine will be located in the low pressure turbine casing and will be capable of developing 80% of the ahead torque at 50% of the ahead propelling speed (or 2400 shp) when operating with steam at 325 lbs. pressure and exhausting to 28″ vacuum and with steamflow not exceeding 42,000 lb./hour. The ahead turbine will be of the impulse, or impulse-reaction, type, and astern turbine will consist of suitable impulse wheels incorporated in the low pressure turbine. The ahead turbine will be provided with sufficient nozzle valves to operate a relative flat water rate curve from 3000 shp to the maximum designed shp, and the water rate at point of best economy, straight condensing, will not exceed 7.02#/shp/hour based on the designed steam conditions.

The main condenser will be of the two-pass, surface type, located athwartship and supported from the underside of the low pressure turbine without the use of any expansion section.

There will be two water-tube, sectional-header boilers fitted with economizers. Each boiler will be designed to evaporate and superheat 30,000 pounds of steam per hour at 465 psig pressure and 750° F. total temperature at the superheater outlet with 240° F. feed temperature to the economized inlet, and will be capable of sustained operation at 40,000 ph.

The boiler efficiency, when evaporating the normal quantity of steam, shall not be less than 87.5% when burning fuel oil at a high heat value of 18,500 btu/# having hydrogen content of 10.5%. Furnace heat released at normal boiler rating will be about 75,000 btu/cubic foot, and will not exceed 80,000 btu/cubic foot at this rate.

The air pressure drop through the boiler will be approximately 3.0″ of water at the specified normal rating with an air inlet temperature of 100° F. and 6.0″ of water at maximum evaporation.

Each boiler will be fitted with a convection type superheater; a 10,000 ph desuperheater; and an extended surface, counterflow type economizer.

There will be two motor-driven, forced draft fans, one for each boiler, of the multi-vane, single width, single inlet, backward inclined blade type with the blast discharging downward into the boiler air casing. The fan rotor will be overhung on the motor shaft extension and the fan will have a non-overloading characteristic and will be equipped with inlet vanes arranged for automatic control.

Under minimum conditions each fan will be capable of delivering 12,000 cfm of air against a static head of about 8.5″ water pressure based on 100° F. air temperature when operating at not more than 2200 rpm. The fan characteristics will be designed to secure maximum practicable efficiency when delivering 7200 cfm against a static head of about 3.0″ based on 100° F. air, when operating at reduced speed and under inlet vane control.

The main and auxiliary circulating,

(Continued on Page 148)

AERIAL VIEW OF INGALLS YARD—The sprawling Ingalls shipyard at Pascagoula, Miss., was busy on ships in all stages of construction when this aerial view was taken.

Vice Admiral William Ward Smith, USN (ret.), at extreme right, was sworn in as Chairman of the Commission succeeding Vice Admiral Emory S. Land (ret.), who resigned from this post on January 15. With Admiral Smith are shown, from left, Commissioner Raymond S. McKeough, Commissioner Richard Parkhurst and the Commission's Secretary, A. J. Williams, who administered the oath.

The New Commissioners

• Richard Parkhurst, who early this year was nominated by President Truman as a member of the United States Maritime Commission, brings to this new assignment a wealth of experience. Mr. Parkhurst went to Washington in 1943 as a consultant to the transportation and economic development division of the Office of Inter-American Affairs, serving without compensation. His services as consultant on shipping have included work with other Government agencies, including the Foreign Economic Administration. He was chairman of the Boston Port Authority from 1929 until his resignation last year.

Mr. Parkhurst, of Winchester, Mass. was endorsed for the Commission post by the entire Massachusetts Congressional delegation. He was associated with the publishing firm of Ginn & Co., in which his family own the controlling interest, from 1919 to 1929.

Mr. Parkhurst is 52 years of age and served in World War I as a chief petty officer in the Navy from 1917 to 1919. His appointment will run until April 16, 1948.

• Vice Admiral William Ward Smith, USN (Ret.), assumed office as Chairman of the U. S. Maritime Commission on June 3, 1946, succeeding Vice Admiral Emory S. Land who resigned in January.

Admiral Smith was born in Newark, New Jersey in 1888 and graduated from the U. S. Naval Academy in the class of 1909. He is a veteran of World Wars I and II. He was commander of cruiser task forces in the Pacific and won the D. S. M. for his exploits during that period. Later he was Director of the Naval Transportation Service and in that capacity represented the Navy in its cooperation with the War Shipping Administration and the War Department on allocations of vessels for troop transport and the movement of material in all war theatres.

Since March 6, 1945 he has been Commander, Service Force, U. S. Pacific Fleet, with the rank of Vice Admiral. In February, 1946, he became a member of the General Board, Navy Department.

• Raymond S. McKeough, who was appointed for a six-year term as a United States Commissioner on October 16, 1945 was born in Chicago, Illinois. He is 58 years of age and is a graduate of De La Salle Institute, Chicago.

Mr. McKeough has a comprehensive background. His first employment was with Armour and Co., and the Livestock Commission houses of the Union Stock Yard, Chicago. He was with the Elgin, Joliet and Eastern Railroad for seventeen years and in 1927 he entered the investment securities business. He was later associated with the brokerage firm of Babcock, Rushton and Co.

He represented the Second District (City of Chicago) of Illinois as a Democratic member of the 74th to 77th Congresses (1935-1943). During his years in Congress he served as a member of the Ways and Means Committee.

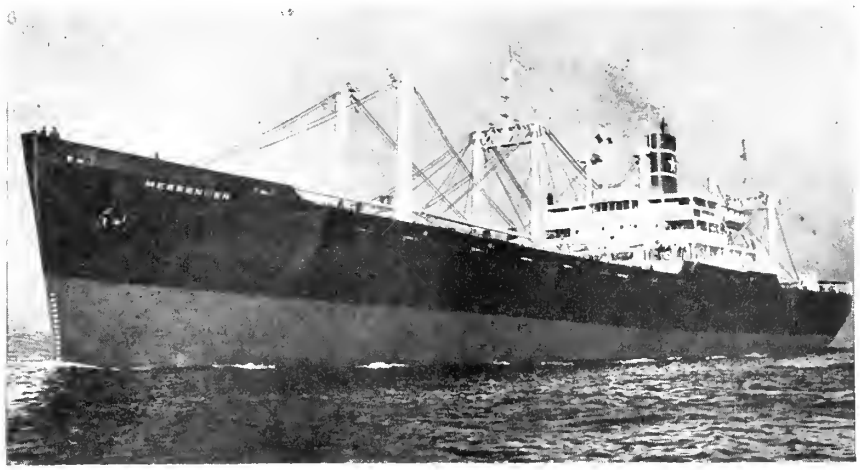
Shelter deck, forward, showing effected deletion of all armament. Wheelhouse top has also been cleared of that equipment. Minor changes were made in setting of cargo winches to improve operation of rigging.

S.S. Golden Light, last of the C-2's at Consolidated, ready for her launching.

Consolidated Steel's C-2 Fleet

All bedecked in their peacetime colors, nine of Consolidated Steel Corporation's fleet of ten C-2 cargo ships are now in operation, with the house flag of the States Marine Corporation flying on five. One has been assigned to the Grace Line, and four to Agwilines. The delivery of the tenth ship, the S.S. Golden Light, will round out Consteel's new construction program in the Los Angeles Harbor area.

It was very gratifying to the man-



S.S. Messenger, first of ten type C2-S-B1 cargo vessels built by Consolidated Steel's shipbuilding division at Wilmington, California, represents the largest vessels of its type constructed in that area.

agement on April 29, 1946, when the last ship slid down the ways, to see many of their former employees return to witness this event. When the ship hit the water, President Alden Roach could only say, "A job well done by the splendid cooperation of the men and women who worked for C. S. C."

The principal characteristics of this C-1 type of hull as designed by the U. S. Maritime Commission are shown in the table herewith.

Equipped with American Hoist and Derrick Co. all-electric cargo winches, the deck gear is the last word in efficiency for cargo handling. All cargo booms are constructed of drawn steel tubes, and pressure lubrication is provided for all swivel fittings. The 30-ton boom which proved to be of so much value during the war is now a permanent deck fixture. Ample padeyes are provided on decks and bulwarks for the stowage of deck loads, and booms can be topped and stowed with speed and accuracy. The arrangement of mooring bits and chocks makes for easy handling and alignment of cables.

There are seven watertight bulkheads dividing the hull into eight compartments: the fore and after peaks; the machinery space; and five holds, three forward and two aft. The fresh water tank is located in Number 3 hold with a carrying capacity of 430 tons or 132,440 gallons.

Propulsion Machinery

The main propulsion unit consists of a double reduction geared compound G.E. turbine which is operated from the upper engine room level with all necessary gages, telegraphs, throttles and valves brought together at one location. The tur-

Top: Main dining saloon, at forward end of cabin deckhouse. At left background are buffet and radio loudspeaker. Saloon also serves for passengers' recreation.

Center: Passengers' stateroom is typical of four located on Boat Deck. All have private connecting bath and ample locker space plus a Baggage Locker located on deck. Ventilation and lighting is more than adequate.

Bottom: Bosun's and carpenter's cabin further shows degree to which crowding in crew's quarters has been eliminated. This cabin and that for three oilers are in the Shelter Deckhouse.

bine units are fitted with proper lifting guides so that casing and rotors may be lifted while in the ship. Spare parts are furnished for the replacement of a complete unit.

Auxiliary turbo-electric generating sets supplied by Joshua Hendy Co. are housed on the starboard machinery flat, while the port flat provides space for a modern machine shop with lathe and drill press.

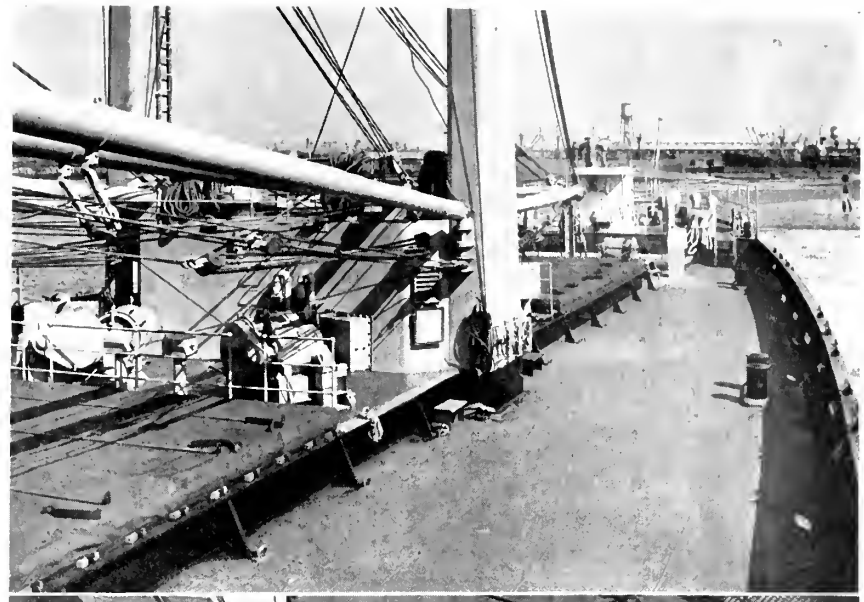
The pumps are mainly Worthington all-electric operated.

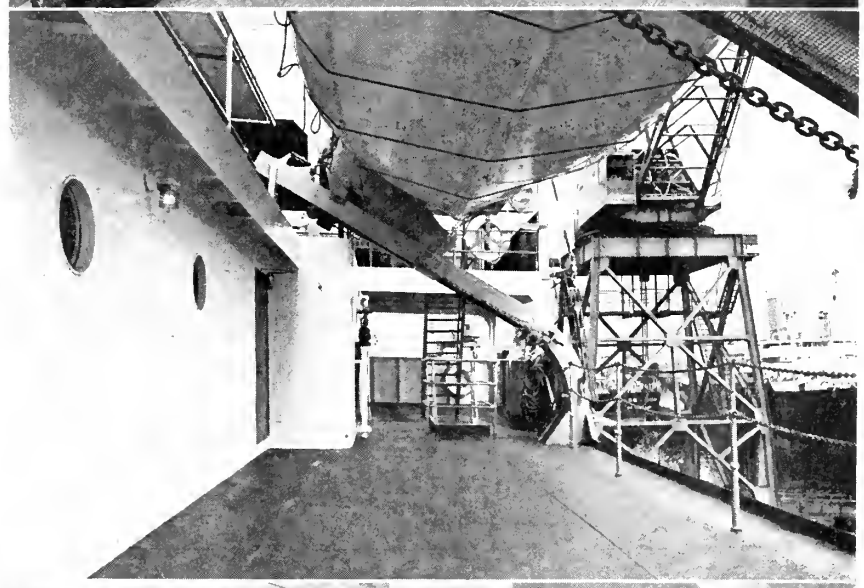
Bilge and ballast, fire and circulating systems, are all cross-connected, so that in case of emergency or the breakdown of any pump, these services can be maintained by switching to other pumps.

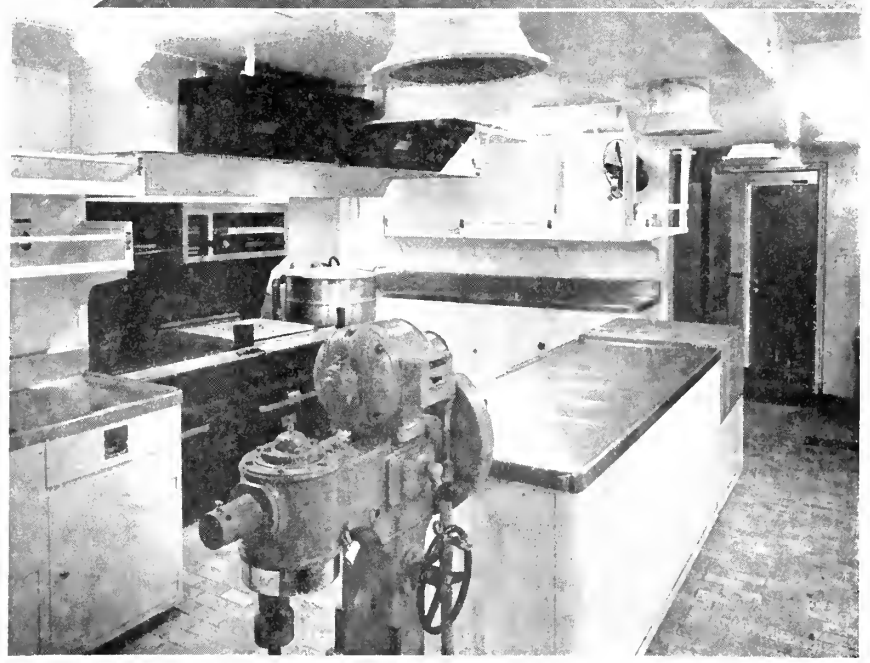
Steam is supplied by Foster & Wheeler steam generators installed on the same elevation as the machinery flat and designed to operate continuously at a temperature of 740° F., generating 450 lb. of steam. These boilers burn fuel oil under forced draft and are equipped with air preheaters and an economizer.

Spacious quarters are provided for the officers, crew and passengers. All cabin spaces are furnished complete, the furniture being made of noncombustible material except for chairs and upholstering. No burlap, fibre, hemp, or kapok is used, thereby eliminating fire hazards. All units are made separable so as to readily pass through the ship's doors or hatches. The furniture is secured to floors or walls to prevent moving in a seaway.

Berths and beds are provided with coil springs, lee rails, lockers and drawers under each, and a light at the head. Wardrobes, lockers, and even dirty clothes lockers are now furnished for the crew. Messroom tables of pedestal design with a highly







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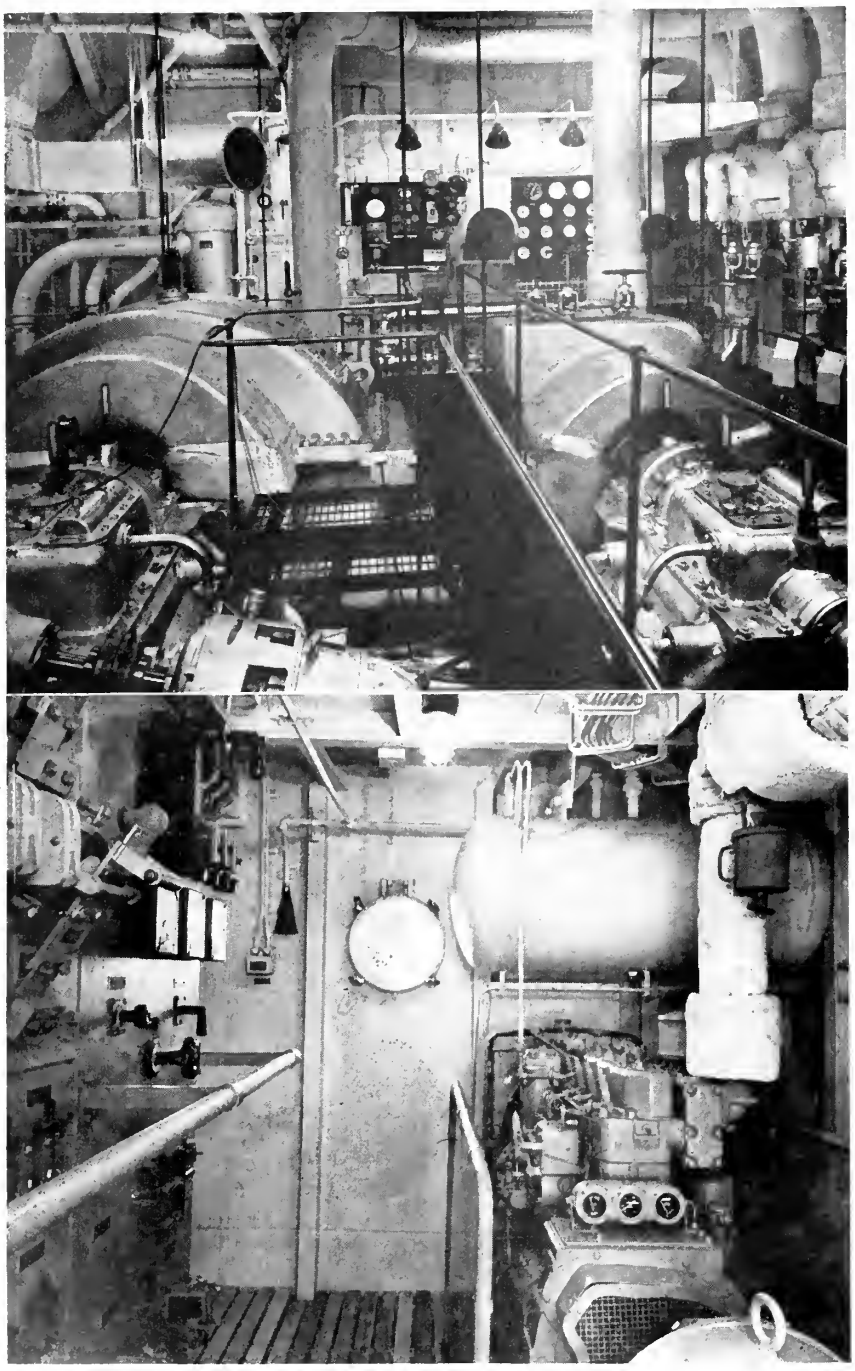
Top: Shelter deck aft.

Center: Boat Deck, reserved for passenger promenade.

Bottom: All-electric galley with Hotpoint range.



Upper: General Electric main propulsion turbine at operating platform level.

Lower: Emergency generator room.

polished lacquer finish immune to cigarette burns are installed in the officers' and crew's dining quarters. The passenger staterooms are furnished with upholstered chairs, coffee tables, smoking stands, sofas, and mirrors.

The captain and chief engineer are each provided with a large stateroom furnished with a built-in 42" x 78" berth, wardrobe, and chiffonier with mirror. There is a transom seat with drawers underneath and an easy chair. Additional office space gives room for a 2' 6" x 4' 6" flat top desk, a 4' table, a 5' sideboard, filing cabinets, bookcase, swivel chair, safe, wardrobe and two additional chairs.

Numerous other features, such as hospital space, shower and accessories, lavatories, laundry, toilet cabinets, drinking fountains, all tend to make the seaman's life a pleasure rather than a burden. The modern and up-to-date galley equipment supplied by the Dohrman Hotel Supply Company includes a potato peeler, "mechanical cow," and dumb waiter. The steward is provided with ample space directly below the superstructure for dry goods; and a large completely refrigerated space, for perishable goods.

Everything for the modern navigator is to be found in the wheelhouse and the chart room, including: radio direction finder with repeater; steering compass; steering stand with mechanical wheel indicator; gyro pilot; gyro compass repeater with switch; gyro alarm unit; engine telegraph; course recorder; rudder angle indicator; revolution indicator; searchlight control; navigating light panel; telephone; voice tubes; barometer; clinimeter; thermometer; flag locker; clock; fathometer; and smoke detector. With the installation of Kearfott windows in the front of the pilothouse, clear vision is assured for

C2-S-B1 PRODUCTION SCHEDULE

Builder's Hull No.	Name	Owner	Keel Laid	Launched	Delivered
1358	SS. Messenger	States Marine Corp.	7-10-45	10-20-45	2- 6-46
1359	SS. Spitfire	Grace Line	7-27-45	11- 9-45	2-22-46
1360	SS. Ocean Rover	States Marine Corp.	8- 8-45	11-29-45	3-15-46
1361	SS. National Eagle	States Marine Corp.	8-20-45	12-21-45	4- 2-46
1362	SS. Mountain Wave	States Marine Corp.	8-24-45	1-15-46	4-18-46
1363	SS. Carrier Dove	States Marine Corp.	9- 4-45	2-19-46	5- 7-46
1364	SS. Twilight	Agwilines	9-15-45	3- 5-46	5-24-46
1365	SS. Wild Ranger	Agwilines	10- 8-45	3-28-46	6-14-46
1366	SS. Crest of the Wave	Agwilines	10-22-45	4-17-46	6-28-46
1367	SS. Golden Light	Agwilines	11- 9-45	4-29-46	7-10-46

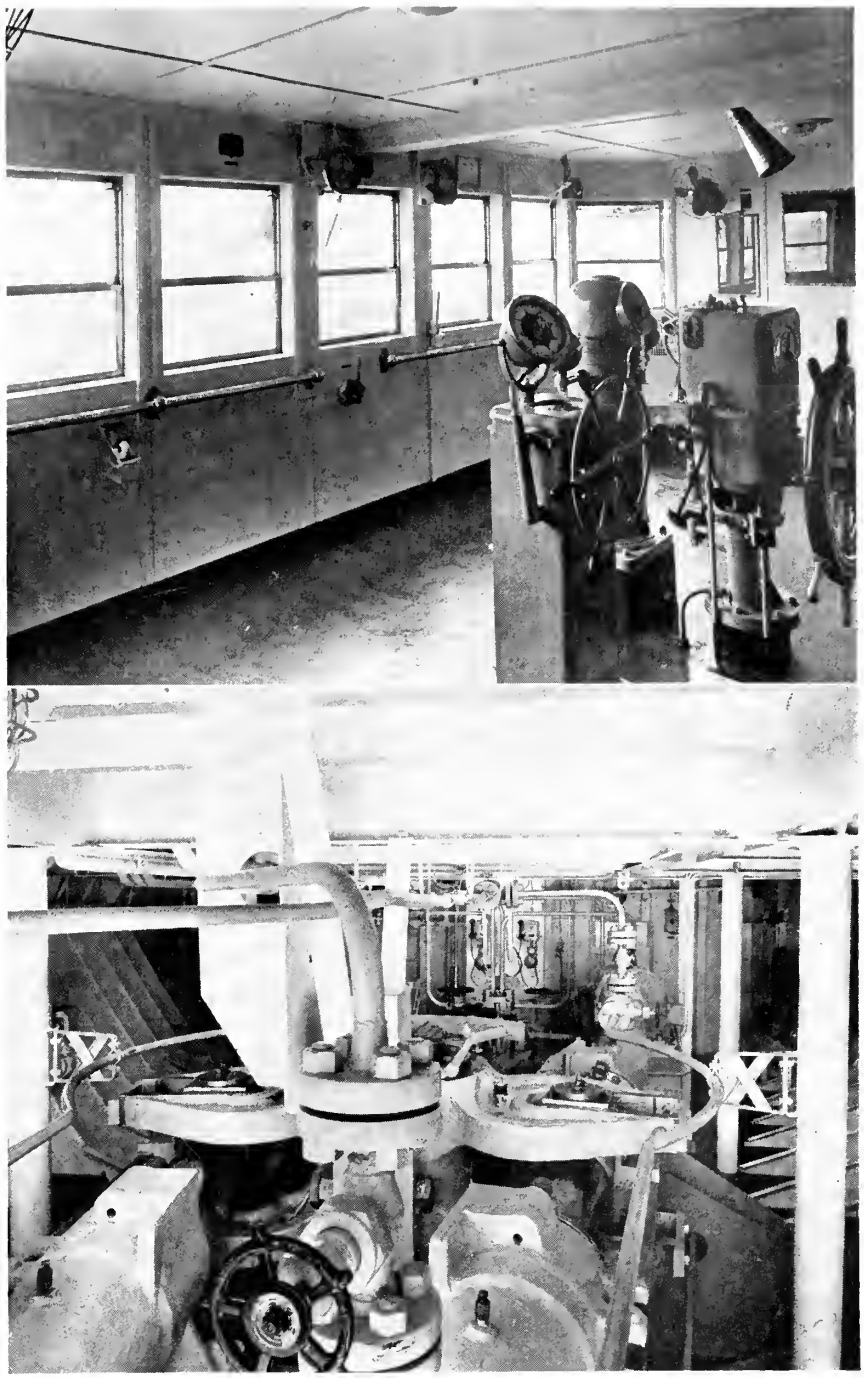
the officer on watch. The radio room is equally well furnished with the finest of maritime equipment.

Two 66-person all-steel lifeboats hung in mechanical davits help to make up the ship's life-saving equipment. Disengaging gear, capable of being operated by one person, is installed in each boat.

Looking at the builder's nameplate, one is assured that supervision and inspection must have been constantly on the alert, for built into this fleet is quality. Reliable performance under any condition is the proof. Trial results have been completely satisfactory to the trial board and the local inspectors. Letters from operating agents have been very gratifying to Consteel. C. S. C. can be proud of their valuable addition to the American Merchant Marine.

CHARACTERISTICS

Length overall	460′ 0″
Length between perpendiculars	435′ 0″
Length at waterline	438′ 6″
Extreme breadth	63′ 2½″
Molded depth	40′ 6″
Mean loaded draft	25′ 9¾″
Mean light draft	10′ 3½″
Cruising range, miles	14,700
Daily fuel consumption, loaded, at normal speed, bbls	245
Bale cargo capacity, cu. ft.	537,200
Light displacement, with 625 tons fixed ballast, tons	5,000
Designed loaded displacement, tons	13,860
Deadweight capacity at designed loaded draft, tons	8,800
Ship horsepower of main turbines	6,000
Maximum power of main turbines	6,600
Normal and maximum engine speed, RPM	92-95
Designed loaded speed of ship, knots	15.5



Upper: Wheelhouse, featuring Sperry gyro compass repeater and gyro helmsman; and Kearfott windows.

Lower: Hydro-electric steering gear.

Maritime Commission Men Observe Atom Test

In the April Pacific Marine Review there were listed the names of 25 merchant type vessels which are designated as target ships for the atom bomb test. Also, 21 merchant-type vessels serving as a so-called support group. Hence an interest in the test by the Maritime Commission.

Observation of the effect of an atom bomb explosion on merchant-type vessels will be made by two Commission technical representatives who will witness the experiment at Bikini.

The representatives are John Vasta, Assistant Head of Research in the Technical Division, and Robert M. Meyer, Naval Architect in the Research Section. They have been assigned to the Navy Department to represent the Maritime Commission during Operation Crossroads.

Although none of the ships involved in the experiment belongs to the Maritime Commission, a number are merchant-type vessels built for the Navy by the Commission.

Information which will be helpful in assessing the degree of damage sustained by both hull and machinery, and in studying the structural behavior of all-welded vessels in comparison to partially welded vessels, is anticipated by the Commission's representatives. This information is expected to serve as a guide to the type of future merchant ship construction.

''THE POWER AND THE GLORY''

This great painting by Irving Sinclair stretches across the north wall of the dining room in San Francisco's famous Cliff House. It is shown here as a perfect exemplification of the work of the San Francisco Port of Embarkation during the war.

San Francisco Port of Embarkation

The San Francisco Port of Embarkation has been designated one of the four Army ports to be operated by the peacetime military establishment in the United States. Others are the New York, New Orleans and Seattle Ports of Embarkation. The post-war mission assigned the San Francisco Port of Embarkation has been broadened and enlarged. The movement of Army personnel and supplies between the Continent and the Pacific overseas bases will be continued. To this function has been added the movement of military dependents and War Department civilian employees between the occupation areas and the Continent and the return of surplus material from the former combat areas, together with numerous other functions not previously performed by the port.

The work load of the port has diminished sharply since the termination of hostilities in the Pacific. Present indications reflect that a level of embarkations and cargo movement through San Francisco and Oakland will continue on a scale considerably in excess of any pre-war activity.

The San Francisco Port of Embarkation will operate under the Chief of Transportation in Washington, directly under War Department control. Post-war planning indicates that three major installations will be operated in the Bay Area. These will be Fort Mason on the San Francisco waterfront, the Oakland Army Base in the Oakland Outer Harbor, and Camp Stoneman near Pittsburg in Contra Costa County. Other activity now being conducted by the port will be consolidated into these facilities.

Future Army Fleet

The Transportation Corps fleet to be operated by the San Francisco Port of Embarkation will be made up of more modern vessels and equipment than any operated by the Army in the past. This fleet will consist largely of fast and well-fitted personnel carriers. Almost all of the troop movements and military personnel traffic will be carried in these vessels. It is expected that the great bulk of military cargo will be lifted in commercial bottoms.

It is intended to fit operations of the port closely into the civilian economy of this community, making use of commercial facilities to the greatest extent possible. All except purely military work will be done under commercial contract. The majority of personnel employed by the port will be civilian employees. The harbor fleet of boats and floating equipment is being reduced materially. The port will continue to maintain only sufficient equipment for routine scheduled operations and to permit continued operation in an emergency. Unusual work loads will be handled and major repairs to equipment will be performed under commercial contract.

It is planned that the present facilities at Fort Mason, including the three Army docks at the foot of Laguna Street, and temporarily Pier 45-S, will handle passenger traffic through the port. The Oakland Army Base will be the center for cargo movements using both Army owned berths and those leased from the Port of Oakland Authority under agreement recently reached with the city of Oakland. Operations at Camp Stoneman will include the new Overseas Replacement Depot at which training and equipment of replacements for the overseas bases will be

Well Done, General!

Left: Major General Homer M. Groninger, who retires after sending Victory out through the Golden Gate and welcoming home the victors.

completed. Troops returning from overseas will be processed through the newly organized staging area at the Oakland Army Base. Dependents of military personnel and civilians moving through the port will be accommodated and processed through Fort Mason.

The number of passenger vessels available for operation by the port is still undetermined. There are twelve new transports of the P-2 and C-4 type which have recently been transferred from the Navy and sent to commercial shipyards for reconversion. The first to be completed, the General Aultman, goes into service during the first week of July. The Admiral Sims, the last of these vessels, was commissioned by the Transportation Corps June 22. All of these modern passenger vessels will be manned by civilian maritime personnel.

The San Francisco Port of Embarkation is entering upon a long range program of progressive improvement to all of the Army owned Port facilities.

Appropriations for this purpose totalling more than two million dollars have already been approved for expenditure during the coming fiscal year. It is expected that this program will be expanded as further appropriations become available to provide the San Francisco Port of Embarkation with modern, efficient and adequate facilities for the performance of the peacetime mission assigned.

12,000 Civilians

Present plans call for a working force of approximately twelve thousand civilians in addition to a limited number of military personnel. About half of the civilian group will be maritime personnel. This force represents a general reduction of the personnel employed during the war. These reductions have been made possible through the sharp decline in the work load handled by the port and by the contraction and consolidation of activities throughout the military establishment. This personnel reduction will impose no burden on the civilian economy of the Bay Area and it is expected that the increased commercial operations by the port will provide employment for a considerably larger number of people than those affected by these personnel reductions.

The San Francisco Port of Embarkation is an integral part of the city of San Francisco and the entire Bay Area. It is hoped that its operations will become even more closely integrated with the civilian communities and the State of California. It is the policy of the Chief of Transportation and the Commanding General of the San Francisco Port of Embarkation to lend assistance and to cooperate fully in all civic and commercial enterprise in this area.

Well Done, Colonel!

Lt. Col. James A. Sullivan, who has guided public relations and publicity for the S. F. Port of Embarkation through most of the war and since, and whose silver leaves, just bestowed, please his friends no less than him.

Brig. Gen. Neal H. McKay, who, on June 13, assumed command of the San Francisco Port Embarkation. He is charged with the gigantic post-war task of keeping the occupation armies in the Pacific supplied with men and materials.

Harrison Cargo Gear

Sixty-three years ago at the 1884 meeting of the Institute of Naval Architects in London, Mr. A. Betts Brown read a paper on "An Application of Hydraulic Machinery to the Loading, Discharging and Working of Steamships," and describing his patented hydraulic gear for cargo handling which was then in practical operation aboard many ships. Mr. Brown says:

"Notwithstanding the enormous improvement made in the form of steamships and the construction of the marine engine, giving surprising results, it is a fact that at the present moment the gear for discharging a ship's cargo is nothing more than the old manual winch of improved design and construction with a pair of ordinary steam engines applied to the handles or cranks thereof . . .

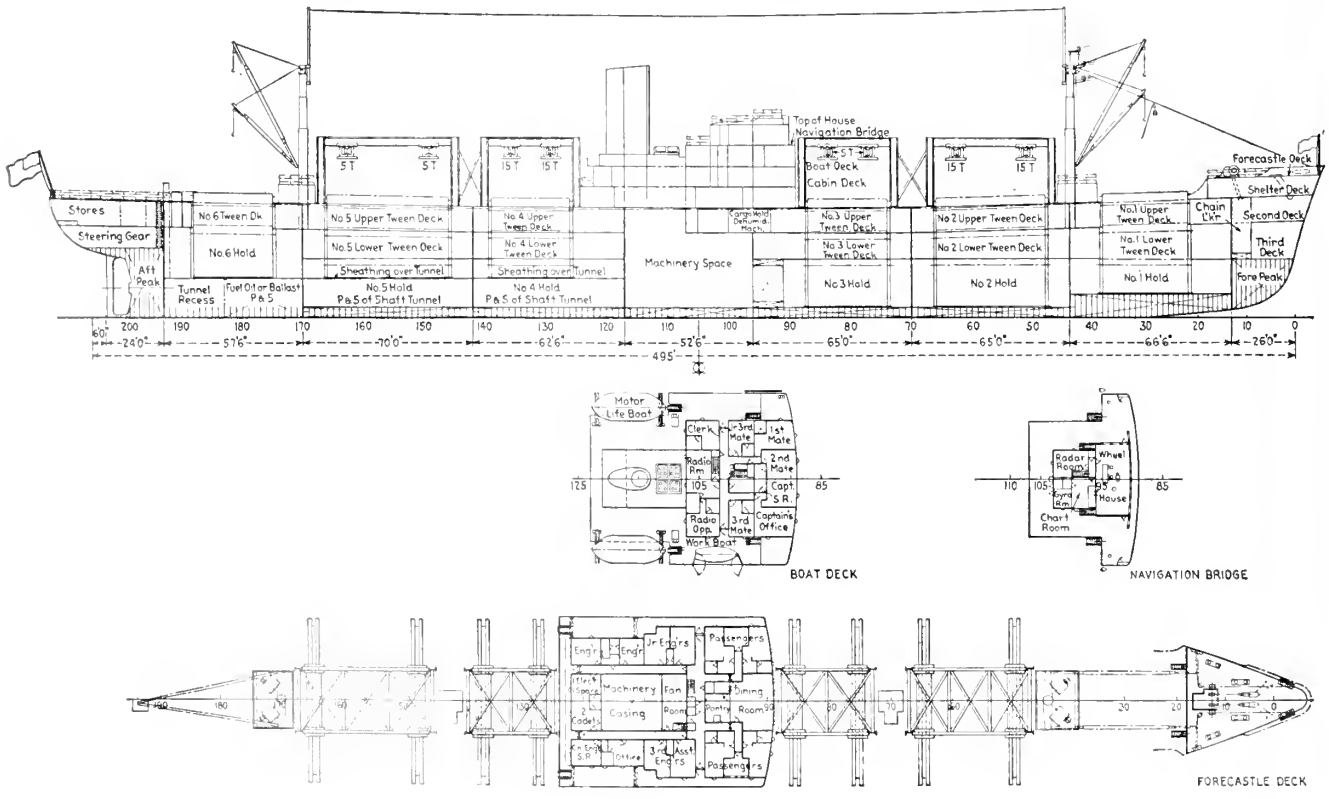
" . . . yet with all the noise of steam engines at work on deck, running at piston speeds of as much as 1000 feet per minute, the cargo is lifted from the hold at a rate of only from one to two feet per second . . . In short, vast sums are spent on fuel to gain half a knot extra speed on a passage, while hours may be wasted in port in consequence of the present system of deck machinery discharging cargo..."

Mr. Brown's hydraulic gear increased the rope speed of seven feet a second. His remarks quoted are as true today as they were at the time he wrote them. We have substituted electric motors for steam engines in our most modern gears but we still use "the old manual winch of improved design" and still hours are wasted in port discharging cargo.

The technical division of the U. S. Maritime Commission determined to do something about this situation and as a result of research they ordered Ingalls' Pascagoula yard to install an experimental Harrison Cargo Gear on the C-3 Sea Hawk.

Arthur C. Rohn, Chief Engineer, U. S. Maritime Commission, presenting a paper at the 1945 meeting of the Society of Naval Architects and Marine Engineers cited these facts and then went on to show that on a C-3 operating over a 3000 mile radius and carrying an average of 60 per cent capacity the annual direct labor cost for handling cargo would be 44 per cent of the total operating cost based on the "standard 64.93 stevedore tons per hour of port time." If the speed of handling cargo could be increased by 25 per cent it would be equivalent in direct wage savings to reducing the fuel rate from 0.6 lbs. shp hour to 0.2 lbs. per shp hour. If there were abundant freights and the ship was sailing full both ways then in order to make equivalent savings in fuel the engineer would have to

Outboard profile and plan of proposed steamer with new type of cargo handling gear.



have boilers that would burn sea water or some free substance.

Rohn's paper makes a number of suggestions:

(a) **Packaging and container stowage:** A greater standardization in sizes and shapes of packaging might enable the use of methods that have achieved phenomenal records in loading and discharging bulk and sacked cargoes.

(b) **Port Facilities and Organization:** Our principal ports should be modernized and streamlined both to expedite movement of cargo and to speed up the routines of customs practice, sorting, checking and delivery or storage.

(c) **Pier Design and Equipment:** Palletizing of all shipments with piers specially equipped to handle pallets. Lift trucks of large capacity, trailers, skids and portable conveyors should be furnished in sufficient quantity to insure prompt movement of cargo on the pier and in the pier shed.

(d) **Hatches of Ships:** Design, number, arrangement and size of hatches are very important factors. Roughly cargo space in a ship increases in direct proportion to the cube, while conventional hatch dimensions increase in proportion to the square of linear dimensions of ship. Long piers with plenty of equipment and plenty of doors in pier shed are a good port investment. Marseilles with equipped piers handles 1500 tons per lineal foot of pier yearly average. New York handles 150 tons. Much time is wasted in handling hatch covers and there are great opportunities for the designer in this item. In large vessels twin hatches are sometimes a great advantage. There should be an integrated study of pier facilities and hatch arrangements.

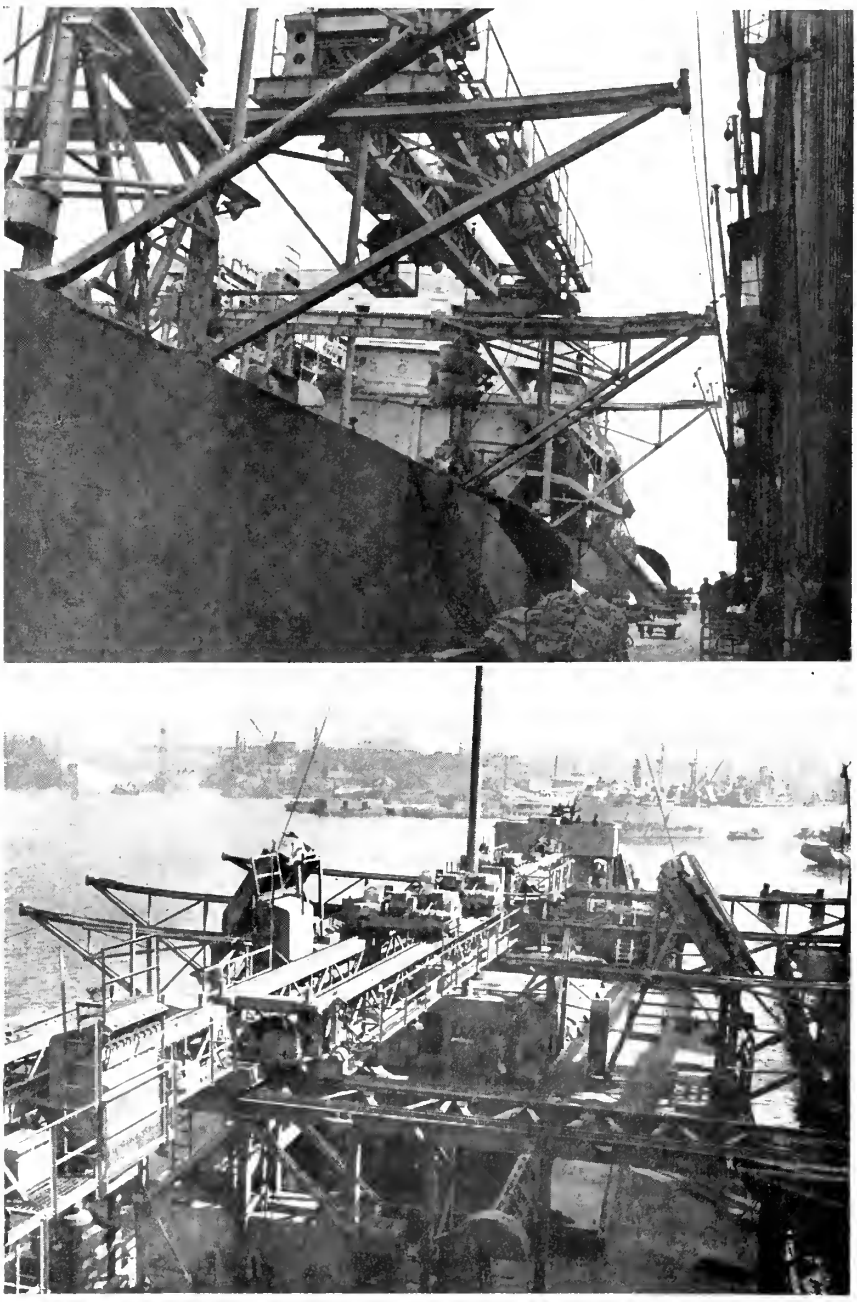
(e) **Holds of ships:** Careful planning of holds and stowage arrangements is very essential to economical handling of cargo. Lighting, ventilation, uniform cubic content, flat floors, minimizing of pillars and stanchions, protection of piping, wiring and ventilating ducts, and access, are a few of the most important items to be considered.

(f) **Cargo Gear of Ships:** The author submits a new approach to cargo handling gear in the crane type as the Harrison gear manufactured by The Harnischfeger Company in Milwaukee. As an experiment the Sea Hawk, a C-3 cargo vessel recently delivered, was equipped partially with conventional cargo gear; but hatches forward were served by an entirely new rig. As our illustrations show overhead gantry cranes travel athwartships over the forward hatches. The traveling cranes can pick up cargo from 20 feet over the ship's side. Outboard tracks are supported by triangular cantilever trusses hinged on the deck edge to stow either inboard or parallel to the ship's side.

Travelers over double-ganged hatches carry two winches of 5 tons capacity and 2 of 20 tons capacity each. Change over from light to heavy lift can be accomplished instantaneously by the shift of a lever, obviating the laborious 4 hours of labor required to rig the jumbo boom of conventional design. Marriage of the two heavy-duty winches through an evener makes it possible to handle single drafts up to 40 tons.

The bridges travel athwartships and the winches travel fore and aft on the bridge. By this double travel,

Harrison cargo gear at Baltimare. S. S. Sea Hawk unloading crude sugar at American Sugar Refineries plant. Gear still in experimental stage.



drafts may be spotted to any desired location within the square of the hatch.

On tests it was the consensus of observer opinion that for lifts up to 3 tons the two rigs were substantially equal in speed.

For heavier lifts, the new rig was progressively faster up to 30-ton lifts handled by marriage of two heavy-duty winches.

Throughout the tests the traveling crane rig worked smoothly and quietly, giving no hint of trouble. After delivery, the maritime gremlins took over and certain mechanical troubles developed. Mechanical difficulties are always to be expected in any new machine, and it would be a waste of time here to relate in detail the items requiring correction. Only major design difficulties and objections require comment in this discussion of the new cargo-handling gear.

Of the points enumerated, hatches, holds and cargo gear are the immediate concern of naval architects and shipbuilders. These items, therefore, have been made the subject of special investigations within the Maritime Commission. Studies along these lines have yielded results sufficiently encouraging to justify further steps in this direction. Actual designs are prepared, incorporating what are considered to be the most promising of these ideas in one ship. The general appearance of this vessel is shown in the outboard profile herewith.

It is contemplated that this post-war cargo ship will have six holds. Of these, Nos. 2, 3, 4 and 5 will be of approximately equal capacity, while Nos. 1 and 6 will be somewhat smaller. The two last-named holds are to be worked by booms and winches, while all others will be served by overhead cargo gear. This equipment is to be an improvement on the overhead gear used in the Sea Hawk.

The folding jibs for extending crane rails overside have been eliminated. In place of the cranes, two thwartships overhead monorail tracks will be fitted at each hatch. These are hung on wheels from the overhead supporting members. They will be capable of movement in a fore and aft direction over the hatch, while at the same time they may be extended overside. On lower flanges of these monorails travel the hoists. At each hatch therefore will be installed two overhead monorails and two hoists.

Each hold fitted with this overhead gear will have two hatches. Owing to the great flexibility of hoist movement, cargo falls are able to plumb nearly all the hold areas.

This is a particularly attractive arrangement from the stowage angle, since wings and end spaces of holds so rigged are largely eliminated. With such bottlenecks done away with, the flow of goods into and out of our proposed ship would be greatly accelerated. In contemplating such a ship in service, however, we can envisage greatly enhanced operating conditions if some form of standardized packaging or container stowage of her lading might be employed. Containers could be stowed in the squares of hatches, while standardized packages might be carried on palettes in the 'tween decks—with a possibility of working such items through side ports. General cargo could be worked in lower holds, directly to or from the cargo falls, with a minimum of manhandling or skidding.

Electric Monorail System On Floating Machine Shops

By Neil B. Musser

Naval Architect, Spencer and Morris Inc., Los Angeles

In the August 1945 issue appeared an article "Concrete Floating Machine Shops", in which Mr. K. M. Walker described the last two concrete vessels built for the U. S. Army by Concrete Ship Constructors in National City. As this was a general description, only brief mention was made of the electric monorail and crane system described below, which was designed, manufactured and installed on board these barges by Spencer and Morris Inc. of Los Angeles. The author believes that this modern electric equipment, which has proved highly efficient in service on these and other vessels, may be used successfully in other marine applications.

The 265 ft. ship-shaped concrete hulls were divided into center and wing cargo holds by longitudinal and transverse bulkheads, forming nine holds of two levels each and a generator room, all served by crane and monorail systems. Two top riding cranes were provided, travelling for a distance of 180 ft. in the shop space located in the 223 ft. main deckhouse. This house, and the 106 ft. upper deckhouse which was used for accommodations, were of welded steel construction, which greatly facilitated attachment of the crane rails and monorails. The fact that the hulls were of concrete had nothing whatever to do with the cargo handling system described.

Access to the interior of the deckhouse was accomplished thru two sliding cargo doors, located aft, one on each side. A hinged jib boom located on the upper deck over each door, and lowered to interlock with the transfer rail inside the house when door was open, permitted the hoist to run out to a position 11 ft. beyond the ship's side on either side of the vessel. The doors were watertight, with 5′x10′-2″ high clear opening, and were arranged to pin open when rolled aft clear of doorway.

Each cargo hatch and the generator hatch is served by the cranes or by monorail spur, and additional spurs are provided to serve the tools and other heavy shop equipment. Heavy objects, requiring the use of two 2000 lb. hoists on two cranes, may be lowered thru the upper deck hatch and handled by the two cranes working together. Similarly, two hoists may work together over the generator hatch, where a spur is located beside the transfer section. The primary function of the cargo handling equipment on these barges was the transfer of engines from military vehicles and weapons from boats alongside to the various shops in the barge, and to service the shop equipment, including

stowing and breaking out spare parts, stores and supplies from the various cargo holds. Overhaul of machinery in the diesel generator room was also an important function.

Although all monorails and both cranes are designed for 2000 net capacity, the hand pushed electric hoists provided over the cargo hitches which are used for stores and spare parts are of 1000 lb capacity. These hoists may be pushed to the end of their spurs and the larger hoists of 2000 lb. capacity run from the cranes to handle heavier lifts when required. It will be noted that No. 2 Port and both center holds are served only by the crane hoists. The monorail which serves the tire vulcanizer is the only one which does not interlock with the cranes. No hoist can be kept on the spur which serves No. 2 Port and the Motor Parts Cleaner, as it would interfere with operation of the heavy crane hoist on this spur. All other spurs have dead ends where the small hoists may be lashed when not in use.

2000 lb capacity hand pushed chain falls are provided over the following equipment. In all cases except the tire vulcanizer, electric hoists may also be used for the same service:

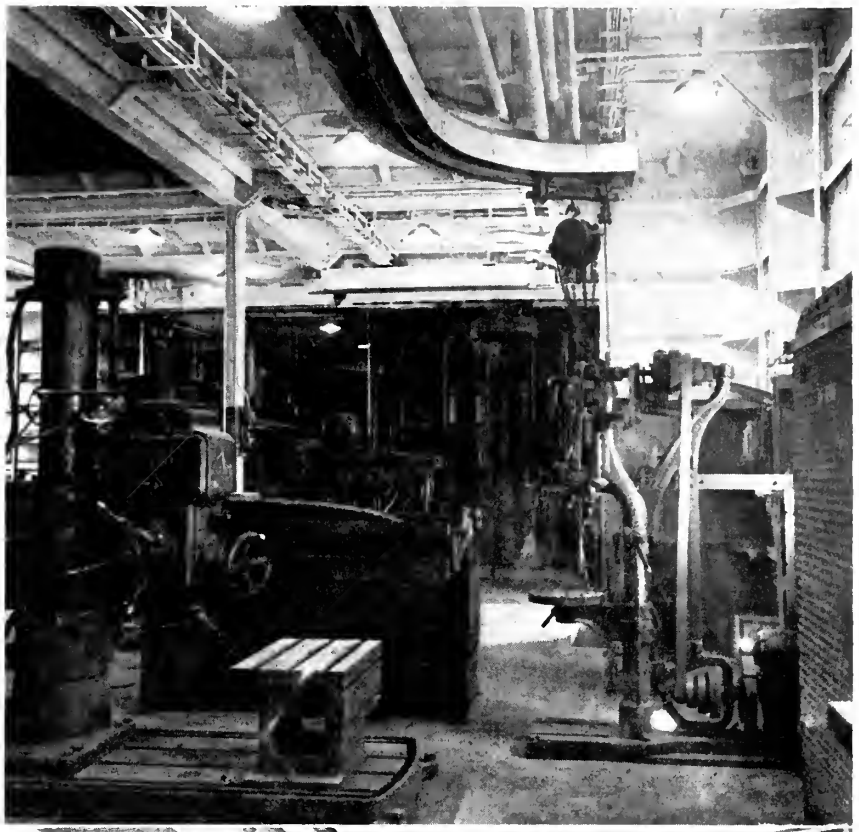
Tire Vulcanizer.
Blacksmith Shop Furnace.
Boring Mill and Dynamometer, Machine Shop Port.
Crankshaft Grinder, Do.
3 Lathes, Machine Shop Stbd.
Bake Oven, Paint Shop.

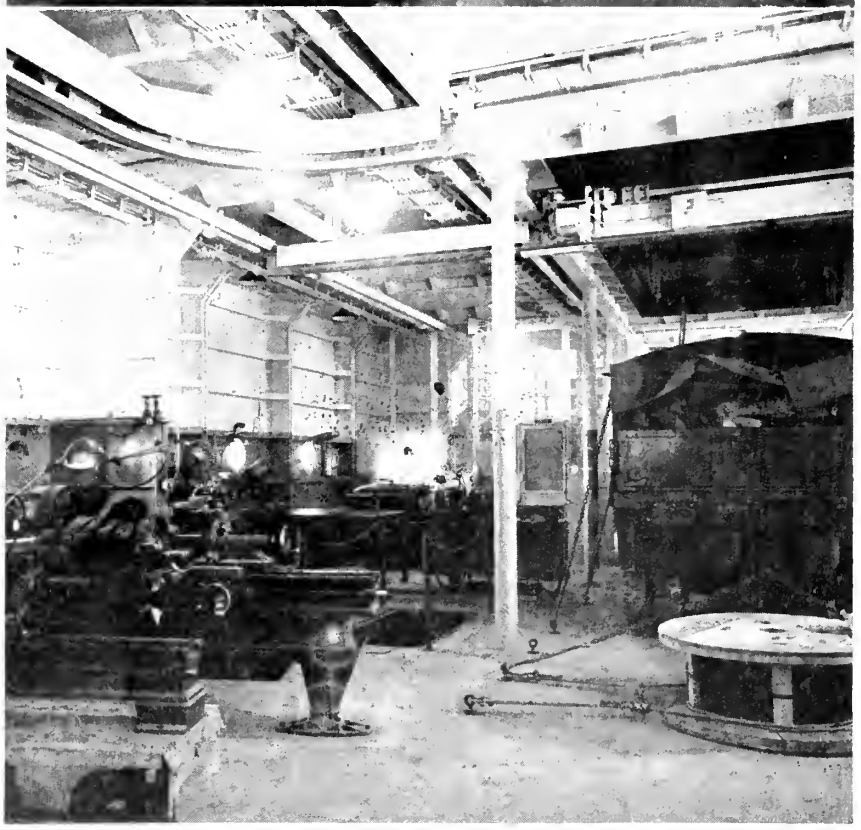
Inside the Generator Room (No. 4 Hold Stbd.) each diesel engine is provided with a monorail plumbing the cylinders, with hand pushed chain fall.

It will be noted that no switches or cross-overs are required.

The straight and curved sections of tram beam forming the monorail spurs and transfer sections are rigidly supported from the deep web beams. Where necessary, short lengths of wide flange beam are used to span the web beams, the tramrails being bolted to the wide flange beams. Slight irregularities in the vessel's structure due to the well known characteristics of welded construction are easily compensated for by shimming, which results in perfect alignment of crane rails and tram-beams.

Two 16" longitudinal girders spaced 11 ft. on centers extend the full length of the main deckhouse, supporting the upper deck loads and





Upper: VIEW IN MAIN DECKHOUSE LOOKING AFT, PORT SIDE. Note 1-ton chain fall lashed on curved spur over small drill press. The short straight spur for No. 4 Port Hold is seen just forward of hoist. Note hand chain pulls for crane interlocks, on crane.

Lower: VIEW LOOKING AFT TO STARBOARD FROM CENTER AISLE. Note welded steel deckhouse structure, and flush hatch in concrete deck over No. 3 Starboard Hold, with watertight cover removed. Curved spur shown with interlock pawl down serves lathes at left. Straight spur serving No. 3S is interlocked with crane, shown under cargo hatch.

providing attachment for the rails for the top riding cranes. 6" X pipe stanchions located generally on alternate deep frames support the girders.

The cranes have squaring cross shaft drive, with two drive wheels and two support wheels. Each crane is provided with an interlock at each end, which acts as a stop to prevent the hoist from running off the end of the monorail crane beam except when this beam is in perfect alignment and locked to a spur or transfer section. The hand chain pulls for operating the interlocks, and the control push button box for each crane are suspended within easy reach of the operator who walks along the main deck between ship's side and hatch or shop tool, following the load.

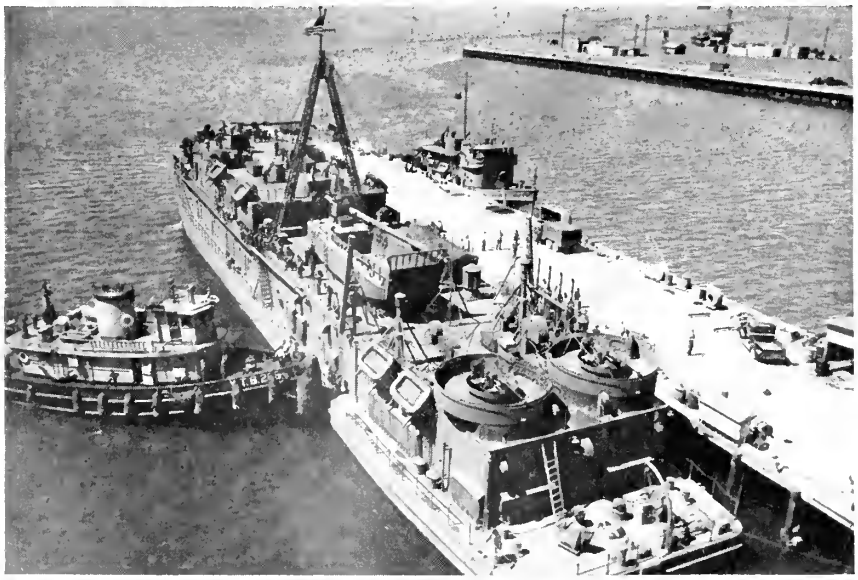
A plywood protection cover for electric conductor bars is located on each side of the trambeam. A similar arrangement of safety sheath and electric conductors must be installed along each monorail transfer section and spur, to provide power to the hoists and their underdrives. In the weather, the safety sheaths must be of steel, as shown for the hinged jib booms.

Each of the 2000 lb. crane hoists is provided with motorized Spencer and Morris Inc. Patented Proportional Pressure Underdrive, which provides traction proportional to the load. A ½ H. P. gearmotor with roller chain drive propels the carrier at 80 F. P. M. The crane travels at 100 F. P. M., requiring a ¾ H. P. gearmotor. The speed of the lift is about 20 F. P. M. which is sufficient for the short lift of 25 ft. The hoist motor is 3 H. P. with high torque characteristics. The hook height above deck is 9'-0" which can be obtained using standard equipment. Higher drafts would require more expensive "low headroom" hoists, and carriers. All motors are 220 v. 3 ph. 60 cycle drip proof marine type, and are equipped with magnetic brakes to stop the motion should the operator release the push button. This is termed "dead man" control, since the button must be kept pushed to continue the motion. This safety feature is important where a vessel may be handling cargo in an open roadstead from another vessel alongside.

Hand set locks are provided to lock the carriers to the rails when not in use. The two cranes may be run to opposite ends of the track and secured for sea by attachment to the bulkheads.

Government test requirements were easily met by the equipment described above. All hoists were test operated by raising and lowering a load 125% of specified working load. The hoists and cranes were run full speed against the end stops, crane bumpers, interlock pawls, etc. to test the safety features under load conditions. One quite spectacular test consisted in picking up the test load on the dock, carrying it over the jib boom and transfer rail to the crane, running it the length of crane travel to the forward hold, and out on the spur to plumb the hatch, where the load was finally lowered to the bottom of the lower hold space. All of these operations and transportation required less than 2 minutes. During this time the operator was working under the easiest and safest conditions imaginable, exerting no more energy than is required to walk along a level deck, push buttons and glance about. What a contrast to the usual stevedore work on a cargo vessel!

Since delivery in March and July, 1945, the cargo gear on these barges has been in constant use, and no difficulties or maintenance expense have been reported.



COMPLETED MAINTENANCE BARGE AT BUILDER'S DOCK.
Note hinged jib booms stowed just aft of boats and 30-ton boom. Sliding door port side visible under jib boom.

Piping the C1-B's

By C. F. Laird

Manager Marine Sales, Crane Co.

All during the depression years of the early 30's there was a clamor that something be done to regain for us some of our lost prestige on the high seas. Little was done, however, until 1936 when the Merchant Marine Act came into existence providing for the building of 50 vessels per year for a period of ten years. The vessels were to be fundamentally designed by the U. S. Maritime Commission and built under their subsidy. These vessels were known as the "C" types and were to form the backbone of our cargo and passenger carrying fleet. Possibly some of the people responsible for the program foresaw our entry into another World War—if so, they performed a real service to their country by providing us with a fine basis for the vast merchant fleet now in our possession.

Prior to the time of our entry into the War almost all the "bugs" had been ironed out of the "C" designs and they had the benefit of fairly

C. F. Laird

long-term sea trials. Several new building yards had come into being and "cut their eye-teeth" on some of the early "C" construction. This latter fact stood us in valuable stead during the War when many of the old-line yards had to be devoted almost entirely to Naval construction. The 50 ship per year limit, of course, was forgotten and in 1942 over 100 "C" types were delivered, 1943 saw the number grow to almost 200, in 1944 there were 300 of these fine vessels finished, while the year 1945 saw us add close to 400 of these ships to our fleet. Add these to the already well publicized "miracle" of the "Liberties" and the "Victories" and the effect on our position as a commercial sea-power becomes at once apparent. We are again the leader, in quantity by far and quality as well—thanks to the fundamental "C" type.

The vessel in the illustration accompanying this article is one of the most interesting. It is known as the C1-B type and its profile is a familiar one, by now, in all parts of the world. Many an invasion and campaign were successfully supplied due to the ability of the C1-B to get a lot of food, munitions, and equipment to any distant front and to get it there **fast!** This particular vessel is 417 feet long, has a deadweight tonnage rating of about 9,000 tons and a cruising range of approximately 20,000 miles. The propulsion is provided by either geared-turbine or diesel power which delivers 4,000 horse power to her shafts. Normally the C1-B carries a

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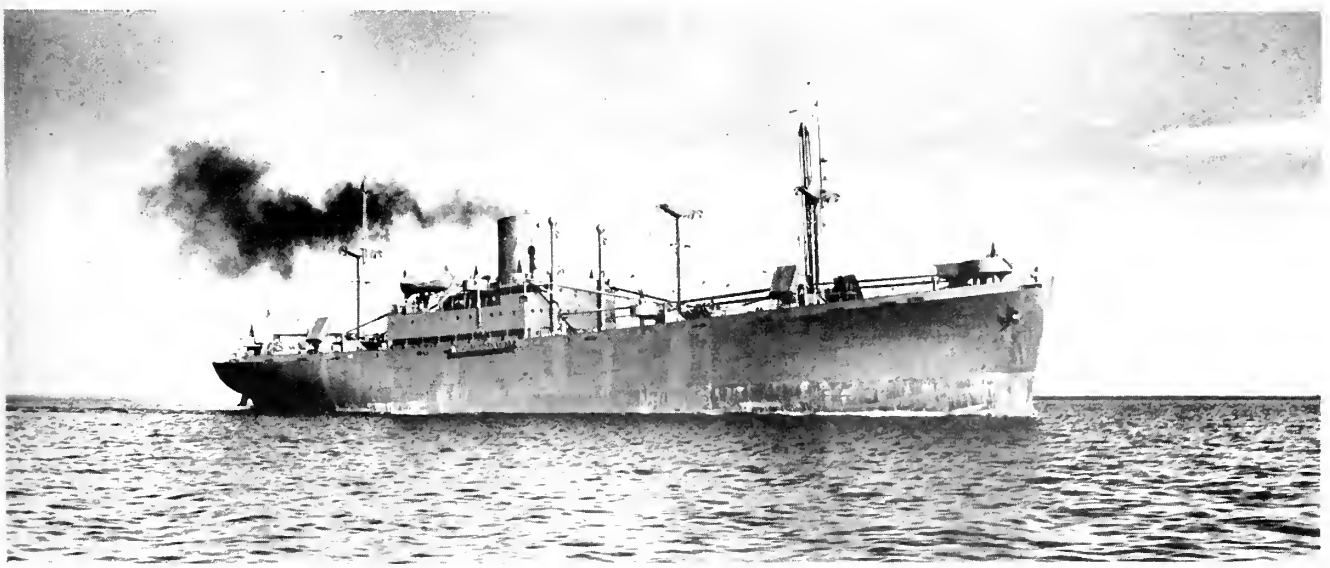
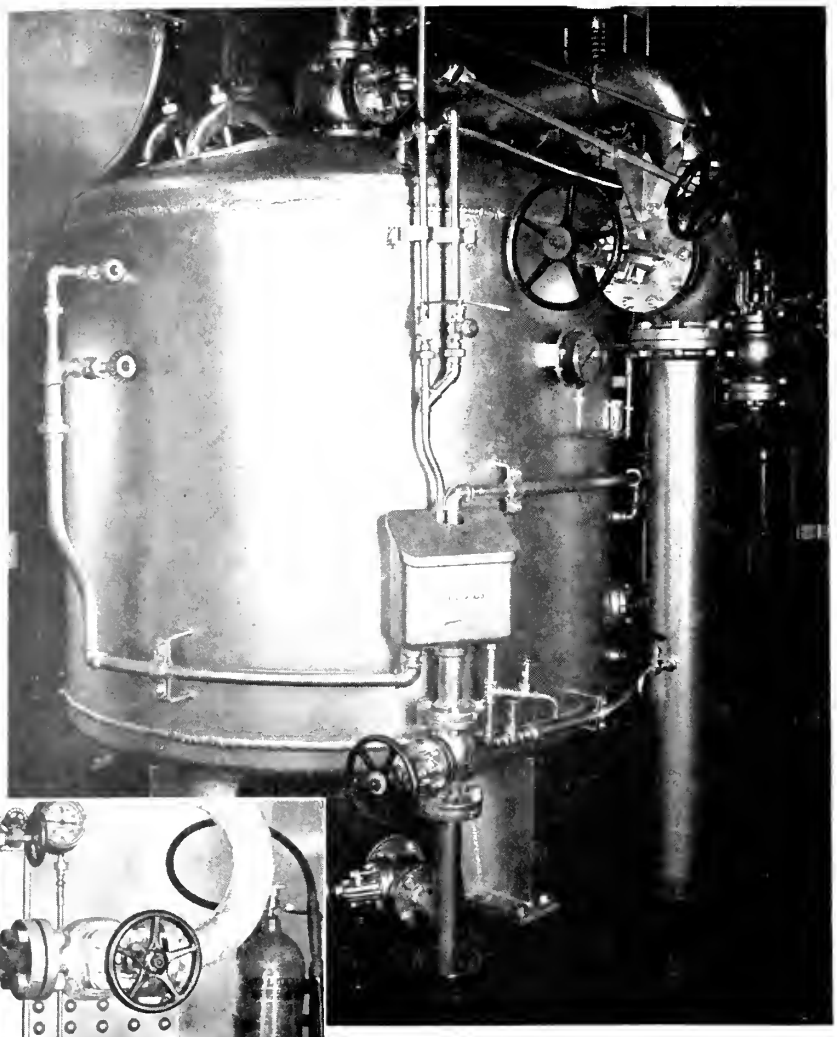
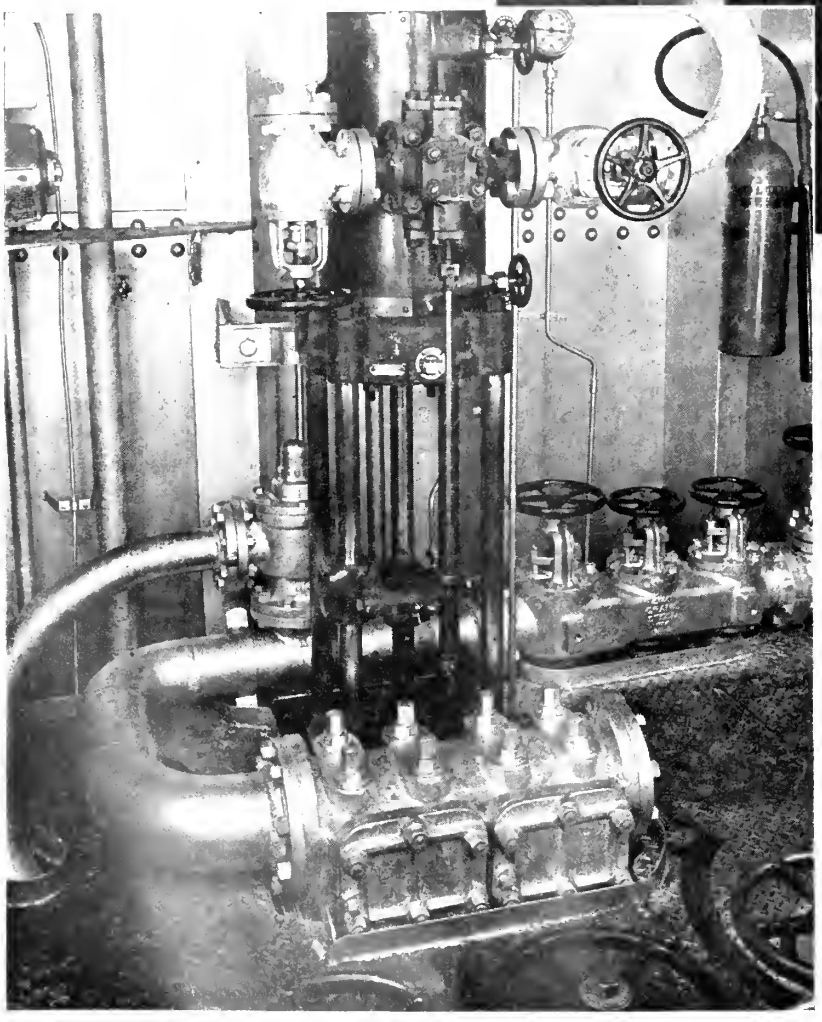


crew of 18 deckhands, 16 engineers and 9 officers and stewards. During the war, this was augmented by a 24-man gun crew to help deliver the goods safely.

These vessels were furnished with the latest types of modern mechanical equipment and thus should be able to compete for many years in what promises to be a severely competitive shipping market. Latest safety devices were provided and the wartime direction finders, compasses, Radar and Loran apparatus make these vessels among the safest afloat.

Almost all the major shipyards of the country have built "C" type vessels during the accelerated program. Crane Co. is proud of its part in furnishing a great volume of valves, fittings, piping and plumbing for this program. Thus, the "C" vessels join the long list of Crane-equipped craft dating back almost ninety years.

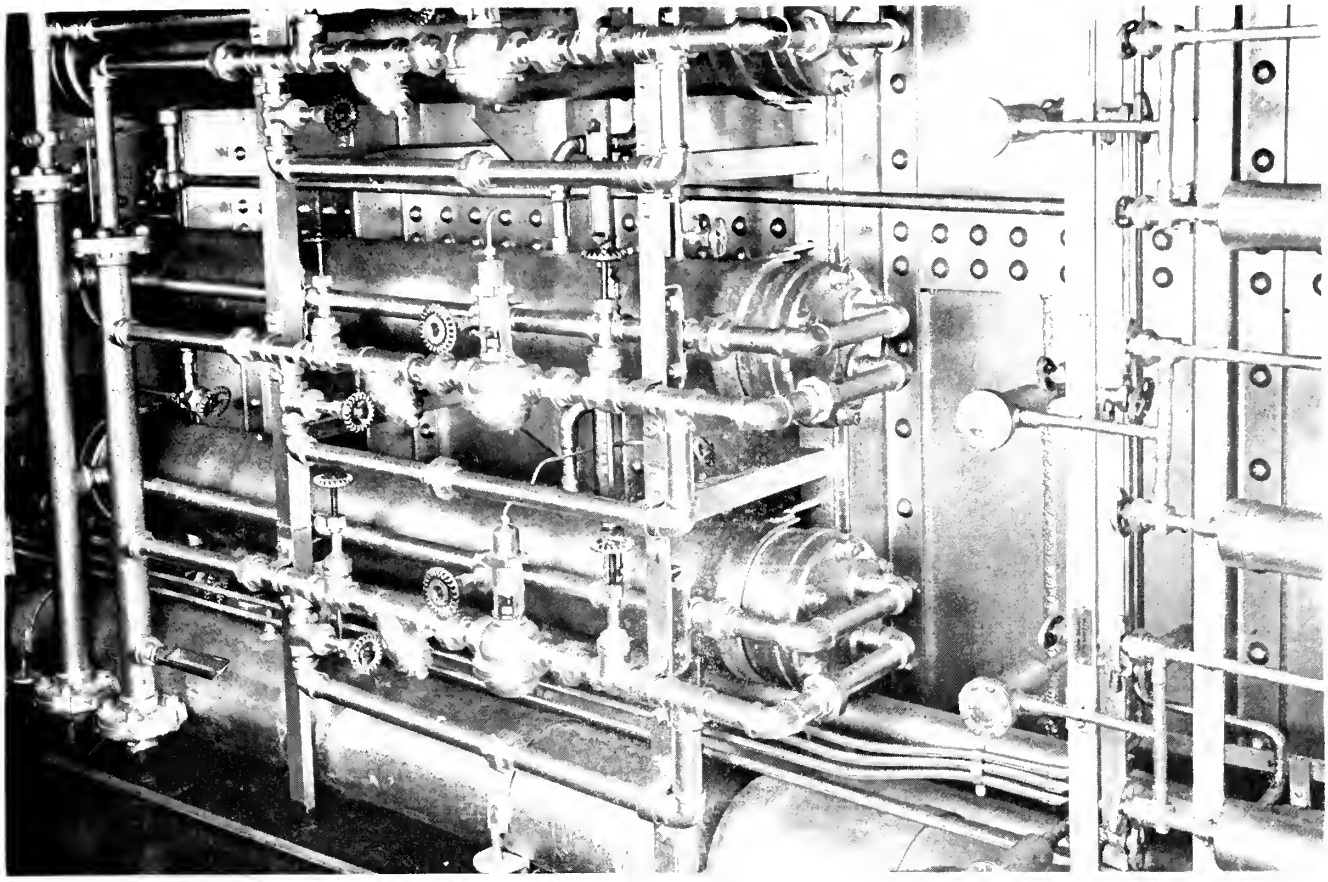




Top: Crane valves and fittings on oil and water separator located in engine room operating level.

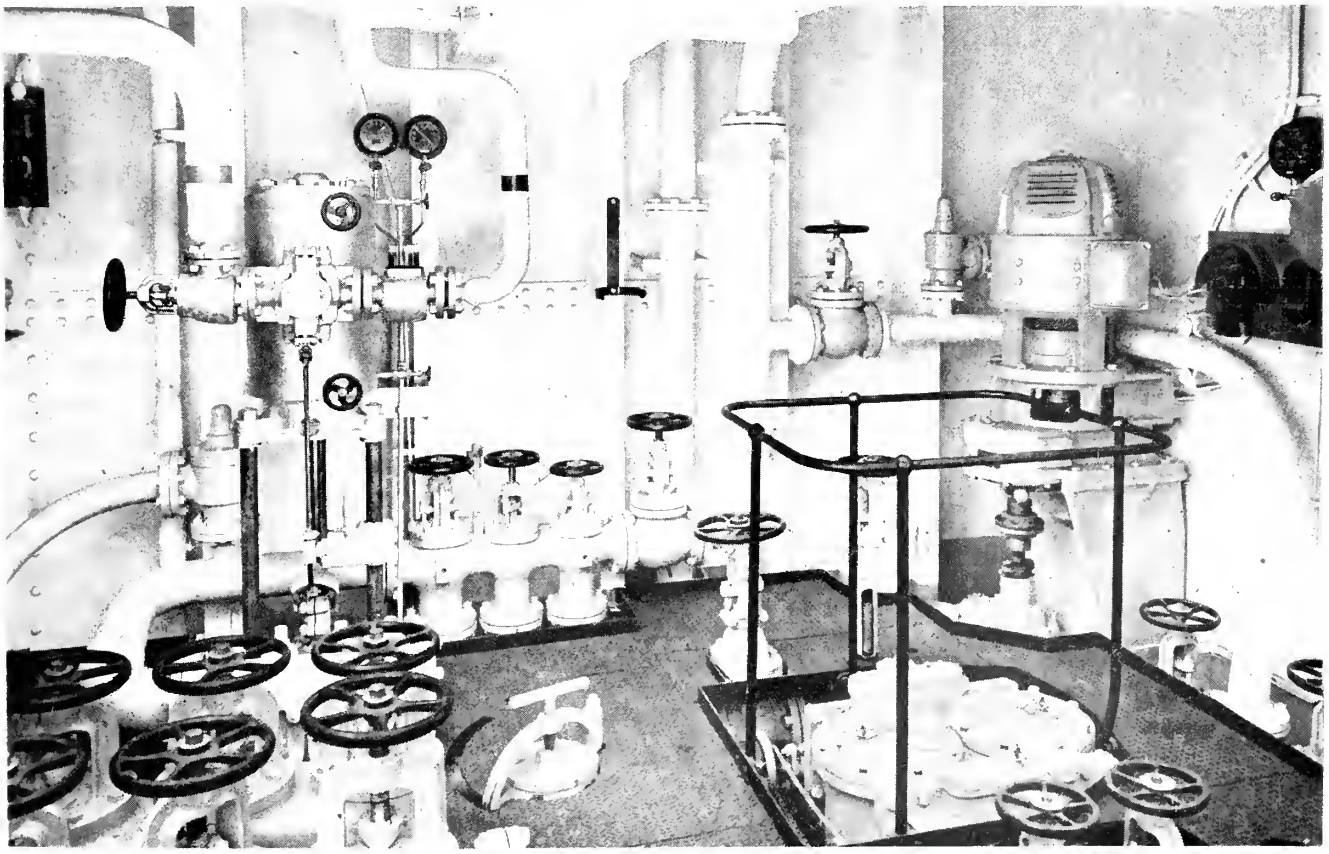
●

Left: Bilge transfer system in lower engine room.



Crane piping to condensers in the refrigerating compressor room of a C1-B.

Bilge and oil transfer piping with welded manifolds by Crane Co.



The Future of Diesel Engines in Ships and Boats

By Robert E. Friend

Address of Robert E. Friend, President, Nordberg Manufacturing Company, before the meeting of the 18th National Oil and Gas Power Conference of the American Society of Mechanical Engineers at Milwaukee, June 12, 1946.

It is appropriate that at this meeting we give serious consideration to the future of the diesel engine industry in America.

I have been asked to present my thoughts with respect to the industry and its future as related to marine installations.

The record of the industry during the war years in the production of diesel engines for all classes and types of marine service is one which we all share and may well be proud of.

The ability of the industry to increase production in four years to a level which, in the spring of 1945, reached an annual volume in horsepower of practically twice the amount produced by the entire industry in all of the years of its history prior to the war, constituted an accomplishment in precision machinery manufacture which might well have been considered impossible.

The great majority of this power went into marine service and, as we know, contributed importantly to the winning of the war.

It is estimated that our Navy alone operated thirty million horsepower of diesel engines during the latter part of the war. These engines were installed in every conceivable type of craft, ranging from small landing boats up to submarines, ammunition carriers, troop transports, and supply ships.

The engines used varied from high-speed units of about 60 hp to heavy duty units of 6000 shp in a single engine. All types of drives were incorporated, including direct drive, reduction gear, twin multi-engine, and electric drive.

The Army Transportation Division directed the building of a wide variety of craft, most of which were diesel powered and consisted of tug boats and supply ships of varied sizes and types.

Robert E. Friend, President, Diesel Engine Manufacturers' Association, and President, Nordberg Mfg. Co., Milwaukee, Wiscansin.

The Maritime Commission, starting in 1939, projected the plans and construction of ships using large diesel engines. During the period from 1939 to 1945 almost one million horsepower of large diesel engines were installed in merchant type ships.

As a result of this greatly accelerated use of diesel marine power in all of its varied forms, designs were greatly improved and in general these engines rendered efficient, dependable service under the most severe operating conditions. The industry as a whole benefited by these operations —design wise and production wise— in a period of six years to a degree which might not have been otherwise accomplished in several decades.

With this record behind us, we must now as an industry address ourselves to the task of intelligently consolidating these great and important gains.

The future of small and medium sized diesel engines of approximately 2000 horsepower or less for marine service was well established before the war and will continue to remain so.

Our fishing industry has for many years depended on diesel power, with the exception of the smaller craft. The Government, recognizing the importance of increasing the supply of fish, started to divert diesel engines under high priorities to the fishing industry before the close of the war. During the past three years hundreds of new fishing vessels have been built and diesel powered. These vessels are using engines which range in size from a single direct propulsion unit of 60 hp to propulsion units of 1500 hp installed in tuna vessels and draggers, which also carry as much as 400 hp in auxiliary generator equipment. Some of these vessels today represent an investment of as much as $500,000.

Steam powered tug boats, river tow boats, ferry boats, and shore type cargo and passenger ships were being converted to or replaced by diesel equipment before the war. The economies effected through the use of diesel power as compared with steam are well established for these classes of service. The trend toward diesel power in these fields of service will be accelerated during the next few years.

What then is the future of large diesel engines? There is an ever increasing demand for such engines by municipalities, public utilities and industry. The same should be true with respect to their use in merchant vessels as a result of the enviable records established by large American diesels in such ships during and since the war.

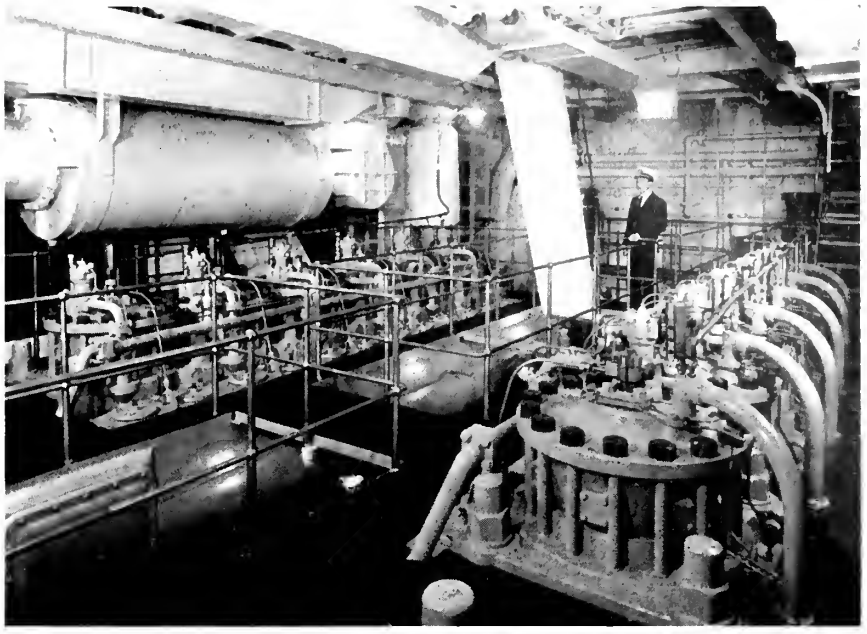
The truth is that the American

diesel industry in particular, as well as its representative publications, have not done a thorough job of educating ship owners, operators and naval architects.

For many years we have listened to the alibi that operating personnel skilled in the operation of large American diesels was not available. That was true to a great extent before the war, chiefly because American manufacturers did not make the effort to assist in training such personnel.

This is not true today. The Navy, the Maritime Commission, the War Shipping Administration, diesel engine manufacturers, and our foremost colleges have all contributed during the war to intelligent, well-directed programs which resulted in the training of a large number of engineer officers in the operation and maintenance of large and small American diesels.

Today that segment of America's diesel engine industry which is prepared to manufacture large engines for marine propulsion offers proven designs, a wide selection of power and drives, the most modern production facilities obtainable, a record of satisfactory performance of more than a million horsepower of such

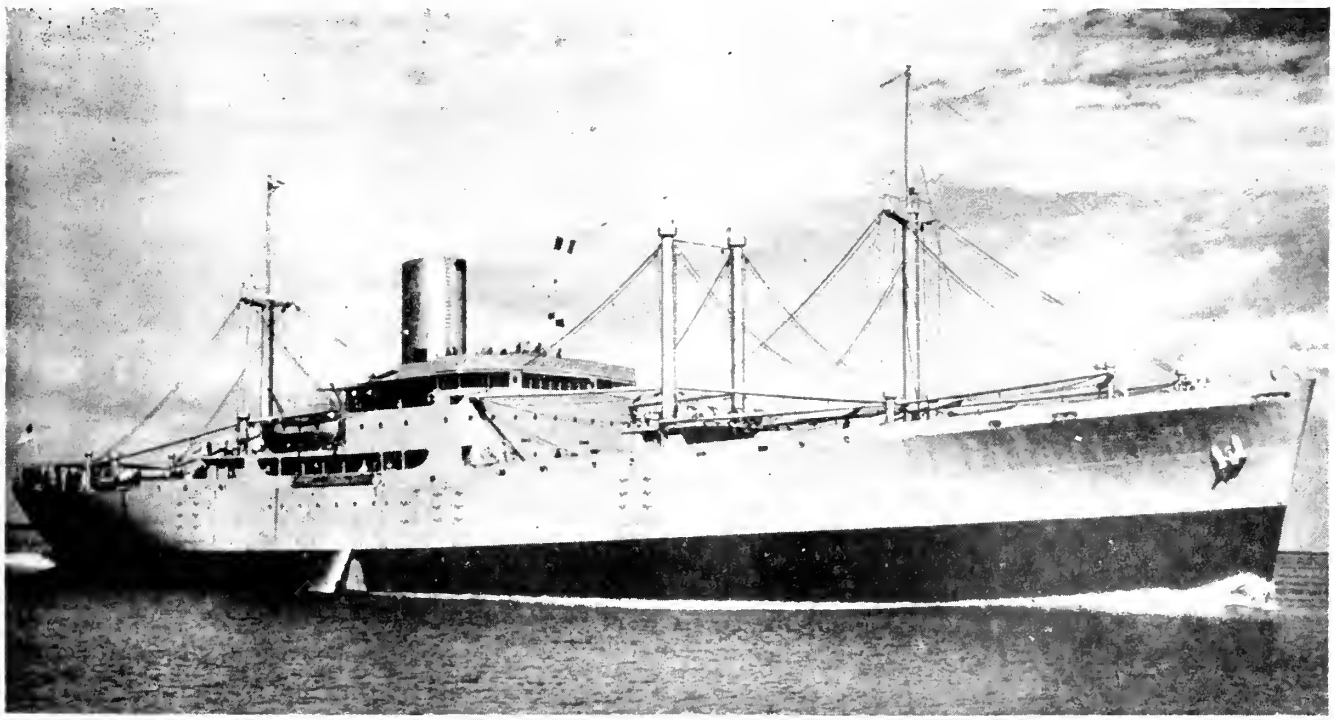


C1-A upper engine room, looking forword, showing cylinder heads.

engines under the most severe operating conditions which might be anticipated, and, in addition, we do have available trained operating personnel.

Our task then is one of projecting and extending the applications of such engines to our present and future merchant marine.

Let us consider for a moment the history of large marine diesel engines abroad. One of the first, if not the first installation of diesel power in cargo vessels, was the Selandia, which was commissioned in 1912. In 1924 the motorship Aorangi was completed with 13,000 hp of diesel engines. The well-known Gripsholm, which pre-war saw extensive passenger service and subsequently has been operated as a hospital ship, is fitted with 15,000 hp of diesel engines. The Dutch passenger liner Oranje was



fitted with 46,500 hp and rates as one of the highest powered diesel passenger vessels in the world.

Recent information from Europe indicates that possibly the most ambitious marine diesel project ever inaugurated, but only partially completed due to the war, was the Fiat program for the installation of 80,000 hp maximum output for each of the liners Roma and Augustus. Each engine was to develop 20,000 hp maximum or 13,000 hp normal at 160 rpm and they were to be installed for direct drive to four propellers. These examples are merely highlights in the use and acceptance of large diesel engines by European countries.

Our foreign competitors are today actively engaged in rebuilding their merchant marine, and diesel propulsion predominates. According to the January issue of "British Motorship," 180 large motorships are presently under construction in British shipyards. In addition, 229 motorships are being constructed in other foreign yards, using as much as 25,000 hp per vessel.

This record should serve to convince the industry of the importance of a sound educational program directed to reach our ship owners and operators with the objective of establishing greater and permanent acceptance of the large American diesel for marine propulsion. Such an educational program should be extended for the entire industry into foreign fields and supported ultimately by service in the principal ports of call throughout the world.

This is our opportunity to consolidate our gains at home and advance the American diesel engine industry to world wide recognition and acceptance. It is a challenge to our alertness and our ability. It is my sincere hope that we accept the challenge and prove our ability to establish the American diesel on the high seas for all types of ships with the same thoroughness and success with which we discharged our responsibilities during the war.

Diesel Drive—
Third Paper in a Symposium on Marine Propulsion

By Charles G. Cox

After a sketchy resume of the development of the diesel engine as a marine prime mover this paper takes up the U. S. Maritime Commission program of large diesel drive cargo vessels as follows:

Today only two builders in our country are active in building large slow speed direct connected engines. They are both of the 2 cycle type, one building single acting and the other the opposed piston type. Single units of these types are available in sizes from 2500 to 8500 hp at speeds from 120 to 160 rpm. The application of direct drive engines is a straightforward problem, and the selection of the type of engine requires careful consideration of the weight and space occupied and should also take into consideration operational problems which are discussed later.

With the advent of the Maritime Commission program which included several types of large diesel drive cargo vessels, a revival of the multiple engine gear drive was undertaken. The adoption of this type of drive was made desirable from an economic standpoint by utilization of standard cylinder size, faster turning engines

Charles G. Cox

whose size, weight and first cost were considerably lower than engines of similar power of the direct connected type.

These propulsion units consisted of multi-cylinder engines connected through electric or hydraulic couplings to the pinion of a conventional reduction gear. Total engine power is transmitted to the shaft at a suitable speed for best propulsive efficiency. By selection of cylinder displacement and rotative speed, most any combinations of speed and power could be obtained and at the same time adhere to engines of a developed design whose performance characteristics on both light and heavy fuel were a known factor.

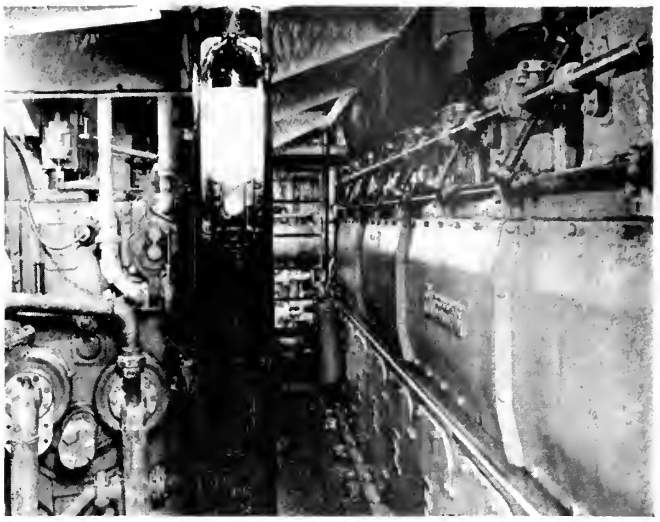
The efficiency of such a drive is affected by a loss in the gear of about 1½ per cent and about an equal amount in the coupling, giving an overall efficiency for the drive of about 96 per cent—neglecting nominal loss for charging of the hydraulic couplings or energizing the electric couplings. Engines of the character used in this type of drive are of sufficient cylinder size and rotative speed to operate at efficiencies almost equal to the larger slower speed types and can burn cheap oil on an equal basis. Maneuvering is ideal in that the whole reversing problem may be handled by a switch controlling the couplings.

Because of labor cost and operational limitations of American ships it is believed the multiple engine gear drive propulsion plant is a most desirable type of diesel drive. Space and weight are reduced to a minimum, fuel economy in terms either

of lbs/shp or bbls/mile are comparable with direct drive machinery and maintenance from the important standpoint of man hours to perform a given task has been reduced many times that required for similar work in other types of drive.

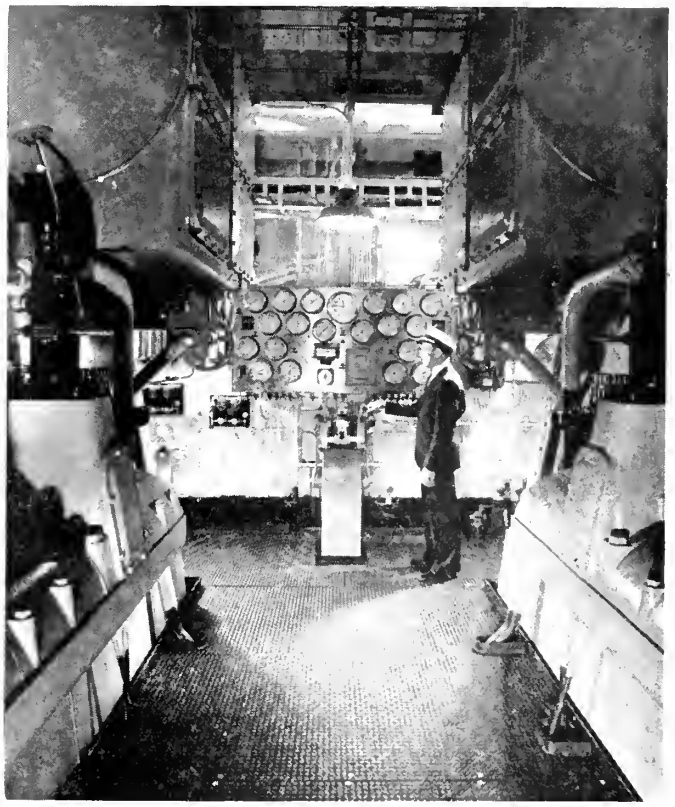
With four or five years experience from which we can gain some concrete operating figures, the performance of American motorships shows some outstanding operational results. By inspection of Engineers' log records made during 1944 and 1945 the interesting tabulation shown in Table I has been prepared on 45 out of 46 C-1A and B motorships. These ships are essentially identical vessels, 412 feet long, all powered by twin six-cylinder, two-cycle, trunk piston, Nordberg marine engines rated at 2075 hp each at 220 rpm. Each engine is connected to the pinions of a Farrel-Birmingham single reduction gear through a Westinghouse electric coupling and the pair of engines deliver 4000 shp at 90 rpm providing a service speed of 13.5 to 14.0 knots.

Results are not only quite consistent without regard to age or operating hours, but are also similar in spite of widely differing types of service and operators. The figures indicate that although some of the ships have been in operation over four years, the engine operating hours vary from 1938 to 14,600 and the fuel consumption averages 3.06 mile/bbl for all vessels. It should be remembered that these figures are based on a large group of ships operating in and out of convoys, in all parts of the world and with crews who in many cases had little or no previous diesel experience.

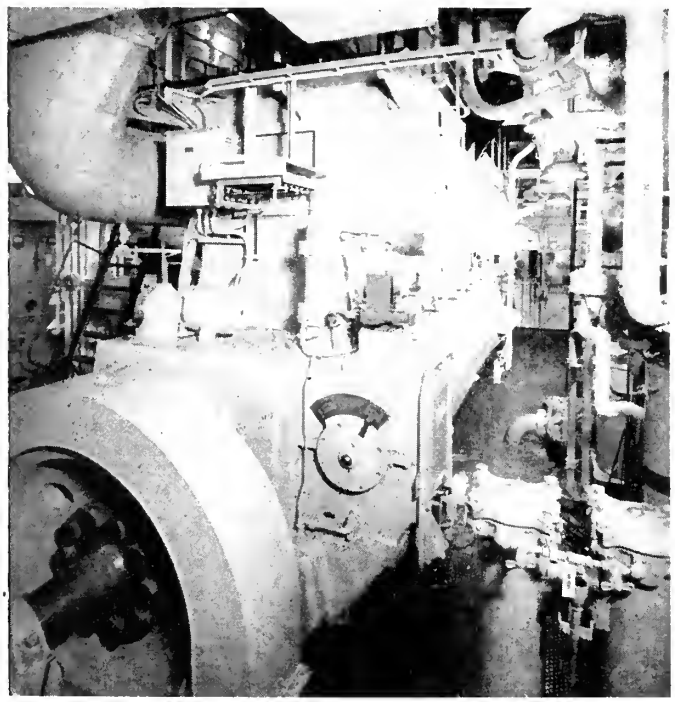


Diesel engine on right and one 275-hp Diesel auxiliary.

Some recent figures on the performance of our various classes of ships developed just prior or during the war. Several steam turbine propelled C-1 vessels showed an average fuel consumption of .61 bbls/mile, or 1.64 miles/bbl as compared with a similar group of C-1 motorships whose consumption averaged .32 bbls/mile, or 3.18 miles/bbl. It is of further interest to note that the fuel consumption of the steamers varied from 1.26 to 2.07 miles per barrel while the motorships varied only between 2.70 and 3.56 miles per barrel. This



Showing central control stand and gage board.



Starboard side of main engine, looking forward.

represents a variation of 67 per cent and 32 per cent respectively, and is a clear indication of the more consistent performance of the motorship regardless of the intelligence and efficiency of the engine room crew.

Such records not only confirm the claims of continuous efficient service performance of American diesel engines, but commend definite consideration of diesel propulsion in our postwar competitive fleet of merchant ships.

While operating fuel economy is one of the major yardsticks of propelling plant selection, maintenance cost from the standpoint of hours per year, as well as availability, is rapidly becoming the most important single factor in the selection of a ship's power plant. It is in this field that diesel engines, and particularly multiple engine gear drive units have shown an outstanding improvement. Engine designs have advanced to the point where breakdowns at sea are an extreme rarity; and special qualities of fuel and lubricating oil are no longer a necessity.

TABLE I

OPERATING DATA—C-1A MOTORSHIPS

Name	Miles Traveled	Operating Hours	Fuel/Cons. Miles/Bbl.
M. V. FOMAHALT	102,000	8,150	.....
M. V. MORMACDALE	199,619	14,110	3.25
M. V. CAPE ROMANO	195,000	14,633	3.20
M. V. CAPE ST. GEORGE	107,200	10,621	3.00
M. V. SANGAY	88,000	6,099	2.81
M. V. CAPE PORPOISE	142,000	10,468	3.80
M. V. CAPE HENRY	148,500	12,073	3.02
M. V. CAPE SPENCER	165,270	12,910	2.98
M. V. CAPE ST. ELIAS	.....	4,400	2.70
M. V. CAPE UGAT	90,000	7,344	3.10
M. V. CAPE CANAVERAL	137,300	11,671	3.40
M. V. CAPE LOOKOUT	141,700	12,432	3.30
M. V. CAPE HATTERAS	138,250	9,707	3.10
M. V. GENERAL RUGE	137,820	11,071	3.80
M. V. GENERAL FLEISCHER	96,980	8,596	3.10
M. V. CAPE BLANCO	90,190	6,625	2.92
M. V. CAPE CONSTANTINE	90,090	7,187	3.12
M. V. CAPE FEAR	108,240	6,622	3.28
M. V. CAPE FLORIDA	99,010	7,618	3.31
M. V. CAPE SAN BLAS	117,650	8,744	3.33
M. V. CAPE IGVAK	62,900	5,319	3.10
M. V. FORT NASSAU	114,850	9,165	3.12
M. V. ALF LINDBERG	22,500	1,938	3.30
M. V. CAPE PILLAR	67,260	5,257	3.35
M. V. CAPE POGE	56,230	4,427	3.30
M. V. CAPE SAN LUCAS	95,820	7,371	2.80
M. V. CAPE SAN ANTONIO	84,910	6,935	3.30
M. V. CAPE PALMAS	57,470	4,420	3.10
M. V. NARVIK	72,410	5,760	3.20
M. V. CAPE MATAPAN	82,830	6,186	3.56
M. V. CAPE LOPEZ	.....	.....	2.90
M. V. CAPE JUBY	66,820	5,275	3.31
M. V. CAPE TRAFALGAR	108,490	8,561	3.30
M. V. CAPE FARO	54,440	4,130	3.10
M. V. CAPE BARROW	57,050	3,834	3.10
M. V. CAPE DUCATO	49,525	3,809	3.24
M. V. CAPE GASPE	76,020	5,834	3.21
M. V. CAPE FRIO	.....	.....	.....
M. V. CAPE NUN	72,670	5,235	3.10
M. V. CAPE SEBASTIAN	51,460	3,724	3.30
M. V. CAPE FALCON	48,400	3,590	3.21
M. V. CAPE BOYER	53,270	4,006	3.20
M. V. CAPE TEXAS	42,310	2,910	3.14
M. V. CAPE PEMBROKE	24,290	4,277	3.52
M. V. CAPE BEALE	41,730	4,608	3.30

Multiple engine drives add further to reduction of maintenance cost by reducing the man hours required, as well as unit cost of replacement parts required in a regular maintenance program or voyage repairs. By use of precision bearings the frequency of bearing inspection is greatly reduced and replacement, when necessary, is rapid and inexpensive. By employing smaller cylinder dimensions and operating engines at higher rotative speeds, not only the time, but the number of men required for piston inspection is reduced many times over that required for the larger direct connected engines. Because of greater flexibility of the smaller, faster turning engines, the whole control and fuel injection system is simplified, again eliminating time and maintenance in expert adjustment.

Availability is greatly improved, not only by reduction in time for maintenance, but also by the fact that either at sea or in port, the vessel may proceed under her own power even if one engine is out of service for adjustment. This is of particular importance to cargo vessels whose service demands that they make a large number of short stays in many ports, and be ready to shift at short notice.

These features cannot be overlooked in face of present cost of labor aboard ship or in the repair yard nor in view of union rules covering performance of work by ship's engine room force.

Because of similar qualities in fuel economy and ease of maintenance direct drive machinery of the two cycle single acting type in 6 up to 12 cylinders at speeds up to 165 rpm is finding favor, both for twin and single screw application. A number of very satisfactory installations of such equipment have been made abroad and M. S. Emory Victory represents the first American application of such equipment. This vessel is a conventional Victory ship powered by a nine cylinder, single acting, 2 cycle, 29″ bore, 40″ stroke, Nordberg main engine, rated 6000 shp at 160 rpm. The vessel was placed in service the latter part of 1945 and to date has completed two round trips on the North Atlantic run for her operators. Data on her performance on averages

(Continued on page 146)

Modern Marine Refrigeration And Air Conditioning

By Willis H. Carrier and L. E. Starr*

Carrier Corporation, Syracuse, N. Y.

Prior to the middle 1930's, carbon dioxide or ammonia equipment was commonly used on board ships. Both refrigerants have disadvantages. Carbon dioxide gas was used extensively for it is odorless and non-toxic. Its critical temperature and high condensing pressure, frequently reaching 1200 lbs., necessitated heavily built equipment, penalizing the system in weight, cost and horsepower. Owing to the high operating pressure, carbon dioxide equipment was usually combined with a brine system, as it was not feasible to pipe the gas throughout the vessel. Ammonia, although a much more suitable refrigerant, had the disadvantage of being toxic. For this reason, ammonia plants were seldom installed on passenger ships although they were used extensively for cargo vessels. In large ammonia installations, brine circulation was often used to avoid piping ammonia throughout the vessel. On small applications, such as ship's stores or small cargo compartments, direct expansion of ammonia in the cooling coils was frequently used.

Research to develop a more suitable type of refrigerant resulted in the production of the "Freon" family. "Freon-12" is the most commonly known and generally used and is both odorless and non-toxic. Operating at substantially lower pressures than ammonia or carbon dioxide, "Freon-12" machines are lighter and smaller with greatly reduced weight per ton of refrigeration output. "Freon-12," though not as efficient as ammonia for low temperature applications, serves its purpose well for shipboard use. While there is yet to be developed for reciprocating equipment an ideal refrigerant, several are proving applicable for low temperatures. One of these is "Freon-22" with thermal characteristics somewhat similar to ammonia, but non-toxic. Many improvements in machines have been realized and new ones are being developed. With more modern design of reciprocating equipment, there is no reasonable argument against higher rpm's. Although some of the old ammonia and carbon dioxide equipment operated at relatively slow speeds, frequently from only 80 to 100 rpm, the actual piston speed was in excess, in some instances, of the piston speeds on a modern design "Freon" compressor operating at 1150 rpm. This change in design has been a forward step in reducing weight, cost and space requirements. Controls for refrigerating systems have been greatly improved in recent years. Many difficulties involved in automatic controls built a few years ago are being eliminated so that manual attention can be reduced to a minimum during normal operation of the plant. Direct expansion "Freon-12" systems have been used satisfactorily on vessels having as much as 250,000 cu. ft. of refrigerated space. "Freon-12" refrigeration is adaptable for use with brine circulation, and quite a number of such plants have been installed. During the past few years, direct expansion systems have predominated.

Changes in the "low side" equipment of refrigerating systems have followed those in the "high side." The elimination of prime surface coils in large cargo compartments and the use of compact finned coils and forced air circulation have resulted in an increase in usable refrigerated space. This space was previously lost to the steamship operator as it was occupied by the bulky and cumbersome prime surface gravity flow air coolers. Forced air circulation has made it possible to carry many products which could not be transported with the older method of side wall and ceiling coils. The correct balance of air quantity, coil surface, and operating temperatures has permitted maintaining definite relative humidities most suitable for the various types of cargo carried.

The centrifugal refrigerating machine is ideally suited to shipboard use when the requirements are in keeping with the range of capacities for which the centrifugal machines have been designed. The most common refrigerant used in a centrifugal compressor is "Freon-11," known as Carrene No. 2. This is an odorless liquid, boiling at a temperature of 74.8° at atmospheric pressure and may be handled safely with little loss in open containers. Both the refrigerant and the centrifugal refrigerating machine are acceptable to the various underwriting and design agencies having authority over equipment installed on board ship. Compared with ammonia and "Freon-12," Carrene No. 2 has a somewhat higher cycle efficiency. By the use of an economizer to permit liquid intercooling, the cycle efficiency is still further improved. The design of the compressor itself (which has no moving parts other than the rotor), and of the accessory refrigerating cycle equipment have been so perfected that pumping efficiencies of over 80 per cent and mechanical efficiencies approaching 99 per cent for larger type equipment have been attained.

The centrifugal machine is a self-contained assembly with a compressor, condenser and cooler, mounted on a common base. There are no refrigerant valves or piping. One extremely desirable feature of the centrifugal compressor is that it can be direct connected to a steam turbine. This feature frequently permits eliminating electrical generator equipment, in many instances greatly improves the heat balance, and permits other economies in the design of the ship's power plant. The centrifugal compressor can likewise be operated by motor drive; in which case a reduction gear is used. With either type of drive, the centrifugal refrigerating

*Abstract of a paper read before the Philadelphia Section of the Society of Naval Architects and Marine Engineers.

machine adapts its output to the load, an important feature for economic operation of cargo refrigeration where changes in loads are frequently encountered.

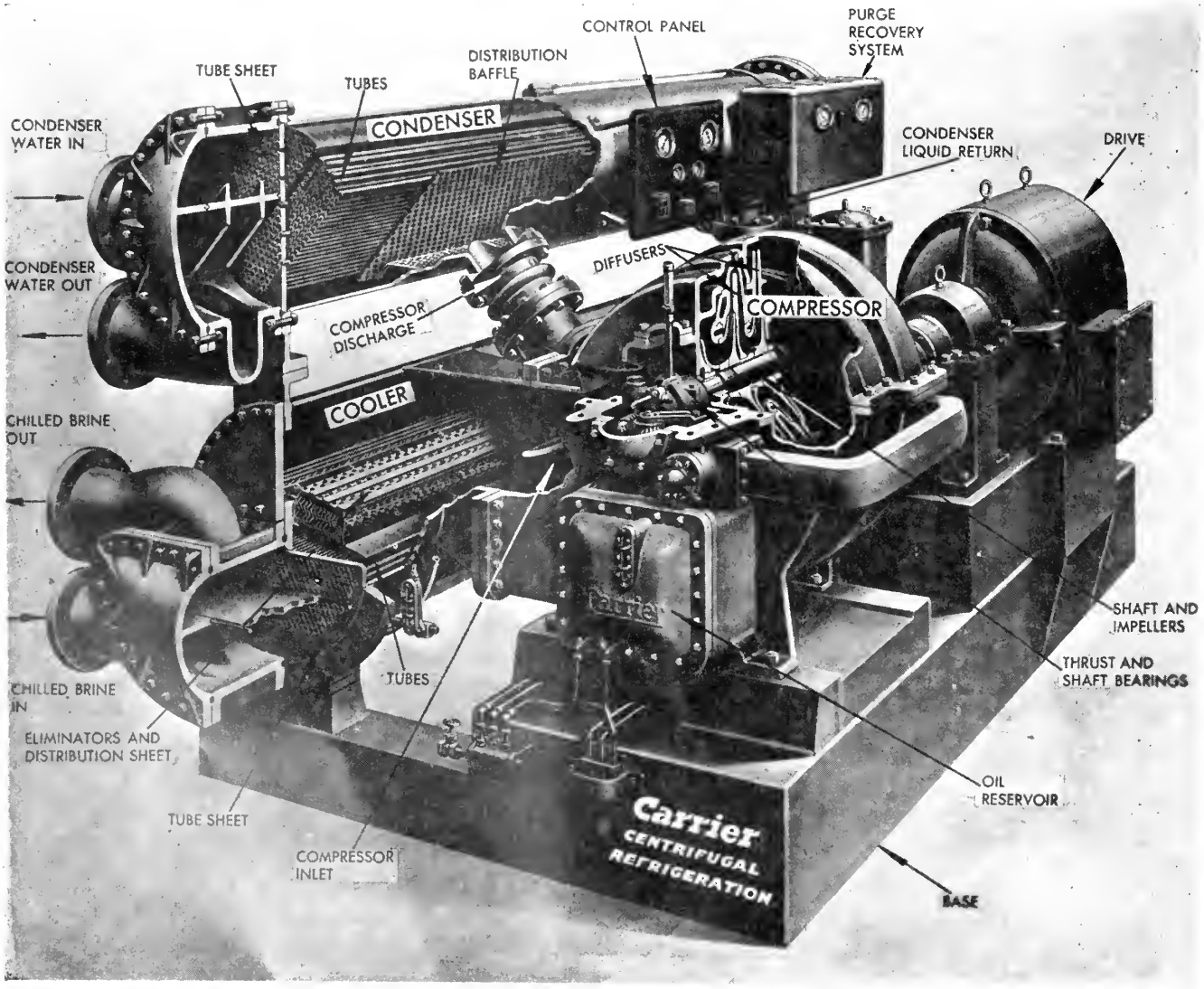
Centrifugal refrigerating machines are now being used on board ship for applications varying from chilling water for comfort air conditioning to maintaining refrigerated cargo compartments at 10° below zero.

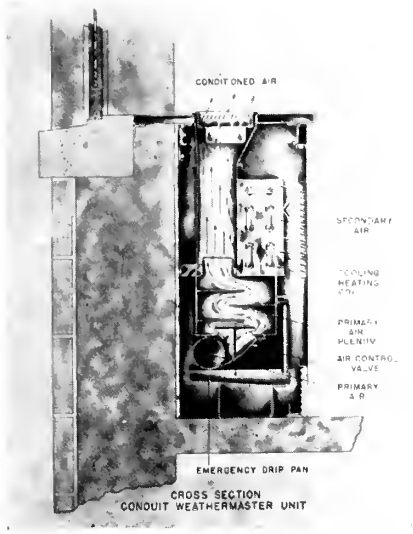
Air Conditioning

Air conditioning, in which refrigeration plays a very important part, is being applied in many vessels. One of the first passenger vessels equipped with air conditioning and with mechanical refrigeration was the S.S. Victoria of the Lloyd Triestino Line, in which the dining saloon and some of the deluxe cabins were air conditioned. The type of equipment used was a Carrier centrifugal refrigerating machine and a spray type air conditioning system with duct distribution of conditioned air. During the years 1930 and 1931, five deluxe passenger vessels were built, namely, Manhattan, Washington, Monterey, Mariposa and Lurline. These passenger vessels under American registry were provided with air conditioning for the dining saloons. The air conditioning systems were eminently successful and were followed by installations on a number of other vessels including America, Queen Mary, Normandie, Ancon, Panama and Cristobal.

At the beginning of the war, air conditioning equipment had been installed on 60 to 70 passenger vessels, including quite a number of private yachts and some vessels of small registry. In virtually every case, the air conditioning was confined entirely to the dining saloons or one or two lesser public spaces. The only vessel prior to the war which was completely air conditioned, including public rooms and staterooms, was the Koan Maru of the Imperial Government Railways of Japan.

On account of the limited number of spaces served, the air conditioning system was the conventional design. There was one air conditioning unit with a circulating fan which supplied conditioned air through a supply duct to the dining saloon and returned the air through a return air duct while introducing a constant amount of outside air for ventilation purposes. Refrigeration to chill the water for the air conditioning system was supplied in some cases by a Carrier centrifugal





The Weathermaster unit located within the room receives conditioned air at high velocity from a central station system. Discharged through nozzles in the unit, the high velocity air induces a flow of secondary air from the room. Coils for either heating or cooling located in the secondary air intake permit the occupant to control the temperature in the room.

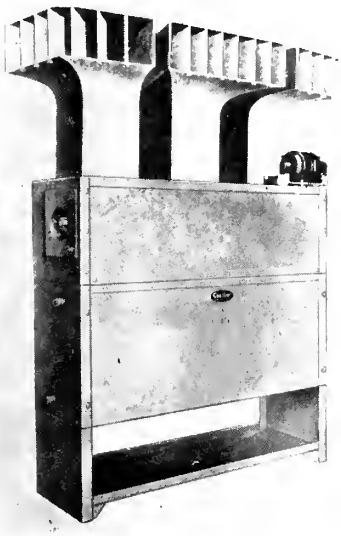
refrigerating machine and in other cases by the spare machine which was furnished for cargo refrigeration. The Queen Mary is unique in using a steam ejector system for cooling the water for air conditioning of the public rooms.

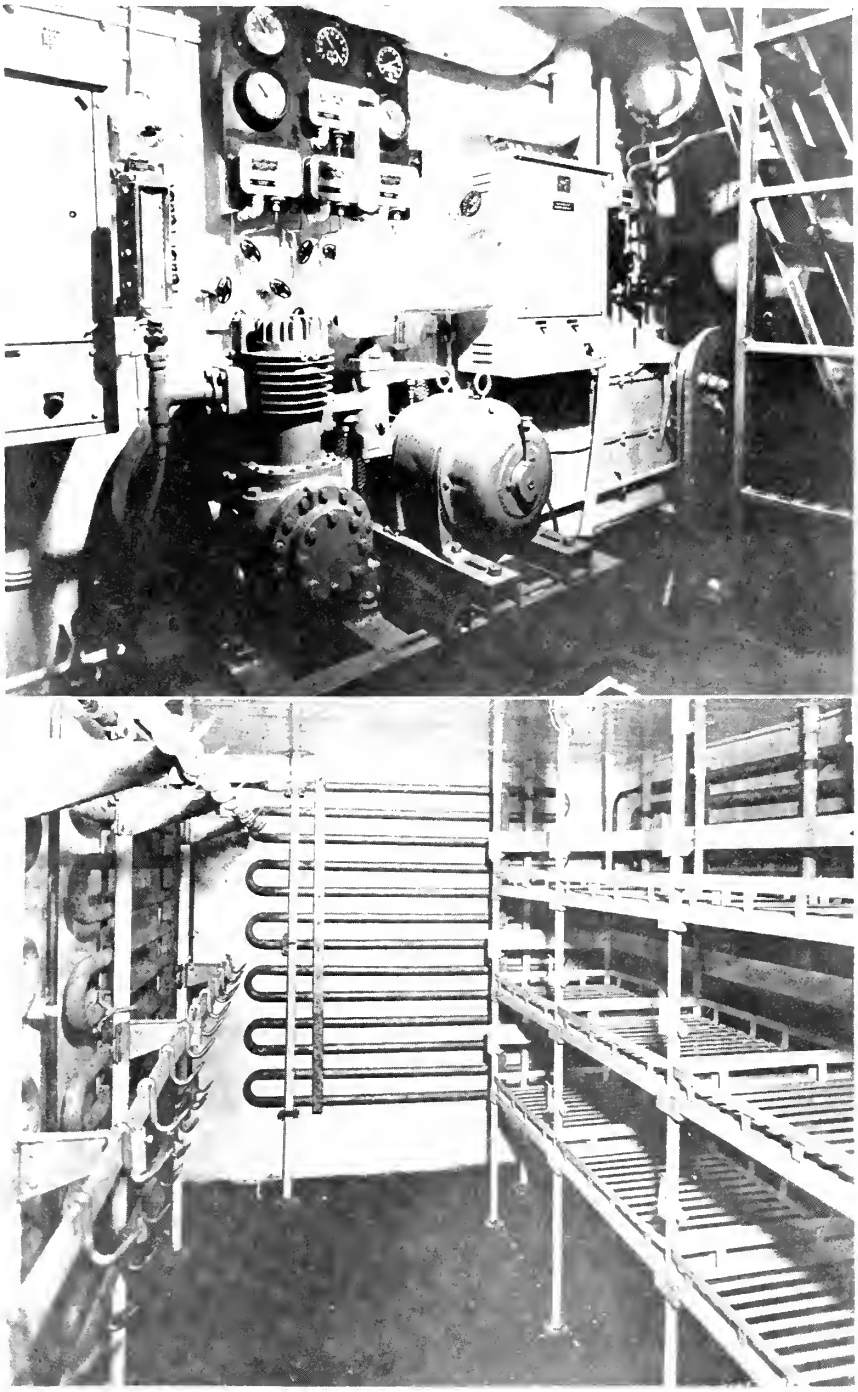
Air conditioning was also installed on quite a number of Naval vessels, its application in each case being primarily for control rooms below decks and not for the comfort of the crew. During the war, air conditioning was limited to Naval ships. During that time, it became evident that partial air conditioning is not satisfactory and that to compete with post-war ships of other nations completely air conditioned vessels are required. There are today eleven ships being built for post-war service which have complete air conditioning for public spaces and staterooms. It is questionable if any ships built from this time on for passenger travel can overlook the fact that the traveling public who rides in air conditioned trains, goes to air conditioned theaters, buys commodities in air conditioned stores, and sleeps in air conditioned hotels will be willing to patronize anything but air conditioned ships.

The application of air conditioning to a vessel is by no means a simple

(Continued on page 150)

Compact finned coils with forced air circulation supplied by a ceiling-mounted cold diffusing unit provide cooling with great savings in floor space.





Upper: Refrigerating unit using "Freon-12" supplies low temperatures required for food preservation on a destroyer.
Lower: Direct expansion coils predominate on shipboard when the refrigeration is supplied by "Freon-12" condensing units.

The Institute of Navigation

Navigation has advanced more in the past five years than in the hundreds of years before the war.

Each new piece of equipment is available for inspection, and each new technique is ready for operational testing and use on the sea or in the air by any who wish to use it. To insure the rapid and complete dissemination of this information, the Institute of Navigation has been formed by the mariners and airmen of many countries. Here is a forum where the latest navigation technique or piece of equipment can be discussed, explained, displayed, and tested. As a record for those who attend the discussions and for the information of those who are unable to attend, the results of these meetings and discussions are made available to all members in the form of a quarterly journal "Navigation," and monthly bulletins.

At the recent annual meeting of the Institute at the University of California at Los Angeles on June 25th, 26th, and 27th, definite attempts were made to consolidate some of the gains made in navigation during the war. The teaching of navigation, along with the vast and intricate advances in the art, has challenged the intiative and imagination of the services. Captain M. E. Crossman, USMS; Captain O. A. Shaw, AAF, and Group Captain H. E. C. Boxer, RAF, each announced the aims and programs of their organizations in teaching navigation in the post-war years.

Captain M. E. Crossman

Mr. H. F. Schwarz, a director of Decca Co. of London, England, came to the United States specifically to place their new navigational radar equipment, Decca, on the rostrum for inspection and discussion. This was the first discussion of Decca in this country.

Glossary of Terms

With new techniques, new equipment, and thousands of new navigators of all nations scattered over the face of the world, on the sea and in the air, a new vocabulary took form. But different backgrounds and different training caused conflicts over meaning. Navigation is a technical subject and it became increasingly difficult for navigators with divergent backgrounds to discuss mutual problems without sinking into the morass of ambiguous meaning. Because each of the distinct groups, typifying a particular background and specialized training, are represented in the Institute, the Army Air Forces distributed a proposed glossary of navigational terms to the members. At the meeting, everyone interested in standardizing the language, entered into the discussion.

Almanac

Because many mariners use the Air Almanac in their navigational problems, it was suggested that the Nautical Almanac be revised and brought up to date. G. M. Clemence, Director of the Nautical Almanac attended the meeting and entered into the discussions. Mr. Sadler, present Director of the British Almanac Office, and Mr. Comrie, former Director of the British Almanac Office, both sent in their comments on the proposed revision. The practical navigators were represented by such authoritative spokesmen as Captain G. G. McLintock, USMS; Col. Geo. W. Mixter, and Captain R. S. Wentworth, USN. The results of this discussion will soon be published in "Navigation."

The Institute of Navigation, an international organization, has begun to compile a working summary of the knowledge gained in the past few years as a starting point for the advances that must be made in the future to keep navigation abreast a rapidly moving world.

In his welcoming address, Provost Dykstra of the University of California, said, "I see a good omen in the character of your organization. It is international. You have invited the countries of the world to join with you in research. I see that many of their representatives are in attendance at this meeting. Navigation is universal. So is friendship. Scientific achievement can be born under no better chance of success than friendly cooperation and mutual access to the products of research. Success to you in your work!"

Aims of U. S. M. S. in Teaching Navigation

By Capt. M. E. Crossman*

The Maritime Service, contrary to public belief, is more than a war conceived and sponsored activity. It is a uniformed service of the United States, and although our history dates only from 1938, we already have established our own traditions and customs, and have acquired a dignity and pride of commonweal service comparable to the oldest of our government organizations.

In 1936, a Congress awakened to the urgent importance of revitalizing our Merchant Marine passed the Act establishing the United States Maritime Commission. This Commission was charged with the responsibility of seeing that American ships were manned with a trained and efficient personnel. After considerable study the Maritime Commission proposed a training design, and on June 23, 1938, Congress amended the Mer-

* Abstract of an address before the International Institute of Navigation, Los Angeles, June 26, 1946.

chant Marine Act to provide for this program.

On that day, we as a Service were born. The amendment directed the Commission to establish the Maritime Service as a voluntary organization of licensed and unlicensed members of the Merchant Marine, with the same ranks and rates as prescribed for the United States Coast Guard. The objective—to provide a trained and efficient Merchant Marine personnel capable of operating the ships of our Merchant Marine in commercial competition with the Maritime Nations of the world.

Only three weeks after the Maritime Service was created, a program designed to train men already in the industry was announced. This program was conducted with such efficiency and interest that by the beginning of this war it was expanding rapidly enough to warrant the operation of six large training stations along the nation's seaboards.

Then the exigencies of war diverted us to the recruiting and training of new men **for** the Merchant Marine. During the war we trained almost 150,000 men, of that number some 15,000 being Deck Officers. The study of navigation, of course, was pre-eminent in their training, as the Deck Officer is essentially a navigation officer.

In covering the course content of the navigation taught at the United States Maritime Service Schools, it should be remembered that two objectives must be kept in mind at all times: First and of immediate importance is the preparation for the successful passing of the license examinations administered by the United States Coast Guard. Second, the student must be adequately prepared to satisfactorily perform the navigational duties of a Third Mate on ocean going vessels of any tonnage. The first of these two requirements necessitates the teaching of much material which is desirable but not absolutely necessary in the ordinary routine aboard a ship at sea.

Since the navigation of a ship at sea means to determine its position at any time and to conduct it safely from one place to another, the Merchant Marine Deck Officer must fully understand, in addition to the mechanics of navigation, the subjects of Signaling, First Aid, Cargo Handling, Principles of Stowage, Seamanship, Rules of the Nautical Road, and a set of complicated Rules and Regulations as set up by the Bureau of Marine Inspection and Navigation.

Measured by projected standards, the men thus trained are considered to be what you might call ship's officers—emergency model. The final result of this course, however, although definitely streamlined, has had a high degree of success.

This moment finds us in the midst of a reconversion period to our original policy of training and re-training personnel **already** in the merchant marine, in order that they may be able to effectively keep pace with the technological development of ship operation, and, by means of a higher degree of personnel efficiency, enable the U. S. Merchant Marine to maintain its position in the face of foreign competition.

With this aim in mind, the U. S. Maritime Service last year engaged the services of Dr. D. B. Prentice, President of Rose Polytechnic Institute, and an outstanding figure in the field of education, to make an expert survey and study, setting forth findings and recommendations upon which a post-war officers' training could be based.

Emphasis has been placed on the following consideration (in the words of Dr. Prentice), "A career as an officer in the merchant marine, especially if it includes service on passenger ships, is comparable in many ways to a combination of broad business and professional activity."

General education, as well as specific education for officer personnel, he pointed out, would not only be an advantage by way of preparation, but almost a necessity if administration of the shipping industry at sea is to rank in the level it deserves.

"It is quite likely," he said, "that international competition following the war will practically force superior education of American Merchant Marine officers, and the higher the eduaction level to which officer personnel aspires, the more attractive will careers at sea appear to outstanding young men."

After analyzing the training programs of the Army, Navy and Coast Guard, a curriculum was formulated to achieve the following eight specific benefits:

1. Prompt qualification for license.
2. Preparation for examination for advancement to higher ratings.
3. A broad general education in addition to the required professional training.
4. Education equivalent in quality to that offered in the best colleges.
5. Education that will justify the conferring of the bachelor degree.
6. Ultimate qualification for accrediting and national recognition.
7. Administration by division into terms with long intermissions for sea service so that the full curriculum can be a financial possibility for any competent candidate.
8. Use of at least parts of long intermissions for correspondence study.

The plan contains two curricula: one for deck and one for engineer officers, each consisting of eight two-month terms of resident study, in which about two-thirds of the degree requirements are to be met. In addition to the resident terms are laboratory courses at sea equivalent to about one-sixth of the degree requirements and correspondence courses through the U. S. Maritime Service Institute make up the balance.

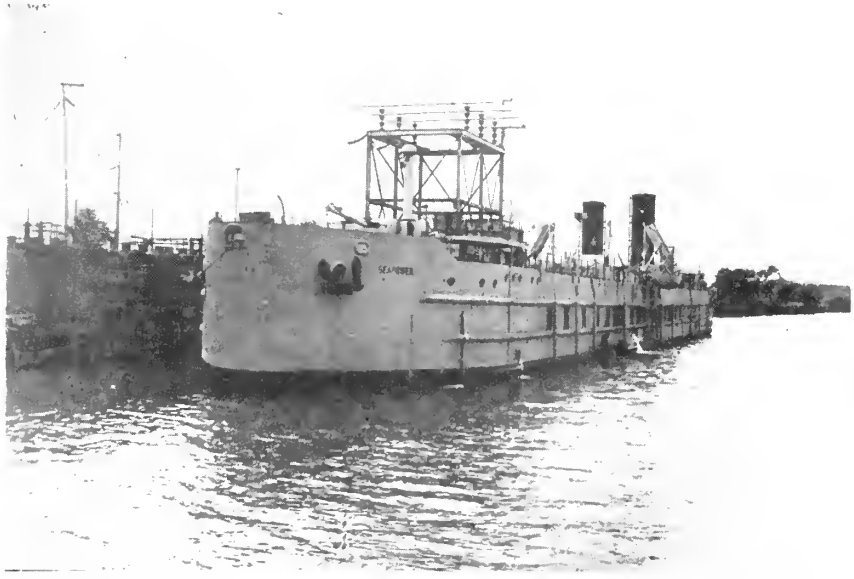
The curricula for a deck officer has the following general content: General courses would include English Composition, Letters and Reports, Public Speaking, Maritime History, Economics, Accounting, International Trade, Economic Geography, Personnel Management, Maritime Law, Electives. Comprehensive or combination courses include Ship Management and Operation, Thesis. Preprofessional courses include Mathematics, Physics and Chemistry. Professional courses include Navigation, Seamanship, Meteorology, Power Plants and Auxiliaries, Signaling and Radio, and Cargo Handling. Since the post-war merchant fleet can expect additional equipment developed during the war, such as Communication Devices, Loran, Radar, etc., the professional courses must also include training in the proficiency of their operation. Inasmuch as a merchant vessel does not carry any trained unlicensed specialists, it will probably be necessary to include a course in screen interpretation of radar and in operation of loran equipment.

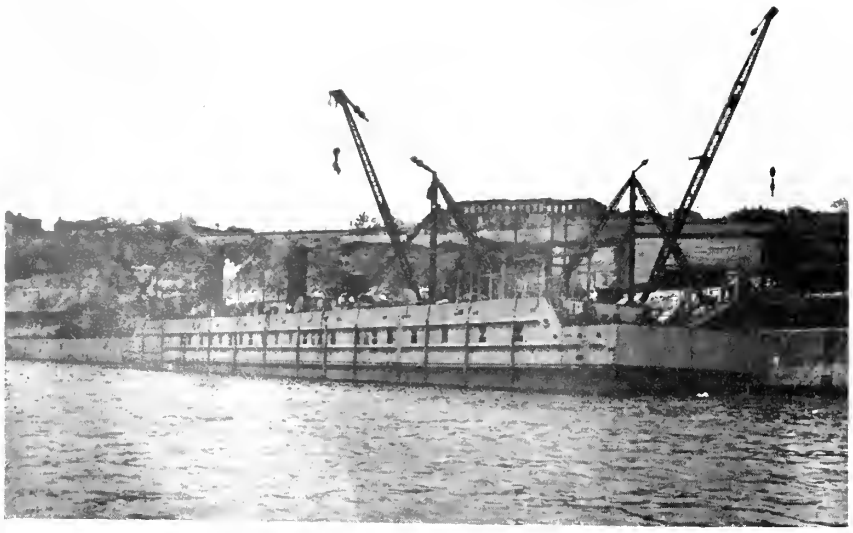
It is felt that this program expresses in a practical way the aim of the U. S. Maritime Service to make our officer personnel not only the most professionally competent but the best educated. With such officers, and with the importance of our merchant marine at last firmly recognized by the American people, we of the Maritime Service believe that we are well on the way to giving the United States the finest merchant marine in the world.

Floating Power Plants of 30,000 KW

By T. Orchard Lisle

Heavy demand for electric power during the war resulting from the exceptionally large manufacturing demand, produced shortages in some of the critical centers in mid-continent and southern states. To overcome this dangerous situation and to make extra power available at any essential point by means of transportable sources of supply, the Defense Plant Corporation in 1942 decided to construct four floating power plants of 30,000 kw each, and gave Gielow Inc., New York naval architects, authority to design and build these vessels. The first complete unit was ready for service 16 months later. That the Army requisitioned three of them, made considerable alterations, and sent two to Europe and one to Manila is another story and will only be dealt with here inasfar as the engineering changes are concerned.





The total cost of the four floating power plants was about $14,000,000; as the alterations after completion of two of them considerably increased from the aggregate original cost of approximately $2,800,000 apiece. The military authorities had hull changes made including the adding of bows to facilitate ocean towing, rudders were put on, electric steering gear fitted, a mast stepped, various types of life saving equipment installed and quarters for 24 men, in addition. There originally were accommodations for 28 men. The Army also had installed a 1,500 kw General Electric frequency changer to run the auxiliaries at 60 cycles while maintaining the main generator at 50 cycles. Degaussing equipment was installed as a protection against mines.

The idea of a floating power plant is not new, as apart from the fact that aircraft carriers and other American warships have been used on occasion to aid waterfront cities with augmented power during times of emergency. The New England Public Service Corporation has owned and operated such a unit for many years with success, and their vessel is named the Jacoma. During the war she was sent by the Navy to the Philippines.

Two of the new barges were towed to Belgium; used there and then brought back. One of these two was then sold to the Porto Rico Power and Light. Another is stationed at Fort Mifflin, Philadelphia, Pa. A

Upper: The floating power vessel "Seapower" ready for business at any port in the world.

Lower: One of the floating power plants without added bow and steering gear.

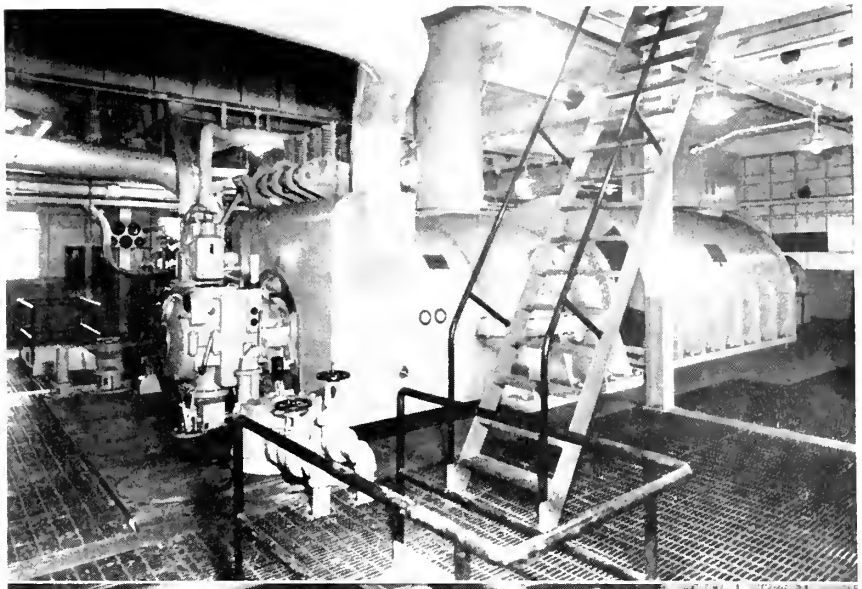
third is now in Manilla, PI, but will come back after Freedom day. The fourth is in Jacksonville, Fla. handling the power shortage in that district.

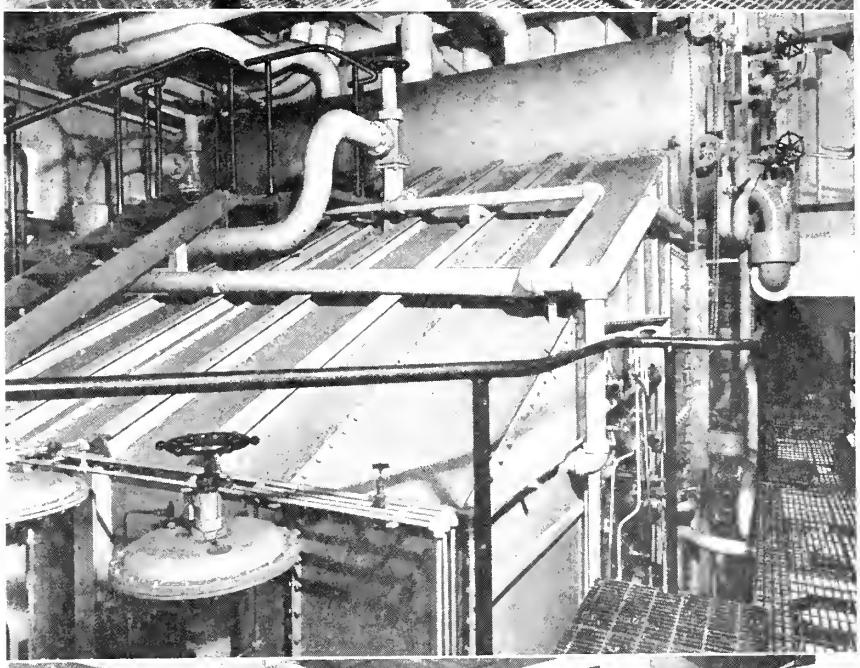
The work of these power barges offers conjecture as to whether or not valuable use could be made of such craft, and if it would be possible and practical to add electric propelling motors so as to make the craft independent of tugs when it became desirable to move from one point to another, although probably the cost of occasional tugs would be less.

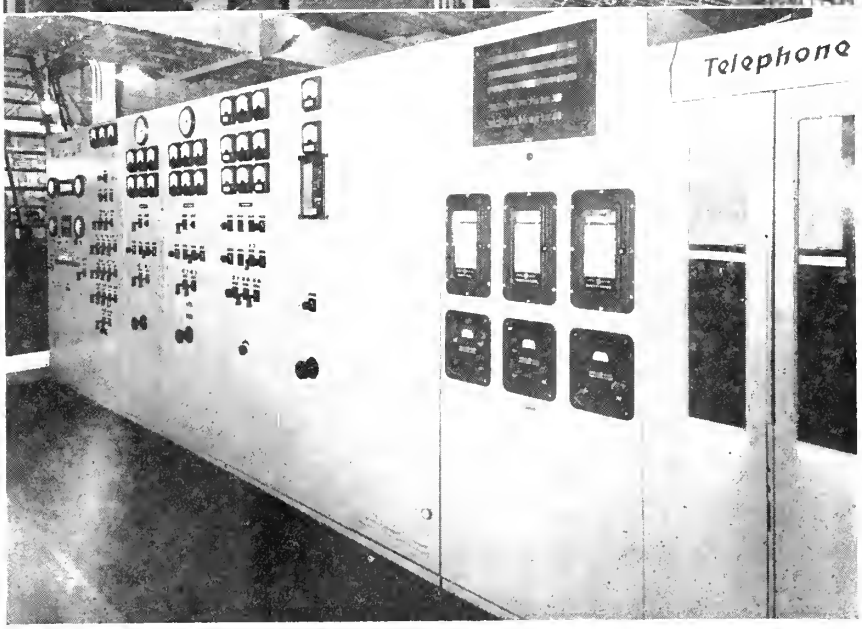
In the light of present ship propulsion developments, the focal point of technical interest in these four floating power plants is the high pressure and high temperature at which their boilers and turbines function. They follow, of course, today's land power plant equipment practice, but point the way for greater efficiency with cargo and passenger ship propulsion units. More about this aspect later, but first a general description.

Because these floating power plants had to be towed on rivers and canals —at least according to the original service program—which meant passing through locks and under bridges, their overall length was restricted to 318 ft., with 50 ft. maximum beam, 9 ft. draft and 19 ft. height above the waterline when loaded with fuel oil for one week's operation.

The contract for the hulls was placed with the Bethlehem Steel Company, who carried out the building at a fabrication plant at Leetsdale, Pa., and not in one of the Company's regular shipyards. The latter were full of urgent naval and merchant ship construction work. High-pressure high-temperature piping prefabricated by Pittsburgh Piping & Equipment Company was installed in addition to the high-voltage wiring, by United Engineers and Constructors at Pittsburgh, Pa., in a special plant. All frames, girders, and floors had to be made from plates and flat bars because no structural shapes were available. All construction, tests and trials were under su-







Top: One of the 30,000-kw General Electric turbo-generators of the four floating power plants.

Center: One of the Babcock & Wilcox boilers.

Bottom: Control panel of 30,000-kw floating power plant.

pervision of J. F. French, project manager, Gielow Incorporated.

The steel hulls are all-welded and are divided by 13 watertight bulkheads, and there is a 3 ft. 6 in. double bottom in all the craft which is used for carrying fuel oil and ballast. The total number of fuel tanks, including those for the auxiliary engines of the Diesel type are 38, and these have an aggregate capacity of 2,048 tons. Accommodations are provided for crews of 28 men per vessel, although as mentioned the Army added quarters for additional men in two of them. Arrangements separate from the main power installation were made for heating, cooling and ventilating the living quarters.

In each barge a 30,000 kw, 13,800 volt General Electric turbo-generator is installed as the main power unit. Each has a land type turbine of the horizontal impulse type, 19 stage, operating at 3,600 rpm, while each generator is of the two-pole rotating field type cooled by hydrogen. The excitor is driven from the generator shaft by reduction gears, and between the turbine and generator there is an electric turning motor. The main control board was also supplied by the General Electric Company, and this houses all controls, indicators, recording instruments and circuit breakers for the main unit and for all auxiliaries.

There are two Ingersoll Rand-General Electric Diesel generator sets for furnishing electric current to the numerous auxiliary units.

Two Babcock and Wilcox boilers are installed in each of the barges. These are the divided furnace, single uptake, express type with double casing, each epuipped with superheater, economizer and air heater. Two of the vessels are equipped with Babcock and Wilcox combination gas-and-steam mechanical atomizing oil burners, enabling natural or coal gas from the land supply systems to be used in case of local fuel oil shortage at the point of operation.

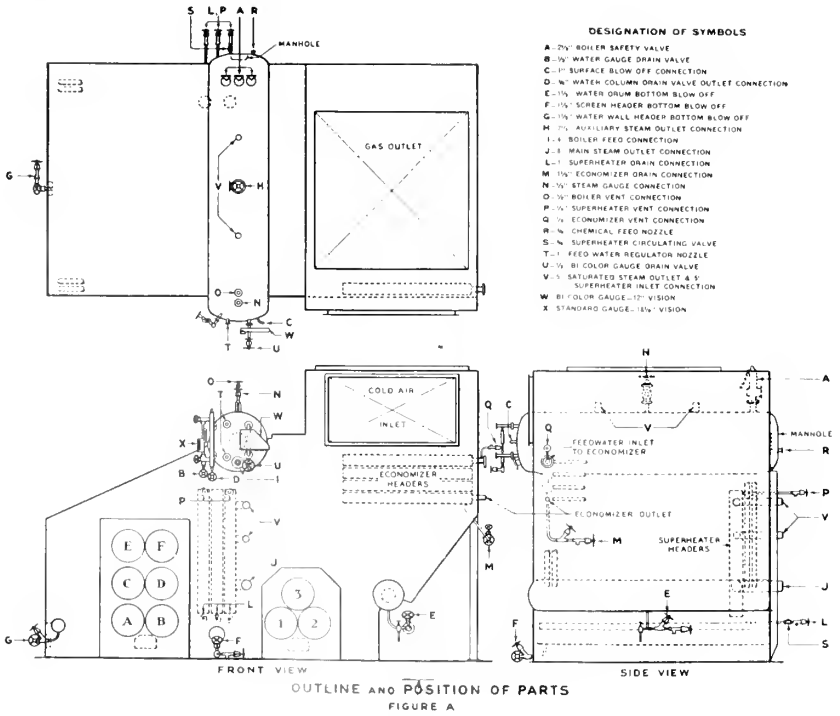
Each boiler can deliver 170,000 lb. of steam per hour at 835 lb. gauge and 910 degs. Fahr. temperature with the feed water at 350 degs. Fahr. Steam at the turbine throttle has a pressure of 825 psi and a normal operating temperature of 900 degs.

It is interesting to compare these figures with the steam turbine installations of recently built merchant and naval vessels, especially as there is a tendency to design and operate this type of propelling machinery at increasingly higher pressures and temperatures. Here are figures for some of the more outstanding vessels built during and since the war.

	Pressure (p.s.i.)	Temperature (Fahr.)	Consumption (Fuel per shp hr.)
Floating power plants	835 lb.	910 deg.	0.522 lb.
Tanker ss Platt	428 lb.	755 deg.	0.59 lb.
Bethlehem ore carrier	1,435 lb.	744 deg.	0.54 lb.
Victory ship "Bluefield Victory"	447 lb.	783 deg.	0.604 lb.
U.S. Naval vessels	600 lb.	850 deg.	——

It will be noted that while the steam pressure is lower than that adopted for the new Bethlehem-built ore carriers, which form today's extreme with merchant ships, the steam temperature adopted for the power plant vessel is 166 degrees higher. Both temperature and pressure are higher than today's naval practice, which in turn are higher than those of the latest Maritime Commission cargo and passenger carriers.

The main power transformer occupies a central compartment in the forward section of the hull, and is located just aft of the crew's quarters. Above the transformer is the transmission tower. Below the crew space are stores, storage battery room, chlorination room, water screens, etc. On one side of the transformer is a machine shop, with the auxiliary switch gear room on the other side. Next comes the main switch gear room and transformer breakers. The next watertight compartment is the pump room, then comes the engine room followed by the boiler space.



OUTLINE AND POSITION OF PARTS
FIGURE A

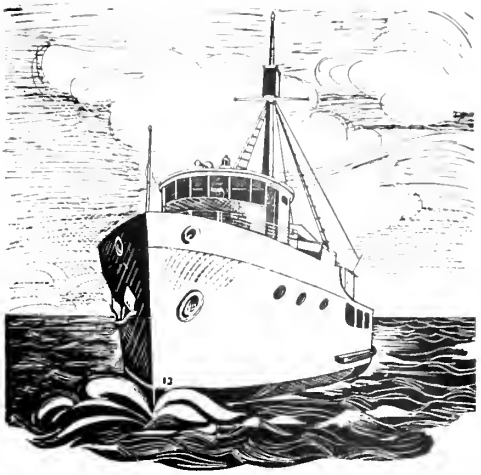
The hull aft is given over to the galley, messroom, lavatories, lockers, additional stores, refrigeration and fresh water tanks.

Westinghouse Electric Corporation supplied the main power transformers for these vessels. The units are of the oil-immersed, forced-oil cooled type rated at 37,500 kilowatt-hours. There is an 8,000 lb. vapor capacity Foster Wheeler submerged coil evaporator installed in the pump room. The low-pressure heater also was constructed by Foster Wheeler. There are two Elliott 9,200 sq. ft. surface condensers, one on either side of the hull with a divided duct leading from the turbine exhaust connection to each condenser. A 10,000 g.p.m. Allis-Chalmers pump supplies circulation water to each condenser.

In order to make these vessels as

(Continued on page 148)

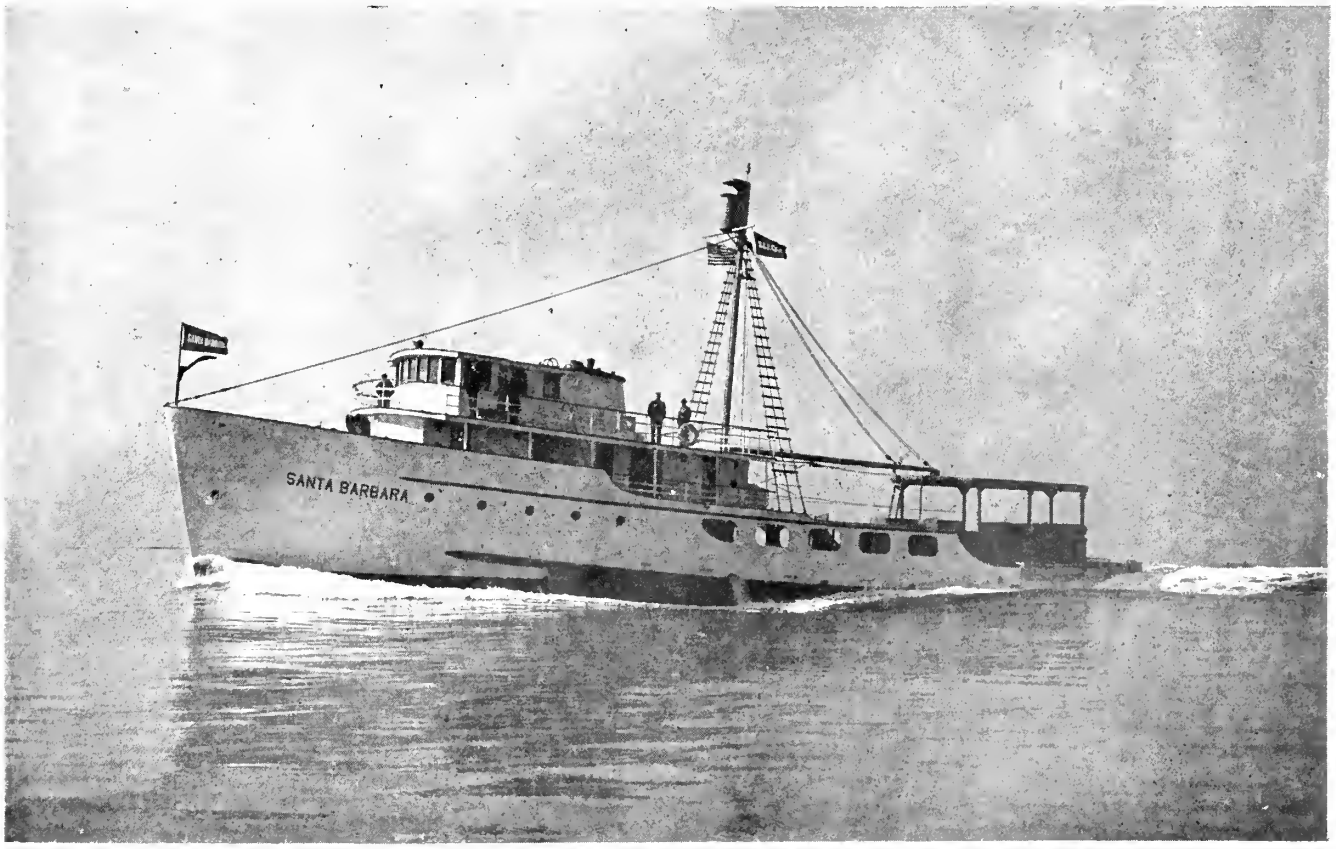
Coast COMMERCIAL CRAFT



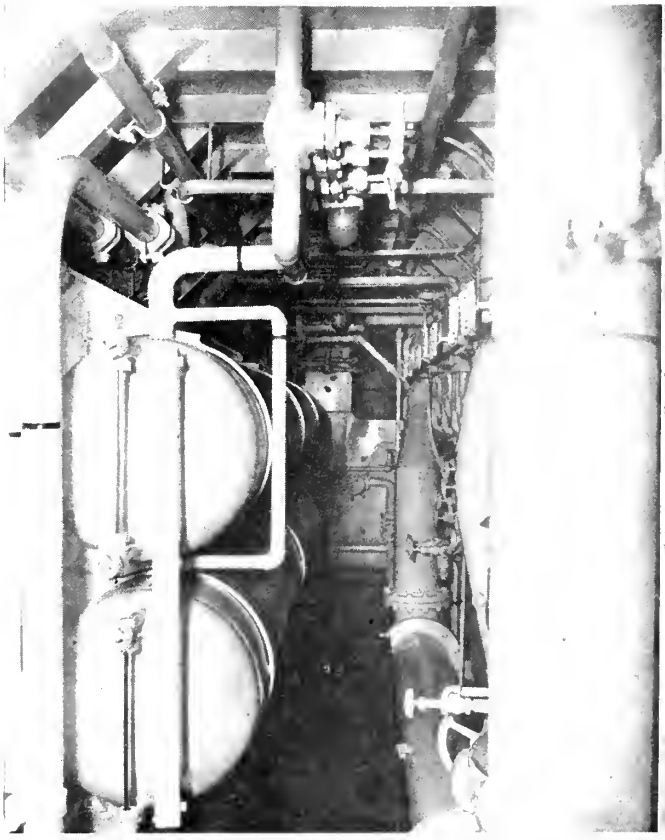
New Tuna Clipper Performs Like Veteran

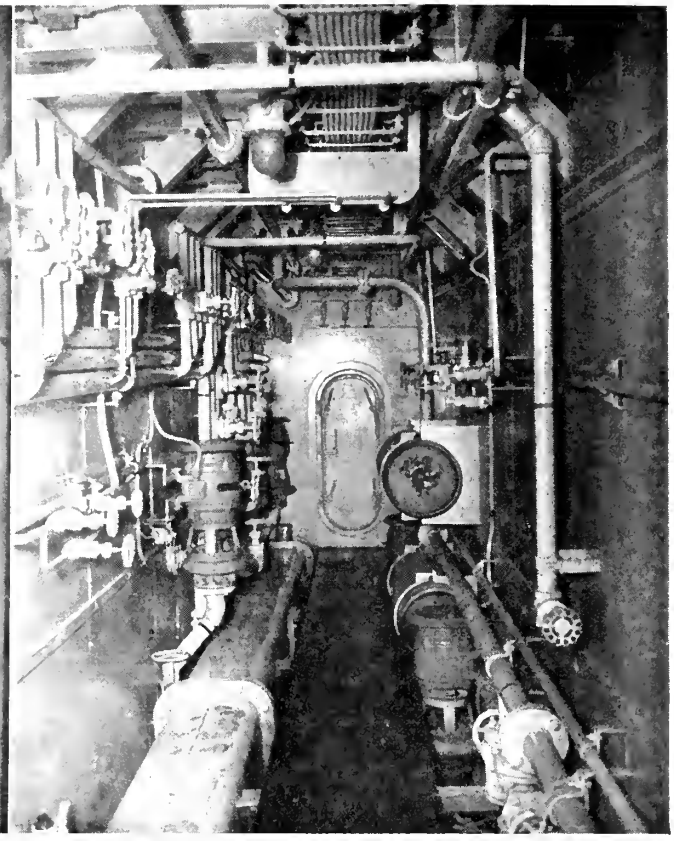
By Tom White

Santa Barbara is the fourth of a line of identical tunamen, except for minor details of design, and power plants. Her sisters, now in service, are Joan of Arc, Star-Kist and Courageous. Their dimensions are 131′ x 27′ x 14′ 5″. Designed by G. Bruce Newby they are products of the yards of the United Concrete Pipe Corp., Steel Shipbuilding Division, at Long Beach, Calif. They meet ABS requirements throughout, including ma-

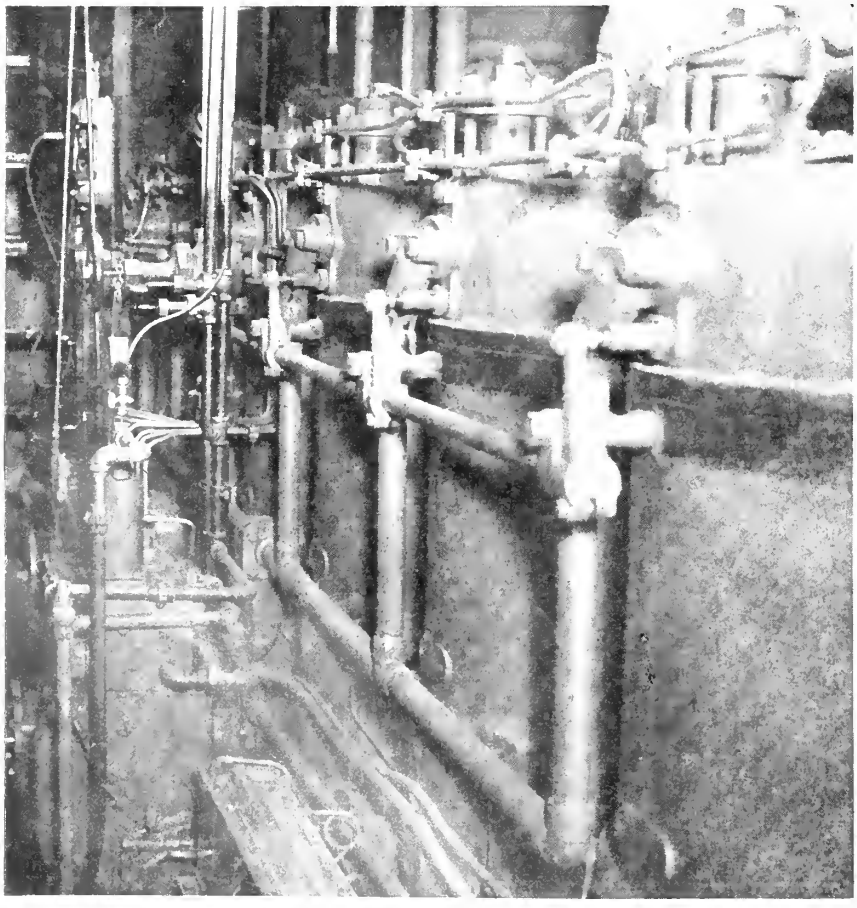


The new 131-foot steel clipper, Santa Barbara





Left: Looking aft in the shaft alley and escape hatch, featuring the ammonia receivers.
Right: The shaft alley and two brine circulating pumps.



Operating side of main propulsion engine.

chinery, and have been issued certificates to that effect.

Her size and a fuel capacity of some 70,000 gallons—give the Santa Barbara a cruising range of ten thousand miles. Her power plant—a Fairbanks-Morse Diesel—also figures in this picture. On her shakedown cruise from her builders' yards to San Diego, a distance just under 100 miles, from light to light, fuel consumption amounted to 40 G.P.H. with her main engine turning at full rated capacity. She made the run in ballast, logging an average of 12.6 knots, or 14.4 statute miles per hour. Upon arrival at San Diego, all hands agreed that engine operation was unusually "clean." The skipper confessed surprise that his new engine could run continuously at full speed, actually operating at 20 turns in excess of the rated rpm. for a full 30-minutes. Commenting on the Long Beach-San Diego run, Silva remarked, "This really is something. I didn't have to 'baby' her along for the first 500 miles, as I did with my new automobile."

Santa Barbara's main engine is a Model 37-E-14, 7-cylinder, 14" dia. x 17" stroke, Fairbanks-Morse, direct-reversing Diesel developing 805 hp at 300 rpm. The main power unit is

hooked up directly to the 6¾" monel shaft, with welded flanges, and swings on 81" dia., 57" pitch, Lambie-designed propeller.

Auxiliary engines consist of two six-cylinder Atlas-Imperial Diesels, developing 225 hp at 514 rpm, direct-connected to Fairbanks-Morse 156 kva. generators. These engines are fresh-water cooled through the medium of Ross heat exchangers.

Twenty pumps take care of the liquid transfer problems. These include 12 Fairbanks-Morse vertical centrifugal pumps, two 50-gal. displacement pumps, and one 3 x 4 salt water pump for each of the following services—fire and washdown, brine circulation, condenser and fuel transfer. The ship is served by an F-M fresh-water system; the sanitary system is the same type of unit, adapted to salt water.

The tuna fishermen's first job is to catch their bait. Then, of course, this bait must be kept alive for the balance of the cruise. To insure this, the bait tanks are provided with an unfailing supply of constantly circulating salt water. This calls for the highest capacity pumps that are carried aboard a tunaman. The Santa Barbara is equipped with twelve F-M, vertical centrifugal type, 12" suction pumps, rated 4,400 gpm., with intakes located three feet above the keel-line, thus assuring air-free water.

A tunaman's refrigerating equipment ranks next in importance to the main engine itself. Considering the time spent at sea, as well as the temperatures prevailing in the tropics, freezing arrangements have to be always just a bit more than adequate for handling the vessel's capacity so as to insure proper condition when unloaded at the cannery.

Santa Barbara's refrigerated fish capacity is arranged in ten steel wells. These wells are each served by closely spaced coils of 1¼" ammonia pipe, and each well is insulated with six inches of cork. Each well stows upward of 20 tons of dry, frozen fish and an additional 40 tons can be accommodated in the refrigerated bait boxes, located on the after main deck. These boxes also are insulated with six inches of cork and altogether some 40,000 board feet of this material is used. The refrigerating equipment is situated in the engine room. Three 6 x 6, single-acting Kohlenberger compressors, V-belt driven by 30 hp. motor together with brine receivers, condensers and pumps give more than sufficient refrigeration capacity to take care of chilling a full load and maintaining that load in the frozen condition.

Santa Barbara's hull has the true cruiser-type stern, which gives her a sleek appearance. A double bottom with a center vertical oil tight keel girder and five oil tight floors provides eight fuel tanks, four under the machinery space, four under the brine-wall space. Transverse watertight bulkheads extending to the main deck divide the hull above the tank tops into six compartments. A unique feature is a space giving common entrance to all accommodations without having to go outside. The machinery is set low, so that the vessel has a gentle roll and rides the seas easily, providing a fairly stable fishing platform, even in a moderately choppy sea.

The insurance rate of this type of vessel is materially under six per cent, which effects a real saving in comparison with the current rates on tunamen hulls of wood construction.

Additional safety provisions are found in Santa Barbara's navigating equipment, which includes a thousand-fathom Fathometer, and a 500-watt combination short wave and radio telephone that affords ship-to-shore and ship-to-ship communication.

Generous provision is made for crew welfare. The galley has an oil-burning Lang range, and a complete Kohlenberger refrigerating system for the galley and ship's stores. Both the cook's room and galley are insulated with Fibreglas.

Accommodations are provided for 16 men, the crew's quarters being insulated against heat, cold and sound; and ports and other outlets are so arranged as to permit the constant circulation of fresh air. Each berth has its own light and fan. Adequate ventilation is supplied to every enclosed space in the hull. Adequate provision of sanitary equipment is installed.

Captain Manual J. Silva, skipper and part-owner at the wheel of Santa Barbara.

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

Ships and Their Cargoes

By William S. Culbertson

I

Our Economic Frontiers

After two world wars, which have left us with a vast productive capacity and a credit economy, the thinking of many American citizens has not caught up with our national needs and necessities. They do not quite see—and in a democracy they must see—that their prosperity and defense, our prosperity and defense, requires a permanent constructive policy toward the varied economic activities of American citizens beyond our territorial frontiers. It should become a commonplace with us to say that our economic frontiers are far out to sea and in foreign countries; that our activities in foreign lands and on the sea—our foreign trade, our shipping, and our overseas investments—are just as much a part of American prosperity and American security as production and trading out in the Middle West or between the States. When once we as a people have that point of view, opposition here and there to the development of our foreign trade and shipping will seem of passing moment as we move on in the evolution of sound policy until it is coextensive with our economic frontiers.

We are headed for a larger and larger participation in international affairs. A river can turn and even double on itself, but it cannot flow backward in its course. Some of our prophets, caught in an eddy, imagine that the river of our economic life is balancing on a divide and that it can flow either way, outward or inward. Instead, we are over the divide. When we can clear our vision to see the broad stream, we will see that it flows strongly outward toward a larger and larger participation in the economic and political affairs of the world. As to the kind of a bed in which this stream will flow, there is a choice. We cannot turn the flood backward, but we can direct it, we can determine whether our economic expansion will be discriminatory, exclusive, aggressive, and militaristic, or whether it will be equitable and designed to invite and, let me say, insist upon world cooperation.

II

Our Economic Activities Overseas

If I were asked to write a primer for the American people on foreign trade I would begin it with two analyses. The first would be an analysis of our balance of international payments.

Our balance of international payments is a record of our dealings with foreign nations. It summarizes the total business dealings of the American people during a given period of time with the rest of the world; it reflects from year to year the peculiar characteristics of our economic life, and it remains a safe and certain barometer of what is going on, and at times gives warning of what our policy should be.

A first requisite for real national prosperity, we should recall, is an increase in the volume of our foreign trade, both exports and imports. But also in line with our national prosperity is the tendency toward a relatively **larger** increase in **imports** than in exports. This tendency should not be unduly hindered; rather it should be permitted to play its part in adapting our economic life to our enlarged place in world trade and finance. As time goes on we may approximate and probably reach a commodity import surplus, i. e., in popular language an "unfavorable" balance of trade.

The changing volume and character of our trade in merchandising reflects changes in consumption, production, and finance. Increasing imports means not only a more diversified standard of living among our people, but it means the creation of dollars to pay for exports which, in turn, maintain employment and profits in factory and on farm and ranch.

In like manner the movement of capital is recorded in our balance of payments. The savings of American citizens seek investment overseas. They usually go abroad in the form of American goods produced by American labor, skill and manage-

Before The Propeller Club, Port of New York, Wednesday, April 24, 1946, Commodore Hotel, New York, N. Y.

ment. Economically, these dollars overseas are as much a part of our economy as New York dollars invested in the Middle West. They create jobs and enlarge the volume of commodity commerce both ways.

III

"Economic Liberty Without Any Inequality"

The second analysis which would begin any primer on foreign trade would be an analysis of the principles of economic liberty and equality of treatment.

In 1944 I was chairman of the Special Economic Mission to French North Africa and the Middle East. This assignment afforded my colleagues and me an opportunity to cite as a model for emulation economic liberty and equality of treatment as guaranteed by several treaties relating to Morocco. The Algeciras Convention of 1906, to which the United States is a party, provides for a regime of "economic liberty without any inequality." A part of this phrase which is usually emphasized is "without any inequality," that is, the "open door." The phrase, however, obviously has a broader interpretation. The words "economic liberty" should be construed apart from the amplifying phrase which follows it. It guarantees a policy of economic liberty applying not only to trade but to the internal economic development of the area.

I am pointing out these economic guarantees not merely because they are important for the strategic area which they directly govern, namely Morocco, but because they are a concrete application of principles which should govern throughout the world.

Our government's objectives for trade are set forth in "Proposals for Expansion of World Trade and Employment" (State Department, Nov. 1945). The document advocates joint action among the nations to remove restrictions which keep international trade small. In addition, the document has an implication which we must insist upon, in case international agreement fails. It implies that the influence and power of the American government should be used to assure to American economic interests abroad both equality of treatment and economic liberty; to assure American economic interests protection under accepted principles of international law. If the declared principles are desirable in a multi-lateral agreement, they are worthy of unilateral support in case other nations decline to cooperate in the removal of restrictions and barriers.

With this obligation of the American government to the American economic community in mind, let me mention several of the proposals:

1. The "proposal" relating to tariff preferences is important because the imperial and colonial preferences in the British and French Empires are among the most serious barriers to trade. They are often overlooked. Our government suggests that it should be agreed that:

"Existing international commitments will not be permitted to stand

in the way of action agreed upon with respect to tariff preferences.

"All negotiated reductions in most-favored-nation tariffs will operate automatically to reduce or eliminate margins of preference.

"Margins of preference on any product will in no case be increased and no new preferences will be introduced."

2. More serious as trade barriers than the mere non-discriminatory tariffs rates, which we maintain in our tariff act, are quantitative restrictions, export subsidies, and exchange control. The "proposals" concerning these barriers are that nations "should undertake not to maintain any quotas, embargoes, or other quantitative restrictions in their export and import trade"; that nations "should undertake not to take any action which would result in the sale of a product in export markets at a price lower than the comparable price charged for the like product to buyers in the home market, due allowance being made for differences in conditions and terms of sale, for differences in taxation, and for other differences affecting price comparability"; that nations with exchange restrictions "should undertake to accord to the trade of other members the equality of treatment with respect to all aspects of such restrictions required under the provisions of the Articles of Agreement of the International Monetary Fund."

3. The Department of State then, proposes that nations engaging in state trading "should undertake that the foreign purchases and sales of their state-trading enterprises shall be influenced solely by commercial considerations, such as price, quality, marketability, transportation and terms of purchase or sale."

Our Special Economic Mission to North Africa and the Middle East, to which I have referred, gave detailed attention to this question of state trading. In our unpublished reports my colleagues and I noted all the gradations of political support given by governments to economic activities, including government monopolies of foreign trade and production. We pointed out the way in which political power is used in the Middle East directly to help trade and declared that if the business community of the United States is to share in the trade and production of the Middle East, our traditional government "protection" is not sufficient. We emphasized that American economic activities cannot be carried on in the Middle East under one set of rules while competing interests are operating under a more advantageous set of rules. If Nations in world council can unite on an economic policy which will free trade and industry from the shackles of restriction and from a reliance on political power to promote trade and industry; if the international organization will make uniform an effective set of economic rules for all nations; then American business can take care of itself without active participation by the American Government. But the private individual, firm, corporation, or bank in the United States cannot compete unaided with the Russian State in the Middle East nor with British political and financial dominance.

I earnestly hope that under the leadership of the United States currencies may be stabilized, exchanges freed, excessive barriers lessened, direct controls and discriminations removed, genuine guarantees of most-favored nation treatment and national treatment secured by multi-lateral agreements, and a limitation placed upon the use of trade and industry as instruments of political policy. If the great powers reach such understanding, the smaller nations in the

Middle East (and elsewhere) will fall in line.

IV

Ships and Prosperity

Now, you are saying that I have hardly mentioned ships. Up to this point I am, in this respect, like certain others who overlook or take for granted ships in the discussion of economic policy! In fact, a certain high official in Washington gave vogue to the idea that we should not develop a merchant marine, so that foreign ships could earn dollars to pay for exports from the United States. I am a little impatient with this line of argument. Fortunately, it has been effectively answered, statistically and analytically. Moreover, I believe that it could be demonstrated that the little which our commodity export trade loses in financing from the carrying of American goods in American bottoms is made up many times over in the stimulation given to our trade in the world's markets by the coming and going of American ships. Ships have had in the past and they have today an indispensable place in a broad policy of national wealth and welfare.

Let me say a word about the past. Among the finest traditions in American history are the achievements of the old merchant marine. Beginning with the activities of colonial shipping our mariners continued to hold a prominent place in ocean carrying trade until the Civil War. In colonial days Americans, crowded into a narrow seacoast strip and limited in their interior development by lack of transportation, turned their energy to the sea and under the shelter of the British navigation laws, and the stimulus of their own ambition developed a lucrative trade with Africa and the West Indies. With the coming of the revolutionary days American seamen became privateers. They preyed upon British commerce and were important factors in bringing to successful issue the revolution. After the revolution they were excluded from many trade routes by the British navigation laws, but before the adoption of the Constitution, when there was as yet no Congress to adopt retaliatory navigation laws, American mariners began to open up new trade routes. The port of Salem became world famous for its ship-building and for its ships and their masters. Excluded from the old trade routes of colonial history, they sought new ports in far-off lands. American ships rounded the Cape of Good Hope and Cape Horn and established themselves in the trade with China. The period between the founding of our government and the War of 1812 was a trying one for American ship owners and American seamen. Indeed, it was the issues of that period, particularly the impressment of American seamen, that brought on the War of 1812. In this war the laurels won by American seamen more than offset the disastrous land operations. Again it was the privateers who contributed to the successes of American arms, for by 1815 they had freed the sea of many of the hindrances to shipping development. During this period the packet

and the clipper ships came into renown. The packet monopolized trans-Atlantic traffic throughout the forties. The graceful clipper became supreme on every sea and established records for speed of which even steam vessels might be proud. It was most conspicuous in the China trade, both with the United States and Great Britain, and in the trade around Cape Horn to California after the discovery of gold in 1849.

In 1835 De Tocqueville spoke of the initiative, courage, and enterprise of the men who owned and operated our ships. He said that "the Americans show a sort of heroism in their manner of trading."

And they show the same heroism in our day. In World War II the shipping industry was the only industry completely requisitioned. In meeting its national responsibilities it greatly strengthened its organization. Its initiative, efficiency and loyalty are recorded in a brilliant record of the operation not only of its own ships but of the fleet built by the Government. In World War II, as in World War I, as soon as ships were provided in large numbers, victory did not lag far behind.

We entered World War I weak in ships; we feverishly built ships and with them bridged the ocean. Between the wars we built new passenger ships and increased the number of lines but still we entered World War II weak in ships, particularly cargo ships. We again built and bridged not only the Atlantic, but the Pacific. Ships again carried millions of men and enormous quantities of supplies to the scene of battle. American supply lines became a mighty achievement of American ships, built by Americans and operated by Americans. How much we have learned from World War II is still uncertain. If another war comes, as well it may, we will not have time, after the conflict starts, to build up a merchant marine. In the two wars of the generation just past, the French Army, the British fleet, and the nature of warfare gave us time to prepare. Now, changing power positions of states and the swift moving instrumentalities of the new warfare warn us that in the next struggle we will not have time to catch up. A reserve of ships would not be enough; we must have the human reserve—men trained and ready, like the thousands who served in the merchant marine during the last war. Seeing the needs of the future in the light of past experiences, the leaders of our Army and Navy have, in recent months, underscored the necessity of maintaining merchant shipping; they have sounded the alarm against post-war indifference and inaction.

The Merchant Marine Act, 1936, declares that an adequate and well-balanced American merchant marine is necessary for national defense and the development of our foreign and domestic commerce. This policy is clear and persuasive. In implementing it we need a more vigorous administration and more open and affirmative inclusion of ships in the discussions of commercial policy and of our post-war naval power. We hear discussions of policies for imports and exports and for foreign investments but very little about the dynamic, creative power of ships in world trade. It is seldom emphasized that ships have a vital role to play in a permanent program designed to maintain prosperity and full employment. They, like trade, are interested in the removal of unfair restrictions. They suffer from unreasonable controls: for example, from the obligation to accept at times inconvertible sterling for their services. In competition with their foreign rivals they deserve government aid in removing this and similar barriers.

We hear also a discussion today of the several branches of the armed

forces but very little about an active merchant marine which is necessary to strengthen and sustain those forces during a war. Transport and supply — logistics, using the technical phrase—became the very essence of successful warfare in the recent conflict.

At the beginning of my remarks today I suggested that we need to clarify our large national objectives which determine the over-all approach to all groups and parties to world trade and shipping. With special emphasis I urge this approach when dealing with ships. Partisanship has no place here. We need to rediscover, if I may use the phrase again, the dynamic, creative power of ships; we need to rediscover in their prosperity, prosperity for all of our other varied economic activities within our far-flung economic frontiers. We need an unvascillating, affirmative government policy which supplements the spirit of enterprise and adventure in owners and operators with government support and cooperation whenever necessary to give to American ships the same protection and the same guarantees which we give to the things which ships carry.

V

Ships and Defense

In 1942, when, as Chief of a section in the Intelligence Branch of the Army (G-2), I took the first official step to formulate American geopolitics, I was looked upon with suspicion, even by many officers of the Armed Forces. But in recent years it has become more respectable to talk about power factors in international relations. One of these power factors is the merchant marine. In this remark I bring you to the threshold of the fascinating discussion of land power vs. sea power and the effect on both of air power and the even newer instrumentalities of warfare. You will find it worth while to follow up this discussion in the writings of Alfred Thayer Mahan, Sir Halford J. Mackinder, Fredrich List, Karl Hanshofer, Nicholas J. Spykman, and several living writers. Leaving their reading to your leisure hours, I will conclude my remarks this afternoon with the words of one of the greatest of the geopoliticians—Alexander Hamilton. He understood the place of ships in our national life. In 1787 in No. XI of the "Federalist" he speaks of "that unequalled spirit of enterprise, which signalizes the genius of the American merchants and navigators, and which is in itself an **inexhaustible mine of national wealth.**" He said: "There are appearances to authorize a supposition that the adventurous spirit, which distinguishes the commercial character of America, has already excited uneasy sensations in several of the maritime powers of Europe. They seem to be apprehensive of our too great interference in that carrying trade, which is the support of their navigation and the foundation of their naval strength." At this time Hamilton advocated "the establishment of a federal navy" "which, if it could not vie with those of the great maritime powers, would at least

be of respectable weight if thrown into the scale of either of two contending parties. . . . A price would be set not only upon our friendship, but upon our neutrality. . . . A nation, despicable by its weakness, forfeits even the privilege of being neutral.

"Under a vigorous national government, the natural strength and resources of the country, directed to a common interest, would baffle all the combinations of European jealousy to restrain our growth. This situation would even take away the motive to such combinations, by inducing an impracticability of success. An **active commerce**, an **extensive navigation**, and a **flourishing marine** would then be the offspring of moral and physical necessity. We might defy the little arts of the little politicians to control or vary the irresistible and unchangeable course of nature."

Alexander Hamilton having spoken, I will only add that sea-power is now as essential to our national security and prestige as it was in his day and that the nursery of sea-power is still an efficient, prosperous merchant marine.

Indian Hydroelectric Plant Planned

Terms and conditions for the construction of the Machkund hydroelectric project in India have been agreed upon by the governments of Madras and Orissa, according to the Office of International Trade, Department of Commerce. The project will harness the power of the Machkund River at the Doduma Falls where the river drops 550 feet. The development of 105,000 kilowatts of electricity is expected.

Seventy per cent of the cost, or an estimated $22,500,000 will be met by the Madras Government and 30 per cent by the Orissa Government. Representation on the Joint Board of Control will be proportionate to the capital contributed.

The Madras Government will be responsible for the construction and maintenance of the dam and hydroelectric installations and each Government will be responsible for the construction, maintenance and operation of the transmission lines and distribution systems in its own territory.

The project will require six years to complete, although it is hoped some power will be available within four years.

Fruit Processing Plant To Be Built in Costa Rica

The Ministry of Agriculture and Industries in Costa Rica has granted an exclusive five-year contract to local American interests in that country for the establishment of a plant for the production of quick-frozen and canned domestic fruits as well as fruit concentrates and flavorings for ice cream, according to the Office of International Trade, Department of Commerce. The factory will be constructed within a year near Puntarenas.

For the duration of the contract the Costa Rican Government grants duty-free importation of machinery, spare parts and accessories, fuel oil and lubricants, supplies and raw materials except for sugar, fruits, lumber and other items available in Costa Rica. In addition, the company has been given guarantees against the lowering of customs duties on imported products similar to those to be produced. According to the terms of the contract, 150,000 colones or $26,700 must be invested in the new factory with not less than 66 per cent of the cost of the finished products to be spent for Costa Rican labor and raw materials.

In accordance with Costa Rican law, 90 per cent of the plant's employees will be Costa Ricans.

Swedish Motorship Saga—
An Interesting New Passenger Liner

In May Gotaverken shipyard delivered to Swedish Lloyds the passenger motorship Saga whose general characteristics are given in the table herewith. This vessel will be used on the Gothenburg-London service of her owners. Much thought and effort has been expended in making her the most beautiful passenger vessel in the Swedish merchant marine.

Our illustrations give a faint idea of the elaborate interiors. Very lavish use of the talents of Swedish artists has produced unusual and very beautiful effects. The public rooms on the promenade deck and the dining room on the shelter deck are decorated with many murals and other forms of art. This lavish use of art is displayed in second and third class public rooms as well as in the first class apartments in a very conscious endeavor to "democratize" the passenger traffic between Sweden and England.

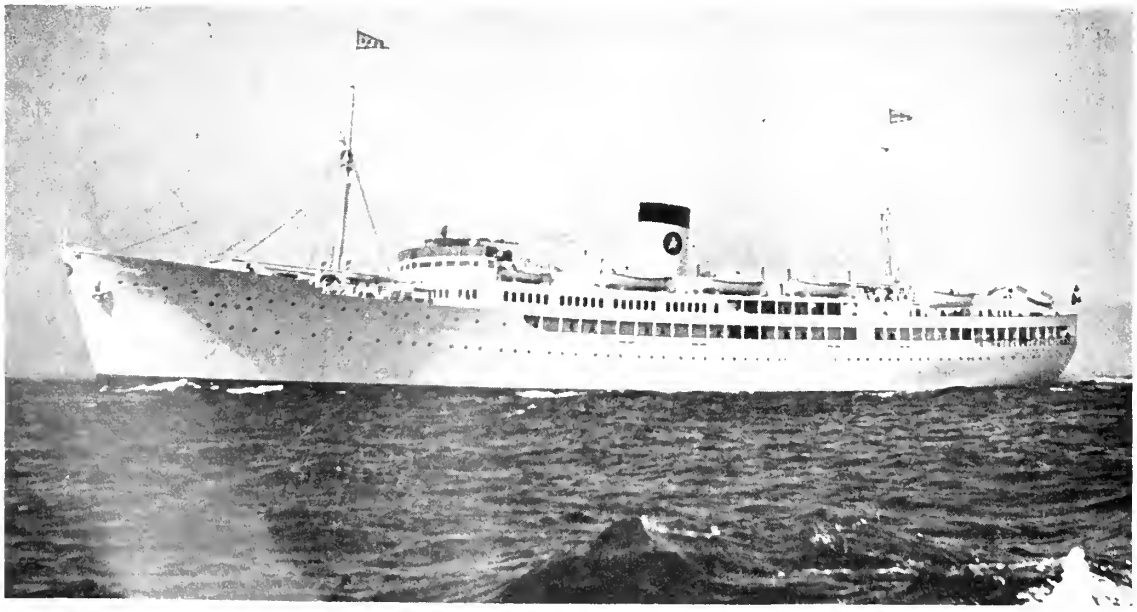
One of the most remarkable uses of art on the Saga is in the 2nd class entrance hall. The after mast passes through this hall and on the circular sheathing of this mast there has been created a very unusual piece of intarsia-work entitled the "World of the Swedish Saga." In this apartment there is also a large mural entitled "A Midsummer Night's Dream" showing a large number of British and Swedish historical and contemporary characters in amusing caricature.

The first class dining room seats 160 persons. This room is finished in mahogany. Smoking room is finished in English style in oak and has an open fireplace and comfortable chairs of dark oak upholstered in blue velvet. Next to the smoking room is the bar finished in blue, red and gold and decorated with a series of frescoes by Kurt Jungstedt depicting romantic motifs in scenes from the Swedish west coast. The bar connects with a dance rotunda. Forward of these rooms and extending aft on both sides, is a spacious lounge, furnished with overstuffed davenports and chairs in bright colors and equipped with large windows offering passengers an unobstructed sea view. The library and writing room in walnut are designed to create a silent, tranquil atmosphere.

The bedrooms are generally finished in mahogany and this wood is used even in some of the crew's quarters. Many of the rooms have private baths and there is lavish provision of baths, showers, toilets and lavatories for each class of passengers and for the crew. An interesting detail is the breakfast tray that can be let down on the touch of a button from the bulkhead above each berth.

For the interest of the passengers a relief map of the British Isles and Sweden and the course of the Saga is installed. On this map a small model of the Saga indicates progres-

Swedish passenger liner M. S. Saga.



sively the exact position of the ship.

Propulsion Machinery

Four medium speed Gotaverken diesel engines are connected to a single propeller shaft through electric slip couplings and gearing. These engines are of the trunk piston type permitting a comparatively low head room in the machinery space and allowing a very convenient and efficient arrangement of passenger accommodations in the decks above the space.

Saga is equipped with the most modern devices: for navigation, such as radar and echo sounding; for communication, such as ship-to-shore radio-telephone service; for ventilation, the entire ship being air conditioned; for cooking, the entire galley being electric; and for refrigeration, including four refrigerated cargo chambers. These services and all the pumps and the deck machinery are supplied with electric power by four diesel driven generating sets each capable of delivering 140 k.w.

Perhaps from the American shipowners' viewpoint the most interesting feature of the characteristics of this vessel is the small crew needed to take care of a luxury passenger vessel in comparison with American standards.

Section of first class dining saloon, M. S. Saga.

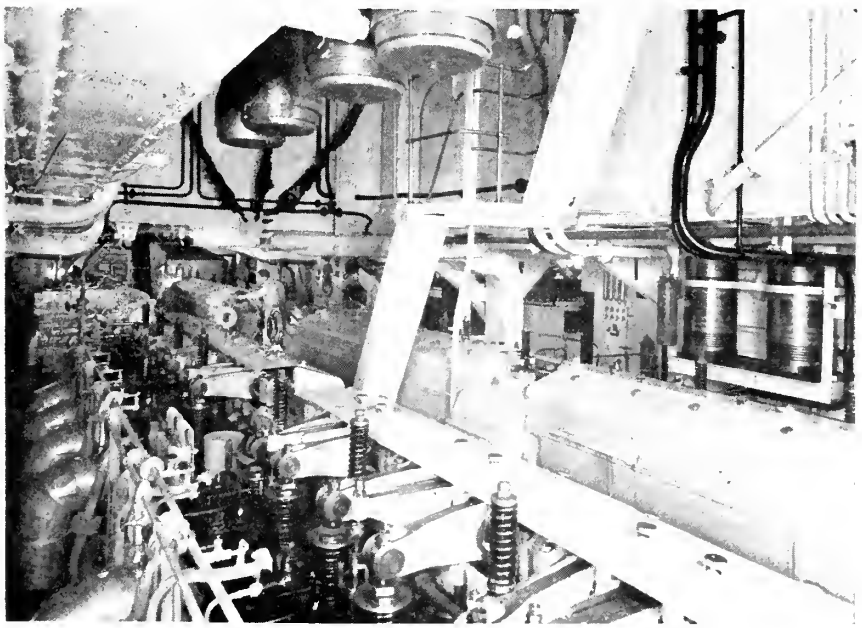
Saga takes care of 400 passengers with a crew of 99.

Under American standards Saga would probably be reduced in passenger carrying capacity to approximately 250 with a crew of 225.

Each of the American crew would receive, under present wage scales, double the wage paid to each of the Swedish crew and would be fed and housed on a much more lavish scale. Under pending demands of the CIO seafarers unions each American crew member would get at least three times the compensation paid a Swedish crew member.

This adds up to paying out for crew wages on such a ship from 4 to 7 times the Swedish wages on approximately 60 per cent of the Swedish revenue.

Upper platform of engine room of M. S. Saga, showing valve gear and cylinder heads of four Gotaverken diesel engines.



PRINCIPAL CHARACTERISTICS

Length Overall	420′ 10″
Moulded Beam	55′ 0″
Moulded Depth S.D.	32′ 11″
Gross Measurement	6,545 Tons
Cargo D.W. Capacity	2,150 Tons
Bale Capacity	136,000 Cu. Ft.
Passenger Capacity Total	400
1st Class	160
Crew	99
Propulsion Power	6,700 i.h.p.
Auxiliary Power	560 k.w.
Sea Speed	18.5 knots

Builders of the Future

OLD TIME PICTURES OF PRESENT DAY FOREIGN TRADERS

RENE MAY
President, Getz Bros. & Co.; Past President, Foreign Trade Assn. of S. F. C. of C.

GUY T. SLAUGHTER
Honorary Life Member, Foreign Trade Assn. of S. F. C. of C.; Pioneer in Philippine Trade.

PERCY R. MOTT
Foreign Freight Agent, Southern Pacific Co., and Member Executive Committee, Foreign Trade Assn. of S. F. C. of C.

WORLD TRAVEL IS WORLD TRADE

American civilian travelers, including businessmen seeking to re-establish world commercial ties, are estimated to have spent more than $300,000,000 for travel within foreign countries in 1945 and approximately $65,000,000 additional in international air and steamship fares, the Department of Commerce reports. This does not include expenditures by civilian personnel of the United States Government traveling abroad on official business, or stationed abroad.

Approximately $240,000,000 of the total spent abroad was expended in Canada and Mexico. Travelers in South and Central America and the Caribbean area spent $18,000,000 and the remainder was spent in various overseas countries.

In the six months following V-J Day, twice as many citizens left for Central and South America and the Caribbean as in the first half of the year, it was said. Departures to all overseas areas, including Latin America, showed a 50 percent increase during the same period.

Preliminary indications are that there will be no let-up in the increase in the numbers of Americans traveling abroad through 1946. However, most travel to foreign countries will be confined to the Western Hemisphere this year.

Foreign travel expenditures by Americans reached a peak in 1929 when $693,000,000 was spent, including the cost of transportation on American and foreign ships.

The Department of Commerce has estimated that American tourist expenditures may in a few years exceed $1,000,000,000 annually and that within 10 years, assuming a high level of economic activity in this country, these expenditures may increase to $1,500,000,000.

Pacific WORLD TRADE

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

To Engineers of the American Merchant Marine

Two questions face the younger and less experienced engineers:

1. Why is the Coast Guard placing more and more importance in greater knowledge of electricity?
2. Why is electricity so difficult to learn?

Ans.—1. The Coast Guard is constantly examining not only engineers but ships. They study casualties, ships' troubles, reports of all accidents, reports of engine room performance. They have found that the marine engineer's lack of real practical electrical knowledge has established a reluctance or fear in their minds which causes them to avoid minor electrical adjustments and normal maintenance.

Ans.—2. The almost total enclosure and increased complication of electrical machines and devices does not invite examination for study as does the steam engine or a system of pipes and valves. The wiring is not easily traced, it is all enclosed and scrambled up.

As difficult as it is for the engineer to advance himself in electricity, I firmly believe that the principal obstacle in electrical knowledge is not in electricity but in MAGNETISM. There must be more knowledge as to how these machines and devices work and what their characteristics are.

With this thought in mind I will devote the next series of articles to electro-magnetism, and deal with this subject on a rather advanced level but retaining the practical and engineering features only.

For elementary knowledge of magnetism I suggest the engineer read the well known text books on electricity which usually devote a chapter to magnetism.

Please bear in mind that all this is for the real purpose of studying electrical machines and devices.

Sincerely,
THE CHIEF.

Electro-Magnetism

The hyphenated word electro-magnetism is used, perhaps not correctly according to some standards, but to indicate two things.

(1) We are primarily interested in the magnetizing force of the electric current and not in permanent magnets or the earth's magnetic field.

(2) To show the intimate coupling between electricity and magnetism an association which is so close and real that the experienced electrical engineer never thinks of electric current without its associated magnetizing effect.

Force

The physical world is literally full of forces. Force is a tendency to cause motion. Friction restrains motion. If a force is permitted to cause a relative motion then the work done is the product of the force in pounds and distance moved in feet. If this work is being done regularly we customarily express the time rate at which it is done in horsepower, it being the force in pounds multiplied by the speed of motion in feet per minute and divided by 33,000.

$$\text{H.P.} = \frac{F \times d}{m \times 33{,}000}$$

F = force in pounds
d = distance in feet
m = time in minutes

It is easy for us to conceive a force of the steam on the piston or of the piston on the crank because we have solid and fluid matter in contact one pushing on the other.

It is not quite so easy for us to visualize the forces of tension which hold the particles of steel together in the piston rod when it is being pulled up by the piston. But we have grown accustomed to many forms of matter which permit forces of tension or pull without separation. There is always a little yield or give, but not separation. While we accept this tension force without too much question it is interesting to note that it is one of the many unexplained phenomena of atomic physics. Just why two atoms of iron hold themselves together with such a powerful pull we do not know.

It should be noted that it is possible to place more force on a body than it will stand, and it then gives way and separates.

There are other kinds of forces which exist in nature which do not require intimate physical contact. The force is transmitted through space between two or more bodies of matter without regard to what occupies the space between. This force may be a push or a pull (repulsion or attraction).

There are three in particular that are very important to the engineer:

(1) Gravitational force
(2) Electro-static force
(3) Magnetic force

Others might be referred to as centrifugal force. Also the force of acceleration (increasing speed of a body). We are principally interested in 2 and 3.

Gravity

Gravitational force is an attraction which exists between all bodies in the entire universe. Bodies of small or

moderate dimensions are attracted toward one another but the force is extremely small. A man standing on the dock is attracted toward the ship tied up to it. But the force of attraction is extremely small, it being about equal to his weight multiplied by the ratio of the weight of the ship divided by the weight of the earth.

Gravitational force F is proportional to the product of the weights (or masses) of two bodies divided by the square of the distance between them. Thus there is an altitude at which the weight of an airplane becomes less as it goes higher and higher. But because of the great size of the earth this altitude is very many miles.

However, small as these gravitational forces are it is still possible, using delicate instruments, to detect the horizontal pull of a mountain on a 10 pound ball, or the lack of pull or weight due to a large mass of oil thousands of feet below the earth's surface. The oil having a density of less than one, and the rock having a density of 4 to 6.

Electro-Static Force

Electro-static force exists between two or more bodies as an attraction or a repulsion.

This force is exerted when there is a difference of electric charge on two or more bodies. There are two kinds of electric charge, one called negative is created when rods or tubes of resin or plastic material are strongly rubbed with a woolen cloth. The other, called positive, is created when a glass rod is rubbed with silk. The charge exists on the resin or glass rod or tube. In other than dry air the charge leaks off too fast to be detected. This same charge is noticed on dry days when one walks across a woolen rug and touches a door handle with a spark and shock. Or when one combs the hair with a hard rubber comb the latter will pick up bits of paper. There are many such experiments. The cause of this electrification is not too well understood, except to say that the surface of the insulation (glass or resin rod) has some free electrons (particles of electricity) which are rubbed off in one case and added in the other.

When two bodies have opposite charges, one positive and one negative, they are attracted. When charged alike they are repelled or if not repelled, at least attracted to the surrounding objects more than to each other so that the net force appears to be repulsion.

The magnitude of the force between charges is proportional to the product of the two charges and inversely proportional to the square of the distance between them. Note the similarity to the gravitational force.

Magnetic Force

A force exists between two bodies in space if they exhibit the property of being magnetized or if electric currents are flowing in or about them. The exact nature of this force is not well understood but is well formulated for measurements and calculations. The force on the compass needle, the pull of the iron to a magnet, the movement of the electric meter, the torque of the motor, are all examples of this force.

Our next article will deal with some specific examples of magnetic properties.

Low Water and Soot Fire

In our May issue there appeared "Report on a Boiler Casualty on C-4 Vessel" in which a boiler fire was described, and precautions listed.

The following article on a boiler fire is from the proceedings of the Merchant Marine Council of the U. S. Coast Guard. Emphasis is placed on the importance of vigilance.

—Ed.

Our modern merchant vessels are fine ships; their boilers and complex machinery, along with being expensive equipment, permit more speed and cruising radius than ever before. Engine room personnel engaged in the operation of this highly modern equipment must, therefore, be better versed in the operational fundamentals of modern propulsive machinery than was necessary prior to the advent of such equipment. In order to assure smooth and efficient functioning of modern machinery and boilers, it is mandatory that engineering personnel combine technical knowledge with practical experience to become skillful in the operation of this highly modernized equipment.

This article proposes to illustrate the important and influential part engineering personnel play in the efficient operation of any merchant vessel, by setting forth the details surrounding the complete destruction of a boiler on a Victory type vessel which can be directly traced to lack of thorough familiarity and intimate acquaintance with the operating principles involved in this casualty.

This particular vessel had just completed a long voyage and, while moored at a pier of a large shipyard, was undergoing some minor repairs. Upon the arrival at the shipyard, the starboard boiler was "secured" in order that it could be cleaned in preparation for boiler inspection. On the following day, the engineering personnel worked in the engine room effecting necessary repairs, and at 5 p. m. the night engineer arrived and took over the night duties. Everything went along satisfactorily until about 9 p. m. when it was reported to the night engineer that the starboard boiler was flooding and water was running out of the vent valves on top of the boiler drum. The night engineer immediately found that the feed valve was only partly closed on the supposedly "secured" boiler, and some difficulty was experienced in closing this valve; however, he was able to close it sufficiently to stop the flow of water. Thereafter things went along smoothly until 3 a. m., at which time the oiler notified the night engineer

that the water was low in the deaerating heater and also that the vacuum on the auxiliary condenser was low. The night engineer then started to recirculate water through the condenser and take extra feed. However, the water level in the deaerating heater remained low, and, at 4 a. m. the night engineer sent the oiler to call the first assistant engineer to the engine room. The first assistant immediately came to the engine room and proceeded to help the night engineer put the plant back into normal operation. At about this time, the night engineer checked the vacuum and found it to be approximately 10 inches. This indicated to the first assistant engineer that the plant was returning to normal operation, and at approximately 4:35 a. m. the second assistant engineer was sent for to take over, and help the night engineer with the plant. The first assistant engineer then returned to his room and went to bed as he had been up the entire preceding day attending to necessary repair work.

Shortly after the second assistant arrived in the engine room, the vacuum on the auxiliary condenser was lost entirely and the generator kicked out, blacking out the entire ship. At the same time, the feed pump and fuel-oil pump stopped, and the steam pressure on the port boiler was lost.

The night engineer and the second assistant then put the Diesel-driven emergency generator into operation and proceeded to start up the plant by use of the cold-starting arrangement. At this time, both of these men checked the water level in the water glass and stated that it was full of water. Two fires were lighted in the port boiler, using Diesel oil and the hand pump to supply the required pressure. After the fires had been lit for approximately 20 minutes, and the steam pressure raised to 40 pounds per square inch, an explosion was suddenly heard inside the boiler, accompanied by a hissing sound. The fires were "secured" and it was then discovered that there was a soot fire in the tube banks. The second assistant then called the chief engineer at his home and notified him of the trouble. The chief engineer arrived aboard at approximately 10 a. m. and, after inspection of the plant, found the boiler to be too hot to approach closely as the soot fire was still burning and continued to burn until approximately 7 p. m. Subsequent examination revealed that the boiler was completely destroyed.

In this case it is evident that the engine room personnel acted in a manner totally contrary to good-engineering practice. In the first place, they failed to "secure" properly the starboard boiler, as was evidenced by the discovery that one of the feed water valves on this boiler was left slightly open. This permitted the feed water to be discharged into the idle boiler. Second, after losing steam on the port boiler, they failed to make certain as to whether or not the boiler contained sufficient water before proceeding to "light off" the fires preparatory to raising steam. They "assumed" the water glass to be full. This action alone represents carelessness in its most glaring form. If the engineers had only ascertained that the boiler was adequately filled with water by the usual checking methods long practiced by experienced engineers, and had then continued to maintain sufficient water in the boiler, the complete destruction of this vital steam generator would never have resulted.

Heavy deposits of soot and carbon on the tubes is a sign of incomplete combustion. They can be caused by:

(a) Incorrect oil temperatures and pressure.

(b) Incorrect adjustment of atomizer and the use of atomizer tips or sprayer plates of improper size.

(c) The continuous use of dirty burners.

(d) Excess or insufficient air for proper combustion.

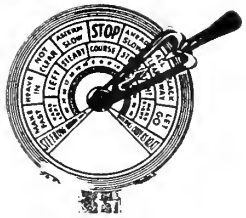
The problems of combustion control are many and varied and therefore the subject is lengthy and cannot be covered completely in this article. However, assuming that the boiler is correctly designed as regards size and shape of furnace, arrangement of the tube banks, size and form of the uptakes, and location of the burners, correct combustion is then largely a matter of proper operation. Heavy deposits of hard carbon are sometimes caused by excess air entering around the cone of oil, thereby cooling the flame down so that combustion is not obtained until the spray has passed some distance back in the furnace. As a result the particles of oil forming the outer surface of the oil cone strike the furnace bottom, side walls, or tubes near the front, thus being cooled below the combustion temperature. The heat causes a break-down of the hydrocarbons and carbon residue adheres to the surface as a solid mass. Since this carbonization is frequently experienced with light grades of oil, and, since a heavy soot deposit readily absorbs moisture, in this case, the crew, in their hasty attempt to raise steam evidently failed to provide proper atomization for the light grade Diesel oil used and incomplete combustion resulted. Actually unburnt particles of light oil were forced into the tube banks, impregnated the soot, and also adhered to the carbon deposits on the tubes, furnace sides, and bottom. The climax was the complete destruction of the boiler.

Proper maintenance of the material condition of boilers and their steaming efficiency depends upon frequent and thorough removal of soot. Accumulations of soot, especially in closely spaced tubes, soon pack down in a mass which is beyond the capacity of the soot blowers to remove entirely and, when this condition is permitted, this accumulation can only be removed by hand cleaning. Therefore, in order to maintain the fire side of boilers in proper condition, the frequent and regular use of properly installed and maintained soot blowers is necessary. Particular care should be taken in the adjustment of the soot blowers to take care of change in relative position between the tubes and wall in a horizontal direction, as the full effectiveness of the soot blower can be realized only when the steam jets are properly lined up with the tubes. One of the principal functions of the engineer is the personal instruction of the operating force in the proper operation and maintenance of soot blowers. This will tend to correct any faulty practice on the part of the operators.

In conclusion, casualties such as this one are the fault of the operating personnel. Prevention of this type of casualty can come only from increased vigilance on the part of those in immediate charge of the engine room, and by implanting in the minds of the engineering personnel aboard these vessels a full realization of their duties and personal responsibilities. The serious consequences likely to result from "errors" in performance should be brought to their attention.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE SEXTANT

Chapter V

How to Determine Amount of Index Error

What Sights Give the Observer

To Determine Amount of Index Error

In using the Micrometer Endless Tangent Screw Sextant, determination of the amount of index error is very simple. After having brought the true and reflected sea horizons into one straight continuous line in the horizon glass, as described in the previous chapter, read the sextant. If the index error is on the arc, the sextant reading will be the index error.

If the index error is off the arc, where the index error is less than 60 minutes (and don't use a sextant which has an index error of more than 3 minutes), read the sextant and subtract the reading from 60. The result will be the index error off the arc. Suppose, for example, that your index error is "off the arc," and the micrometer wheel reads 58 minutes, 30 seconds. Simply subtract 58′ 30″ from 60′ 00″, and the result is your index error off the arc—1′ 30″.

In using the vernier sextant the same procedure is followed. If the index error is on the arc, the sextant reading will be the index error. If the index error is "off the arc," simply read the sextant and subtract the reading from the number of minutes on the vernier. For example, if, as in Fig. 14, the vernier is 10 minutes in length, and your reading is 7′ 40″, simply subtract this 7′ 40″ from 10′, with the result that your index error is 2′ 20″ off the arc.

What Sights Give the Observer

"To sight" is to look at an object with care, and from this definition has been derived the seaman's expression to "take sights." Taking sights is the nautical term for carefuly observing one or more of the heavenly bodies with a sextant in order to determine the position of a ship at sea. As this is done several times each day when out of sight of land, it becomes a highly important part of a ship's routine.

While the actual taking of an observation is very simple, the results achieved thereby are considerable. It may be helpful to the reader to see exactly what is done when the ship's officer "takes a sight."

Now an observer on a ship looking around sees a small circle bounding his view, and this apparent meeting place of the sea and the sky is called the sea horizon. This appears to him to be flat and he sees it for the whole 360° of the circle bounding his view. Looking skyward he sees one-half of the heavenly world—called the Celestial Concave—180°, in fact, from any one point of the horizon to the opposite point. In the day time he may see the sun or the moon, either or both; and by the use of a telescope he may see one or other of the planets Venus or Jupiter. These are all the heavenly bodies he has at his disposal during the hours of daylight.

During the nighttime, however, from dusk till dawn, the navigator may or may not have the moon; some of the four planets Venus, Jupiter, Mars and Saturn are generally visible; and he has some fifty odd stars which he may bring to his aid from which to "take sights." Having decided which heavenly body to use, all that the navigator has to do is to use the sextant to measure the angle between the sea horizon, generally called the visible horizon, and the center of the observed body. Now this angle—taken with a sextant—of a heavenly body above the sea horizon is called its altitude, and because various corrections have to be applied later to this, the actual altitude read from the sextant is known as the observed altitude. You should refer to Fig. 16 as an illustration of what the sextant actually does. The index mirror and horizon glass are shown, also the arc of the sextant; the sun is shown in the heavens, and as this may actually be seen with the naked eye it is known as the true sun.

If the observer places his eye at the end of the telescope in the sextant, and looks directly towards the horizon, when he has moved the index arm 30° from zero (0° on the arc), owing to the sextant being an instrument of double reflection, he has really made the angle at his eye 60°, and as this is the altitude of the sun, he should just see the reflected sun on the horizon. Right here it should be pointed out that the direct image as seen in a sextant is that image seen through the unsilvered part of the horizon glass (through the clear glass which forms the upper part of the horizon glass). In this case in Fig. 16, the direct image is the sea horizon, while the reflected image, in this case the sun, is that seen by double reflection from the index mirror and horizon glass.

The only other important point for the mariner is the imaginary one directly overhead to an observer, called his zenith—which is naturally 90° from any point of the horizon. It can be realized, therefore, that the altitude and the distance from the body to the zenith (called the zenith distance) are complements, or, in other words, the altitude and zenith

distance being measured on either side of the body from the horizon (0°) to the zenith (90°) must between them always equal 90°. Thus in Fig. 16 the sun's altitude being 60° (actually measured) gives the zenith distance (not measured, but theoretical only) as 30°.

It was stated that the observed altitude was the angle of the center of the body above the sea horizon, but as the sun, moon, and planets each have a perceptible disk their centers cannot be observed accurately. The part of the circumference which we actually observe is one of the edges called the limb; thus in Fig. 16 an observation is being taken of the sun's lower limb; we say we take an "observed altitude of the sun's lower limb," sometimes abbreviated to "Obs. Alt. Sun's L. L." On certain occasions the sun's upper limb is used. Whichever limb is used it is important to record this information in the sight's notebook, because when the time comes to make the various corrections to the observed altitude, it depends on which limb of the sun has been observed, whether the correction for semi diameter (i.e., half the sun's diameter) is to be added or subtracted.

The moon's enlightened limb is always observed, and here again we may use either the moon's upper limb, or the moon's lower limb. Also, the correction for semi diameter is applied according to which of the moon's limbs has been observed.

A planet's semi diameter is so small that it may be neglected in sea work, so when taking an observation of a planet, to obviate any correction for semi diameter the sea horizon should be made to to cut through the center of the planet.

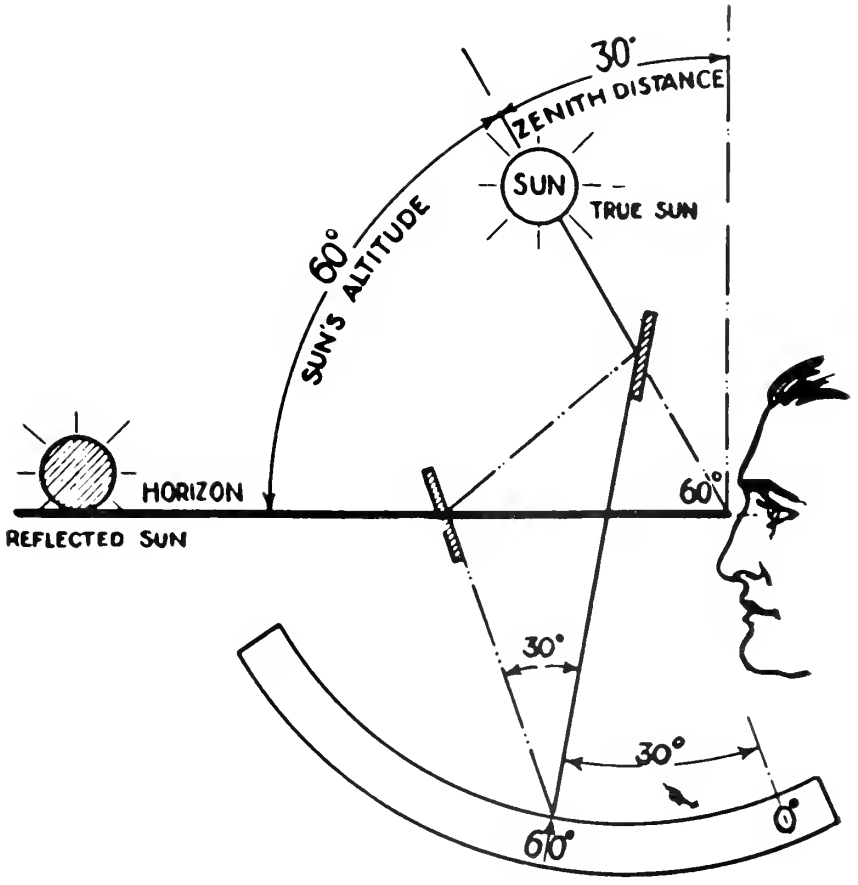
Owing to the earth's daily revolution all the heavenly bodies appear to rise in the east and slowly increase in altitude until a certain point is reached; they then decrease in altitude until they set in the west. This fundamental movement is going on all the time, though clouds may obscure the heavenly bodies and daylight, of course, makes it impossible to see the stars at this time.

If an observer faces true north or south at sea, then an imaginary line running from the true North Pole to the true South Pole passing directly overhead through his zenith is called a meridian—in this case being known as the observer's meridian. Now this imaginary line marks the point when the altitude of a heavenly body ceases to rise and commences to fall, or in other words, when it ceases to bear easterly at all but bears exactly north or south of the observer before starting to bear westerly. Now when a heavenly body reaches the observer's meridian, it is said to culminate, and at culmination attains its greatest altitude. The time of culmination is called the time of transit, and thus the Nautical Almanac will tabulate the "Times of Transit of Heavenly Bodies"—meaning the time of the passage of the body over the observer's meridian. More generally, however, seamen refer to this time as the time of a body's meridian passage. At any rate, these expressions all have the same meaning.

Right here it should be remarked that the altitude of a body depends on the position of that body and the position of the observer in relation to it. All bodies have an altitude of 0° at rising and setting, but their altitude at the time of meridian passage depends on whether the body will pass almost directly overhead of an observer or a long way north or south of him.

From the foregoing it will be seen that there are two distinct types of "sights"—one taken when the body is moving—rising or falling—called simply an observed altitude; and the other taken when the body is stationary—called a meridian altitude, and we have seen that this occurs whenever a heavenly body crosses the observer's meridian—hence the name.

The speed of the body's movement and the length of time it is stationary on the meridian depends entirely on the relative positions of the observer and the body. For example, when the declination (i. e., Celestial Latitude) of the body is about the same as the observer's latitude, the sun has a long way to climb, because it will be nearly overhead with a meridian altitude of about 90° at transit. It will thus appear to rise and fall rapidly and will remain stationary at transit for a matter of seconds only. On the other hand, if the observer is in, say, 60° North Latitude, while the sun is on the Equator, the meridian altitude at transit will be about 30° only, so the rise and fall will appear to be very slow and the sun will appear to "stand still" at transit for several moments.



Pacific MARINE REVIEW

Washington Digest

The Pay Raises

Frank J. Taylor, chairman of the Negotiating Committee for the General Agents of the War Shipping Administration on the Atlantic and Gulf Coasts, issued a statement relating to the recent wage settlement in which he said:

"The terms imposed by the Government bring the pay of seamen on U. S. flag ships to a level of approximately 135 per cent above that in effect in January, 1941. This compares with the total increases which have been granted in the other basic industries of approximately **50 per cent.**

"Under the new increases ordered by the Government, the wages of an able seaman will have advanced 137 per cent since 1941; for a messman 162 per cent, and a wiper, 162 per cent.

"The new increase amounts to about $51 per month for each seaman or an increase of approximately 30 per cent over present wages.

"The wage bill on American ships, both Government-owned and privately-owned, will now be approximately four times the average existing on comparable ships under the flags of the other principal maritime nations. Using the Liberty ship as an example, the month basic wage bill under various flags will now be as follows:

Flag	Monthly Wages
British	$ 2,735.00
Norwegian	2,463.75
Dutch	2,417.85
Belgian	2,389.50
Greek	2,150.00
United States	10,184.00*

*Estimated.

"The United States Treasury can doubtless bear this burden on Government-owned ships, but it remains to be seen for how long privately-owned ships under the American flag can survive against competition under the staggering handicap now imposed upon them."

Essential Foreign Trade Routes and Services Determined By Maritime Commission

Aimed at charting a "course to an American Merchant Marine which will adequately serve the foreign commerce of the United States," a report on "Essential Foreign Trade Routes and Services Recommended for United States Flag Operation" was adopted May 20 by the United States Maritime Commission and made public May 21, 1946. The Commission's report differed in some details with the proposed report of the sub-committee on Trade Routes of the Commission's Post-War Planning Committee.

Services recommended, the Commission report emphasized, contemplate a privately-owned and operated merchant fleet, and Government aid will be accorded in cases where it is found necessary to maintain adequate United States flag service on essential foreign trade routes, although the Commission would prefer that the private operations be conducted without subsidies. It was added that the **Commission is prepared to grant such a subsidy even though one or more United States flag lines already are in the trade involved,** if such action is found necessary to provide adequate service.

Thirty-one trade routes are provided for in the Commission set-up, with some of them broken into two sections, and in one instance two trade routes being combined. Major differences from the report proposed by the Trade Route Subcommittee are in connection with the services proposed to be operated on the various trade routes, one principal change being in connection with service from Gulf Coast ports of the United States to the Far East, which is provided for in a separate service, whereas the subcommittee had recommended a combination of Atlantic and Gulf ports' service to the area.

In addition, **the Commission report provides for a service from the Pacific Northwest (Washington and Oregon) to Manila, Hong Kong, Straits Settlements and Calcutta, with return to the Pacific Northwest ports via California ports.** This service was not provided for in the subcommittee report. Another major change from the subcommittee recommendations involves the Gulf-Transatlantic service, operating to the United Kingdom and Continental Europe. In this trade, the Commission apparently took cognizance of the pre-war division of trade between two Gulf Coast carriers, with one operating from the East Gulf area and the other from New Orleans and Texas ports, a division which the subcommittee report had not included.

Service is provided on one trade

(Continued on Page 99)

Admiralty Decisions

By Harold S. Dabbs

of the San Francisco Bar

Demise[1] or Affreightment[2] — A Charter Question

A charter carriage is distinguished from common carriage by the fact that the charterer engages the whole of the ship's capacity. Chartering, however, is broken down into two general forms: the demised ship under which the charterer mans her and operates her himself; and the contract of affreightment in which the owner continues in possession and manages and operates her. The differences in liabilities between charterer and owner, and between them on one side and third parties on the other are vitally affected by the type of charter. As between the owner and the charterer, the owner's general duty is to supply a proper ship and, if there is an affreightment charter, also to operate it efficiently; the charterer's duty is to pay for its use and, if there is a demised charter, to care for and preserve the vessel. With this general analogy of the types of charters, it is easier to understand the significance of the decision of the **Santa Martha** (1946 A.M.C. 672, C.C.A. Fifth), in which the Libelee, Oscar Abello Ameller, a citizen of the Republic of Cuba, and the owner of the M/V Santa Martha, chartered his vessel to the Mantanzas-Florida Line, S. A. (hereafter called the "Line"), a corporation under the laws of Cuba, under an agreement, in substance, whereby the owner was to be compensated for the use of the vessel by one-half of its net earnings. No right to navigate or to direct or to control the vessel, or to restrict it in its operations, trade, or traffic was reserved to the owner.

While being operated under said agreement by the Line in the carriage of gasoline for the libellant from Port Everglades, Florida, to the port of Nuevitas, Cuba, the vessel and most of its cargo were lost. The Line being in bankruptcy, and the vessel being lost, the shipper, getting process by foreign attachment, sought to obtain a judgment **in personam** against the owner for the value of the lost cargo.

Libellant claimed that the contract between the owner and the Line was one of affreightment under which the owner of the vessel was liable for the lost cargo. Libellee contended that the contract between him and the Line was a demise whereby the entire control, management, operation, navigation, and use of the vessel was in his lessee. It was conceded by libellant that in the event the contract was a demise, and not a contract of affreightment, it could not recover.

The lower court was correct in holding that the contract was a demise and not a contract of affreightment. The mere fact that the owner was to be compensated by a percentage of the profit does not make him a copartner or a joint adventurer with the Line. In the absence of a showing that the owner retained some right to direct and control the operation of the vessel the agreement should be held to be a demise, and in the absence of an agreement to be responsible for losses occurring in its operation he should not be construed to be a partner or joint adventurer. In **United States** vs. **Shea** (152 U. S. 179), the court said:

> "No technical words are necessary to create a demise. It is enough that the language used shows an intent to transfer possession, command, and control."

The contract between Ameller and the Line several times used such language as "gives in rental to said company the boat," "the renting company," "sign the name of this company to rental contracts for boats," in view of which, and in the absence of any proof of the retention of, or exercise of, command, direction, and control of the vessel, as did the lower court, that the charter was a demise rather than a contract of affreightment.

The decree of the lower court was affirmed.

[1]Demise: A transfer of a right or dignity. The use of the word in connection with the transfer of the crown on the death of the sovereign has led to its wrongful use for "decease."

[2]Affreightment: The contract by which a ship is hired to carry goods.

Responsibility Under a Ship-Agency Contract

During the course of the war and particularly the year 1945, personal injury suits have been instituted in federal and state courts throughout the nation naming general agents of the United States as respondents and defendants. Each of these suits arise out of an injury suffered by a seaman or longshoreman injured aboard a ship or immediately adjacent to it. The theories of agency have been explored from time to time in these cases and the courts have more or less reached a line of demarcation in the respective liabilities of the agents and the owners who were, during the war in 99 out of 100 cases, the United States. The courts have given considerable weight to the terms of the particular general agency agreement entered into between the agent, who is usually a steamship company, and the United States as owner of the vessel. In the recent case of **Caldorola,** Respondent, vs. **Moore-McCormack Lines, Inc.,** Defendant, impleaded with the partnership of Thor Eckert & Co., Defendants-Appellants, N. Y. Supreme Court, Appellate Div., 1946 A.M.C. 628. Plaintiff received a judgment in his favor which was subsequently reversed by this court. The facts are as follows:

The Plaintiff, a longshoreman, while engaged in unloading cargo, was injured by a fall of a defective boom on the steamship Everagra. The vessel was owned by the United States. Defendants-appellants had a contract with the United States, designated as a General Agency contract, whereby they were appointed "agent to manage and conduct the business of vessels" assigned to them by the United States, including the Everagra.

The contract provided that defendants-appellants were to conduct the business in accordance with directions, orders and regulations issued by the United States. The "business" included the vessels' trade, collecting and accounting therefor, equipping, victualing, supplying and maintaining

the vessels, inspecting and advising the United States with respect to the state of repair and condition of the vessels, and arranging for their repair.

As to operation of the vessels, the contract provided that defendants-appellants should procure a master who "shall be an agent and employee of the United States, and shall have and exercise full control, responsibility and authority with respect to the navigation and management of the vessel"; that they "shall procure and make available to the Master for engagement by him the officers and men required by him to fill the complement of the vessel," the officers and members of the crew to be subject only to the orders of the Master.

The regulations of the War Shipping Administration, to which defendants-appellants' conduct of the business was subject, provided that they shall "determine the repairs necessary," and arrange for and order the performance of required repairs, with or without prior approval of the Repairs Division of the War Shipping Administration, depending on whether the expenditures shall exceed $10,000.

Plaintiff might, of course, proceed against the United States in the Federal Court in Admiralty, where he would not be entitled to a jury trial, but brought this action against the agents in the State Court, where he could have a jury trial, on the theory that they were negligent in not repairing the defective boom and that such negligence gave rise to a cause of action in plaintiff's favor. Concededly, they had not supplied the boom and their alleged negligence was failure to repair the boom. Defendants-appellants contended that any failure on their part to repair the boom was only a breach of contract as to the United States and was not actionable negligence as to plaintiff.

Plaintiff agreed, perforce, with defendants-appellants' major premise that he may not avail himself of their breach of contract with the United States, but must bottom his cause of action on a showing of their control of the instrumentality causing the injury. (**Cullings** vs. Goetz, 256 N. Y. 287.) The question, therefore, was whether they had such control of the boom as to incur responsibility to one in plaintiff's position for the condition of the boom.

Defendants-appellants were not vested with management or operation of the ship. Their contract with the United States made it clear that their functions related to the ship's "business" as distinguished from its physical operation. They were not in control of the ship itself. That was vested in the master as the agent of the United States and not as agent of defendants-appellants. They had no control over the use or operation of the ship machinery, such as the boom, on the occasion of this injury. They had access to the ship and had a contractual duty to the United States of inspecting and determining the necessity for repairs and arranging for the making of repairs.

Plaintiff regarded defendants-appellants' access to the ship and their authority to order repairs as sufficient control to imply a responsibility for the condition of the ship to persons on the ship in connection with the ship's business. The court failed to agree with plaintiff's interpretation of their authority to order repairs as sufficient to impose a responsibility. The defendants-appellants did not in fact have control of the ship or its machinery, and the opportunity and duty which they had to order repairs were contractual only and related only to the United States. They were not the equivalent of control or a substitute for control in relation to the public.

The defendants-appellants had not supplied the boom nor done anything to render it defective. Their failure to observe its condition and order its repair was strictly non-feasance. The distinction between misfeasance and non-feasance may be unimportant as related to one in control of property who has a responsibility, arising out of control, for the condition of the property, and whose failure to repair a dangerous condition may be regarded as negligent operation of the property and as actionable as his creation of the condition; **not so of one not in control and not having the public responsibility for the condition of the property. Non-feasance on his part is not actionable except as to one to whom he has incurred an obligation of action.**

The principal legal authority advanced by plaintiff in support of his position is **Brady** vs. **Roosevelt S. S. Co.** (317 U. S. 575, 1943 A.M.C. 1, 299). The agency contract in that case was very different, however, requiring the agent to man and operate the vessel.

The court indicated that it was unable to tell from the reported decisions of the Appellate Division, Second Department, in **Pedersen** vs. **Stockard Steamship Corp.** (1945 A.M.C. 23, 268 App. Div. 992), and **Pipitone** vs. **Standard Fruit & S. S. Co.** (New York Law Journal, p. 988, March 12, 1946), whether the alleged negligence of the agent in those cases consisted of furnishing defective equipment or failing to repair defective equipment. Reading the two decisions together, however, the court gathered the impression that the other court meant to indicate a view that non-feasance of the agent, under the contract involved in the present case, would be actionable. The New York cases cited in the **Pipitone** opinion are **Mollino** vs. **Ogden & Clarkson Corp.** (243 N. Y. 450), in which the agent had taken "sole and absolute control" of the property, and **Moch Co.** vs. **Rensselaer Water Co.** (247 N. Y. 160), where the court held the defendant not liable for non-feasance, pointing to the distinction between launching an instrument of harm and failing to become an instrument for good.

Defendants'-appellants' duty to repair here was a duty owing only to the United States and arising out of contract. Plaintiff cannot avail himself of the contract, and having failed to show that defendants-appellants had such control of the ship or boom to make them publicly responsible for the condition of the ship or boom, plaintiff failed to establish that defendants-appellants were under any duty to plaintiff to repair the boom or that their failure to make the repair was any breach of duty owed to the plaintiff or gave rise to any cause of action in plaintiff's favor.

The court stated that judgment should be reversed with costs, and the complaint dismissed with costs.

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route in the Commission report from all Atlantic ports in the Maine to Key West range to the West Coast of South America, although the subcommittee had included in its recommendation only service to the South American area from New York.

Subsequent to submission of the proposed report of the Trade Route Subcommittee, that proposal was referred by the Commission to members of the industry for comment and suggestion. The changes made in the Commission report are said to have resulted from comments by the carriers concerned in the various routes.

Text of the Commission report follows:

"The Maritime Commission is directed by the Merchant Marine Act of 1936 to study, perfect and adopt a program for the operation of an adequate and well balanced merchant marine fleet to provide shipping services on all routes essential for maintaining the flow of the foreign commerce of the United States.

"The peace-time functions of our merchant marine are now being resumed. To what extent can our present fleet be used to provide shipping services on routes essential for maintaining the flow of the foreign commerce of the United States and what specially built vessels will be required to reach the goal of a well balanced fleet? The initial step toward reaching an answer is to determine the routes which are essential. The second step is to consider the services to be provided over these routes.

Essential Routes

"As a result of extended study and investigation, giving full consideration and due weight to the factors prescribed by the Merchant Marine Act, 1936, the United States Maritime Commission has determined and hereby declares that the following trade routes are essential within the meaning of the Act for the promotion, development, expansion and maintenance of the foreign commerce of the United States:

"Trade Route No. 1—U. S. Atlantic ports (Maine-Key West inclusive)—East Coast South America (Brazil, Uruguay, Argentina).
"Trade Route No. 2—U. S. Atlantic ports (Maine-Key West inclusive)—West Coast South America (Chile, Peru, Ecuador and the Pacific Coast of Colombia).
"Trade Route No. 3—U. S. Atlantic ports (Maine-Key West inclusive)—East Coast of Mexico.
"Trade Route No. 4—U. S. Atlantic ports (Maine-Key West inclusive)—Caribbean ports.
"Trade Route No. 5—U. S. North Atlantic ports (Maine-Cape Hatteras inclusive)—United Kingdom and Eire.
"Trade Route No. 6—U. S. North Atlantic ports (Maine-Cape Hatteras inclusive)—Scandinavian, Baltic ports.
"Trade Routes Nos. 7 & 8—U. S. North Atlantic ports (Maine-Cape Hatteras inclusive)—Antwerp, Hamburg Range.
"Trade Route No. 9—U. S. North Atlantic ports (Maine-Cape Hatteras inclusive)—Atlantic France and Northern Spain (French-Belgian Border south to Northern Border of Portugal).
"Trade Route No. 10—U. S. North Atlantic ports (Maine-Cape Hatteras inclusive)—Mediterranean, Black Sea, Portugal, Spain (South of Portugal), Morocco (Casablanca to Tangiers).
"Trade Route No. 11—U. S. South Atlantic ports (Cape Hatteras-Key West inclusive)—United Kingdom and Eire, Continental Europe (North of Spanish Border), Scandinavian and Baltic ports.
"Trade Route No. 12—U. S. Atlantic ports (Main-Key West inclusive)—Far East (Philippine Islands, China, Manchuria, Korea, Japan, U. S. S. R. in Asia, French Indo China, Formosa and Siam).
"Trade Route No. 13—U. S. South Atlantic & Gulf ports (Cape Hatteras-Texas inclusive)—Mediterranean, Black Sea, Atlantic Spain, Portugal, Morocco (Casablanca to Tangiers inclusive).
"Trade Route No. 14—U. S. Atlantic & Gulf ports (Maine-Texas inclusive)—West Coast of Africa (from Southern Border of French Morocco to Cape Frio) and Madeira, Canary, Cape Verde and other Islands adjacent to the West African Coast.
"Trade Route No. 15A—U. S. Atlantic ports (Maine-Key West inclusive)—South and East Africa (Cape Frio-Cape Guardafui) and Madagascar.
"Trade Route No. 15B—U. S. Gulf ports (Key West-Mexican Border)—South and East Africa (Cape Frio-Cape Guardafui) and Madagascar.
"Trade Route No. 16—U. S. Atlantic & Gulf ports (Maine-Texas inclusive)—Australia, New Zealand, New Guinea and South Sea Islands.
"Trade Route No. 17—U. S. Atlantic & Gulf ports (Maine-Texas inclusive)—Straits Settlements, Netherlands East Indies.
"Trade Route No. 18—U. S. Atlantic & Gulf ports (Maine-Texas inclusive)—India, Burma, Persian Gulf and Red Sea.
"Trade Route No. 19—U. S. Gulf ports (Key West-Mexican Border inclusive)—Caribbean ports.
"Trade Route No. 20—U. S. Gulf ports (Key West-Mexican Border inclusive)—East Coast South America (Brazil, Uruguay and Argentina).
"Trade Route No. 21—U. S. Gulf ports (Key West-Mexican Border inclusive)—United Kingdom and Eire, Continental Europe (North of Spanish Border), Scandinavian and Baltic ports.
"Trade Route No. 22—U. S. Gulf ports (Key West-Mexican Border inclusive)—Far East (Philippine Islands, China, Manchuria, Korea, Japan, U. S. S. R. in Asia, French Indo China, Formosa and Siam).
"Trade Route No. 23—U. S. Pacific ports—Caribbean ports.
"Trade Route No. 24—U. S. Pacific ports—East Coast of South America (Brazil, Uruguay, Argentina).
"Trade Route No. 25—U. S. Pacific ports—West Coast of Mexico, Central America and South America.
"Trade Route No. 26A—U. S. Pacific ports—United Kingdom and Eire.
"Trade Route No. 26B—U. S. Pacific ports—Havre, Hamburg Range.
"Trade Route No. 27—U. S. Pacific ports—Australia, New Zealand, New Guinea and South Sea Islands.
"Trade Route No. 28—U. S. Pacific ports—Straits Settlements, Netherlands East Indies, India, Burma, Persian Gulf and Red Sea.
"Trade Route No. 29—California ports—Far East (Philippine Islands, China, Manchuria, Korea, Japan, U. S. S. R. in Asia, French Indo China, Formosa and Siam).
"Trade Route No. 30—Washington and Oregon ports—Far East (Philippine Islands, China, Manchuria, Korea, Japan, U. S. S. R. in Asia, French Indo China, Formosa and Siam).
"Trade Route No. 31—U. S. Gulf ports (Key West-Mexican Border inclusive)—West Coast South America (Chile, Peru, Ecuador and the Pacific Coast of Colombia).

"The foregoing list of essential routes may be augmented or otherwise altered by the Commission as circumstances warrant.

Routes and Services

"A 'trade route' is regarded as a major channel through which trade flows. A 'service' is the means provided for the transportation of trade over a particular trade route (fundamentally the vessels and the schedules on which they are run.) The Maritime Commission has considered the ocean services which should be maintained under the American flag on essential foreign trade routes. A statement is attached to this report marked 'Exhibit I' which summarizes the services the

Commission considers should provide adequate American flag participation. It is recognized that other service arrangements may also accomplish the desired result and the Commission is prepared to consider any other service plans that may be submitted by interested citizens.

Private or Government Operation

"The Merchant Marine Act, 1936, specifies that the ownership and operation of the United States Merchant Marine should be by citizens of the United States in so far as may be practicable. The services recommended by the Maritime Commission in Exhibit I contemplate a privately-owned and operated merchant fleet. The peacetime purpose of a merchant marine is to provide shipping services to maintain the flow of the foreign commerce of the United States. The Commission proposes to see that this purpose is accomplished by private operation wherever possible but by Government operation if necessary.

Government Aid

"The Maritime Commission would prefer that private United States flag operation be conducted in the foreign trade without government aid but it will enter into contracts for the payment of operating differential subsidies, in accordance with the provisions of the law wherever this is found necessary to maintain adequate United States flag service on essential foreign trade routes. It is prepared to grant such a subsidy even though one or more United States flag lines are already in the trade, if it finds that is necessary to provide adequate service by vessels of United States registry.

Cooperation Between U. S. Flag Operators

"For successful operation it is usually necessary that a ship obtain good cargoes, both outward and homeward—this is especially true in the long voyage trades. In an effort to accomplish this some of the services recommended (Exhibit I) have been designed in such a manner as to serve several routes on the same voyage. In some instances this should make possible faster and more direct service over a portion of a route than could be otherwise attained. This may also make possible the extension of service to ports which under other circumstances would not be accorded regular sailings. Coordination of different services has also been suggested as a means for providing better services. Cooperative working arrangements between two or more United States flag operators may be needed to accomplish this. Foreign flag lines have often worked out joint sailing arrangements to their mutual benefit. Surely United States flag lines can work together. Wherever an operating differential subsidy is granted, the Maritime Commission will require that the recipient cooperate with other United States flag carriers in the trade.

Conclusion

"This declaration of essential routes and the statement of services recommended for United States flag operation are intended to chart a course to an American Merchant Marine which will adequately serve the foreign commerce of the United States. This is the goal. The Commission will consider other approaches provided they will lead to the same goal."

Exhibit I, attached to the Report, gives the services recommended for United States Flag merchant fleet on the established essential foreign trade routes, and reads as follows:

(Note: The following services, including itineraries, sailing frequencies, numbers and types of vessels, are recommended, but are not necessarily binding.) **Quoted in full are Routes 23 to 31 which relate to Pacific Coast services.**

TRADE ROUTE No. 23—U. S. Pacific ports—Caribbean ports.

(No recommendation for direct service between U. S. Pacific ports and ports in the Caribbean area have been made as this area is served by vessels which transit the Caribbean in the process of serving other routes.)

TRADE ROUTE No. 24—U. S. Pacific ports — East Coast South America (Brazil, Uruguay and Argentina).

1. **Freight Service:**

Itinerary: U. S. Pacific coast ports via Straits of Magellan or Panama Canal to Buenos Aires, Montevideo, Santos, Rio de Janeiro with calls at other East Coast South American ports as traffic offers returning via Panama Canal or Straits of Magellan to U. S. Pacific Coast ports with privilege to call at British Columbia, West Coast Central America, Puerto Rican, and Caribbean ports to load and discharge cargo.

Sailing Frequency: Monthly sailings—12 per year.

No. & Type of Ships: 4 C-3 type freight vessels.

TRADE ROUTE No. 25—U. S. Pacific Ports—West Coasts of Mexico, Central America and South America.

1. **Freight Service:**

Itinerary: U. S. Pacific ports to ports on the West Coasts of Mexico, Central America and South America; return over the same route to U. S. Pacific Coast ports with the privilege of calling at British Columbia ports to load and discharge cargo.

Sailing Frequency: Approximately every 2 weeks—20-26 sailings per year.

No. & Type of Ships: 5 C-2 type freighters.

TRADE ROUTE No. 26-A—U. S. Pacific Ports — United Kingdom and Eire.

1. **Freight Service:**

Itinerary: U. S. Pacific Coast range to London, Liverpool, Glasgow, and other United Kingdom and Irish ports as traffic offers, via the Panama Canal, and return, with privilege of loading and discharging cargo at British Columbian, West Coast Central American, Puerto Rican, other Caribbean, and Baltic ports.

Sailing Frequency: 52 weekly sailings per year.

No. & Type of Ships: 13 C-2 or other suitable type freighters with refrigerated space.

2. **Refrigerator Service:**

Itinerary: U. S. Pacific Coast range to United Kingdom ports, via Panama Canal, and return, with privilege of loading and discharging cargo at British Columbian, West Coast Central American, Puerto Rican, and other Caribbean ports.

Sailing Frequency: 52 weekly sailings per year.

No. & Type of Ships: 9 special type fully refrigerated freighters.

TRADE ROUTE No. 26-B: U. S. Pacific ports — Havre - Hamburg Range.

1. **Freight Service:**

Itinerary: U. S. Pacific Coast range to Havre-Hamburg Range via Panama Canal and return, with privilege of loading and discharging cargo at British Columbian, West Coast Central

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On the Ways—

SHIPS IN THE MAKING

Consolidated's Crest of the Wave sliding off the ways.

"ON THE DOCKS"

The phrase "On the Ways" is temporarily becoming obsolete for this section of Pacific Marine Review so far as the Pacific Coast is concerned. The last hulls, ordered on this coast under the U. S. Maritime Commission war shipbuilding plans, will be in the water before Fall.

However, shipyards are not idle. The phrase "On the Ways" should be changed to "On the Docks" for every shipyard prepared to do that work is very busily engaged in one of the largest ship repair, ship renovation, and ship reconstruction programs in history.

Vendors of marine materials and equipment are finding a ready market if they can make deliveries. Such items as: rope and cable; winches and windlasses; lifeboats and their equipment; deck and interior paint; welding rod and flux; linen and blankets; tableware and cooking utensils; draperies and upholstery; charts and navigating instruments; service refrigerators and toasters; galley ranges and plumbing; pipe and tube; and many others; are needed in whole or in part on practically every vessel that is to be converted for private use.

On many vessels there will be much more extensive needs in materials and equipment. For instance the need is so large on the war transports Mariposa, Monterey and Lurline, to be reconverted to luxury passenger liners for the Matson Navigation Company, that the firm plans on a cost of $6,000,000 for each ship. Another example is the conversion of the U. S. Transport Uruguay to the luxury passenger and cargo liner Uruguay for the Moore-McCormack Company of New York, contract for which has recently been let to Federal Shipbuilding and Dry Dock Company of Kearny, New Jersey for $4,500,000.

In big jobs like these two examples and in all sizes and values of jobs from repainting to complete overhaul and rebuilding every dry dock and outfitting dock in the privately owned and operated Pacific Coast yards is busy and in many cases working round-the-clock with three shifts. In most locations there are long waiting lists.

Items following in this section stress some of the more important recent contracts and assignments.

RECONVERSION OF LINER CHIRIQUI

An excellent example of the extent to which these rebuilding jobs go is given by the reconversion of the 6,963 gross ton passanger and refrigerated cargo liner Chiriqui, owned by the United Fruit Company and in service during the war as a Navy transport. This work is underway at the New Orleans shipyard of Todd-Johnson Dry Docks Inc.

Todd submitted to the War Shipping Administration, which took over the ship on a bareboat charter and assigned her to the Navy, the low bid of $1,503,410. The next lowest bid was $1,623,479 by the Gulf Shipbuilding Corp., of Mobile, Ala.

Chiriqui, built in 1932, is 415.4 feet long, 60.2 feet in beam and 24 feet in depth. She carries about 120 passengers in normal operation.

Restoring the Chiriqui involves an extensive amount of fine joiner work in the passenger spaces. The job entails the complete gutting out of all remaining interior fittings and decorations and the rebuilding, decorating and refurnishing of all passenger cabins and public rooms and the building in of fire screen bulkheads and the installation of fire doors. New flooring and deck covering will be installed throughout the ship. Only modern fireproof construction materials and furniture will be used in the new installations, to bring the ship up to the best standards of safety at sea.

Reconversion specifications also call for a general and complete overhaul of the vessel's machinery and deck equipment, extensive scaling and complete repainting of the ship. Considerable new decking will be installed. The passenger galley will be completely re-equipped. The vessel's cargo spaces will be completely repaired and refitted and the refrigerated cargo spaces rebuilt, to restore to the ship the fruit-carrying facilities she had in pre-war trade.

46 Million Bid Approved

The U. S. Maritime Commission has announced its approval of the Bethlehem Steel Company (New York) bid for construction of three 650 foot, 22 knot, passenger-cargo steamers for the American Export Line's Mediterranean service. This bid is subject to agreement by the operator and that of course is subject to U.S. Maritime Commission approval of subsidy demands by the operator. The bid was $15,495,000 for each vessel. Each vessel is planned for a passenger capacity of 650 persons.

Present at the launching of the USS R. J. Keppler were, left to right, J. E. Burkhardt, Technical Manager of the shipbuilding division of Bethlehem Steel Company; W. H. Collins, Vice President of Bethlehem's shipbuilding division, and W. M. Laughton, District Manager of Bethlehem's West Coast Yards.

The launching of the KEPPLER, 52nd naval combat ship to be built at the yard, took place at 6:00 p.m., June 24, at Bethlehem's San Francisco Yard.

•

Bethlehem Officials Praise L. A. Yard

W. H. Collins, vice president of Bethlehem Steel Company and J. E. Burkhardt, technical manager of the Company's, Shipbuilding Division, were guests of honor at a luncheon recently given by E. C. Rechtin, manager of the San Pedro Yard. Mr. Collins told the group of Bethlehem key men who attended that his survey of conditions at the Port had convinced him that the future of the local yard was most promising. He stated that Bethlehem was definitely in the ship repair business to stay and intended to continue to provide a complete and competent repair service in this port.

Ships Building in Pacific Coast Yards

Of the thousands of large ocean-going steel merchant vessels ordered at Pacific Coast yards by the U.S. Maritime Commission only eleven remain uncompleted. These are:

The two big P-2 passenger liners President Cleveland and President Wilson scheduled to be delivered from the Bethlehem-Alameda yard in 1947;

The three C-2 type cargo steamers to be delivered before December 1, 1946 by Consolidated Steel Corporation;

The three Victory type cargo liners to be delivered before December 1, 1946 by Oregon Shipbuilding Corporation; and

The three C-3 type cargo liners to be delivered before December 1, 1946 by the Western Pipe and Steel yard of the Consolidated Steel Corporation.

All of these vessels with the exception of P-2 S.S. President Wilson are off the ways at the outfitting docks of the yards in which they are being built.

New Pacific Line Organized

Reports have been circulating from Vancouver of another new trans-pacific shipping organization which has been established to operate from the West Coast of the United States and Canada to the Far East.

The new organization, called the Pacific Orient Express Line, will maintain a monthly freight service to Japan and North China using three modern 9000-ton motorships with a speed of 14 knots. They are the Vito, built in 1937, and the Vignes and Vilja, both built in 1945.

The line is reportedly owned by two Norwegian brothers, O. Ditlev-Simonsen, Jr., and Halfden Ditlev-Simonsen, both of whom operate separate steamship companies under their own names in Norway. They joined to form Halfden Ditlev-Simonsen & Co., which will direct from Norway the Pacific Orient Express Line.

U.S.S. Keppler Launched

The second naval combat vessel to be launched in the Bay Area since V-J Day, the U.S.S. R. J. Keppler, 2200-ton long hull super destroyer, went down the ways Monday, June 24, at Bethlehem Steel Company's San Francisco yard. The Keppler is the 52nd naval combat vessel launched at this yard since the start of the Navy's World War II shipbuilding program.

The two largest merchant ships ever to be built on the Pacific Coast shown under construction on the ways of the Bethlehem-Alameda Shipyard, Inc., Alameda, California. The vessel on the left is the S.S. PRESIDENT WILSON and the one on the right is the PRESIDENT CLEVELAND.

PRESIDENT CLEVELAND IS LAUNCHED

Launched at 7:30 Sunday evening June 23 the huge hull of the transpacific passenger liner President Cleveland slid down the ways at the Alameda yard of the Shipbuilding Division of the Bethlehem Steel Company, Ltd., the largest and heaviest merchant vessel hull aver launched on the Pacific Coast. It is true of course that these same ways have launched eight sister hulls as troop transports and that some of these transports will be converted to passenger vessels. Nevertheless the President Cleveland and the President Wilson are the first vessels of their size built as passenger liners on the Pacific coast and the launching weight of approximately 8000 tons is somewhat larger than that of the transports.

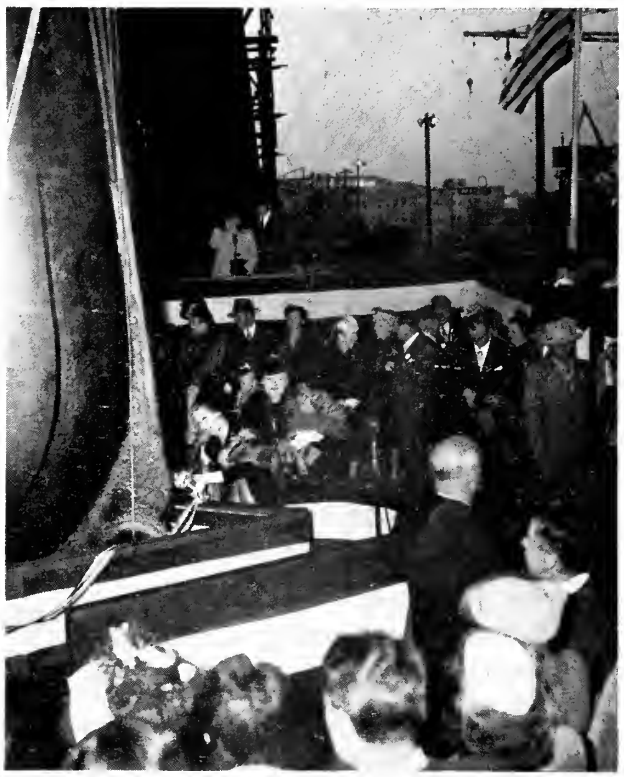
S.S. President Cleveland was sponsored by Mrs. Henry F. Grady wife of the President of the American President Lines to whose transpacific services these two fine vessels are assigned by the U. S. Maritime Commission.

Mrs. Grady has a distinguished record as a public spirited citizen. A member of one of the most noted of the old Spanish-California families she early evidenced a flair for social-political activities and has been for some years a very strong and constructive influence in Democratic party councils in California and in Washington.

Launching a large hull at the Bethlehem-Alameda yard involves some problems in dynamics. The channel of the Oakland Estuary in front of these ways is not much wider than the length of these hulls. The huge weight of 8000 tons must be curbed in its rush down the ways to prevent large damage to the hull and to waterside structures across the channel. In Bethlehem practice this is accomplished by attaching chains to the side of the hull and having these chains pull heavy piles of chain down the berths alongside the ways.

So skillful is the technical division in figuring weights necessary for this job that the hull was brought to a stop just as the chain piles touched the water.

A large and enthusiastic group of employees and guests cheered the President Cleveland on her initial plunge.



SMACK!
Mrs. Henry F. Grady christens the S.S. President Cleveland, which is ta be operated in transpacific service by American President Lines, at the Bethlehem-Alameda yard before a throng of interested steamship and shipyard officials of San Francisco.

First Post-War Combination Liner Delivered

The 14,945 ton Santa Barbara—America's first post-war combination liner—was delivered June 17 to her owners, Grace Line Inc., by the North Carolina Shipbuilding Co., at Wilmington, N. C. The ship proceeded on June 18 to New York where passengers and cargo were loaded preparatory to her departure June 25 for west coast ports of South America.

A modified C-2 type vessel designed to carry 52 passengers, the Santa Barbara will offer such travel comforts as completely air-conditioned passenger quarters; all outside rooms, each with a private bath and automatic telephone; a built-in tiled swimming pool; and full-view windows replacing portholes. Cargo capacity of the vessel will be 9000 deadweight tons, of which 100,000 cubic feet will be refrigerated for carriage of fruit and other perishable goods.

Eight other Santa ships of this type will enter service on Grace Line routes to the west coast of South America and to the Caribbean this summer and fall. The Santa Cecilia, second of the new ships, is scheduled to be delivered to Grace Line around the middle of July. Subsequent delivery of the others is expected at two to three week intervals thereafter.

BOW VS. ICE

Smashing her bow against the ice, the sturdy U. S. Coast Guard cutter "Citrus" heads into the windswept ice jam to help free trapped steamers that boldly attempted to fight their way out of the harbor at Buffalo, N. Y. Ice conditions have delayed traffic on the Great Lakes, vital highway of war industry supply, later than normal this year.

Appointments to Become Merchant Marine Officers

High school seniors who desire to become officers in the U. S. Merchant Marine and apply for appointment as cadet-midshipmen in the U. S. Merchant Marine Cadet Corps must have their applications postmarked not later than October 1, 1946, in order to be considered for the next entrance examination on November 6, 1946. Seniors scheduled to be graduated in January or February, 1947, with insufficient scholastic units when the application is submitted, will be permitted to take the November examination subject to satisfactory completion of studies in progress.

Youths 16½ to 21 years of age and armed force veterans to the age of 24 may apply. Candidates who complete the training will be qualified for a license as a deck or engineer officer in the U. S. Merchant Marine and a commission as Ensign, U. S. Maritime Service, and Ensign, U. S. Naval Reserve, upon being graduated from the U. S. Merchant Marine Academy. The four year training course includes one year at sea on a merchant or training ship.

Applicants should apply directly to the Supervisor, U. S. Merchant Marine Cadet Corps, Training Organization, WSA, Washigton, 25, D. C.

Six of Grace Line's nine new combination passenger-and-freight ships now being fitted out at North Carolina Shipbuilding Co., Wilmington, N. C. Delivery of the first of these, the Santa Barbara, was effected June 17 and arrangements are now being completed for her maiden voyage leaving New York the latter part of June for the west coast of South America. All nine ships, including three yet to be launched at Kearny, N. J., will offer completely air-conditioned quarters for 52 passengers. When joined by the cruise liners, Santa Rosa and Santa Paula, they will provide bi-weekly passenger service on Grace Line routes from New York to the Caribbean and weekly passenger sailings from New York to the west coast of South America.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

Car leading the parade of Cadet Midshipmen from New York State Maritime Academy down Park Avenue for the official opening of the Exposition; left to right: Vice Admiral Herbert F. Leary, USN, superintendent of the Academy; Queen Eleanor Wilcox and Arthur M. Tode, honorary president of The Propeller Club of the United States. Below: A view of Cadet Corps marching down Park Avenue.

NATIONAL MARINE EXPOSITION A HUGE SUCCESS

The National Marine Exposition, the first merchant marine exposition in 25 years, was held at the Grand Central Palace, New York, under the sponsorship of The Propeller Club of the United States, from May 20 to May 25, as part of its program for developing public interest in American shipping.

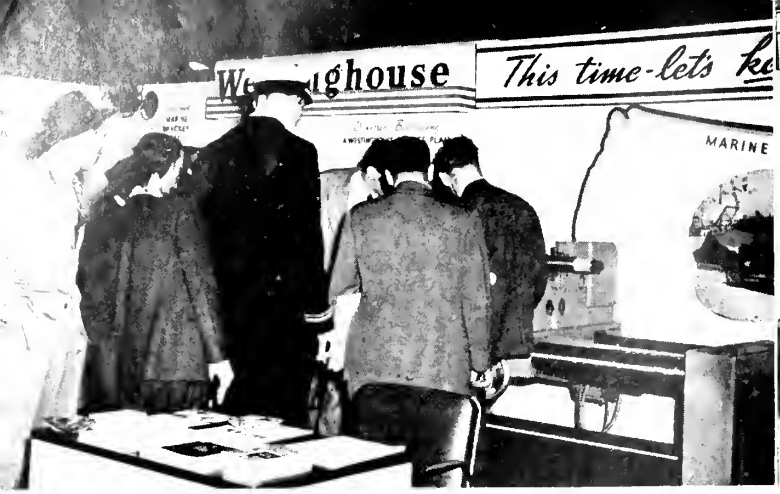
It was a particularly timely exposition because of the great part the maritime industry is playing in the reconversion program — by the reopening of trade routes and the resumption of America's commerce with other nations; and because of the many advances in ship design, furnishing and navigational devices which have been perfected during the war years.

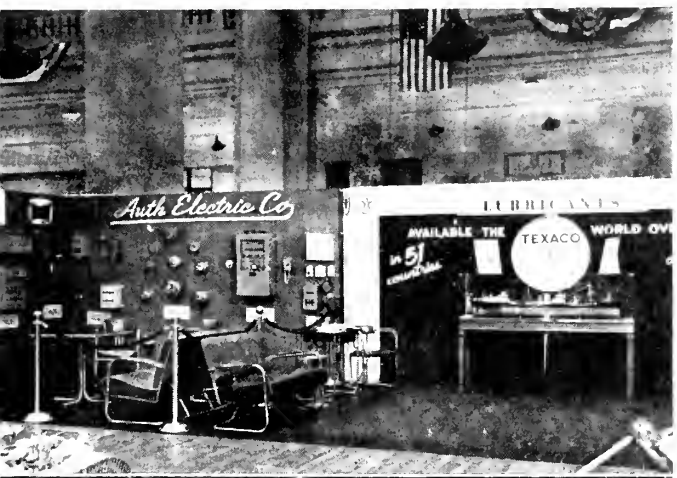
The Propeller Club, in sponsoring this exposition, rendered a valuable service to the American marine industry in providing the medium by which manufacturers and others may exhibit their products and explain their services to the naval architect, the shipbuilder, the ship operator and other potential purchasers; while the public had the opportunity to inspect many items of equipment which would have been impossible without the show.

The American marine industry was well represented by the 200 exhibitors which covered the steamship and

(Continued on page 106)

Frank J. Taylor (right), president of the American Merchant Marine Institute, indicates New York City on the 7-foot-high revolving globe which is the center of Socony-Vacuum Oil Company's exhibit. Looking on, is Richard G. Coffin, manager of Socony-Vacuum's marine sales department.





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Westinghouse Electric Corporation (booth shown at upper left) have Pacific Coast branches in Seattle, Washington, Portland, Oregon, San Francisco, Emeryville, Los Angeles and San Pedro, California.

●

Shell Oil Company has branches all up and down the Pacific Coast. Headquarters at 100 Bush Street, San Francisco.

●

The Texas Company, at left, with offices and plants throughout the Coast area is headquartered in Los Angeles.

●

Mackay Radio and Telegraph Company has office in San Francisco.

●

Kearfott Engineering Co. of New York is located in San Francisco.

●

Brickseal Refractory Co. (Xzit) is headquartered in Los Angeles.

●

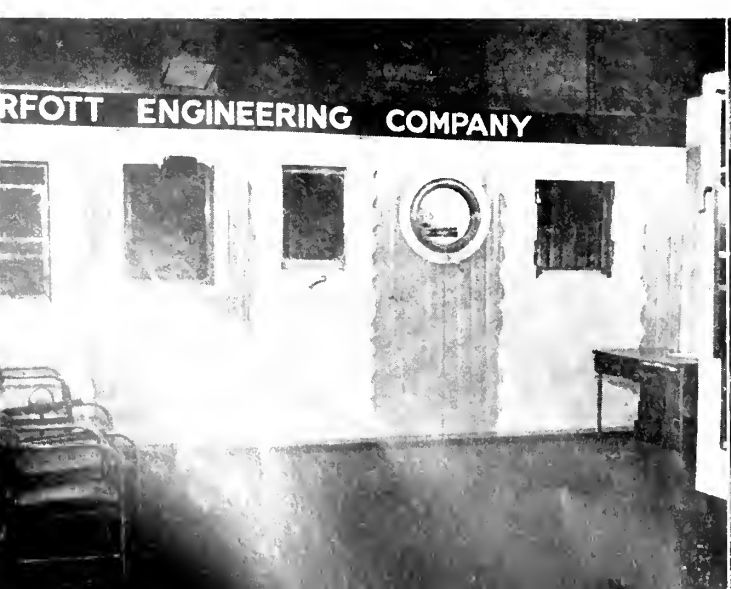
shipbuilding companies, manufacturers of every type of marine machinery and equipment, navigational apparatus and a variety of engineering specialties, ship furnishings and other equipment.

"Top secret" electronic equipment including radar was displayed by Sperry Gyroscope, General Electric, Submarine Signal, Raytheon, Radiomarine, Bludworth, Mackay Radio, Westinghouse and Bendix.

Leading American steamship companies were represented — AGWI Lines, American Export, American President Lines, Alcoa, United Fruit and Grace. Each Line's exhibit emphasized the theme of extensive operations on their former trade routes within a few months. The Grace Line exhibited a typical stateroom for the nine new combination passenger-and-freight ships the company has under construction. New features include air-conditioning, intra-ship telephones and full-view windows replacing portholes. The Grace booth also displayed a sectional model of one of the new ships, depicting the arrangement of the built-in swimming pool and cargo hatches with coverings designed for conversion into beach decks at sea.

The prominent oil companies were represented The Texas Company, Socony-Vacuum, Gulf, Standard of

(Continued on page 107)



New Jersey and Sinclair. Two outstanding naval architects who figured importantly in the design of the ships comprising the new Merchant Marine, Gibbs & Cox and George G. Sharp, both presented exhibits which were eye-openers to the future design of ship's interiors.

The most efficient and modern apparatus for fire detecting and extinguishing, lifesaving equipment and devices, air conditioning, electrical fittings, cargo handling machinery and many other items, large and small, which come into the fore when building, equipping and operating of vessels are concerned, were on display.

The exposition opened with ceremonious fanfare at noon on May 20, with the Marine Exposition Queen, Miss Eleanor Wilcox of New London, Connecticut, direct descendant of Captain Moses Rogers of the SS Savannah, first steamship to cross the Atlantic, cutting the ribbon which was strung across the entrance to the Exposition, which officially opened the show. An elaborate program was worked out for each day of the week dedicated to activities pertaining to the construction and operation of America's vessels.

Monday, May 20, Naval Architect's Day, sponsored by the Society of Naval Architects and Marine Engineers, was the official opening.

Tuesday, May 21, was Shipbuilders' Day, sponsored by the Shipbuilders' Council of America. An interesting feature was a motion picture showing the construction of various types of ships.

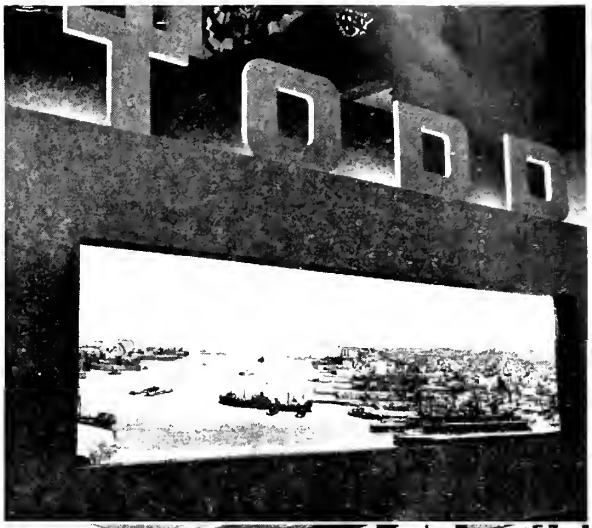
Wednesday, May 22, National Maritime Day. The Cadet Corps from the U. S. Merchant Marine Academy, Kings Point, New York, were the honored guests.

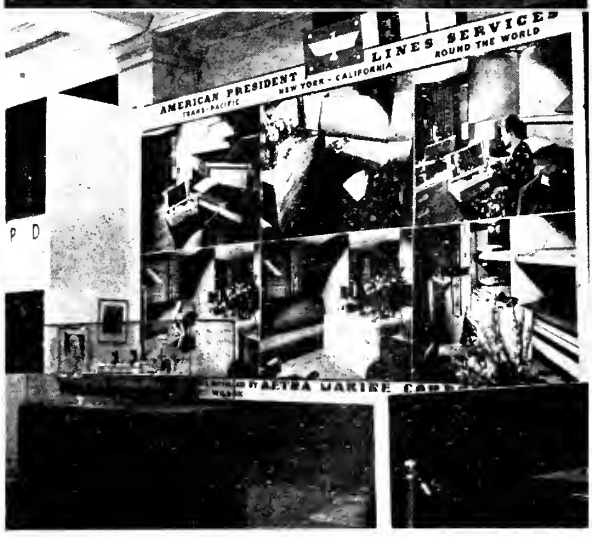
Thursday, May 23, honored the steamship companies, with the cooperation of the American Merchant Marine Institute, and the participation of steamship company officials and other shipping associations.

Friday, May 24, was National Foreign Trade Day with the cooperation of the New York National Foreign Trade Week Committee. The annual Foreign Trade Luncheon was held at the Waldorf-Astoria under the auspices of this committee.

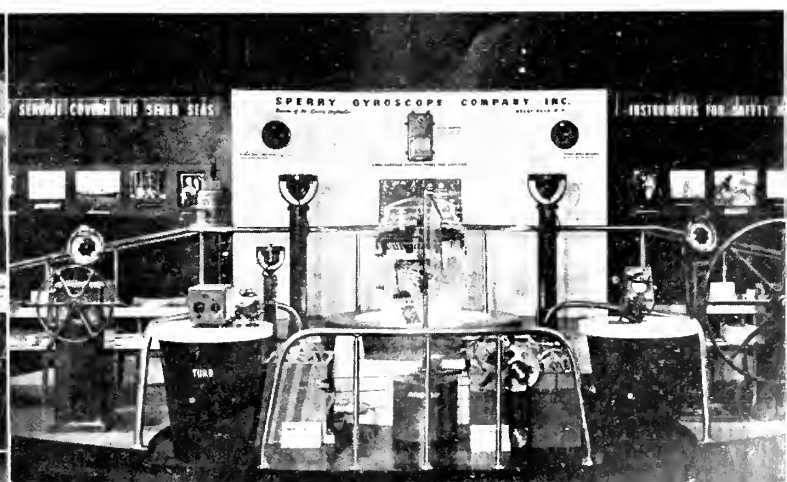
Saturday, May 25, was Navy and Coast Guard Day.

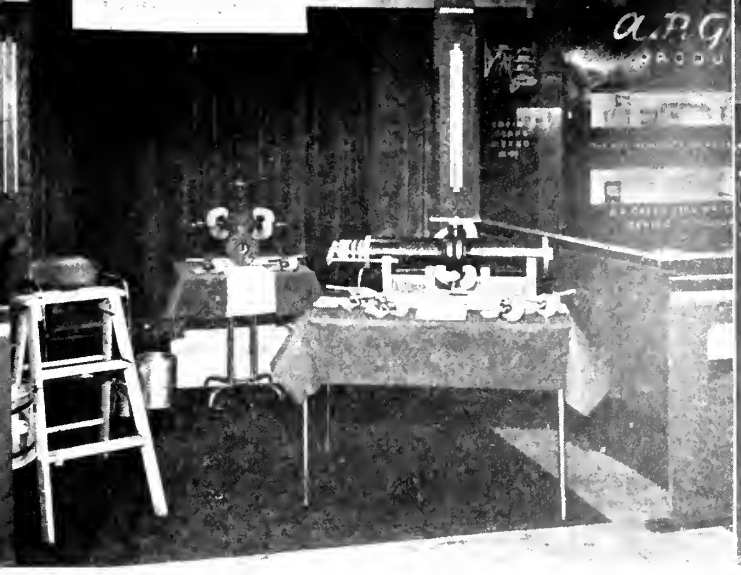
This exposition was under the management of National Marine Expositions, Inc., of which Roger E. Montgomery is president and general manager. From the very favorable reaction for the exhibitors this year, sixteen of the major participants immediately have contracted for space at the San Francisco Marine Exposition in 1947.

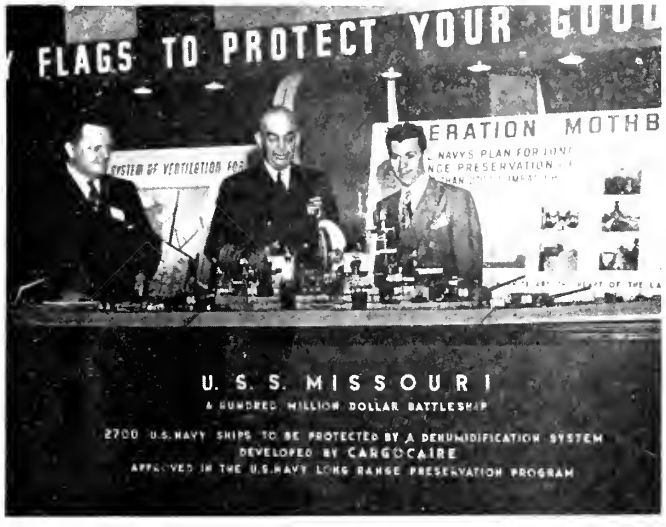




At top, left: Worthington Pump & Machinery Co., Pacific Coast Division in San Francisco; De Laval Steam Turbine Co., has office in San Francisco; Todd Shipyards Corp. is located in Las Angeles, California and Seattle, Washington; American President Lines headquarters are in San Francisco; International Paint Company, Inc. represented in San Francisco and Sperry Gyroscope Corp., has Pacific Coast representation.







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T. G. Persson Company of Bloomfield, N. J. is represented on this Coast.

●

Raytheon Manufacturing Co. has an outlet at 310 Sansome Street, San Francisco.

●

Cargocaire Engineering Corporation has an office in San Francisco.

●

Plymouth Cordage Co. is represented in San Francisco by Johnson & Joseph.

●

Selby, Battersby & Co. is represented in San Francisco by J. H. Cordes, and in Los Angeles by J. M. Costello Supply Co.

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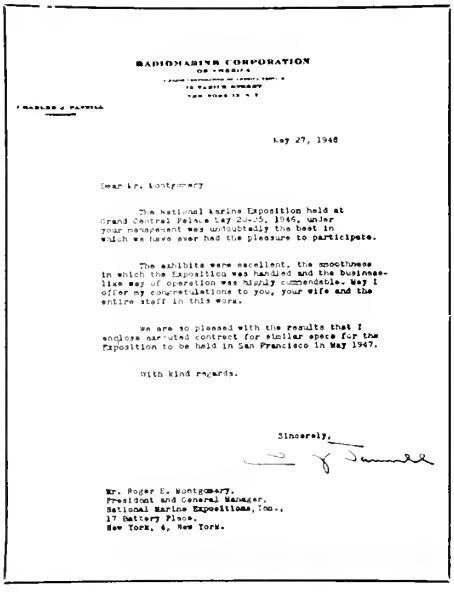


RADIOMARINE CORPORATION
OF AMERICA

May 27, 1946

Dear Mr. Montgomery:

The National Marine Exposition held at Grand Central Palace May 20-25, 1946, under your management was undoubtedly the best in which we have ever had the pleasure to participate.

The exhibits were excellent, the smoothness in which the Exposition was handled and the business-like way of operation was highly commendable. May I offer my congratulations to you, your wife and the entire staff in this work.

We are so pleased with the results that I enclose executed contract for similar space for the Exposition to be held in San Francisco in May 1947.

With kind regards.

Sincerely,

Mr. Roger E. Montgomery,
President and General Manager,
National Marine Exposition, Inc.,
17 Battery Place,
New York, 4, New York.

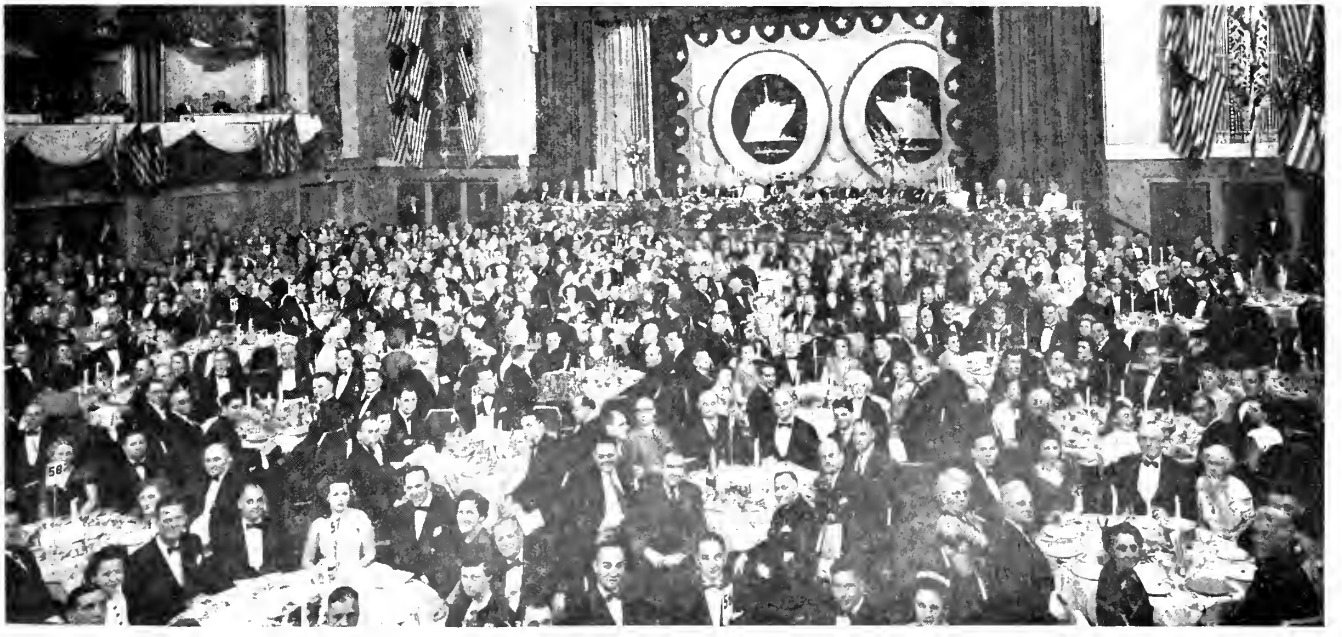
Socony-Vacuum reception in connection with National Marine Exposition, was held on May 20, 1946. Left to right: Ralph Baehmer, William B. Jupp, W. P. Moore, Richard G. Coffin, Edwin W. Fiske, Jr., F. E. Powell, Jr., and J. E. Beale, all of Socony-Vacuum.

At left: Bendix-Aviation Corporation, Scintilla Magneto Division booth at the Exposition. On the Coast Bendix-Scintilla has representation in Los Angeles, Magneto Sales & Service Co., 751 Towne Avenue; in San Francisco, H. G. Makelim Magneto Repair Co., 1583 Howard Street.

●

At right: Frank Riel, director of Public Relations, American Merchant Marine Institute.

Scene of the annual banquet of The Propeller Club of the United States. Propellers, find yourselves!



HARD TO CONVINCE— Carl Savage, in charge of the event; Jack Schneider, Submarine Signal Co.; and Bill Trout, Marine Electric, do a maypole dance around one of the country club's splendid trophies. Savage is trying to explain to the others, both prize winners, that their prizes will not be as big as this one.

Portland Propellers Hold Golf Tourney

A highlight of the Portland Propeller Club's recent activities was the golf tournament and dinner staged at the Oswego Country Club on May 1. The affair was a whopping success and the event will be repeated annually. The following pictures were taken for the Pacific Marine Review and our Portland correspondent was warmly welcomed and feted.

The Portland Club is greatly disappointed at not receiving the chance to hold the National Propeller Club Convention in Portland next year and expresses thanks to those ports which voted to bring the convention to the Pacific Coast. Hopes are that the following year will see the convention in Portland.

Guest of honor of the club was president of the Shipping Club of Portland, Dwight Morris, manager of the Portland Stevedoring Company, who heartily concurred with the sentiments expressed by the Propellers with regard to effectuating closer cooperation between the two clubs.

Special event of the evening was a tribute to the late Admiral Vickery, long a special friend of the Portland Club. Paul Flegal, secretary of the club, called for a minute's silence in respect for the Admiral; a letter from the club to Mrs. Vickery was read and approved; and as honored guest, Rear Admiral Phillip F. Roche, long a personal friend of the late admiral, spoke a few words in eulogy. Admiral Roche is a member of the Seattle Port.

Carl Savage, chairman of the house committee, was complimented by the club on organizing an entertaining and efficient outing, and for arranging a pleasant evening with no speeches and a fine dinner.

Prize winners of the golf tournament were: W. J. "Bill" Trout, Marine Electric Co., longest drive on No. 9 hole; E. J. Schneider, Submarine Signal Company, closest to pin on No. 3 hole; Darrel M. Gibson, Maritime Commission in Vancouver, B. C., high net score; Les Mathis, Seattle Propeller Club, low gross; Kit Conyers, Pope & Talbot, low net; Jack Snow, high gross.

Northwest Parade of Progress Exposition

The Pacific American Steamship Association, representing 15 major West Coast steamship companies, was among the prominent exhibitors at the Seattle Northwest Parade of Progress Exposition which opened on June 8 in conjuction with the International Labor Organization sessions under way in Seattle since June 6.

Emphasizing the importance of merchant shipping to the average American family, the exhibit featured a collection of products that are imported from all over the world in American bottoms, and which have become essential to our standard of living.

The theme of the exhibit, "Ship by Water—Use American Ships" was dramatically illustrated in a 20-foot photographic mural showing several types of American merchant ships used in foreign and domestic commerce.

More than five thousand persons crowded into the new Seattle Field Artillery Armory to see the opening of this gala exposition.

Jane Withers, popular young movie and radio actress, was a headliner on the entertainment program given twice daily at the show.

PORTLAND GOLF TOURNEY

(1) L to R: Carl Savage, chairman house committee; Dwight Morris, president Portland Shipping Club; Dean Hunter, president Propeller Club of Portland; Admiral Phillip F. Roche, guest of the evening; Ed Tucker, representing the Seattle Propeller Club; Paul Flegel of Willamette Iron & Steel Works, secretary of the club.

(2) Watching L to R as Paul Flegel, club secretary, demonstrates his brassie work: Bryant Moore, Commercial Iron Works; W. E. Schiffer; E. J. Griffith, Albina Engine & Machine Works.

(3) Homer Shaver, George Jackson, Archie Fries, and Leonard Shaver represented the transportation men at the dinner. Jackson and Fries handle the Western Transportation Co., and the Shaver cousins operate the Shaver Transportation Co. of Portland. When the pianist played songs, this table led the rest in singing.

Furness Lines Names J. J. Walsh Manager

Henry Smurthwaite, United States resident director of Furness, Withy & Company, Ltd., announces the appointment of **John J. Walsh** as general manager of the Furness Lines organization, with headquarters at 34 Whitehall Street, New York.

Mr. Walsh has been with the company since 1915, when he was a member of the staff of the Philadelphia house, transferring to New York in 1919, where he specialized in the company's transatlantic service.

In May, 1923, he was advanced to the post of assistant manager of the firm's San Francisco office, and in the following year he became Director of Furness (Pacific) Ltd. In 1934 he was appointed manager in charge of Furness, Withy & Company's operations in all Pacific Coast ports.

At the outset of the war, Mr. Walsh became deputy representative of the British Ministry of War Transport, in charge of all British shipping on the Pacific Coast.

Succeeding Mr. Walsh as manager in charge of Furness (Pacific) Ltd.'s Coast operations is **James West,** who has been with the company since 1924. Mr. West will also become deputy representative for the British Ministry of Transport.

(4) THEY'VE GOT TO BE SHOWN; so club pro, Bill Carey, points to the low gross score of Les Mathis, Seattle, as proof that visiting firemen from that city make good in Portland. L to R: Carey; Dean Hunter, the talking golfer; Don MacMillan, Swan Island; Frank Gillard, Kaiser Vancouver; John Bruns, War Assets Administration.

(5) John Brennan, country club manager; Kit Conyers of Pope & Talbot, first president of the local club in 1938; Les Mathis, Seattle, who walked off with the prize for low gross score of the afternoon.

Max Moore at left with W. H. "Hal" Hoskier.

HOSKIER-QUAKER RUBBER LINK

W. H. "Hal" Hoskier is the newly-appointed marine representative for the Quaker Pacific Rubber Company, located at 168 Second Street, San Francisco. With the full resources of Quaker Pacific and Quaker Rubber Corporation at his disposal, he will devote his entire attention to satisfying the requirements of the marine industry in the Bay Area for all types of rubber products.

Hoskier is widely known in Pacific Coast shipping circles and recently severed his connections as managing partner of the Louis Ottesen Company, manufacturers of marine canvas equipment.

The Quaker Rubber Corporation has been manufacturing marine and industrial supplies for 61 years. Main factory is in Philadelphia, with branches in New York City, Chicago, Cleveland and Houston.

Coupling fire hose with expansion ring coupling.

Quaker Pacific Rubber Company serves the West Coast. Main offices are in San Francisco, with branch and warehouse in Los Angeles and representatives in every principal port and city from San Diego to Seattle.

Living up to its slogan, "If there is a way to get it done, Quaker will do it," Quaker Rubber has maintained constantly a complete research and experimental laboratory. Problem after problem, long thought unsolvable, have been licked by Quaker engineers. The marine field long has received special attention.

Quaker Pacific now has available on the Pacific Coast for immediate delivery a large stock of marine and industrial rubber goods. Quaker is sole manufacturer of Daniels P.P.P. Piston Rod Packing and Ebonite, a special rubber compound that withstands steam, superheated steam, high temperatures, hot or cold water, ammonia, air, oils, gases and acids. Ebonite will not absorb oil or water. It is used exclusively in the manufacture of Ebonite sheet packing, pump piston rings and sleeves and other Quaker Ebonite products.

Among other Quaker supplies and equipment available are conveyor and transmission belting; oil and water suction and discharge hose; air, steam, deck and fire hose, and all types of molded products.

Below: Warehouse scenes at Quaker Pacific's location at 168 Second Street, San Francisco.

Bethlehem Propellers

...FOR PEAK EFFICIENCY

With its all-inclusive technical and manufacturing facilities, Bethlehem is in position to design, cast and finish propellers of all types of manganese bronze, cast iron, and cast steel, in diameters from 6 to 20 ft., and up to 45,000 lbs., finished weight.

Bethlehem propellers are the product of Bethlehem craftsmen from start to finish and are laboratory-tested to assure strict conformance with specifications and Classification Societies' requirements. They are guaranteed as to material and workmanship by the company which produced more than 3,000 propellers for naval and merchant vessels during the past five years.

Other Marine Equipment Manufactured by Bethlehem

Steam Turbines and Parts
Diesel Engine Parts
Engine Auxiliaries
Crankshafts
Line and Propeller Shafts
Oil and Water Separators
Special Valves and Fittings
Contra-guide and Streamlined Rudders
Stems and Stern Frames
Bronze, Iron and Steel Castings
Heavy and Light Forgings

SHIPBUILDING YARDS

QUINCY YARD
Quincy, Mass.
STATEN ISLAND YARD
Staten Island, N. Y.
BETHLEHEM-SPARROWS POINT SHIPYARD, INC.
Sparrows Point, Md.
SAN FRANCISCO YARD
San Francisco, Calif.
BETHLEHEM-ALAMEDA SHIPYARD, INC.
Alameda, Calif.
SAN PEDRO YARD
Terminal Island, San Pedro, Cal.

SHIP REPAIR YARDS

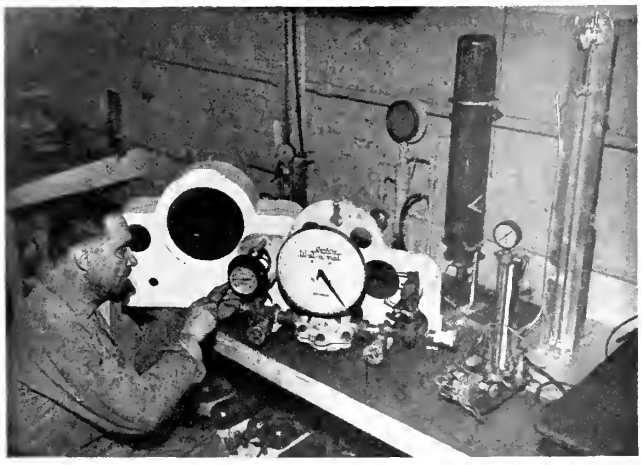
BOSTON HARBOR
Atlantic Yard
Simpson Yard
NEW YORK HARBOR
Brooklyn 27th Street Yard
Brooklyn 56th Street Yard
Hoboken Yard
Staten Island Yard
BALTIMORE HARBOR
Baltimore Yard
SAN FRANCISCO HARBOR
San Francisco Yard
Alameda Yard
SAN PEDRO HARBOR
(Port of Los Angeles)
San Pedro Yard

SHIPBUILDING . . . SHIP CONVERSION . . . SHIP REPAIRS
NAVAL ARCHITECTS and MARINE ENGINEERS

BETHLEHEM STEEL COMPANY

Shipbuilding Division

GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY



Left: Repairing moisture regulator in instrument filling department. Right: Testing pressure gages in Gage Department.

PACIFIC COAST INSTRUMENT COMPANY'S NEW LOCATION

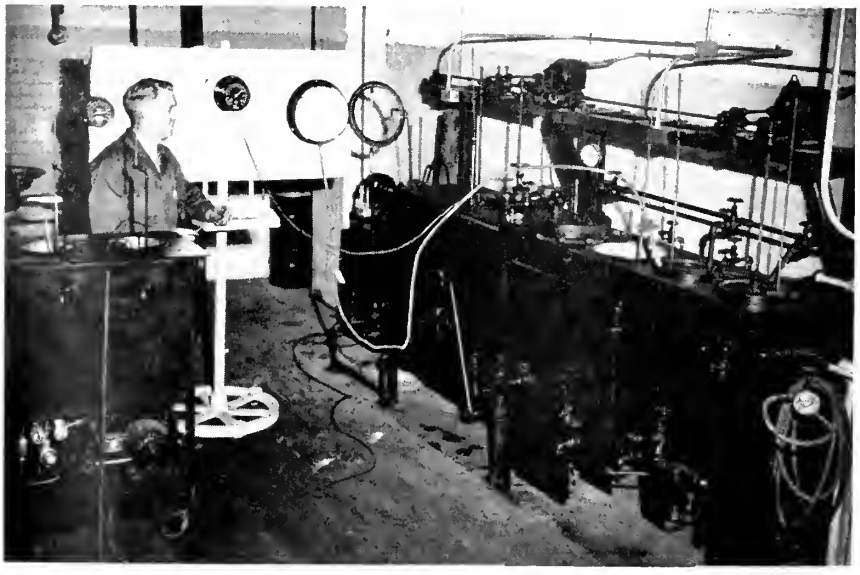
The Pacific Coast Instrument Company, pioneer San Francisco instrument repair firm, recently moved to a new and more convenient location at 246 Mission Street, San Francisco, California.

The history of this well-established firm dates back 20 years when Andrew Bitzel, recognizing the need of an instrument repair service, opened a small shop on Second Street. Due to the steady growth of the company, the shop in 1930 was moved to larger quarters at 80 Natoma Street. During the war, few vessels left San Francisco docks without first having had their gages, pneumercators and thermometers repaired and calibrated by "Andy" Bitzel and Will Rogers, shop foreman at that time, together with a crew of instrument repairmen. In 1945, due to ill health, Bitzel retired. Fred Murdock was appointed general manager and Will Rogers was appointed shop superintendent. Will joined the company in 1928 and knows the instrument line from A to Z.

In January of this year, the company leased the building at 246 Mission Street. Here new and better equipment was added, making the shop one of the most complete on the Coast for engineering and service on all types of temperature, pressure and controlling instruments. Customers may have their instruments rebuilt to suit their particular needs or designed to fit any specification. Instruments are shipped to the shop for repair from all points on the West Coast, including Mexico City and Vancouver, B. C.

Fred Murdock

An additional feature of the firm is the sales and servicing of new instruments, representing the factory for the Helicoid Gage Division of the American Chain and Cable Company, Paxton Mitchell Diesel Engineering Company and Trimount Instrument Company.



Testing instruments ranging from below zero to 1000 degrees Fahrenheit.

National Maritime Day luncheon at Commercial Club, May 22, 1946. Captain H. J. Tiedemann presents the Mariner's Medal to Captain Eugene M. Olsen. At left, listening intently, is Mayor Roger D. Lapham of San Francisco, Calif.

U. S. MARITIME SCHOOLS MERGE — CAPTAIN CROSSMAN IN CHARGE

Both the Atlantic and Pacific District Operations were eliminated the last of June and the U. S. Maritime Service Graduate Station at 1000 Geary Street, San Francisco, was transferred to Alameda, California, June 30, now under the supervision of Captain Malcolm E. Crossman, USMS, superintendent of the U. S. Maritime Service Training Station.

At the same time, Commodore Telfair Knight, commandant of the U. S. Martime Service, Washington, D. C., announced the appointment of Captain H. J. Tiedemann, USMS, as superintendent of the U. S. Maritime Service training station and training ships at St. Petersburg, Florida. Following Captain Tiedemann's departure from his offices at 1000 Geary Maritime Service Center, Commander D. B. McMichael, USMS, executive officer, was made the Pacific Coast Enrolling and Liaison Officer.

Under Captain Tiedemenn's direction the entire war effort for the training of ships' personnel was greatly speeded, as he was responsible for all training activities on the West Coast. Prior to their assignment to merchant ships, 30,754 U. S. Maritime Service trainees checked into the U. S. Maritime Service Graduate Station, 1000 Geary Street, San Francisco; 5994 men were commissioned ships' officers in the U. S. Maritime Service following the completion of training and graduation from the Officers' School in Alameda, California.

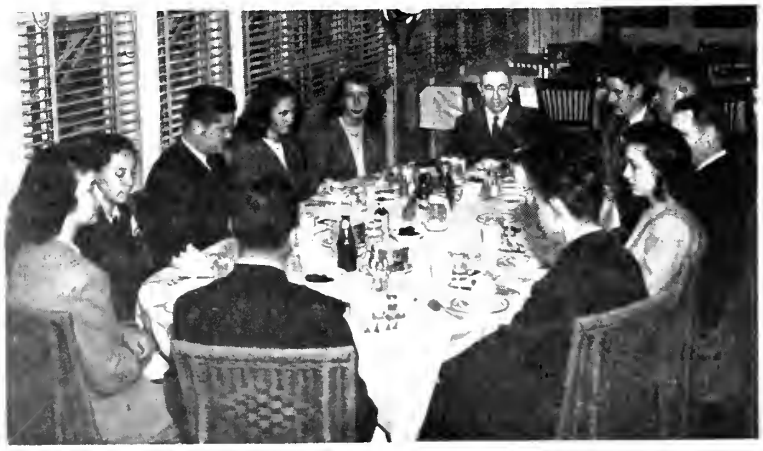
A native of San Francisco, Captain Tiedemann was appointed Pacific District Operations Officer for the U. S. Maritime Service on August 1, 1944. This was at a time when the speedup of the war in the Pacific was reaching a crescendo with "the supply line to victory" ever extending westward.

At the 1000 Geary Graduate Station 250 bunks were placed on the third and fourth floors of the station when it was converted from an automobile display building to a graduate station in 1943. The administrative offices of the Pacific District have occupied the first and second floors. Davy Jones' Locker canteen, which was sponsored by the Women's Organization for the American Merchant Marine, was in the basement.

At the Marine Hospital in San Francisco, California, on May 21, 1946, Captain H. J. Tiedemann, USMS, former Pacific District Operations Officer, now in St. Petersburg, Florida, presents Seaman Robert A. Thomas with the Merchant Marine Distinguished Service Medal at his hospital bedside.

GUESTS AT THE CAPTAIN'S TABLE

Captain Malcolm E. Crossman, USMS, superintendent of the U. S. Maritime Service Officers School, Alameda, California, was host to a group of high school student essay contest winners on Saturday, May 25. Following a tour of the entire station and a motor boat ride in the bay the students had lunch with Captain Crossman at his table. The subject of the essay contest was: "Foreign Trade and the Merchant Marine of the United States." It was sponsored by the U. S. Maritime Service and the Foreign Trade Association.



COPPER ALLOY BULLETIN

MARINE AND POWER EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared by Bridgeport Brass Company "Bridgeport" *Headquarters for BRASS, BRONZE, and COPPER*

Condenser and Heat Exchanger Tubes

Most Common Factors Influencing Corrosion Rate

Numerous laboratory examinations of condenser tubes which in some instances have given many years of service and in others only a few weeks or months of service, have revealed that there are probably at least a dozen different factors which influence the rate of corrosion of condenser or heat exchanger tubes in power plants. These factors may function in an adverse manner or they may be beneficial as listed in the table below. The problem is complicated by the interaction of these factors. This should not necessarily discourage us from trying to uncover the most troublesome factor or combination of factors. In many instances individual consideration of all of these corrosion rate factors has helped to uncover the most troublesome one.

In previous issues of the Copper Alloy Bulletin, we discussed the effects of alloy composition and water composition, as well as the acceleration of corrosion due to the deposit of foreign matter. We also mentioned a few of the preventive measures to increase tube life such as cleaning of tubes and removal of a large percentage of entrained gases from the circulating water before it enters the tubes.

Steam and Steam Condensates

All of the copper base alloys usually have excellent corrosion resistance to steam and steam condensates of low impurity content. Occasionally stress corrosion cracking or corrosion grooving localized near tube sheets and supports is encountered where the condensate contains much ammonia. Corrosion grooving sometimes occurs when much carbon dioxide is present. Thinning of tubes has also occurred when much hydrogen sulfide was present.

High Water Velocity May Lead to Impingement-Corrosion

In condenser and heat exchanger tubes the movement or turbulence of some waters at the inlet ends of tubes frequently leads to localized corrosion—commonly called "impingement-corrosion" or "inlet-end-corrosion". The seriousness of this type of attack varies with the alloy composition, water composition, water velocity and the quantity and size of entrained gas bubbles and sand. When much entrained gas is present in the water stream, the impingement corrosion pits are undercut on the down stream side at those points where the gas bubbles (second phase) impinge on the metal surface. Aluminum Brass, 70/30 Cupro Nickel containing about ½% iron and Duronze IV (arsenical aluminum bronze) have the best corrosion resistance to this type of attack in sea water. "Inlet-end-corrosion" is also combated through the use of various protective measures applied to the inlet ends of tubes, such as Flowrites, plastic inserts, and coatings.

Effects of High Velocity Steam

Steam containing droplets of water (second phase) traveling at high velocities and impinging on condenser and heat exchanger tubes will rapidly corrode most metals. This is usually encountered in those tubes facing the steam inlet and steam lanes. The surface is roughened by numerous cones all tilted in one direction. Sometimes the tips of the cones do not develop and the corroded surface may be covered with a large number of minute cones with rounded tops. Trouble from this source is kept to a minimum by (1) removing as much moisture as possible from the steam, (2) use of the most corrosion resistant metals, (3) maintaining high quality steam and (4) the use of steam deflector plates.

Effect of Internal and External Stresses

The effect of applied (static) or residual (resulting from cold drawing) stresses upon the copper base alloys varies considerably depending upon the composition of the alloy and the corrosive environment (moist ammonia). Certain copper alloys under these conditions may fail from localized corrosion (stress corrosion or season cracking) in the form of narrow cracks which gradually penetrate the tube wall. This type of corrosion is best combated by keeping stresses and the concentration of ammonia at a minimum; where these cannot be controlled then the use of copper, 70/30 cupro nickel, or Duplex tubing should be considered. Residual stresses resulting from cold work during the manufacture of tubes are eliminated by the stress relief obtained by annealing to meet the grain size requirements of A.S.T.M., Federal, Navy, and other specifications. Duplex Tubes, however, are normally supplied in the hard condition.

Cyclic stresses associated with vibration may lead to fatigue or corrosion fatigue cracking of condenser and heat exchanger tubes. These failures can be recognized from their location, that is, a few up to several hundred minute circumferential cracks develop midway between tube support sheets or within a few inches from the tube sheets. In addition such tube failures generally occur at those points where the steam or vapors enter the condenser or heat exchanger, that is, in tubes facing the inlet or vapor lanes (top to bottom of lane). Stopping the vibration is the most satisfactory way to combat this situation. This has been done through the use of tube stiffeners and additional tube support plates.

Alloy Selection

As we learn more about the complex subject of corrosion, we begin to appreciate the very important role played by the metals and alloys from which condenser and heat exchanger tubes are made. Engineers who take the trouble to study experimental lots of different alloys tested under actual service conditions are of course in an excellent position to know, when the time for retubing comes around, which alloy will serve best. Such results lead to the purchase of tubes on a service basis rather than on a first cost basis. Further information on condenser and heat exchanger tubes can be obtained from our Technical Service Dept. Write for your copy of Bridgeport's Condenser Tube Manual—112 pages full of technical data and useful tables.

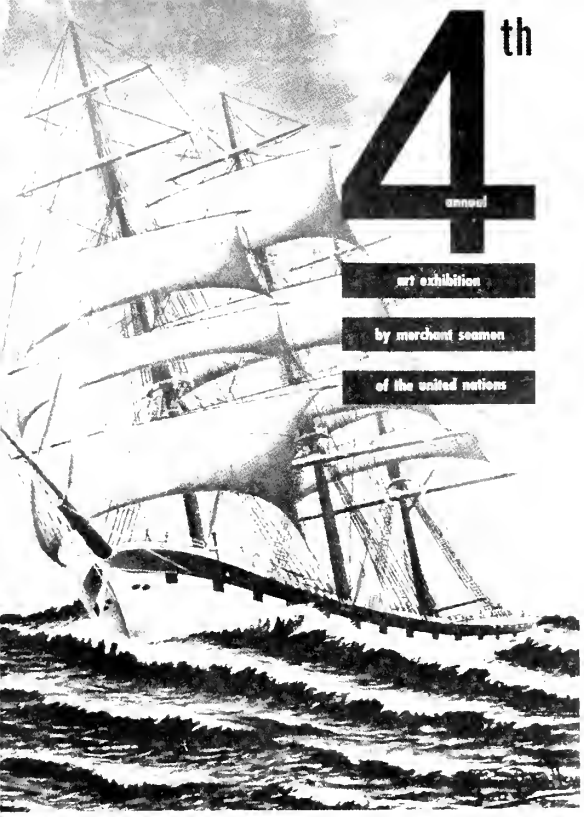
Most Common Factors Influencing the Rate of Corrosion

The letter or letters in parentheses following each factor indicates whether or not this factor generally has an adverse ("a") or beneficial ("b") effect on the corrosion rate as the value of concentration increases.

1. Alloy Composition ("a" or "b")
2. Composition of Water
   - (a) Anions, specific nature and concentration ("a" or "b")
   - (b) Cations, specific nature and concentration ("a" or "b")
   - (c) Total dissolved solids ("a" or "b")
   - (d) pH and pHs ("a" or "b")
   - (e) Gases, H_2S, Cl_2, CO_2, O_2, NH_3 (usually "a" occasionally "b") rate of supply, concentration, distribution.
   - (f) Organic Material, specific nature and concentration ("a" or "b")
   - (g) Total suspended matter, nature, size, etc. ("a" or "b")
   - (h) Conductivity ("a")
3. Composition of Steam and Steam Condensate Similar to items 2a to 2h
4. Nature and Distribution of
   - (a) Corrosion products ("a" or "b")
   - (b) Silt and debris ("a" or "b")
5. Velocity of
   - (a) Water with ("a") and without a second phase (solid or gas)
   - (b) Steam with ("a") and without a second phase (liquid)
6. Stress
   - (a) Static ("a")
   - (b) Residual ("a")
   - (c) Cyclic ("a")
7. Design of Heat Exchanger ("a" or "b")
8. Operation of Heat Exchanger
   - (a) Continuity of operations (affects factors 5, 6, 8, 9 and 11) ("a" or "b")
   - (b) Method of cleaning (affects factor No. 4) ("a" or "b")
9. Temperature on Outside and Inside
   - (a) Low ("a" or "b")
   - (b) High ("a" or "b")
10. Pressure on Outside and Inside
    - (a) High ("a")
    - (b) Low ("b")
11. Galvanic Coupling ("b")
12. Physical Properties ("a" or "b")
    - (a) Hardness, (b) microstructure
    - (c) Fatigue Characteristics

BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • *ESTABLISHED 1865*

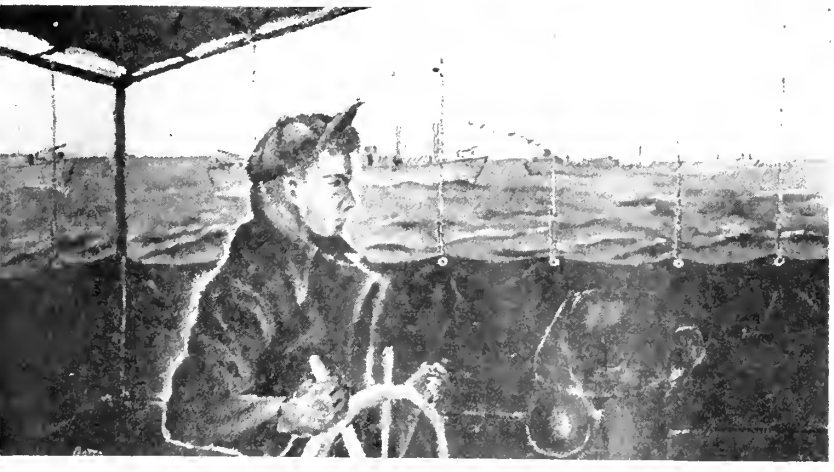


onsored by united seamen's service and war shipping administration—1946

The fourth annual art exhibit, under the auspices of the United Seamen's Service and the War Shipping Administration has been touring the United States with work by United Nations seamen artists. Even in the midst of the death-ridden routes, these seamen artists kept up their creative work and some who have never painted were stimulated to express themselves on canvas and they used any materials that were available aboard ship.

During the latter part of June this exhibition was hung in the Marine Exchange in San Francisco, and was a highly successful show. Visitors to the Marine Exchange, after viewing the 64 paintings, were asked to cast their ballot for the painting they considered worthy of receiving first prize. The artist whose picture won, Harry A. Maclaren, exhibited a pastel, "Belle of the Indies," and received the prize of a Victory Bond donated by the Pacific Marine Review.

Second birthday of The Wamen's Organizatian for the American Merchant Marine, who were recent sponsors for the 4th Annual Merchant Seamen Service Art Exhibit. Left to right: Mrs. J. F. Jahnstone, Mrs. Earle H. Carder, Mrs. Henry F. Grady, Mrs. Patterson, Mrs. Harry W. Parsons, new president af the organizatian, Mrs. James S. Hines, (in back) Mrs. Frank Short, retiring president, Mrs. David Currier, Mrs. Duane Tweeddale, Mrs. Alfred Pittman and Mrs. Paul Crank.



The $ Sign in the Sky

As the Manila station of Globe Wireless, Ltd., went back on the air Saturday, June 1, 1946, after an enforced silence of four years and five months, it was recalled that three generations of Dollars have played an active role in the history of the company.

The late Captain Robert Dollar, known the world over as the "Grand Old Man of the Pacific," visualized the wireless system. With his vast fleet of Dollar ships continually sailing around the world, he realized how much more efficiently he could operate his business if there were some way in which he could communicate with his ships and foreign offices at all times. Cable rates were too expensive a luxury in those days for the captain's Scotch thrift.

Consequently, the first Dollaradio experimental station was built at Mussel Rock in 1928. Housed in a wooden shack 20 feet square, where they worked, slept and ate, the duty of the first radio operators was to keep in contact with the S.S. President Taft of the Dollar Steamship Line as it crossed the Pacific from San Francisco to Manila.

From the tiny shack at Mussel Rock came some notable "firsts" in radio history. Nightly contact was made with Admiral Richard E. Byrd's radio station 30 feet below the snow in Little America and the operator on duty copied material for relay to the New York Times for publication in the morning newspaper.

Another "first," from the standpoint of distance of communication, was a contact made from the Mussel Rock station to the airplane Stars and Stripes as Admiral Byrd flew from his northern base across the Antarctic polar ice cap.

Before Captain Robert Dollar passed from the scene the Dollaradio had experimental stations in operation at San Francisco, Los Angeles, Portland, Seattle, New York, Honolulu, Guam, Shanghai, and Manila.

With the captain's son, R. Stanley Dollar, as president, the company incorporated under the name of Globe Wireless, Ltd., and entered the public correspondence field on April 20, 1934, with the formal opening of the Manila station.

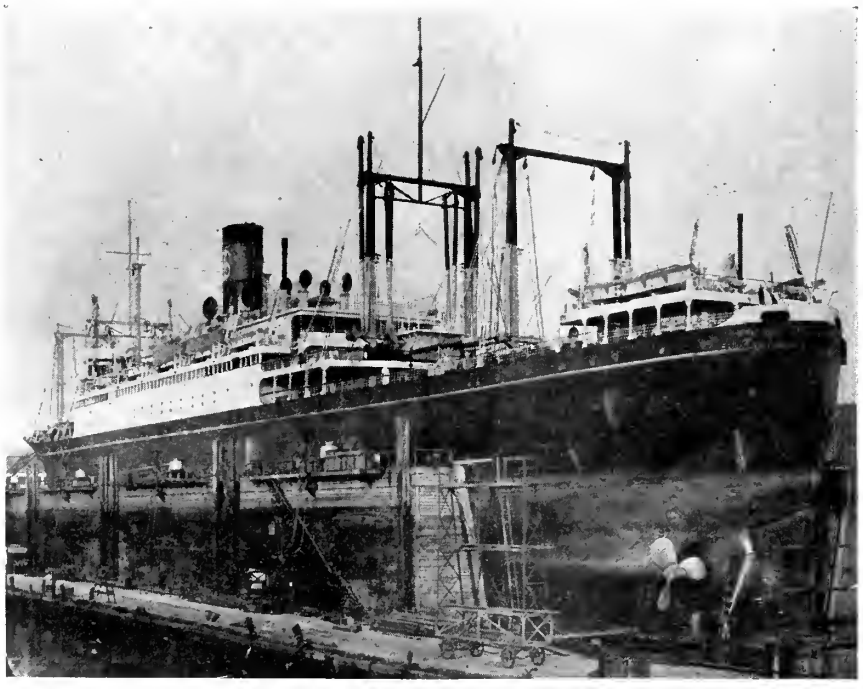
By 1941 the Globe Wireless System was a completely successful international radio-telegraph system. Following the plans of its founder, Captain Robert Dollar, Globe concentrated in communications to the Pacific Far Eastern area. In addition a complete marine radiogram service was offered to and from ships at sea in every ocean. Offices were located at San Francisco, New York City, Chicago, Seattle, Portland, Los Angeles, Honolulu, Shanghai, and Manila.

Then came Pearl Harbor day and all the facilities of the Globe system were turned over to the U. S. Army and formed an important network for military communications.

On February 22, 1941, Mr. Dollar's son, R. Stanley Dollar, Jr., enlisted in the U. S. Army as a private. He received his training at Camp San Luis Obispo and shortly after the outbreak of war was sent to the Hawaiian Islands to take part in the Island defense.

With his unit, 164th Field Artillery, 40th Division, he landed on Luzon at Lingayen Gulf on D Day, January 9, 1945. He went all through the Philippine campaign, was awarded the Bronze Star medal, and after more than five years in the service of his country, was discharged on March 12, 1946, with the rank of major.

Now R. Stanley Dollar, Jr., is a director of Globe Wireless, Ltd., while his father, R. Stanley Dollar, continues as president of the communications company that grew from the vision of his father, Captain Robert Dollar.

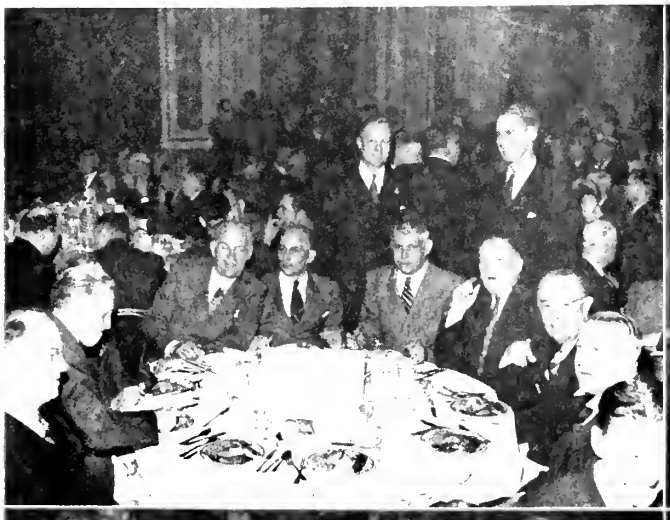


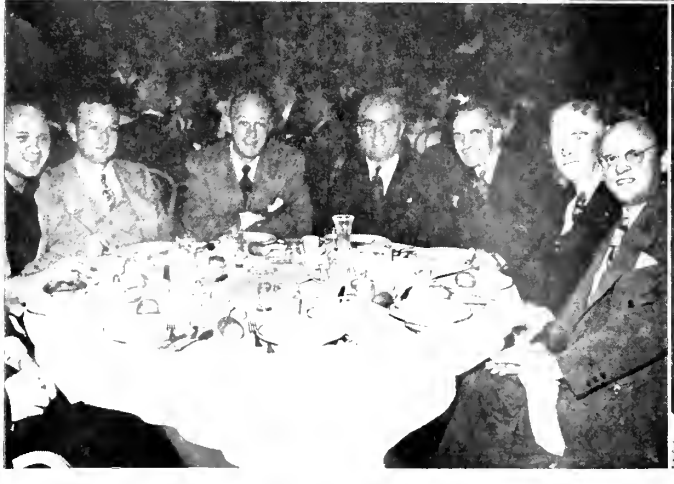
S. S. President Taft, Dollar Steamship Line. First radio contact maintained between this ship and Dollaradio station at Mussel Rock, 1928.

Banquet Scenes From the S. F. Observance of National Maritime Day

At left: One end of the head table at the Commercial Club in S. F. we find Ray Waterlow, Don Frazerackley, Ralph Meyers, president of the Shipowners' Assn. of the Pacific and Al Gatov in an animated discussion.

Below: Banquet scenes of the Mariners fralic. A jolly crowd assembled to climax the festivities of National Maritime Day.





Construction Office Of the USMC Closes

L. R. Sanford, director, Construction Division of the U. S. Maritime Commission, announces the Regional Construction Office in the Administration Building, Moore Dry Dock Company, West Yard, Oakland, has been discontinued. Hereafter, all communications and contacts which heretofore had been made with this office will be addressed to the Construction Division, U. S. Maritime Commission, Washington, D. C. where the duties and functions of this office have been transferred with certain exceptions.

Sanford's announcement said that Roscoe P. Strough is being retained for the present time at the Administration Building, Moore Dry Dock Company, in the capacity of Construction Representative instead of Assistant Director.

Under Strough's general supervision there will be retained the Technical Section, Purchase Approval Section, Plant Engineering Section, Ship Construction Section, Production Section, Industrial Relations Section, and the Materials Inspection Section.

Parker M. Robinson, San Francisco district manager for the Pittsburgh Testing Labaratory.

Pittsburgh Testing Laboratory Takes Over S. F. Concern

The purchase of one of the West's oldest firms of testing and inspection engineers and chemists, Smith, Emery and Co. of San Francisco (which was founded in 1904 by Emery E. Smith, former Stanford professor, and Arthur L. Emery, consulting engineer and chemist) by the Pittsburgh Testing Laboratory, was announced by C. M. Houck of Pittsburgh, Pa., vice president of the Pittsburgh concern.

Parker M. Robinson, widely known throughout the West in engineering and construction circles, formerly associated with Westinghouse Electric Corp., Western Pipe and Steel Co., Hunt, Mirk and Company, has been named San Francisco district manager. Mr. Robinson, an engineering graduate of the Universities of Pittsburgh and Yale, holds a California civil engineer's license.

Rubber Salesman Promoted

Walter C. Burns of San Francisco has been appointed district sales manager of the mechanical goods division of United States Rubber Company in San Francisco.

Mr. Burns returned recently to the rubber company after four years in the armed forces.

At left: Charles S. Silsbee, Dearborn's Marine Division.

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Spotlighted in Caterpillar Tractor Co. Engineering Department personnel changes are N. E. Risk (left) and George T. Lundberg; Lundberg becomes assistant to H. S. Eberhard, vice president, and Risk assumes Lundberg's former post as supervisor of transmission design.

Chas. S. Silsbee Heads Dearborn's Marine Division

After four years of active duty in the Navy, Lt. Comdr. **Charles S. Silsbee,** formerly of Dearborn Chemical Company's Marine Division, has been released from the service and again joins the Dearborn staff as the new head of the Marine Division in the New York offices.

Mr. Silsbee was graduated from the United States Naval Academy in 1925 and served two years aboard the Battleship Idaho. In World War II, his Navy assignment was that of Planning Officer. With a staff of Marine Engineers and Naval Architects, he supervised all planning in the conversion and construction of commercial-type vessels for naval service in the Baltimore area.

The knowledge thus gained will be of immeasurable value in the application of Dearborn products and services in the marine field.

Caterpillar Advances George T. Lundberg

George T. Lundberg, for the past several years supervisor of transmission design in the Engineering Department of Caterpillar Tractor Co., has been named assistant to **H. S. Eberhardt,** vice president in charge of Caterpillar manufacturing, engineering, research and training.

N. E. Risk, who is responsible for supervision of all engineering and coordinated activity pertaining to the application of allied equipment and special attachments, will also assume supervision of transmission design.

Kerotest Pacific Company Plant, Los Angeles, Calif. New subsidiary of Kerotest Manufacturing Company of Pittsburgh, Pa.

KEROTEST ACQUIRES SECURITY VALVE

The Security Valve Division of Security Engineering Company, Inc., Whittier, California, a member of Dresser Industries, Inc., has been acquired by the Kerotest Manufacturing Co., Pittsburgh valve manufacturer, according to an announcement by Edward G. Mueller, Kerotest president.

A new manufacturing plant has been acquired at Slauson and Alcoa Avenue, Los Angeles, where the present line of security cast and forged steel valves and Kerotest valves will be produced for Pacific Coast and Western distribution.

At the same time, Mr. Mueller announced the formation of a new company—The Kerotest Pacific Company—in order to more satisfactorily serve the many customers of both Security Valve and Kerotest throughout the Western States.

During World War II, the complete manufacturing facilities of both Kerotest and Security plants were devoted to the production of valves and fittings for war requirements.

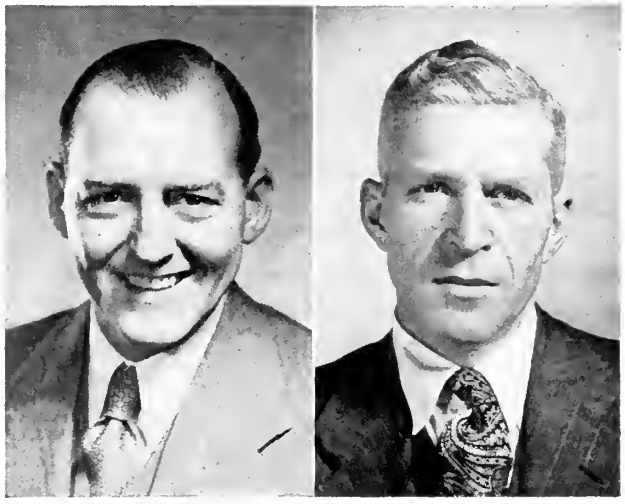
The plant will occupy a large modern building on the corner of Slauson Avenue and Alcoa Avenue, in Vernon, Los Angeles, California, with complete manufacturing and warehousing facilities. New modern aquipment is being installed for the precision manufacture of cast and forged steel valves and fittings, according to Mr. Mueller.

Officers of the Kerotest Pacific Company are as follows: Edward G. Mueller, president; Stanley J. Roush, vice president and general manager; Walter G. Swaney, secretary-treasurer and general manager.

The general sales offices will be located at 3305 E. Slauson Avenue, with district sales offices in San Francisco, Houston, Chicago, Odessa and New York. Sales representatives will be located in Tulsa, New Orleans, Richmond, Va., and Charleston, W. Va.

MARINSHIP CHANGES HANDS

Jean S. Spigler (at right), U. S. Maritime Commission resident plant engineer, receiving the key to the shipyard from Robert Digges, general manager of Marinship Corporation, when Marinship came to a "STOP" on May 16, 1946.



Albert Bauer (left), assistant general manager of Oregon Shipbuilding Corporation and the Kaiser Company, Inc., Swan Island, was named general manager of all Kaiser interests in the Portland-Vancouver area. At the same time Russell Hoffman (right), general superintendent of Oregon Ship, broadened his field of activities by taking over similar duties at the Swan Island yard which is engaged in ship repair and ship layup work. Oregon Ship is currently engaged in building three passenger cargo vessels for the Alcoa Steamship Company.

Thomas J. Bannan Heads American Gear Association

Distinctive recognition has been given to western manufacturing in the election of Thomas J. Bannan as president of the American Gear Manufacturers Association at their annual convention, June 3-5 in Hot Springs, Virginia. Mr. Bannan is president and general manager of Western Gear Works, with plants in Seattle and Los Angeles, as well as an associate plant, the Pacific Gear and Tool Works of San Francisco. Mr. Bannan has been actively associated with the firm since 1917.

Thomas J. Bannan

The AGMA is composed of approximately 125 leading gear manufacturers in the country and includes academic members from major educational institutions. For many years this Association has been the source of progress in the field of gearing, through the development of gear standardization and research in materials and manufacturing technique. The AGMA gear standards developed for American industry include nomenclature, specifications for materials, tooth forms and lubricants, recommended practices for rating and selection of all types of gears and geared units.

Bilge Prexy

Al Bora, new president of the Bilge Club of Los Angeles Harbor.

Malcolm P. Ferguson, South Bend, Indiana, new president of Bendix Aviation Corporation.

McMeekin in New Alignment

Thomas B. McMeekin, for seven years on the Coast as service installation engineer for Busch Sulzer Brothers Diesel Engine Company, has recently been appointed West Coast agent for Aircraft & Diesel Equipment Corporation of Chicago, manufacturers of ADECO fuel injection equipment. His duties will include sales and engineering services primarily in the Bay Area where he has wide acquaintance based on his installation work on the famed C-1 vessels, built at Western Pipe and Steel Company's yard at South San Francisco. Much of this diesel work was conducted under his supervision at the United Engineering Company's shops.

McMeekin is a B.S. Chemistry graduate of Westminster College, Class of '27. For many years thereafter he was associated with the Sun Shipbuilding and Dry Dock Co. at Chester, Pa. From this association and his ship design and engineering experience, he joined the Sun Oil Company. For eight years he served in the engine rooms of Sun tankers. He holds a Chief Engineer's ticket.

Thomas B. McMeekin, Aircraft & Diesel Equipment Corp.

His work as service engineer for Busch-Sulzer, with offices on the 9th floor of the Rialto Building in San Francisco, will continue.

NEWS FLASHES

920-FOOT LINER PLANS READY.

Invitations to bid on construction of two 920-foot express passenger liners, larger and faster than any ever built in this country, were authorized June 28 by the Maritime Commission. They will be built for the transpacific service.

These vessels, known as Great Circle Liners, will be of the Maritime Commission design P5-S2-E1, which the Technical Division of the Commission has had under preparation for several years. Capable of transporting 1200 passengers on each sailing, they will be able to reach Japan over the northern route in eight days.

With more than twice the horsepower of the hitherto largest liner built in the United States, the S.S. America, they will have a service speed of 30 knots under average sea conditions. All accommodations will be on a luxury scale, including three swimming pools, complete air conditioning, and a theater. A crew of 590 will be required for operation.

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NAVY PLANS $28,000,000 SCHOOL.

The Secretary of the Navy has submitted plans to the Senate Naval Affairs Committee for a postgraduate Naval school in the West. It is understood that the plans submitted included property surrounding the Del Monte Hotel in California and that the cost was estimated at $28,700,000.

At this writing, however, the location for the institution has not been determined.

The training will tie in with 52 colleges and universities which have, or will have, preliminary reserve officers training courses.

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FISHING BOATS FOR CHINA.

Two firms in Tacoma have announced the award of contracts by the United States Treasury Procurement Division for the building of trawler-seiner type fishing boats for UNRRA. The vessels to be assigned to China to help revitalize its fishing industry.

The Tacoma Boat Building Company has contracts for 9 boats, costing upwards of $1,000,000.

The Pacific Boat Building Company of Tacoma has contracts for 8 boats, construction to be at either its Tacoma or Bellingham yard.

Tacoma Boat Building Company has already reconditioned 16 vessels for China's fishing industry.

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MATSON EXPANDS AIR ACTIVITIES.

The Matson Navigation Company is seeking to expand its operations facilities at the Oakland Airport where the company is engaged in converting and servicing heavy aircraft for a number of companies and foreign countries. Present payroll covers 462 persons at the airport and expansion will run this to 1200.

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BIDS WANTED FOR CONVERTING STELLA LYKES AND ELIZABETH LYKES.

American shipyards and repair yards are invited to submit bids to the Maritime Commission for reconditioning for peacetime use the 435-foot C2-S-AJ1 freighter Stella Lykes. Bid opening date is set at July 17, 12:15 p.m., at Room 4821, Department of Commerce Building, Washington, D. C.

At the same date and hour bids will be opened for similar work on the similar vessel, Elizabeth Lykes.

BETHLEHEM EXPANDING AT SPARROWS POINT.

The Bethlehem Steel Company Shipbuilding Division announces an expansion program that will cost from $3,000,000 to $4,000,000 at Sparrows Point Shipyard, which is now ready to handle any type of ship reconversion or repair.

The above is one item in the $134,000,000 development program for the entire Bethlehem organization.

* * * * *

PLANT RUBBER COMPANY'S NEW BUILDING.

Plant Rubber and Asbestos Company, subsidiary of the Paraffine Companies, Inc., is adding to its Redwood City manufacturing plant a new $1,000,000 asbestos cement products factory.

* * * * *

MOORE-McCORMACK MOVES TO NEW LOCATION IN PORTLAND, ORE.

Moore-McCormack Lines, Inc., in Portland, Oregon, have moved to the Board of Trade Building, S.W. Fourth Avenue at Oak Street, Portland, Oregon.

* * * * *

CLYDEBANK MARKS NEW ERA OF SHIPS.

The launching June 14 of the first ship started and completed since the end of the war at the huge Clydebank yard of John Brown, Ltd., symbolized the shift into high gear of Britain's post-war shipbuilding program. The Norfolk, an 11,700-ton refrigerated cargo ship, will carry meat and butter for the New Zealand Navigation Company, which lost about 80 per cent of its tonnage during the war. The shipbuilders are optimistic for the near future. All yards have enough orders to keep going for at least three years. At John Brown's there is on the ways a new Mauretania, whose length of about 750 feet will make her as big as any ship likely to be constructed soon.

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HAGAN ACQUIRES WILLBURT PLANT.

John M. Hopwood, president of Hagan Corporation, combustion and chemical engineers, reports that his company had acquired the Willburt Company's Plant No. 1 at Orrville, Ohio, in which all Hagan equipment has been manufactured for 27 years, and will begin at once an expansion program to meet increased demands.

* * * * *

BULWINKLE BILL AFFECTS WATER CARRIERS.

Senator Reed, Kansas, has favorably reported (S.Rept.1511) to the Senate from the Senate Interstate Commerce Committee the so-called Bulwinkle Bill (H.R. 2536) to amend the Interstate Commerce Act with respect to certain agreements between carriers. The proposal would permit certain agreements to be entered into between carriers or between classes of carriers, with the approval of the Interstate Commerce Commission, without becoming subject to the anti-trust laws, similar to the exemption from those laws provided for in Section 15 of the Shipping Act, 1916.

Designed primarily to permit agreements between railroads, the measure includes water carriers as one of the classes of carriers which would be permitted to make agreements with other classes of carriers, but such permission would be limited to agreements relating to transportation under joint rates or over joint through routes.

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COASTAL WATER CARRIERS GIVEN RIGHT TO BOOST RATES IN LINE WITH RAIL ADVANCES.

Atlantic coastwise and Atlantic-Gulf steamship operators who filed with the Interstate Commerce Commission petitions for increases in their rates substantially the same as those sought by the Class I railroads of the country in ICC Docket Ex Parte No. 162 were granted the same right to increase their rates upon three days' notice to the Commission and to the general public as the ICC accorded the railroads in orders approved in the proceedings and published June 21. Authority to make the rate increases on three days' notice is limited to the period from July 1 to July 31, 1946.

* * * * *

DUTCH TO BUY 400,000 TONS OF LIBERTY SHIPS FROM U. S.

J. J. Oievaar, secretary of the Netherlands Shipping Ministry, has stated that his Government has decided to purchase from 300,000 to 400,000 tons of Liberty ships from the United States, according to Aneta, the official Dutch news agency. These vessels will be made available to private shipowners until new ships are ready.

RECONVERSION BIDS ASKED ON S.S. BRAZIL.

Invitation for sealed bids from American citizens for the reconversion of the Brazil from troopship to cargo-passenger vessel has been issued by the Maritime Commission. Bids to be opened July 8. (In the Pacific Marine Review for June the reconversion of the Uruguay was discussed at some length; the Brazil is the sister ship of the Uruguay.)

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BIDS ON S.S. URUGUAY.

On June 10 bids opened on the Uruguay disclosed the following: Federal Shipbuilding and Dry Dock Company $4,437,000, with completion in 240 calendar days; Todd Shipyard Corp., New York, $4,644,468, completion in 200 calendar days; Atlantic Basin Iron Works, Brooklyn, $4,944,000, completion in 240 calendar days; Bethlehem Steel Co., New York, $5,206,000, completion in 210 calendar days.

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NEW STEEL MILLS IN THE WEST.

O'Keefe & Merritt announce plans for a 50,000 ton per year capacity sheet steel mill at Maywood, California, to be completed early next year.

The Seidelhuber Iron and Bronze Works, Seattle, plans a steel rolling mill at Seattle to cost about $3,500,000 with an annual payroll of $2,400,000. Capacity at the start will be 50,000 tons of sheets and bars with an ultimate capacity of 300,000 tons. George Nickum of Engineering Associates, Inc., Seattle, is preparing the plans.

The award of the Geneva Steel plant to the United States Steel Corp. carries with it the plans for U. S. Steel's subsidiary, Columbia Steel of San Francisco, for the expenditure of $25,000,000 at the Pittsburg, Calif., plant of Columbia. This plant will probably specialize in tin plate for the canning industry.

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SHIP WARRANT RULES REVOKED.

The President on June 6 signed an order revoking the Ship Warrant Rules and Regulations (WSA General Order No. 25).

The Ship Warrant Act dating from July 14, 1941, authorized the Maritime Commission to fix priorities for merchant ships in the interest of national defense and was empowered to grant preference in the use of shore facilities.

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BETHLEHEM GETS AMERICAN EXPORT LINES CONTRACT APPROVAL.

Subject to concurrence of the operator the Maritime Commission announces approval of the Bethlehem Steel Company bid (New York) for construction of three 650 foot, 22 knot, passenger-cargo ships for the American Export Lines. The vessels are to be used in the Mediterranean service and will carry 650 passengers. Bethlehem's bid was $15,495,000 for each ship.

* * * * *

THE AMERICAN-HAWAIIAN PLANS PACIFIC OPERATION.

Generally interpreted as an indication of intention to resume transpacific operations, American-Hawaiian Steamship Company has applied for membership in the Pacific Westbound Conference. American-Hawaiian formerly operated a regular freighter service to the Philippines and China under the name Oceanic and Oriental Navigation Company. In this line American-Hawaiian and Matson had joint interests (a prediction of this development was suggested in the Pacific Marine Review in February of last year).

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KEROTEST MANUFACTURING COMPANY ACQUIRES SECURITY VALVE.

The Security Valve Division of Security Engineering Co., Inc., Whittier, Calif., a member of Dresser Industries, Inc., has been acquired by Kerotest Manufacturing Co., Pittsburgh valve manufacturer.

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APPLICATIONS FOR WAR-BUILT FLEET.

During the first preference period ending May 31 the Maritime Commission received applications for purchase or charter of 1001 war-built merchant ships.

Prospective American purchasers applied for 331 vessels, American charterers applied for 112 vessels, and foreign purchasers applied for 558 vessels. There are more applications for C-2 and C-3 vessels than there are ships of these types available. This is also true of Liberty colliers. Among foreign applications 230 are for Libertys and 153 for small coastal vessels.

LAY-UP PLANS

It is the present plan of the War Shipping Administration to lay up approximately 3000 ships. Of this number 400 will be permanently laid up and the balance placed in a care and maintenance status that will make them promptly available for use in an emergency.

* * * * *

NEW SHIP PROGRAM OF MARITIME COMMISSION.

It is the plan of the Maritime Commission to use its Construction-Loan Fund for the building of 33 ships. Of these 21 will be cargo vessels, 8 passenger vessels and 4 combination passenger and cargo.

* * * * *

ALCOA AWARDED 2 POWER LINE BIDS.

The Reclamation Bureau has awarded 2 contracts to the Aluminum Company of America for transmission line wire to be used in the California Central Valley Project and in Arizona. One contract for over two million feet of aluminum wire, totaling $197,000, is for the Phoenix-Tucson transmission line and part of the Davis dam project under construction on the Colorado River. The second contract is for over one million feet of aluminum wire and fittings for the Oroville-Sacramento line and totals $246,000.

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TWO COMPANIES ABSORBED BY CARGOCAIRE.

O. D. Colvin, president of Cargocaire, announces that the Colvin Slocum Boats, Inc., and the Landley Company have been merged with Cargocaire Engineering Corporation.

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WELLS INSULATION COMPANY EXPANDS.

The Wells Insulation Engineering Co. of Palo Alto and Burlingame has opened a branch at 7003 East 14th Street, Oakland. The company specializes in rock wool insulations.

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OLYMPIC STEAMSHIP COMPANY GOES WEST.

The Olympic Steamship Company of Seattle, which has heretofore operated coastwise, announces its entry into the transpacific trade by next fall. The program calls for sailings every three weeks from major Pacific Coast ports to the Philippines, China and Japan. Four C type vessels will be purchased.

* * * * *

NEW STEAMSHIP LINE TO SERVE LATIN AMERICA.

James Griffiths & Sons, Inc., pioneer Pacific Coast operators with head office in Seattle, have organized the Inter-American Line to serve Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Canal Zone and Colombia, from United States Pacific Coast ports. Monthly sailings are planned.

* * * * *

GENERAL ELECTRIC TO OPERATE ATOM PLANT.

The War Department announces that the $347,000,000 atom plant at Hanford, Washington, will be turned over to General Electric Company on September 1 for operation. It is presumed that the intention is to develop atomic power for civilian use and it is likely that an important part of the tremendous amount of electric power now available at the plant will be diverted to civilian use also.

* * * * *

MERCHANT MARINE COMMITTEE ASKS SUBSIDY FOR ALASKA SHIPS.

The House Merchant Marine Committee has asked Congressional appropriations committees to provide funds for continued government operation of three privately-owned steamship lines from the Pacific Coast to Alaska.

A committee spokesman said if the lines were returned to their owners now, they could not operate them without a "very substantial" increase in freight rates. He said the committee planned legislation to give the lines relief and prevent any burdensome increase in freight costs to the people of Alaska.

The three lines--the Alaska Steamship Co., the Northland Steamship Co., and the Alaska Transportation Co.--were taken over during the war and have been operated since by the War Shipping Administration.

LIGHT VISIBILITY

Dark surfaces steal light; glare imposes too much. Both are wrong. Color Engineering recommends what's right in *your* plant for better seeing, better work.

WORK EFFICIENCY

Any worker's efficiency rises when his surroundings are attractive and comfortable, his well-being protected, his routine made easier to follow. Make it so he *can* do better and he *will* do better—whether or not he realizes why.

EMPLOYEE MORALE

Color increases light, color relieves strain, color high-spots work areas, color warns of dangers, color guides operations—all combine for greater employee security, less discontent, more self-respect and pride, less labor turnover.

SAFETY

Color Engineering provides a safety color code for every production hazard. More—proved eye-rest colors decrease your accident rate; decrease your insurance costs.

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Color Engineering speeds up material movement by planned traffic flow systems, automatically guiding work and workers where wanted.

WANT MORE AND BETTER WORK for the wages you pay?

***Color Engineering* by Fuller will cut fatigue, accidents, absenteeism; build morale, improve housekeeping, increase productivity.**

Color, scientifically used, will show a profit on your production cost sheets. That's no swivel-chair theory. It's a practical fact already proved in many Western plants.

Color Engineering by Fuller is a scientifically planned system that literally paints out trouble by dramatizing danger; lifts the level of employee effort by removing irritations; and increases interest in the job, and pride in "the outfit I work for." *Color Engineering* is an asset—it goes on the Resources side of your financial statement.

An interesting hour with our newest free book, "*Color Engineering* by Fuller," will give you ideas. Illustrated in color to show you the why, where, how and when! Write for it!
W. P. Fuller & Co. Factories: San Francisco, Los Angeles, Portland. Branches in principal Western cities.

FULLER *Color Engineering* PAINTS

HEAD TABLE AT THE L. A. NATIONAL MARITIME DAY FETE

The Los Angeles Propellers, together with the Kiwanis Club and the Foreign Trade Group in Los Angeles, held a joint celebration on May 22, of National Maritime Day. Above are some pictures of the head table dignitaries (left to right): Arthur Eldridge, general manager, Los Angeles Harbor Department for the L. A. Board of Harbor Commissioners; Emerson Spear, chairman, World Trade Committee, L. A. Chamber of Commerce; Faye G. Bennison, general chairman, Foreign Trade Week Committee; C. S. Booth, Matson Navigation Co., chairman of the day; F. A. Hooper, district manager, American-Hawaiian S. S. Co.; William Jennings Bryan, Jr., Collector of Customs of Los Angeles; Walter Measday, district manager, U. S. Department of Commerce; and W. P. Martin, president of the Long Beach Board of Harbor Commissioners.

GUEST SPEAKER AT L. A.

At left: John Cushing, former Deputy Administrator, W.S.A., Pacific Area, and delegate for the United States at U. M.A. in London, is now president of American - Hawaiian S.S. Co. in San Francisca, was the guest speaker at the L. A. Maritime Day program of the Propeller Club of Los Angeles-Lang Beach. Here he is with Helen Chapman, Miss Foreign Trade of 1946, and H. E. Pickering, past president of the Southern California Propeller Club.

Matson Appointments

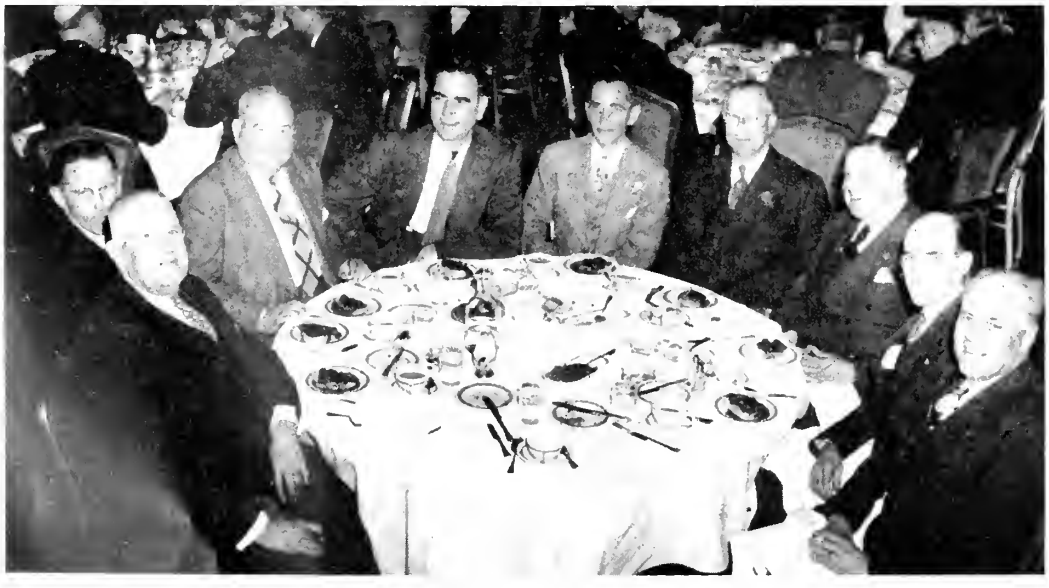
Appointment of **Commodore C. A. Berndtson** as marine manager for the Matson Navigation Company was announced by Hugh Gallagher, vice president and operations manager. Commodore Berndtson has been for many years master of Matson's flagship, the S. S. Lurline.

Captain H. R. Gillespie, who has been serving as acting marine manager during the illness of the late Captain A. G. Townsend, is being transferred to Los Angeles as general superintendent at Wilmington. J. H. Jensen, formerly assistant Matson Terminals manager, becomes general Terminals manager, with headquarters at Pier 32, San Francisco.

At the same time **M. F. Cropley,** Matson freight traffic manager, announced the following appointments in connection with Matson's operations in Los Angeles: J. B. Banning Jr. as assistant freight traffic manager in charge of Southern California; C. S. Booth as general freight agent; and Paul N. Carter as district freight agent.

CORRECTION

We are repeating the accompanying picture because of inaccuracies in the caption as it appeared in our May issue. The caption should read: Around the table, left to right, are: Charles J. Nolan, U.S.M.C.; William P. Manuell; F. H. Fox, Gadfrey Waters, Peter Mesquita and Al Wanner, all of General Engineering and Dry Dock Company; Harry B. Taylor; Paul N. Mulvany and R. P. Straugh, both of the U.S.M.C. regional affice in Oakland. Main fault was in showing Harry B. Taylor as "retired," whereas he is assistant to Rear Admiral Wm. H. Shea, U.S.C.G. (retired), who is chairman of the West Coast Guarantee Survey Board of the U. S. Maritime Commission. Harry is well known on the Pacific Coast, where he has presided at many surveys. William P. Manuell, unidentified in our May caption, is also attached to Admiral Shea's staff on present assignment.



Hercules Gasket Shop Gets Ajax Line

The Gasket Shop, division of Hercules Equipment and Rubber Company, 435 Brannan Street, San Francisco, California, has recently been appointed Northern California distributor for the United States Gasket Company line of Ajax spiralwound gaskets, formerly distributed by the late Charles E. Lowe.

Ajax spiralwound gaskets have had a wide distribution on the Pacific Coast, particularly with the marine industry. A service stock of the popular sizes of flange, boiler manhole, tube cap and water wall gaskets will be maintained.

The addition of this line to Hercules Equipment's two manufacturing divisions, The Gasket Shop and Standard Rubber Company, rounds out what is perhaps the most complete gasket and packing service in the West.

Jack Thaler Returns to Thaler Pipe

Jack Thaler, co-owner and sales manager of the Thaler Pipe and Supply Co., has returned to the industrial piping field after thirty-one months of active duty with the Navy.

While in the Navy, Jack served in Boston, New Orleans, Washington, D. C., and New York. He was special purchase officer and assistant to an industrial manager as engineering and piping consultant.

He was awarded the following ribbons: Commendation, American Theatre and World War II Victory.

JACK THALER

Thaler has been appointed as a distributor for Northern California by Taylor Forge and Pipe Works of Chicago.

Taylor seamless steel products are used very extensively throughout the industrial field and are added with pride to Thaler's stock of pipe, valves and fittings.

It is significant, that because of thoroughly tested principles of design and construction, there have been no basic changes in the design during the many years of use and manufacture of the Taylor seamless steel line.

This complete line of seamless steel welding fittings and forged steel welding flanges is now being warehoused by Thaler Pipe at 5812 Hollis St., Emeryville, California.

Glenn Carson Gets Regional Post

Gotham Instrument Co., Inc., with factories in New York and San Francisco, in keeping with their policy of regional representation, have appointed Glenn O. Carson as regional sales manager for the West. The territory is now open for local distributors and representatives.

Mr. Carson has had vast experience in the electrical and mechanical fields. His long association with such organizations as Instrument Laboratory, Inc., and Standard Boiler & Machine Works outstandingly equips him to promote Gotham's complete line of indicating, recording and controlling thermometers, temperature and pressure recorders and controllers as well as laboratory type thermometers.

Mr. Carson will make his office at 331 Kinnear Place, Seattle, and will have the facilities of The Gotham Branch Factory at 591 Mission St., San Francisco, California.

New Unit at Allison G. M. Devoted to Bearings

Allison Division of General Motors has set up a new unit devoted exclusively to development and production of bearings, according to an announcement by E. B. Newill, general manager of Allison. The new unit is to be designated the Allison Bearing Plant, and will contain all the bearing activities of the Division. The location of the plant will be in the original Allison plant on Main Street in Speedway, Indiana. Manager of the new unit is **B. L. Cruzan,** who joined the Allison organization in 1918.

To be in direct charge of bearing production and development is **E. G. Davis,** who has been bearings engineer but who now has the enlarged responsibility for all bearings engineering and production, including the production facilities which formerly were located at Plant 5. In addition Mr. Davis will supervise research work on forward looking developments in the bearing field.

Bearing sales, service and customer contact will be supervised by **P. G. Martich,** who formerly was bearing sales engineer. He will have larger responsibilities through the expansion of sales outlets which the company is seeking for its bearing business.

During the war, more than 10,000,000 bearing were made by Allison for many different kinds of aircraft, diesel and marine engines. Allison bearings are sleeve-type with silver, bronze, copper or lead-plating on a steel shell by processes originated by Allison as early as 1925. It was this pioneering which paved the way for the high horsepower engines of World War II, because the high power aircraft flown in the war depended on this Allison-developed connecting rod bearing.

Matson Line New Freight Set-up at LA

Announcement has been received from Ralph J. Chandler, vice president of the Matson Navigation Company, of the assignment of executives in the handling of freight matters: Joseph B. Banning, assistant freight traffic manager; Charles F. Booth, general freight agent; Paul S. Carter, district freight agent, and Captain H. R. Gillespie, general superintendent, Wilmington Terminal.

SHORESIDE PERSONALITIES

John H. Wills, De Laval Steam Turbine Co.

C. M. WAGNER was appointed acting district passenger manager for the United States Lines on the West Coast June 1. He has been with the Lines since 1919 and will make his headquarters in the San Francisco office.

KENNETH F. WATERWORTH, formerly traffic manager for 12 years with the Interocean Line, is now San Francisco manager of the Marine Transport Line. He succeeded Frank J. Schmitt, who went to New York to assume management of the office there.

COLONEL CARROLL V. KING, SR., associated with Howard Terminals in Oakland for 20 years before the war, wears the Legion of Merit Medal for ability in handling transportation problems for the San Francisco Port of Embarkation.

EDWARD L. RYAN, whose firm E. L. Ryan Co. is located at 122 Marine Avenue, Wilmington, California, is the representative in California for U. S. Gasket Company and Coen Oil Burners, and specializes on refractories and special brick shapes that are required on the various marine boilers.

Mr. Ryan, before going into business for himself, was with The Texas Company. He has held a Master's License for 20 years, and also holds a pilot license and owns his own Airplane.

E. L. Ryan of U. S. Metallic Gasket Co.

The shop in Wilmington, California

H. L. Southworth

Herb L. Southworth has recently opened his own office at 225 Steuart Street, San Francisco. He will handle the exclusive agency for the Northern California, Oregon and Washington territories for the Kingsbury Machine Works of Philadelphia, manufacturers of thrust and journal bearings.

A complete line of packings for all types of telemotors and steering rams for the marine trade will also be carried. It is his intention to continue as usual with his consulting business.

CAPTAIN CHARLES F. MAY, president of the Masters, Mates and Pilots of America, was appointed a member of the California State Board of Pilot Commissioners by Governor Warren. He assumes the office vacated by the death of Captain Andrew Townsend. Captain May became a member of the Commission on June 1.

HARRY L. BAKER, well known in Pacific travel circles, is in charge of the American President Line's San Francisco uptown passenger office located at 152 Geary Street. The Company decided the centrally located passenger headquarters were necessary to more adequately serve the passenger trade, which is expected to be the heaviest in volume in transpacific history with the entry of the new President luxury liners.

SHORESIDE PERSONALITIES

FRED L. DOELKER, vice president of Grace Line, returned recently from a two month's trip to Sweden, where he visited with Consul General Axel Johnson and other executives of the Johnson Line.

GERALD MACK, after serving for four years in the New York offices of Norton, Lilly & Company, has returned to the San Francisco office of the company to be head of the traffic department.

CARL E. McDOWELL, following his discharge from the United States Navy as a Lieutenant, Senior Grade with a service record comprising the Central Pacific Theater as well as a Navy instructorship stint on the Pacific Coast, has resumed his pre-war position with Pope & Talbot Lines at San Francisco, as executive assistant to Mr. Wheeler.

JOHN E. CUSHING, president of the American-Hawaiian Steamship Company and wartime assistant deputy administrator for the War Shipping Administration in the Pacific Area, is now a director of the California State Chamber of Commerce, following the organization's annual election in May. The balloting also saw H. D. Collier, Standard Oil of California, re-elected to the directorate.

GEORGE F. NICHOLSON, consulting engineer, has returned from military service and recently announced the reopening of his former offices in Los Angeles, and Washington, D. C. He will again be specializing on harbor and waterfront engineering and construction and beach preservation. Washington, D. C. office is 518-19 Union Trust Building, and the Los Angeles office is in the Foreman Bldg., 7th and Hill Streets.

Amile J. Forni, sales engineer, Marine Sales and Service Department, Electronic Equipment Division, Raytheon Manufacturing Company.

W. V. LYNCH, manager of the coffee department of W. R. Grace & Co. and nearly as well known in steamship as in coffee circles, is the new president of the Pacific Coast Coffee Association.

CAPTAIN THOMAS WHITE, after serving as port captain during the entire period of the war, retired from the service of the Weyerhaeuser Steamship Company. He was tendered a testimonial luncheon by fellow executives of the organization before he resigned.

CAPTAIN EDWARD MACAULEY'S resignation as acting chairman of the U. S. Maritime Commission became effective on May 21 upon the acceptance of the resignation by President Truman. Captain Macauley was head of the Commission since Vice Admiral Emory S. Land resigned in January, and it was then known that Captain Macauley was desirous of leaving government service and returning to his home in Burlingame, California. His term as a member of the U. S. Maritime Commission would have run until September 1950.

Roach a Director of China-America Council

Alden G. Roach, president of the Consolidated Steel Corporation, with head offices in Los Angeles, has been elected to the national board of directors of the China-America Council of Commerce and Industry.

Mr. Roach's election to the Board of the China-America Council is a reflection of the great and increasing interest in China trade prevailing among industrialists in the Los Angeles area. The Pacific Coast has long had a special interest in China-America trade, as is evidenced by the fact that of the 400 American firms making up the China-America Council, approximately 40 per cent are located on the West Coast. Active groups have long been functioning in the San Francisco, Portland and Seattle-Tacoma districts.

FLAME HARDENING: Air Reduction Sales Company has published a new catalog describing design and use of Airco flame hardening apparatus. Items covered in the catalog vary from simple water-cooled torches and tips for hardening small parts to complete apparatus for use on large jobs. Since all of this apparatus is light in weight and fully portable, it is possible to bring the heat to the work.

CONDENSER TUBE INSERTS: A new bulletin which describes Flowrites, metal inserts for inlet ends of condenser tubes, which prevent tube and erosion has just been published by Condenser Service & Engineering Company, Inc., Hoboken, New Jersey. The booklet shows reports of tests conducted at Massachusetts Institute of Technology, with tables, graphs, and data showing how condenser operation is improved with Flowrites. Installation instructions are included.

A MARINE COUPLING BULLETIN published by the marine division of Morse Chair Company, Detroit, Michigan, illustrates and describes typical conditions under which a flexible coupling relieves excessive bearing loads and shaft distortion from which fatigue breaks frequently occur. It also describes the special "neoprene biscuits" with unusual absorption qualities and muscle-like resilience which are the heart of these marine couplings.

"BUDA ONE-SIXTY-ONE SERIES": A 12-page booklet published by the Buda Company, Harvey, Illinois, describes diesel engines for automotive, industrial, and marine service. Illustrations show 1, 2, 3, 4, 6, and 8-cylinder models, ranging from 15 to 300 horsepower. The heavy-duty six and eight-cylinder diesels are available in both standard and supercharged models. The text includes pressure lubrication data, a discussion of Buda "slow pressure" combustion system, engine data table and other descriptive information relative to application.

Recent Sperry Gyroscope Catalogs

THE EYE THAT SEES IN DARKNESS: An eight-page two-color booklet published by the Sperry Gyroscope Company, Inc., Brooklyn, New York, describes their "Marine Radar" equipment for "blind" navigation by instrument in darkness or fog. Illustrations and drawings make the description more graphic.

GYROSCOPE THROUGH THE AGES: This 30-page illustrated booklet, by Sperry Gyroscope Company, Inc., Brooklyn, New York, is a sketchy account of the evolution of the gyroscope and of its application to navigation, avigation and other practical uses.

INCANDESCENT SEARCHLIGHTS: A standard file size, eight-page pamphlet published by the Sperry Gyroscope Company describes and illustrates their line of Incandescent marine-type searchlights.

THE ROPE SHORTAGE: A 16-page profusely illustrated booklet, published by the Plymouth Cordage Company, Plymouth, Massachusetts, indicates the best ways in which to meet the present rope shortage problems.

NEW THUR-MA-LOX BULLETIN: The Dampney Company of America, Hyde Park, Massachusetts, announces a comprehensive bulletin from its Thurmalox Division, Doylestown, Pa. This special coating protects metal surfaces in power and process equipment against temperature damage from sub-zero to red-hot and has been time-tested by widespread use throughout industry.

The bulletin lists the story of the Thur-Ma-Lox coatings, what they do and how they are applied, with a list of typical applications for Nos. 7 and 10, and included data sheets.

RADIOMARINE ISSUES NEW RADAR BOOKLET: Details of the new Radiomarine Model CR-101 shipboard radar equipment are described in a 12-page booklet recently issued by the Radiomarine Corporation of America. The product of exhaustive research and experienced RCA engineering, the new radar equipment is rugged and powerful, designed primarily for installation on cargo or passenger vessels to provide accurate navigational information and for use as an anti-collision device. Consisting of a binnacle-type indicator unit, an antenna assembly and a transmitter-receiver unit, the Model CR-101 incorporates the most modern advances in the radar field and features simplified controls, short and long ranges, a large easily interpreted picture on the cathode ray scope, and true or relative bearing presentation with the flick of a control knob.

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THE HYDE WINDLASS COMPANY BOOKLET: A recent publication called "Men, Methods and Machines," has been issued by the Hyde Windless Company of Bath, Maine, manufacturers of steering gear, windlass, winch, capstan or propellers. The book tells the story of Hype from the days of sail to present day reconversion period. It is a picture story, showing the plant and assembly shops, and methods employed in production.

WIZARD CONDENSER INJECTOR: A new bulletin illustrating the Wizard condenser injector which instantly stops tube leaks while the condenser continues to operate. It describes the construction, operation, and installation of this simple, inexpensive insurance against untimely condenser shutdown, and the catalog lists various users ashore and afloat.

The U. S. Maritime Commission has published a booklet called "American World Traders—New Ships for the Merchant Marine." The booklet is a description of the principal types of ships designed and built by the Commission, and which make up our merchant fleet for the different routes and commercial needs. Photographs, profile silhouettes, and tonnage figures are included in the description.

CONSOLIDATED STEEL CORPORATION, in publishing the annual report to the shareholders for the fiscal year ended August 31, 1945, incorporated a photographic display of the types of ships built during the war, and their facilities throughout the country. Aerial views of all the yards and the products manufactured by Consolidated, make an intensely interesting and attractive booklet, as well as a fine report.

"MEN OF VISION" is the title of a booklet telling the growth, expansion and war-time production of the Caterpillar Tractor Co., of Peoria, Illinois. It is a beautiful booklet on this industry and tells the story of men with vision in the diesel tractor field.

AIRCO CAMOGRAPHS: A new bulletin published by the Air Reduction Sales Company, New York, describes Airco Nos. 4 and 5 oxyacetylene cutting machines. The bulletin covers specifications, operating instructions and electrical requirements.

DIESEL DRIVE

(Continued from page 72)

taken from the log for these two voyages is shown in Table II.

It becomes clear from the foregoing that the diesel powered ship, despite

TABLE II

PERFORMANCE DATA

M.S. Emory Victory

Total Running Time Main Engine	1064 hours
Total Miles Traveled	14,583 miles
Average Speed	15.5 knots
Average Engine Speed	153.5 rpm
Propeller Slip	5.0%
Mean Draft—Outbound	25′ 6″
Homeward Bound	Light
Miles per barrel fuel (all purposes)	2.24

These figures may be compared favorably with average data recently published on steam turbine powered Victory ships which shows:

S.S. Victory Ship Data

Average Speed	15.15 knots
Propeller Slip	2.93%
Mean Draft	20′ 06″
Miles per barrel of fuel	1.33

the excellent improvement in steam power economy, has maintained its advantage from the economy point of view and at the same time has overcome the curse of high maintenance which plagued it in the development years. Design, performance and operation are beginning to draw a rather clear and favorable picture for the modern diesel powered ship and foresighted American ship operators should not overlook this economical type of propulsion for our competitive commercial cargo ships.

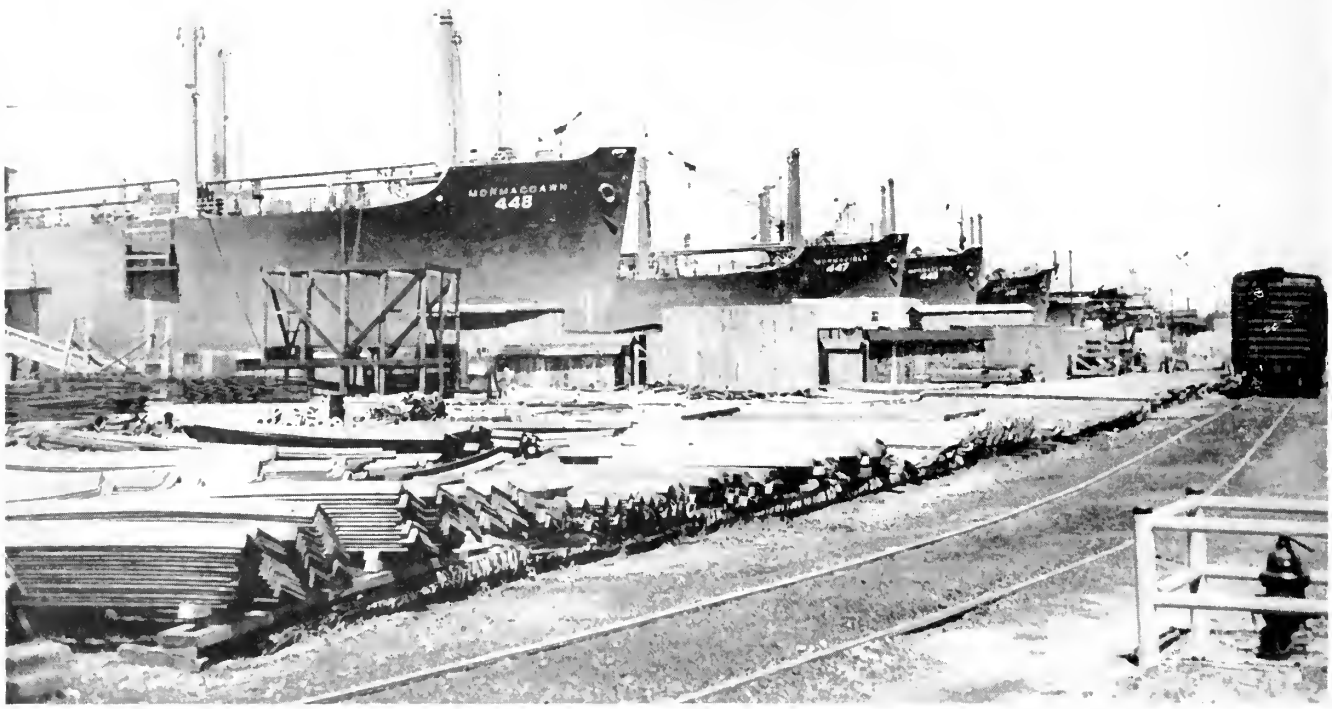
Ingalls Builds Rhine River Barges

The storied castles on the Rhine, centuries-old watchers of river traffic on the historic European water course, will soon look down on self-propelled diesel barges which are now being manufactured by the Ingalls Shipbuilding Corporation's Decatur, Ala., shipyard. Ingalls is building 25 of the barges like the one shown in this artist's conception; each 208 feet long over-all and of 23 feet molded breadth, for the French Supply Council for service on the Rhine. They are single-screw craft, powered by 480 hp diesels turning at 400 rpm. The first barge will be completely assembled, launched and tested on the Tennessee River, then disassembled into sections for shipping to France.

The shaped after and forward sections will be completely erected and assembled at Decatur, including the installation of joiner items, electrical wiring, piping, etc. The main engine and the auxiliary generating set will be installed on the first barge, but not on subsequent ones.

Designed by George G. Sharp, naval architect, the barge will have quarters for the crew in the after end and also in the forward end. Hatch covers over the cargo holds will be formed from light gauge galvanized pressed steel, and covered by canvas tarpaulins.

Liberal coloring will be used. The hull will be painted black, the waterline red, and the hatch cover tarpaulins brown. White will be the color of the superstructure, ventilators buff and window frames red.



NEW PLEASURE FLEET—Ships scheduled to visit almost every port in the world are shown in this recent picture taken at the Ingalls Shipbuilding Corporation yards in Pascagoula, Miss., where more than $100,000,000 worth of peacetime vessels are being built. The first four in the wet dock are Moore-McCormack vessels, first of a fleet of seven, and others down the line are luxury liners for the Delta Lines' South American run.

BRAZILIAN CARGO LINERS

(Continued from page 51)

fire, and main and auxiliary condensate pumps will be of the vertical, centrifugal, motor driven type. The main circulating pump will have a driving unit of about 75 hp and will have a capacity of some 10,700 gpm. The motor driven fire pump, driven by a 30-hp, 1750 rpm unit, will have a capacity of 400 gpm. The main condensate pumps (two) will each produce 125 gpm with 15 hp driving units.

The fire pump will be assisted in its duty by a vertical simplex steam pump having a capacity of 425 gpm. The general service and bilge and ballast pumps will also have a capacity of 425 gpm each and will be of the vertical simplex steam type.

The main feed pump, a horizontal, centrifugal, turbine driven unit, will deliver about 165 gpm of water at 240° F. against a 600 psig discharge head with a 20 psig suction pressure.

The lube oil and fuel oil service pumps will both be vertical, rotary, motor driven units, the former producing 250 gpm with a 15 hp motor, while the latter will produce 12 gpm with a 7½ hp driver. The oil standby pumps will both have a capacity equal to the main units but will be of the vertical steam type, the lube oil being simplex and the fuel oil duplex.

The two fresh water pumps will each deliver 30 gpm with the aid of a 2 hp motor and will be double acting piston type units.

The feed heater will be of the direct contact deaerating spray type with a storage capacity of 1000 gallons. Operating conditions: 240° F. feed outlet, steam 10 psig.

The evaporating plant will be of the low pressure, single effect, submerged tube type producing 6000 gpd.

Electrical power will be derived from three 3-wire, compound wound, turbine driven generators, 200 kw each, supplying 120/240 volts dc.

FLOATING POWER

(Continued from page 80)

unsinkable as possible the bilges of the 12 compartments are served by 20,000 g.p.m. emergency Pomona pumps, electric motor driven, which can discharge water at the rate of one foot per minute. Altogether, about 150 manufacturers supplied equipment for these power plants, which are said to be the most modern in the world.

When the prototype of these floating power barges, the Jacoma, was built in 1930 by the Newport News Shipbuilding and Dry Dock Company, Newport News, Va., she represented a noteworthy advance in power plant engineering development. Her B & W boilers were designed for a working pressure of 400 psi at a total steam temperature of 700 degs. Fahr, and were more highly rated than any commercial marine installation of her day.

Marine Refrigeration

(Continued from Page 75)

problem. Each type of space must be treated differently according to its use. Systems should be zoned so that various sections and compartments of the ship can be operated independently. Mixing of air is to be avoided between spaces having different uses. Thus, it would be undesirable to have a bar or smoking room on the air conditioning system of a lounge or writing room.

The air conditioning of staterooms is even more complicated. Here again the danger of mixing recirculated air is apparent, and likewise there is the necessity of having individual temperature control so that each room occupant can obtain the conditions which he, or she, prefers.

There are three methods of air conditioning a stateroom. One is the use of an individual self-contained air conditioning unit in each room. The unit is a small cabinet composed of the refrigerating compressor, cooling coil, condenser and fan assembly. This method is recommended only for isolated rooms as it requires service connections and continued maintenance.

A second method is the conventional system in which the air is discharged from a central air conditioning system to the various staterooms through supply ducts and returned from the rooms through return air ducts. The return air is mixed with a certain amount of outside air supplied for ventilation purposes, reconditioned and redistributed. To obtain individual room temperature control, supply air is cooled to the lowest temperature requirement. Reheater coils are installed in the outlet of each stateroom to permit the room occupant to raise the air temperature when the room becomes too cool.

A third method is a high pressure supply air system with a specially designed air-mixing unit, a Weathermaster or conduit unit located in each stateroom. The air supplied to the Weathermaster is all drawn from the outside, is dehumidified and cooled in a central station system. The air supplied to the room unit is under relatively high pressure which permits the use of a very small duct. The primary air from the central system is discharged through special nozzles in the conduit unit inducing air circulation from the room itself, so that the total air circulated within the stateroom is approximately five times the amount of primary air introduced through the duct. There is no fan or moving part in the room unit. A secondary coil in the unit, through which chilled or hot water is passed, absorbs the sensible heat load in summer and supplies the heating requirements in winter. The room occupant has individual control of temperature both in winter and summer by controlling the quantity of water through the secondary coil. The conduit type of air conditioning system is being installed on five passenger vessels now under construction. It embodies the desirable features peculiar to air conditioning of staterooms, consisting primarily of the small supply air duct, elimination of all recirculated air between staterooms, absence of return ducts, and individual temperature control available to each room occupant.

The trend of past events and the favorable acceptance of air conditioning on ships indicate that:

First, all passenger ships of the future will be extensively air conditioned.

Second, the system of air conditioning for staterooms and cabins will permit the occupant to control the temperature the year-round without unpleasant draughts or noise.

Third, a general ship system of refrigeration may be developed which will integrate into the one system, the very low, low, and moderate temperatures required for storage and air conditioning. For the very low and low temperatures, spare equipment will always be available in case of failure of any element. When use of the spare equipment is necessary, the air conditioning equipment will be operated at reduced capacity.

Fourth, there will be a trend away from reciprocating refrigerating machines in large capacities. Centrifugal compression machines with either turbine or motor drive will receive greater acceptance; as will absorption refrigerating machines if the development is such as to reduce space requirements, weight, and cost of operation. Machines under 120 tons capacity at moderate temperatures or 50 tons at low and very low temperatures will remain definitely the multi-cylinder, high speed, reciprocating type.

Fifth, in refrigerated cargo ships relatively small compact air cooling units will replace heavy and cumbersome refrigerating coils. Brazed copper will take the place of steel both in the piping and coils. Continued improvement in controls will permit effective direct expansion to be employed and at the same time afford perfect temperature control and also relatively trouble-free operation.

Sixth, developments of the future will tend towards increasing the reliability of operation of the refrigerating equipment.

Water Conditioning On Motor Ships

An increasing number of small diesel-powered vessels is being serviced by the Hall system of boiler water conditioning, according to Bull & Roberts, New York, marine chemists and representatives of the Hall system.

Dr. A. C. Purdy, of Bull & Roberts, points out that: "When these vessels entered service, most of them were equipped with small coil boilers for auxiliary steam production, but since this type of boiler has apparently proved unsatisfactory in operation, it has been replaced in a number of instances by a small Foster-Wheeler D-Type "package boiler." This latter boiler contains 1150 pounds of water and operates at 95 psi.

"It is pointed out that treatment of the cooling water in the main engines will inhibit corrosion. On a number of installations we have been treating diesel cooling water for some months. The boiler water test cabinet is applicable to control testing, it only being necessary to make up a chromatic color standard in one of the phosphate precipitation tubes. The operators are able to control chromatic with reasonable accuracy and have no trouble in maintaining the suggested slight alkalinity.

"Before making recommendations for treatment of the cooling water, a check of the system should be made, as we find that in the case of a few of these vessels the cooling water and boiler feed water circuits are interconnected. In such cases, provision must be made to separate the engine cooling water circuit from the boiler water circuit."

WASHINGTON DIGEST

(Continued from Page 100)

TRADE ROUTE No. 27—U. S. Pacific ports—Australia, New Zealand, New Guinea and South Sea Islands.

1. Passenger and Freight Service:

Itinerary: San Francisco, Los Angeles, Honolulu, Pago Pago, Suva, Auckland, Sydney, Melbourne, and return via the same ports.

Sailing Frequency: Every 4 weeks (13 sailings per year).

No. & Type of Ships: 2 Special passenger-cargo type ships.

2. Freight Service:

Itinerary: (a) From U. S. Pacific Coast ports (with privilege of calling at British Columbia ports) to Australian ports of Sydney and/or Melbourne and/or Brisbane, with privilege of calling at Hawaiian Islands, Samoa, Fiji, and/or other Pacific Islands lying along the same general route; and with the further privilege of extension to other Australasian ports as sufficient inducements offer.

(b) From U. S. Pacific ports (with privilege of calling at British Columbia ports) to Australian ports of Sydney and/or Melbourne and/or Brisbane, with privilege of calling at New Zealand ports, and/or at Hawaiian Islands, Samoa, Fiji, or other Pacific Islands lying along the same general route; and with the further privilege of extending services to other Australian ports as sufficient inducements offer.

Sailing Frequency: 10 sailings per year to be adjusted as traffic offers.

No. & Type of Ships: 3 C-2 type freighters.

Note: Privilege to be granted of making approximately 1 sailing per month over either of the two routes (2a & 2b) or over the two routes combined as traffic offers.

TRADE ROUTE No. 28—U. S. Pacific ports—Straits Settlements, Netherlands East Indies, India, Burma, Persian Gulf, and Red Sea.

Itinerary: Trade between U. S. Pacific Coast ports and the foreign areas of Trade Route No. 28 is to be carried in vessels provided for by Services "C-1, C-2 and C-3" on Trade Route 17, and Service "G-2" on Trade Route No. 30.

Note: Trade Route No. 28 (California portion) will also be served by westbound round-the-world vessels.

TRADE ROUTE No. 29—California ports—Far East (Philippine Islands, China, Manchuria, Korea, Japan, U. S. S. R. in Asia, French Indo-China, Formosa and Siam).

1. Passenger-Freight Service "E":

Itinerary: Los Angeles/San Francisco, via Honolulu to Yokohama, Kobe, Shanghai, Hong Kong, Manila and returning via same route to California.

Sailing Frequency: 26 fortnightly sailings per year.

No. & Type of Ships: 4 P-2-R-1 type passenger-freight vessels. (To be replaced by a suitable number of special type vessels of adequate speed.)

Note: To be coordinated out of California ports with round-the-world service to provide weekly sailings.

2. **Freight Service "F":**

Itinerary: Los Angeles, San Francisco to Yokohama, Kobe, Osaka (other Japanese ports as traffic offers), Shanghai (other North China ports and ports in Manchuria and Korea as traffic offers), Hong Kong, Manila, Philippine Island outports, and French Indo-China and Thailand (as traffic offers) returning to Los Angeles and San Francisco; privilege to be granted of calling at ports of Russia in Asia.

Sailing Frequency: 26 fortnightly sailings per year.

No. & Type of Ships: 5 C-3 type freighters.

Note: Trade Route No. 29 will also be served by westbound round-the-world vessels.

TRADE ROUTE No. 30—Washington and Oregon ports—Far East (Philippine Islands, China, Japan, Manchuria, Korea, U. S. S. R. in Asia, French Indo-China, Formosa and Siam.)

1. **Freight Service "G-1":**

Itinerary: Seattle, Tacoma (as traffic offers) Portland, Oregon (alternate sailings) to Yokohama, Osaka, Kobe, Shanghai, Hong Kong and Manila, returning over same route to Pacific Northwest.

Sailing Frequency: 26 fortnightly sailings per year.

No. & Type of Ships: 4 C-3 type freighters.

2. **Freight Service "G-2":**

Itinerary: Portland, Oregon, Seattle, Washington, other ports in Washington and Oregon as traffic offers, to Manila, other Philippine ports as traffic offers, Hong Kong, ports in French Indo-China and Siam as traffic offers, Netherlands East Indies, Straits Settlements, Calcutta, other Bay of Bengal ports as traffic offers, returning via Straits Settlements and Dutch East Indies, to California ports, thence to ports in Oregon and Washington; vessel to have privilege of calling at British Columbia to load and discharge cargo.

Sailing Frequency: Approximately one sailing per month—12 sailings per year; to be coordinated in so far as practicable Eastbound with Service C-3 (Trade Route No. 17) from Calcutta to California.

No. & Type of Ships: 3 C-2 or other suitable type freighters.

3. **Freight Service "H":**

Itinerary: Oregon and Puget Sound ports (as traffic offers) to Japan and North China, Manchuria and Korea, returning to Pacific Northwest ports with privilege of calling at U. S. S. R. ports in Asia as traffic offers.

Sailing Frequency: 48 irregular sailings per year.

No. & Type of Ships: 8 AP2 or other suitable type freighters.

TRADE ROUTE No. 31—U. S. Gulf ports (Key West-Mexican Border)—West Coast South America (Chile, Peru, Ecuador, Pacific Coast of Colombia).

1. **Freight Service:**

Itinerary: Texas City, Houston, Galveston, New Orleans (other Gulf ports as traffic offers) to West Coast South American ports; returning to Texas City, Houston and New Orleans.

Sailing Frequency: 2 sailings per month—20 to 26 sailings per year to allow for seasonal conditions.

No. & Type of Ships: 3 C-2 or other suitable type freighters.

ROUND-THE-WORLD SERVICE:

1. **Passenger-Freight Service:**

Itinerary: Boston, New York, Havana, via Panama Canal, Los Angeles, San Francisco, Honolulu to Yokohama, Kobe, Osaka, Shanghai, Hong Kong, Manila, Singapore, Bolawan (as traffic offers), Colombo, Bombay, Suez, Port Said, Alexandria, Naples, Genoa, Marseilles to New York and Boston.

Sailing Frequency: 26 fortnightly sailings per year.

PORT HUENEME MAY OPEN FOR COMMERCE

By George Grimes

Pacific Coast shipping and industrial circles are interested in the prospective opening of Port Hueneme (Y-nee-mee), California, to commercial shipping.

This port was built, just before the war, by the people of the Oxnard Harbor District, who issued bonds for the construction of the harbor entrance and of Dock No. 1. Shortly after the Japanese attack on Pearl Harbor the port was bought by the United States Navy, which spent some $47 million in improvements, including the construction of eight additional docks, warehouses, and railroad spurs.

The Harbor District has now formally applied to the United States Navy for a lease, for commercial purposes on the original dock it built, Dock No. 1, together with the warehouse there.

The application was presented by H. A. Forbes, who was commissioned by the Harbor District Commissioners to negotiate for the lease. Forbes is the man who was largely responsible for the early planning that led to the construction of Dock No. 1, and he is well known in Pacific Coast and, in fact, world-wide shipping circles. The application was handed to the Navy on June 6.

The plea for the dock lease is based upon the elemental justice of returning Dock No. 1 to the people who built it, as an economic necessity to the development, not only of Ventura County, but of the large area of Southern California which is preferential territory to the dock.

It is believed that if the lease is granted, it will make Port Hueneme a wholesale and distributing center for the 700,000 persons living in the preferential territory; that many jobs will be opened to returning war veterans, that transportation costs in the area will gain a parity with the costs of other Pacific Coast harbor areas; and that a vast and rapid expansion of industries will follow in the territory adjacent to the harbor.

Mr. Forbes has buttressed his application with many exhibits showing the saving in time and transportation costs that would accrue to business and agriculture in the preferential territory, through the opening of the port, and with statistics revealing the tremendous agricultural, mineral and chemical production of this area.

It is shown, for example, that the preferential territory covers in excess of 31,500 square miles, with 1,389,132 cultivated acres, and produces 65 per cent of the potatoes, 36 per cent of the nuts, 30 per cent of the beans, 28 per cent of the citrus fruits, 55 per cent of the cotton, 46 per cent of the crude oil, 75 per cent of the diatomaceous earth, and practically all of the 375,542 tons of potash and 216,687 tons of borates, produced in the state of California.

This area's total agricultural production in 1944 amounted to 3,600,210 tons, with a value of $300,026,804, not including dairy, poultry and livestock products with a value of $84,605,671. Total production of oil was 148,117,720 barrels with a value of $159,541,689.

An effective part of the application is the inclusion of approximately 150 letters from all parts of the state, particularly the preferential territory, in support of the plea for the lease. These letters reveal the eagerness of business and agricultural and industrial interests to make use of the dock, if its commercial use is granted.

During the war Port Hueneme, as the Seabee Advance Base Depot, became known as the most efficient harbor in the United States. It ranked third, behind only New York and San Francisco, in shipments of dry cargo.

KEEP POSTED

A New Remote Control

BOS'N'S MATE controls, products of the Dauby Equipment Company, Inc., are the outgrowth of the urgent need of the marine industry for high quality dependable remote controls. They are based on engineering specifications after a year of operation with the 10th A.A.F. air-sea-rescue squadron of the 11th A.A.F. in the Alaskan-Aleutian area during the war. The president of the Dauby Equipment Co. served as a technical representative in this area with direct orders to standardize the remote control specifications. The BOS'N'S MATE controls are now designed after these specifications.

Front view: Showing how double dome appears at control points. One handle may be clutch the other throttle. The small knobs mounted on the face ore synchronizing valves, one for each master unit.

The Dauby line includes diesel governor controls, gasoline throttle controls, power clutch and steering. All are of the direct hydraulic type

(Continued on Page 156)

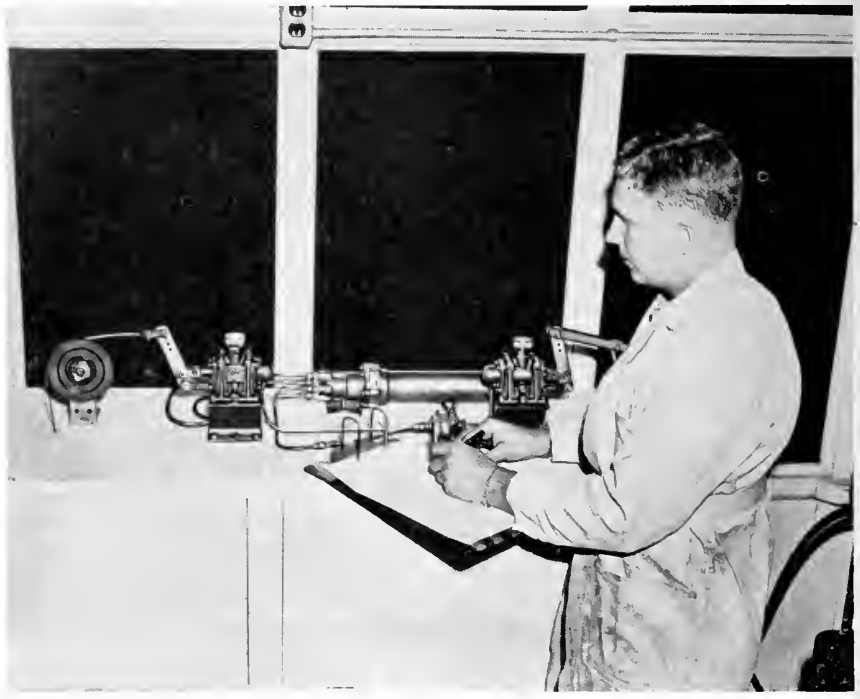
A NEW REMOTE CONTROL

(Continued from Page 154)

and feature the "feel" factor which makes remote indicating systems unnecessary.

The firm has adopted two unusual policies in the installation of marine equipment. Units are supplied completely equipped with all fittings and other details necessary for complete installation, and the service policy allows for complete replacement of units, when excessive wear becomes evident, at a price far below the cost of field service overhaul, as new units are sent out before worn ones are removed. No delay in operations is experienced at overhaul periods.

There are many outstanding new features included in this new design and the units are so unusual in installation that practically any type of requirement can be accommodated.



Life Test of Ellinwood Hydraulic Control

A hydraulic control that will outlast a boat and probably the life of a boat owner is being produced by Ellinwood Industries, Los Angeles.

A life test of the firm's Model "C" control is still in progress at the Los Angeles plant with 500,000 cycles having been exceeded and the control still going strong, according to the Hydraulic Research Department of the Marine Equipment Division of the company. The life test is being made under a rated load of 100 inch pounds.

Not only has the test failed to wear out the control, it was pointed out, but "the rate of leakage was so slight that the unit ran almost 250,000 cycles before we had to add fluid—240,000 cycles to be exact."

The test was started some months ago as a routine 200,000 cycle breakdown test to discover any possible sources of failure in the Model "C." So far there have been none.

In addition to the Model "C," Ellinwood produces a variety of hydraulic equipment for use on almost any size engine or boat.

Vent Terminals by Zurn

Vent terminals are now made by the J. A. Zurn Mfg. Co., Erie, Pa., that provide an extra degree of protection by using brass barrier plates that prevent flames from passing through the vent terminal and igniting inflammable liquids and gases in the vented tanks. The convexity of these plates offers 150 per cent perforation open area in relation to inlet size.

KEEP POSTED

The manufacturers of the new equipment announced in this department will be pleased to furnish complete details without obligation on your part. For quick service, please use this coupon.

PACIFIC MARINE REVIEW
500 Sansome Street - - - San Francisco

Send me descriptive data of the following new equipment as reviewed in your ..... issue. Page No. .....

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(Identify by name of manufacturer and machine)

NAME.....

BUSINESS.....

ADDRESS.....

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Bryan O'Connor Back Around the Bay Area

Old-time members of The Mariners Club got a real thrill from seeing **Bryan J. O'Connor** come aboard for the last two get-togethers. Bryan was in on the founding of the club during those halcyon days when Jim Cronin, Frank Fox, Stanley Allen, et al., envisioned the maritime organization which has made such colorful history in San Francisco.

Bryan O'Connor headed up the program committee back in Charlie Robertson's administration. He was always extremely active and a hard worker in the club until the urgency of wartime work. He is now back at his favorite routine, contacting the marine trade around the Bay Area, representing Toumey Electric & Engineering Company.

Marine Surveyors Change Company Name

The firm of Genereaux and Hansen of 311 California Street, marine surveyors and consulting engineers, has now been changed to Genereaux, Hansen and Smith. Thomas W. Smith, lately resigned from his commander's commission in the United States Navy, has joined the company as a partner. Previously, Smith had sailed as a chief engineer for many years with various Pacific Coast shipping companies and is well known on this Coast. He was an independent marine surveyor.

Kirsten Photo-Electric Pilot

Ets-Hokin & Galvan have been appointed distributors in California for Marine Division of Kirsten Pipe Company of Seattle.

For over 15 years the pilot has furnished all of the advantages of completely dependable automatic steering enjoyed by larger vessels with expensive equipment.

The selection of Ets-Hokin & Galvan as distributor assures the marine industry that 26 years of marine electrical experience is behind the installation of dependable automatic steering for commercial and pleasure craft up to 100 feet.

The seven branches of Ets-Hokin & Galvan in California give prompt attention to inquiries.

Built-in Warner Coupling For Flexible Tubing

A simple, fool-proof coupling which makes possible a "10 second" joining and disconnecting of individual sections of flexible tubing has been developed for Spiratube, the non-collapsible, retractable tubing manufactured by The Warner Brothers Company, Spiratube Division, Bridgeport, Conecticut.

The Warner coupling is built into the tubing, eliminating the need of fittings. The coupling, a flat spring steel collar, may be compressed to slip inside the end of another section and then released to form a strong, tight joint.

Pacific MARINE REVIEW

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Pacific MARINE REVIEW

AUGUST 1946

Shadow Puppet—Java

Dave Callegari, beside fiber preparation machine, an employee of the Tubbs Cordage mills since 1919.

MEN and ROPE

For nearly a century the TUBBS trademark has identified the finest in rope . . . a heritage proudly carried on today by veteran cordage men in every department of the Tubbs mills.

An extra margin of superiority is provided by these experienced men, working with the finest fibers and precision machines, doing their tasks with skill and efficiency acquired through the years.

This combination of MEN and ROPE is one of the reasons you may be sure you are getting the highest quality — the utmost in dependability — in a Tubbs product. Be sure to specify the TUBBS trademark to your supplier.

When the finest Manila fiber is once more available, look again for this famous rope trademark.

TUBBS
EXTRA SUPERIOR MANILA
CORDAGE COMPANY

TUBBS CORDAGE COMPAN

SAN FRANCISCO SEAT

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Pacific MARINE REVIEW

Pacific Shipping Era Dawns

An Editorial

WHEN THEODORE ROOSEVELT was President, he predicted that the 20th Century would be the Century of the Pacific. "The Century of the Pacific," said T. V. Soong last year at San Francisco, "is here."

The American shipping industry is facing West and firms whose past activities were in the Atlantic or intercoastal routes are now seeking routes across the Pacific. Their judgment seems to use to be sound.

Traffic to Europe will be heavy during rehabilitation. When loan funds and relief shipments diminish with the restoration of crops and factories, there will be an interval pending the availability of private capital for extended purchasing. Competition in tourist traffic by sea and air and American and foreign lines will be intense. This competitive situation is largely the case to the south also.

But the Pacific is as a new world in both ship production and operation. It is worthy of reflection that Pacific Coast Yards led the East, South, and Lake areas during each war year and produced a total of 2,129 ships of over 2,000 tons. California alone produced 1,602 vessels and led also in tonnage and in horsepower, with a total of over 7,000,000 installed. National policy as it is expressed in the Merchant Marine Act should keep Pacific Coast shipyards in operation.

Future ship operations on the Pacific will be on a grand scale. Application at the July 24 hearing in Washington included Waterman, Isthmian, Alcoa, American-Hawaiian, Pope & Talbot, Olympic, Far East, Griffith, Pacific Transport, Permanente, Frango, Norton-Lilly, Deconhil, American Export, American Mail, American President, Lykes, Oceanic, Pacific Mail, U. S. Lines, and Grace. Add to these, the Alaskan, Hawaiian, Intercoastal, Coastwise and Canadian Services.

With the Japanese lines eliminated, operating costs will be largely on uniform American standards, and may be somewhat equalized by subsidies.

Markets for American commodies are unlimited. When the "relief" period passes, the construction period will go on and on. In the Pacific, nations will build and industrialize and create markets for ever higher types of cargoes.

On the Pacific range and in Pacific Coast ports, the Maritime Industry faces its great future.

Variable Pitch Propellers

An Editorial

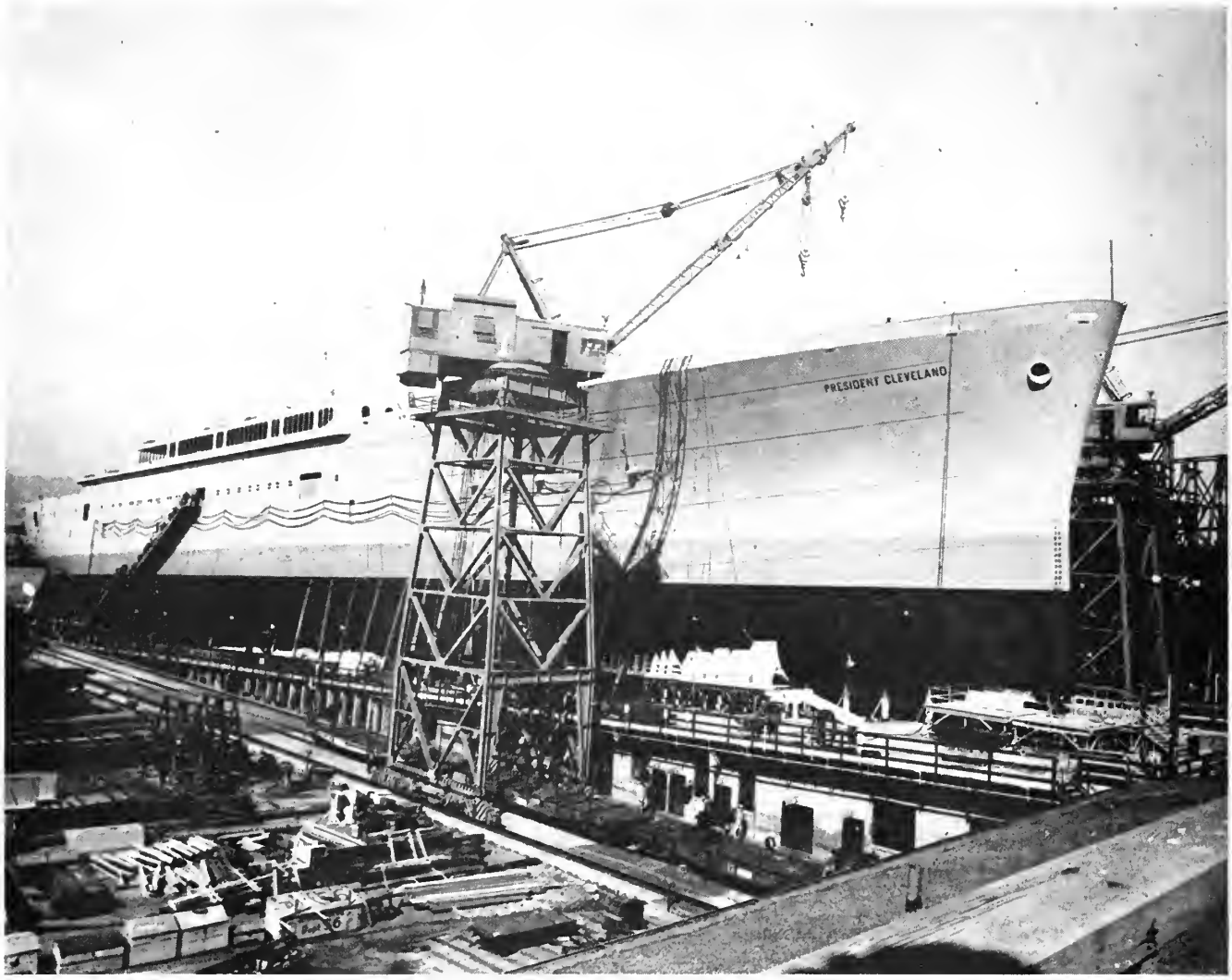
ONE of the most promising new developments in marine propulsion is the variable pitch propeller. Based on experience with aircraft propellers and with the variable pitch blades of hydraulic turbines there are now available marine propellers that are completely reversible and capable of being set at any desired pitch with absolute reliability.

Many installations in Europe (particularly in Sweden) have demonstrated the reliability of this device. These installations run as high as 4000 shp on a single propeller and there seems to be no inherent reason why this device should not transmit much higher powers.

For the diesel engine and the prospective gas turbine these propellers offer the simplest means (and at a lower cost both for installation and maintenance than any other form) of reversal. They give full power in reverse. In maneuvering they protect the diesel prime mover against the wear and tear incident to sudden changes in engine speed or engine reversals. Critical speeds of the ship can be easily avoided and vibration troubles from this source eliminated while still running the engine at its best speed for economy. Air compression capacity for starting can be greatly reduced since maneuvering operations with a reversible propeller do not depend on the quantity of compressed air in the tank. Some of these advantages apply also in steam turbine installations.

Perhaps the most unique advantage of the variable pitch propeller is the opportunity it gives to have the propeller and the engine adjustable independently so that propeller pitch and engine speed can be set at the most efficient combination for any speed of the ship, forward or reverse. In certain operations, particularly in towing and in the cruising range of speeds in certain sea routes, this results in very substantial over-all savings in fuel bills. Swedish engineers have worked out very ingenious pilot house controls for propeller blade pitch and for engine speed which may be operated independently or interlocked to give automatically by the use of one lever the best combinations over wide ranges of vessel speed as determined by test during the trial runs. These controls show astonishing fuel savings in towing operations.

This device is of such advantage that it will undoubtedly be a factor in naval architecture and American manufacturers of marine propellers should consider producing variable pitch wheels.



S.S. PRESIDENT CLEVELAND

The Launching of a Great Ship

Some Practical Aspects of Ship Launching

THE RECENT launching of S.S. President Cleveland, express passenger-cargo liner under construction at Bethlehem's Alameda yard for the American President Lines, introduced to the waters of Oakland Estuary one of the future queens of the Pacific Coast, the largest merchant vessel ever built on the Pacific Coast. The purpose of this article is to take the reader behind the scenes at this launching and show the careful preparation leading up to what seems to most spectators a very simple event lasting a few seconds and almost always completely successful in getting the ship into the water.

Much of the text and some of the illustrations in this article are compiled from a paper, jointly authored by Harrison B. Andrews and Archer M. Nickerson, Jr., both of the technical staff of the Bethlehem Steel Company's Shipbuilding Yard at Quincy, Mass., and read before the October, 1945, meeting of the New England Section of

Full technical description and drawings of the vessel whose launching is the subject of this article have appeared in the November 1945 and the February and March 1946 issues of Pacific Marine Review. In this issue we are concerned with the launching and some details of separate systems in the construction of the ship.

We will be covering the progress of construction in future issues and will certainly cover the finished product as the largest transpacific passenger liner built in an American shipyard.

the Society of Naval Architects and Marine Engineers.

The hulls of the ships launched in the practice of a large shipyard will weigh as high as 20,000 tons and this weight must be lowered forty feet while moving a distance of 1000 feet. This weight can, if it gets out of control, cause great trouble and expense. So before starting the construction of a large vessel careful engineering studies are made to settle two important figures that have an important bearing on launching. These are the slope of the ground ways and the pressure on the grease. There is a fairly definite relationship between these items.

There is always a tendency to make the slope as low as is safe because it is advantageous in construction to have the hull as close to the ground as possible.

The various companies now handling launching greases have all contributed to the improvement of the product so that now the shipbuilder can rely without hesitation on the published data. Not too many years ago in this country, and still today in some European yards, the carpenter formulated the launching greases and, as with all good chefs, added his own special touch or words of sorcery to the brew.

Today we accept the fact that the base coat should give us a hard smooth surface able to withstand the pressures at pivoting, and the slip coat should, under pressures of 1.75 to 2.25 tons per square foot, give constant low coefficients of friction without squeezing out.

The figures of grease pressure mentioned above are not hard and fast limits, as many launchings have been successfully performed with pressures both above 2.25 and below 1.75 tons per square foot. Since the object is, in all cases, to set up the launching arrangements for a good start and the published figures of pressure and slope, in connection with slow starts, are obviously few, it is difficult to obtain data for the lower limits of pressure.

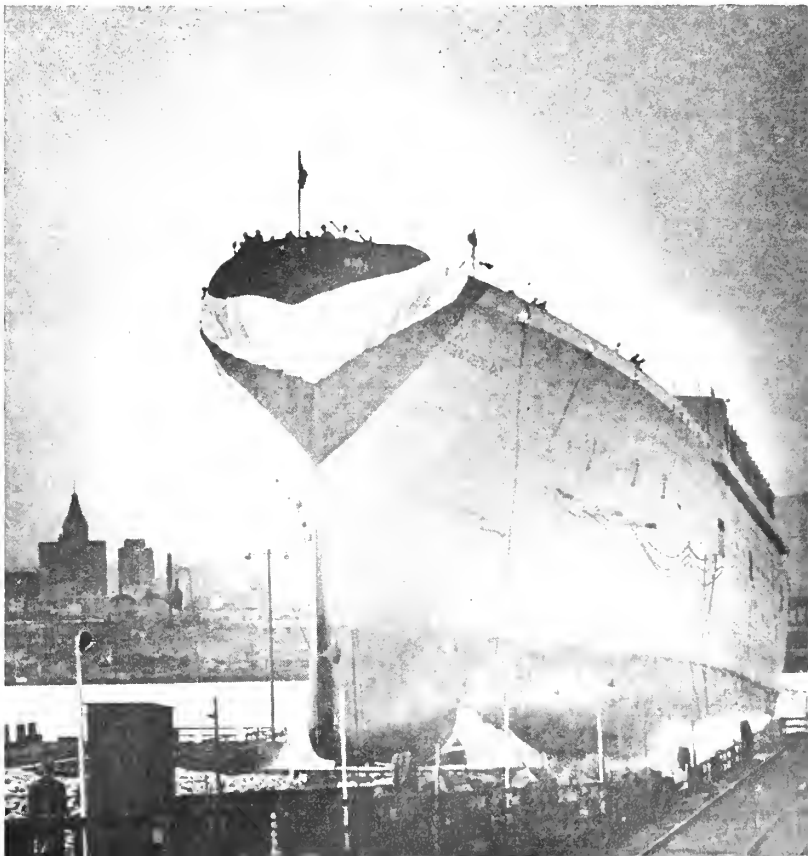
Laboratory test curves are available from the various grease manufacturers, and also from tests at some shipyards, showing coefficients of sliding friction plotted against grease pressure but it is difficult to translate the results from the small scale test equipment into the much larger and rougher actual launching set up.

A ship's launching may justifiably be classed as equally an art as a science. Despite the accounting for all known factors and identical conditions for two launchings, marked differences in performance often occur. This is notably true in starting. For example, instances can be cited when with all conditions constant except temperature, the launching taking place in the lower temperature will be normal while in that of the higher temperature the ship may be sluggish in starting or may even refuse to move. This does not discredit the treatment of the problem as a scientific one but simply urges the addition of a grain of salt to the result and makes the final success of the launching more savory.

Additional considerations of the starting problems are largely in the hands of the carpenters who construct the launching cradle. The ground ways should be aligned closely to the required declivity; the grease should be applied carefully; the cradle should be constructed so as to obtain the best possible distribution of load over the grease; and the wedging up and removal of shoring and blocking should be carried out according to schedule.

Launching Party on Platform. Mrs. Henry F. Grady, wife of President, American President Lines, ready to smash bottle, backed by Mrs. M. J. Buckley, wife of Vice President in charge of freight traffic.

S.S. President Cleveland almost afloat.



View under hull about amidships. Launching inspection crew giving final once over. Note drag chains in background.

S.S. President Cleveland. View of hull from starboard after quarters with props removed ready for launching, showing propeller spectacle frame, and after poppet.

Proper wedging up of cradle and poppets and the removal of shoring and blocking transfers the weight of the hull evenly and gradually to the sliding ways. The entire structure is now in such condition that its sliding down the ways is opposed only by the force of friction and some device or trigger that holds it in place. Upon release of this device the vessel will immediately start if the tangent of the angle of slope is greater than the coefficient of friction of the greased surfaces.

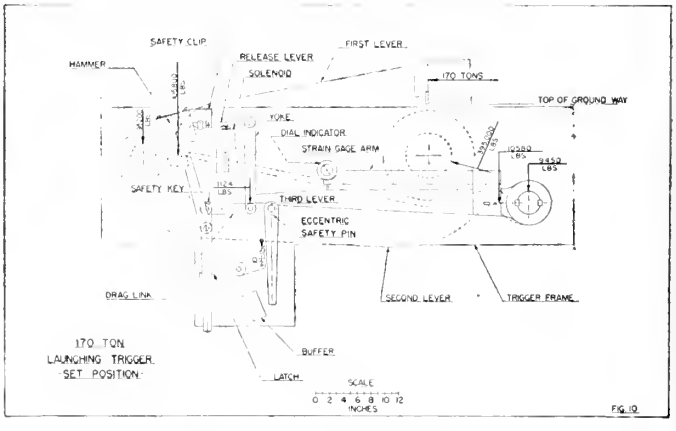
Great care should be taken in the foundation and alignment of ground ways so that they take these heavy transferred weights evenly.

There are several types of releasing devices used for launching ships' hulls. These range from simple beam levers and fulcrums, the long end of the levers being held by lashings which are cut simultaneously through various forms of dog shores and the steel plate arranged for burning, to rather interesting trigger mechanisms used for very heavy hulls. These triggers may be operated manually, mechanically, hydraulically or electrically.

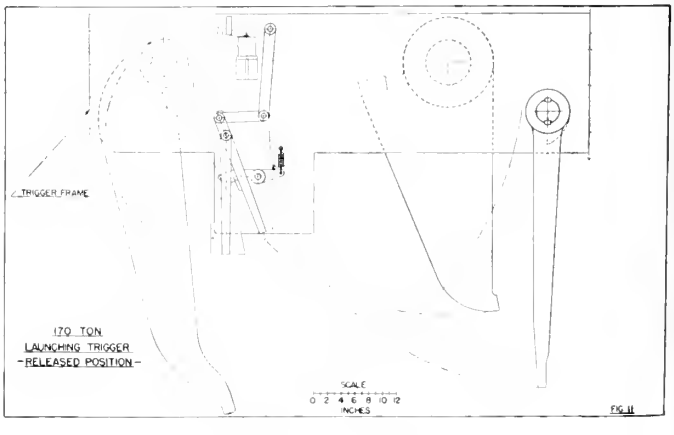
Bethlehem a few years ago designed a workable trigger, simple in installation, giving release in a limited vertical clearance, applicable to various types of hull, capable of being used in groups of pairs with simultaneous release; operable electrically or manually, and practicably foolproof. This device was used in releasing The Cleveland.

Drawings reproduced herewith show these triggers in the holding and in the release positions. Since 1941 when they were first used these triggers have been in use at numerous launchings always with perfect success. Each trigger is equipped with a strain gauge and at all launchings strain gauge readings are taken by a "trigger man" whose duty is to remove the hammer safety clip and the outside lever safety pin. An electrician is also on duty to transmit these readings and instructions between the trigger man and the launching log desk by telephone. After all supports except the launching ways are cleared out from under the hull the trigger men remove the strain gauges, the hammer clips and the safety pins and stow them in a rack provided for the purpose adjacent to the launching log desk. Each removal trigger part is numbered and has its assigned place in this rack. When the rack is full those in charge know that the triggers and the

The Launching Mechanism



170-ton launching trigger in set position.

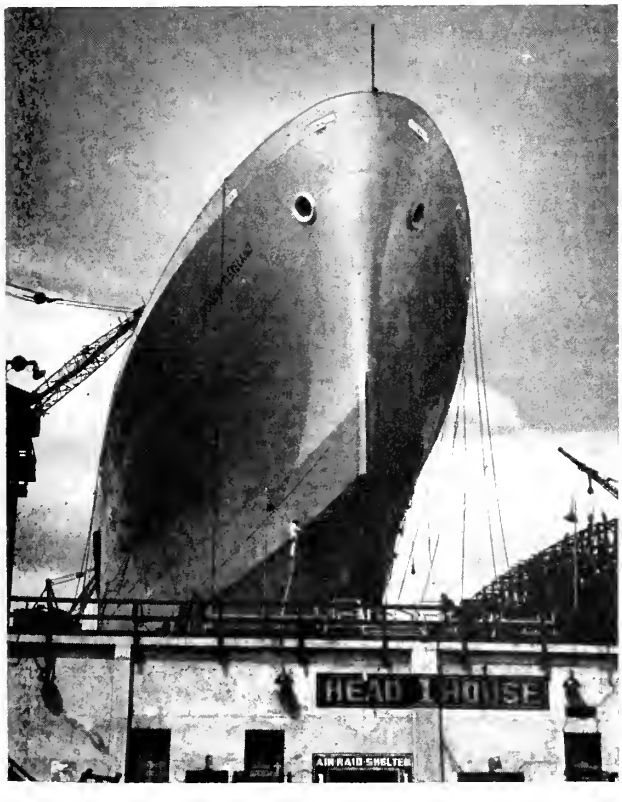


170-ton launching trigger in released position.

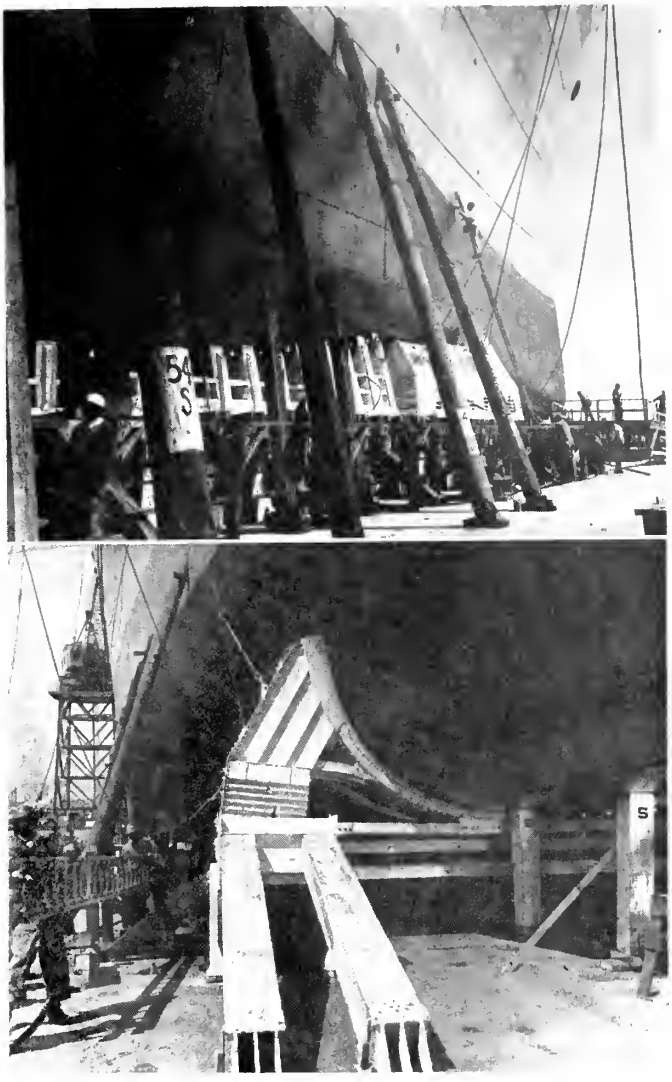
hull are clear. After a warning signal to the sponsor, the triggers are released by simply closing a master switch.

These triggers are designed to take the full gravitational component of the hull's weight without reference to the retarding effect of friction. The pair used in launching The Cleveland were designed to hold 170 tons on each trigger and tested for 340 tons on each trigger. The launched weight of hull and cradle and sliding ways approximated 8600 tons. One pair of the triggers will take care of launching weights up to 10,000 tons without exceeding the working strain for which they were designed.

On release of the hull at a launching the problem of checking the progress of the hull in the water immediately becomes acute, especially in a narrow channel like the Oakland Estuary. Many devices have been used for this purpose, but the one now almost universally used in American shipyards is the chain drag system. Wire ropes are attached to the hull near the bow and these ropes are attached at their shore ends to piles of heavy chain placed on the ship berth alongside the ways. Using such factors as the length of hull travel desired, the weight of ship and cradle, depth of water over the way ends, coefficient of friction of the grease used, water resistance coefficients, and the coefficient of friction of chain on the surface on which it's dragged, calculations are made with great care. These coefficients vary quite considerably and it is therefore necessary to build up a volume of experimental data and to use that data with good judgment in order to arrive at a satisfactory performance. This knowledge and judgment are acquired by a constant analysis of the observed actual performance at launchings as compared with the calculations for those launchings.



Bow of S.S. President Cleveland ready for launching on No. 1 shipbuilding berth at Bethlehem-Alameda yard.

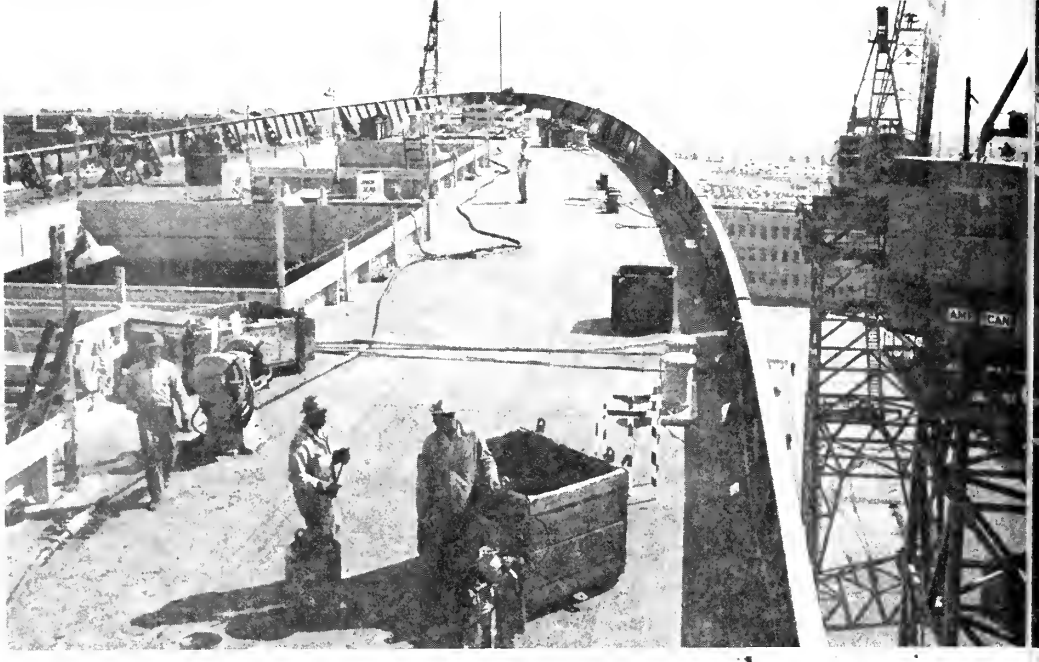


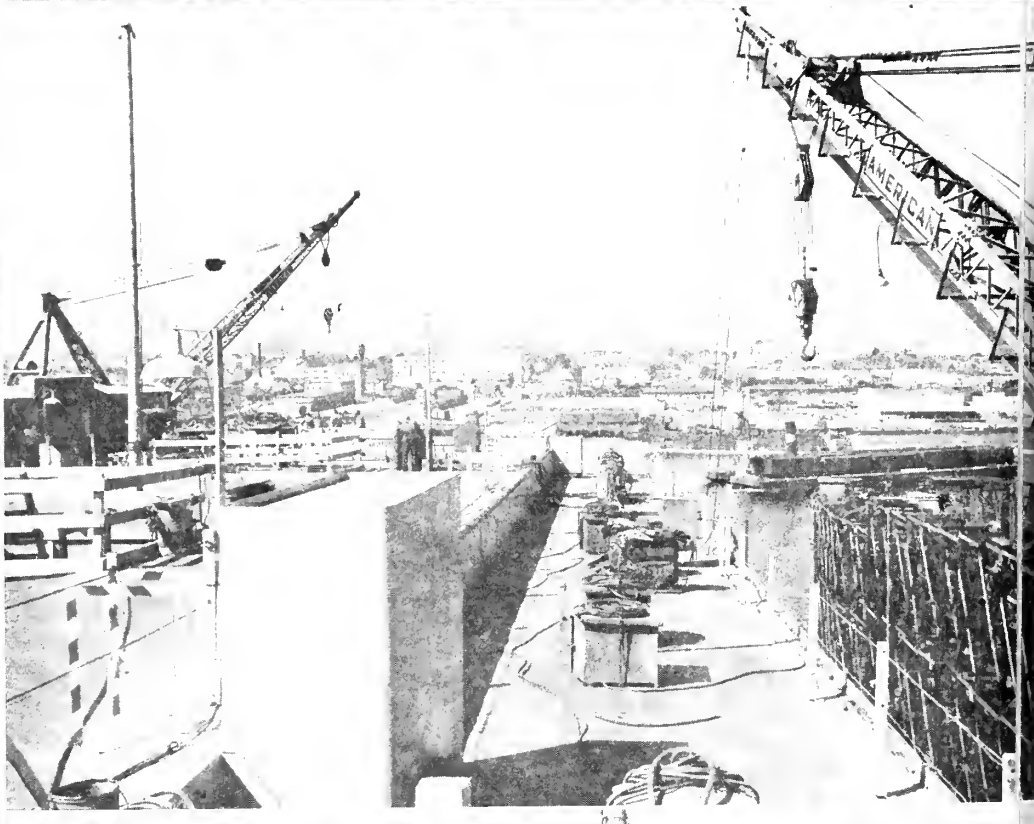
Above: Forward poppet from starboard side.
Forward poppet looking aft.

The experts at Bethlehem yards, judging from the launchings we have seen, are very successful at this work. In numbers of launchings we have seen the piles of chain bring the vessel to complete stop with the water just lapping the outer edge of the chain piles.

This was the case with the Cleveland where eight piles of chain weighing a total of 350 tons were attached to the ship by eight 2¼-inch wire cables and dragged down the concrete surface of the building berths which had been previously sanded to increase friction. The length of ways at these berths is 655 feet, and 8 tons of launching grease were used for the big slide.

The launching weight was the heaviest for a merchant ship ever handled in a Pacific Coast shipyard and the launching act and the ceremony therewith was carried through with that smooth perfection that characterizes the art among those who are the heirs of many generations of practice in this game.





Right Upper: S.S. President Cleveland looks at Alameda across her bow. Middle and lower: S.S. President Cleveland looks at Oakland across the inner harbor

Air Conditioning of P-2 American President Liners

by J. W. MARKERT*

THE TWO P2-SE2-R3 vessels being constructed at the Bethlehem Alameda Yard of the Bethlehem Steel Company for the transpacific passenger-cargo trade of the American President Lines are outstanding in a number of respects. (1) They are the largest merchant vessels, and the first post-war passenger liners, to be built on the Pacific Coast. (2) They are the largest post-war passenger liners to be built in an American shipyard. (3) These vessels will have the largest and finest comfort air conditioning plant ever installed on board ship. In order to properly coordinate the joiner work, and ventilation and air conditioning facilities, a subcontract was let to the Aetna Marine Corporation for joiner and sheet metal work. This contract includes the development of all arrangement, detail and working drawings as well as the fabrication and installation of the material.

Air conditioning is provided for all Cabin and Tourist Class staterooms, foyers, lobbies, and public spaces. Concessionaires and crew's staterooms with Cabin and Tourist Class areas are also treated, as well as the Captain's and Chief Engineer's accommodations. The messrooms and recreation rooms provided for the officers and crew are also air conditioned.

J. W. MARKERT

The air conditioning system of the P2-SE2-R3 vessels are designed for an outside summer dry bulb temperature of 95° F. and summer outside wet bulb temperature of 80° F. Heating facilities are based on an outside winter temperature of 0° F.

It is interesting to note that the cooling and heating loads are established on the basis of the most severe port weather conditions. This procedure is rather common because, in general, vessels will encounter relatively mild conditions at sea, except when navigating in certain land bound waters.

All of the air conditioning systems are designed to provide the same effective temperature* for all spaces, 74°. However, in order to achieve economical selection of equipment, it has been necessary to vary slightly the actual design room dry bulb temperature and maximum relative humidity of the several different classes of systems.

Large public spaces; served by systems known as the Class "A," are

* Effective temperature is an arbitrary index for combining the effect of temperature, humidity and air movement as felt by the human body.

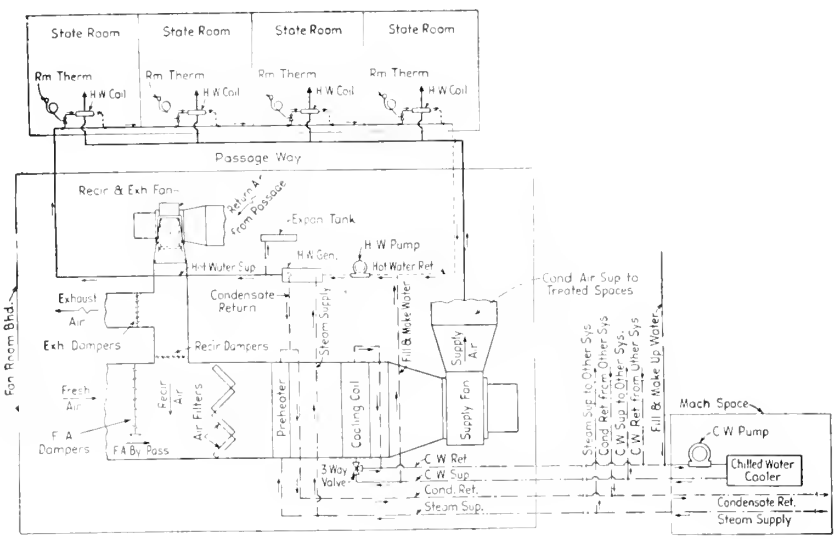


Fig. 1. Descriptive diagram of Class "D" air conditioning system.

* The author is Chief, Ventilation & Heating Branch Technical Division, U. S. Maritime Commission.

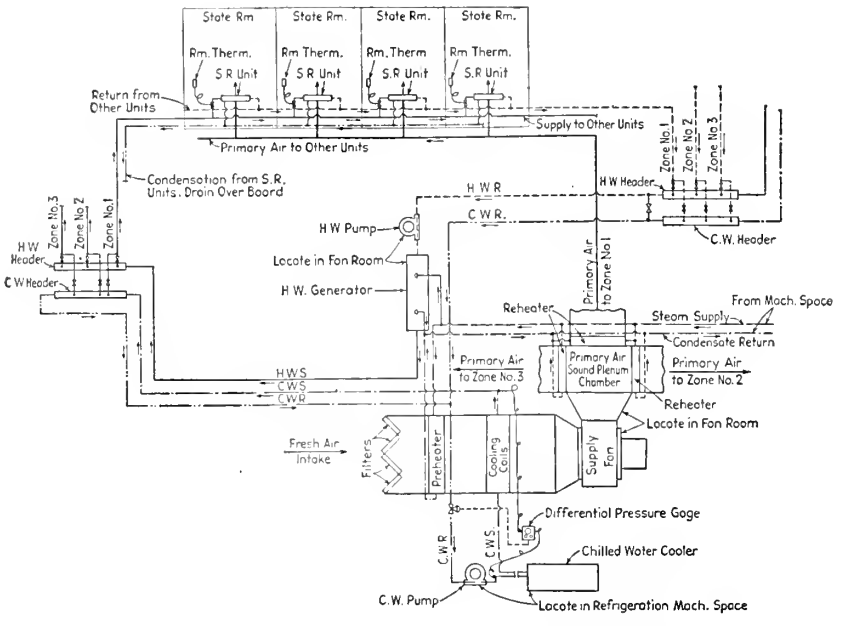


Fig. 2. Descriptive diagram of Class "E" air conditioning system.

designed for 80° F. dry bulb temperature and 55 per cent relative humidity. Tourist Class and other small spaces served by Class "D" systems (See Figure 1) are designed for 81° F. dry bulb and 50 per cent relative humidity, while Cabin Class Staterooms and other spaces served by Class "E" systems (See Figure 2) are designed for values of 82° F. and 40 per cent relative humidity. The apparatus dew point of all Class "A" and "D" systems is about 58° F.

Manufactured Weather

Air conditioning like other forms of engineering has several diverging schools of thought, with respect to the best method of doing the same job. The first group believes that air conditioning should be relied on only when it is impossible to be comfortable without it. They believe that the average passenger prefers the invigorating effect of relatively large quantities of untreated sea air, except when conditions become unbearable. The second group base their conclusions on the belief that it is most desirable to achieve an arbitrary degree of artificial comfort mainly by means of cooling and dehumidifying, and limit the amount of fresh air to an absolute minimum commensurate with satisfactory odor control.

A third group, which is closely related to the second one, has a definite horror of recirculating air between spaces, and takes great pains to eliminate this accepted means of economy, so common to numerous successful systems. Many partially informed persons consider this process repugnant. Nevertheless, recent investigations have proven conclusively that recirculation does not spread infection, and medical authorities show little concern over the use of this conservation method. Furthermore, the possibility of recirculating objectionable odors can be virtually eliminated by intelligent design, elimination of recirculation when the weather permits, and, in extreme cases, by the use of several tried and proven odor adsorbers.

In a sense, the air conditioning treatment provided for these vessels may be considered an experiment, for an effort has been made to satisfy all of these three schools of thought. The requirements of the first school are satisfied by the Class "D" system, shown in Figure 1. Ninety-three (93) rooms are served by this type system, having a total refrigeration load of 51 tons for about 260 persons. Thus, the average load per person is less than 0.20 Tons.

The requirements of the second and third groups are met by the Class "E" system, described in Figure 2. Seventy-nine (79) staterooms, housing approximately 220 persons and having a total refrigeration load of 57 tons, are served by this system. The average load per person is 0.26 Tons.

In order to eliminate any misunderstanding, it should be clearly understood that the selection of one particular system for each class of state room was done only for the sake of uniformity of treatment within the class. It was not done because one system was considered superior to the other. As a matter of fact, it was generally agreed that theoretically the same "quality of conditioning" could be obtained with either system, if it were designed in accordance with good practice. The two classes of air conditioning ("D" and "E") were installed on these vessels for the sole purpose of obtaining essential comparative data on design, installation, operating performance, maintenance requirements, and public acceptance.

The large public spaces, as previously mentioned, are served by Class "A." These systems include equipment for filtering, preheating, ventilating, cooling and dehumidifying, and reheating. The Main Lounge Smoking Room, Cocktail Lounge and Marine Veranda, Tourist Lounge and Tourist Smoking Room, Cabin Dining Room, and Tourist Dining Room, are each provided with separate systems. Because of the fact that the minimum design fresh air requirements were almost equal to the total air requirements, recirculation was not required for the economical design and operation of about one-half of these systems.

The officers and crew's messrooms and recreation rooms are provided with automatically controlled air cooling units, consisting of a cooling and dehumidifying coil, recirculating propeller fan, double deflection grille and enclosure. These units are suspended from the ceiling of the spaces served. Because of deck height and space limitations, it was necessary to furnish two small units for several spaces. The fresh air for these spaces is supplied by the crew's quarters ventilation systems. An automatically controlled duct heater (steam) is provided for reheating the air to suit the space requirements.

Air Distribution

Probably the most difficult and important problem in marine air conditioning is that of air distribution in small spaces with low headroom. Too little air movement creates a feeling of "stuffiness," while excessive air motion, on the other hand, causes drafts—the all too common failing of many air conditioning installations. Fortunately, this problem was considered of sufficient importance to justify a series of experiments being made, at the time the Maritime Commission first started on the design of post-war vessels. The investigation provided data for efficient system design, and determined the most foolproof method of introducing cooled air into conditioned spaces. This factor is of prime importance in staterooms fitted with double berths, in order to prevent objectionable drafts in the upper berths and dead air pockets in lower ones. It has been found essential to give careful consideration to each individual stateroom arrangement in order that these faults may be avoided.

The studies mentioned above provided the basis of system design and method of air distribution used in all air conditioned spaces of these American President Line vessels, particularly those served by the Class "A" and "D" Systems. Figures 3 and 4 show views of Aetna Marine's sample Tourist Class Staterooms. A different type of special diffusing terminal was installed in each stateroom to permit architectural comparison. The type shown in Figure 3 is actually being installed on the vessels. Figure 5 and 6 show views of the Cabin Class Staterooms constructed by the Joiner Contractor. The primary air induction units blow the conditioned air parallel to the bulkhead from the top of the cabinet to the ceiling. The induced recirculated air is drawn back into the unit by means of the grille in the front panel.

Heating

The foregoing description indicates that most of the heating is accomplished by means of duct heaters and unit coils. In addition, the P2-SE2-R3 vessels are fitted with 75 steam convectors, two electric heaters, and finned pipe heating elements having a total length of 210 linear feet.

Fig. 3. View of type "R" special Agitair diffuser in small tourist class stateroom. (Courtesy Aetna Marine Corp.)

The steam heating system is designed to furnish steam at 35 psi., gauge, to preheaters, reheaters, convectors and finned pipe heating elements. Intermittent service is provided for this equipment, except those heaters which are used for reheat during the cooling cycle. The system is arranged to permit the use of 15 psi., gauge, waste exhaust steam during mild weather.

Convectors are constructed in accordance with the standard Maritime Commission design, and are being furnished by the Trane Company. These units are used in baths, lobbies,

Fig. 4. View of large sample stateroom, showing Tuttle and Bailey special half round diffuser. (Courtesy of Aetna Marine Corp.)

Fig. 5. View of high pressure primary air induction unit, in large cabin class stateroom. (Courte y Aetna Marine Corp

Fig. 6. View of Carrier air conditioning unit in large cabin class stateroom, enclosure removable.

vestibules, toilet and shower spaces and other small spaces.

The electric heaters serve several isolated crew toilet spaces in the forward part of the vessel, and were incorporated in the design to eliminate certain drainage complications.

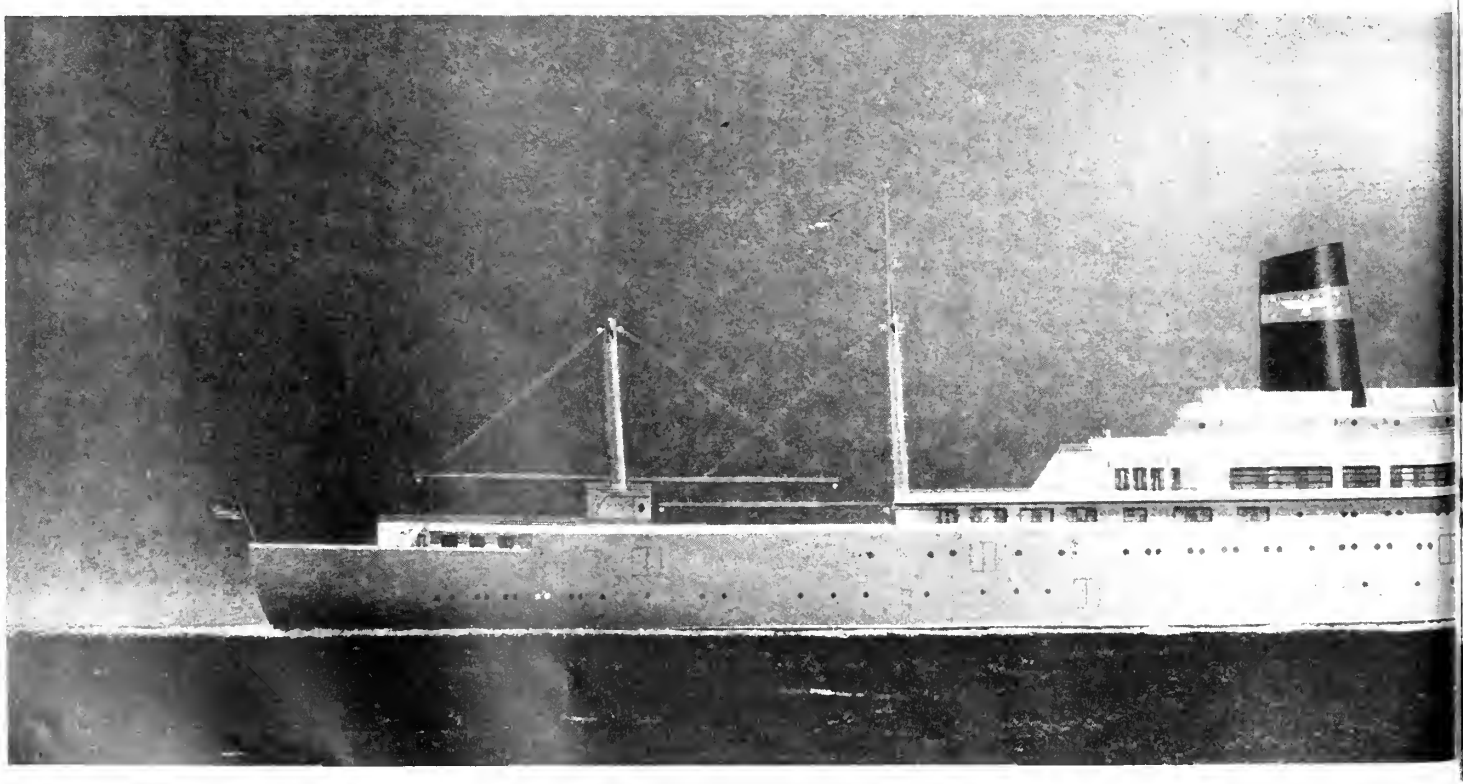
Public spaces, such as the Main Lounge and Smoking Room, have large exposed glass areas. The finned pipe elements have been provided to eliminate down drafts at these exposures. Special, hot dip galvanized, Vulcan radiation was selected for this service. The elements are skillfully concealed behind built-in furniture, and inboard of the coamings below the full length glass windows and doors.

Cargo Conditions

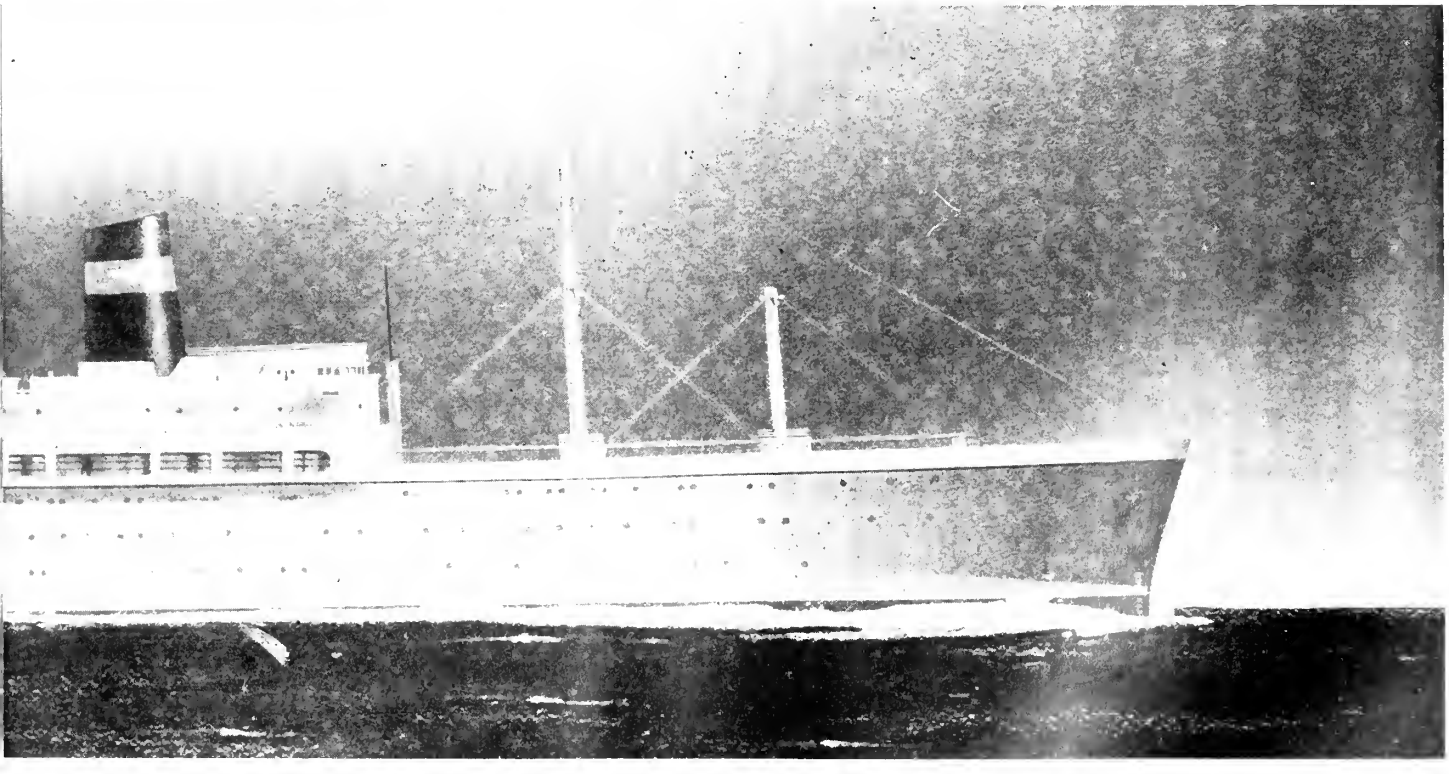
Holds No. 2 and No. 3 are provided with cargo conditioning facilities for preventing condensation damage to dry cargo. This equipment, designed with the cooperation of A. F. Hinrichsen, Incorporated, utilizes "Kathabar" dehumidifying equipment. The treatment is confined to Holds No. 2 and No. 3 because it afforded the most economical relation between cost and cargo capacity treated. The entire system is designed in accordance with the most advanced standards.

The cargo hold conditioning system delivers 1250 cfm, dry air (50 grains maximum moisture per pound of dry air under the most severe moisture conditions). A short duct system carries the dry air to the supply-recirculation system serving each hold. Natural ventilation is used for exhaust purposes.

The dampers used for switching the hold systems from the ventilation to the recirculation cycle, can be automatically regulated from either the Chart Room or the Cargo Conditioning Equipment Space; by means of a



CABIN CLASS STATEROOM, OUTBOARD, SHOWING SOFA BED—BY DAY



pneumatic control system. All hold and dry air fans are of the standard Maritime Commission design.

Control System

These vessels have the most complete and most extensive automatic control system ever provided for a marine air conditioning installation.

All controls are of the pneumatic type, arranged on panel boards to simplify operation. This equipment will be completely installed, calibrated and tested by the manufacturer, Minneapolis-Honeywell Corporation. All concerned agreed that a unified responsibility was absolutely essential to assure proper performance of this extensive system, upon which successful operation depends so heavily.

The control equipment is being built in accordance with the special requirements of shipboard service. Damper motors are of the external type, and are arranged to utilize all fresh air except when the cooling equipment cannot maintain the design apparatus dew point. All valves and damper motors are fitted with positive positioning relays.

A 3½ hp. air compressor is installed for furnishing power to the pneumatic control system. The piping is inter-connected with the ship's service compressed air system for emergency use. All piping is heavy hard copper tubing with sweated fittings.

Refrigeration Plant

The refrigeration plant sets a standard which has been generally adopted in all later designs. Two 150 ton Carrier centrifugal refrigeration machines (one motor drive and the other turbine drive) are provided for chilling the water required by the twenty-seven air conditioning systems installed throughout the vessel.

All pumps are of the vertical-motor driven centrifugal type, including the stand-by pump which is a duplicate of the hot and hot or chilled water pumps. Pumps, heat exchangers, refrigeration machines and condensers are centrally located in the Refrigeration Machinery Space. Figure 7 shows the diagrammatic arrangement of this equipment.

Three water piping systems are provided for carrying chilled and hot water to the various apparatus rooms and room units. The first system has a capacity of 800 gpm, using two 400 gpm pumps (100′ total head). This system carries the chilled water to the cooling and dehumidifying coils. In addition, this system furnishes the small quantity of water used in the second piping system. This second system, served by a separate pump, is designed for 100 gpm (100′ total head) and carries either hot or cold water, as weather conditions require, to the Carrier high pressure induction units which form part of the two Class "E" systems. The third system is also designed for 100 gpm. It furnishes hot water for the Class "D" system reheaters, and the second system, when the Class "E" room units require hot water for reheat purposes.

All of the water systems are constructed of hard copper piping with sweated silver soldered fittings. The piping systems are designed with reverse returns in order to insure balanced flow. All automatic valves are of the three-way, diverting type, to minimize unbalance and excess pressure in the system when the valves are only partially open.

These two American President Lines passenger vessels incorporate the highest standards of the air conditioning profession. The job is thoroughly engineered, both with respect to fundamental considerations and details. Furthermore, the engineers responsible for the design and construction have been unusually far sighted in their decisions. Exceptional consideration has been given to facilities for efficiently balancing and testing all of the various components of the air conditioning installation. Careful, time consuming studies have been made to simplify operation and maintenance of the vessel in service. Also, particular pains have been taken to provide practical accessibility to concealed equipment. There is little doubt but that these vessels may justly be considered a symbol of the air conditioning industry's contribution to the future success of the United States Merchant Marine.

Fig. 7. Arrangement of air conditioning system in refrigeration machinery space.

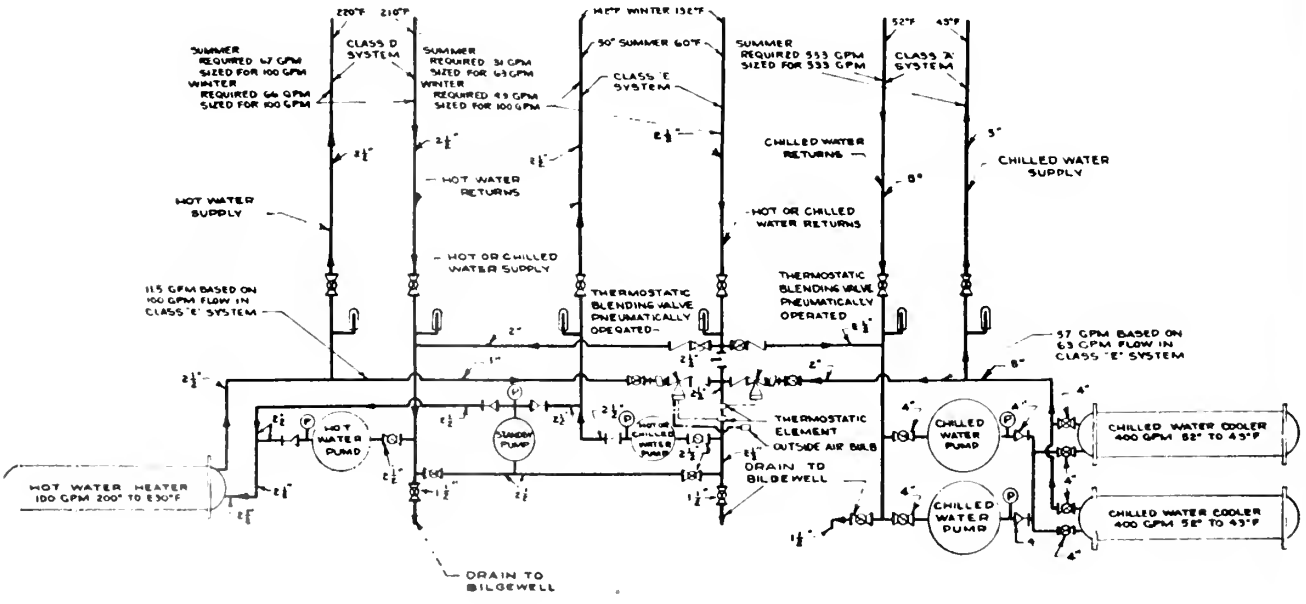


Fig. 1. Aetna all-steel bulkheading and linings in place.

Fig. 2. Close-up of Aetna ceiling structural shapes in place securing flush bulkhead panels and marinite ceiling panels.

Class "B" Bulkheads on The President Cleveland

by NORMAN PROFFITT, Pacific Sales & Equipment Co.

The living spaces for the crews of S. S. President Cleveland and S. S. President Wilson, new American President Line passenger liners for the Pacific trade, will, in comfort, utility and durability, display the ultimate of modern design for these areas.

To fulfill these purposes Aetna Marine all-steel Class "B" bulkheads and metal joiner doors were chosen by the interior design section of George G. Sharp, the vessels' naval architect. Developed during the war by Aetna's design engineers to meet the stringent requirements for a strong, fireproof, lightweight, flush, easily cleaned, and durable Class "B" bulkhead for troop ship construction, Aetna's all-steel panels were the obvious answer to the designers' problem in the crews' living spaces. Due to the ingeniously formed panel edges providing a strong interlocking joint which acts as a stiffener and thus eliminates pilasters, posts or fasteners other than coamings and supporting members for ceilings, complete economy of weight is achieved. Joiner doors and frames are designed to take full advantage of these characteristics of the divisional bulkheading and allow quick installation without welding.

For outboard hull sheathing over insulation the same panels are used without additional stiffeners or supporting members due to the special interior design of the panels themselves which retain the requisite flush finish on both faces. Shell contour is followed by adjusting the angle of installation of the Aetna footing which is designed to accommodate any type of deck covering specified.

Ceiling panels of the crews' spaces are of Johns-Manville lightweight Marinite 3/8" in thickness secured to and supported by Aetna's lightweight structural shapes welded directly to the deckhead. By the combination of Marinite and Aetna structural shapes a strong, flush, durable ceiling is obtained without sacrifice of weight or appearance while retaining the flush

(Please turn to page 162)

Fig. 3. Aetna joiner door frames installed ready for hanging of door. Ceiling structural members installed with offset, to meet special condition, ceiling panels in place on offset.

Moore's Interim Conversion Of Two Transports

These two vessels have already entered the service of the American President Lines. As soon as they can be spared, probably upon completion of the new President Cleveland and President Wilson, they will be withdrawn for complete conversion. San Francisco's famed naval architects, Joslyn & Ryan, have been given a contract for drawing the plans and specifications for the big job, which is estimated at several million dollars for each vessel.

Bids will probably be called for around the first of the year and there is reasonable expectation that the work will be done on the Pacific Coast.—Ed.

An interim conversion of the two P2-S-R2 troop transports, the General M. C. Meigs and General W. H. Gordon, was recently completed by Moore Dry Dock Company, Oakland, California, for the U. S. Maritime Commission. These vessels, now operating in the service of American President Lines, eventually will be completely converted for passenger and cargo service. Although their present arrangement does not provide the luxurious accommodations which eventually will be available upon their complete conversion they will materially assist in meeting the immediate demand for transpacific passenger accommodations as well as serving in the movement of troops to and from the Orient.

In addition to a complete overhaul of machinery various changes have been made in these large, modern vessels built in 1944. On the bridge and boat decks joiner doors, additional berths and lockers were added. The barber shop and dark room were removed and toilet and shower rooms installed.

New airports and curtains and joiner doors were provided in the staterooms, port and starboard on the promenade deck. The number three hatch on this deck was trunked and the existing stairways relocated to provide egress for troops. A barber shop was installed in the space formerly used for the engineer's office. Rooms were provided for the Chief Purser, Chief Steward, second and third stewards, purser's clerks and purser's department, as well as toilet and shower spaces.

CHARACTERISTICS

Length overall	622' 7"
Length B. P.	573' 0"
Beam	75' 6"
Depth molded to main deck	51' 6"
Draft molded	25' 0"
Displacement designed	19,650 Tons
Shaft horsepower (twin screw)	18,000
Speed at designed draft	19 Knots

On "A" deck additional port lights, berths, lockers, seats and desks were installed in the passenger and crew quarters. New bulkheads were fitted on "B" deck to provide additional space for crew quarters equipped with joiner doors, berths and lockers. On the port side of this deck a new pantry, similar to one on the starboard side, was installed, complete with steam table, toasters and other equipment. Additional mess space was added forward of the old pantry. Four new rooms were added between frames 118 and 130, twelve between frames 130 and 146, six between frames 140 and 166 and four between frames 166 and 186, as well as toilet and shower spaces. A trunk was installed around the troop access ladders at frames 146-166. The laundry ventilation on "C" deck was changed to provide a better air supply and gratings and vertical battens were added at frames 85-102 to increase the stores space.

All troop bunk bottoms were removed, cleaned, and replaced. New boom rests were installed in the way of #7 hatch. Searchlights were relocated on the navigation bridge to give better coverage. All deck plates at gun foundations were faired-up. On "B" deck watertight doors were installed to provide ready access to the spaces and watertight doors also were installed in way of the shaft alley access.

All lifeboats, davits and gear were completely overhauled, involving the renewal of portable tanks and repair of integral tanks.

The electrical work included the checking and overhaul of the main generators; armatures were re-banded, the commutators trued and new brushes provided to insure continuity of service. A six circuit 250-volt power panel was installed on "B" deck to serve the new pantry. The lighting changes involved five decks and required the installation of 690 lights, including overhead, berth, mirror and bracket lights, 72 switches and 73 outlets. Forty-seven fans also were installed. The electrical circuit involved 11,000 feet of cable. A portion of the Navy running lights, including recognition light and screens for the aircraft, side, masthead and range lights were deleted. A new anchor light was installed aft and new lights were provided on the promenade deck.

Sixty-one motors in two main and auxiliary engine rooms were overhauled and painted with insulating varnish, megged, provided with new brushes and commutators trued-up.

The general announcing system has been checked and provided with new speakers, and the ship's service telephone thoroughly overhauled and

tested. The latest Radio Marine Corporation console type 4-U radio unit for transmission and reception has been installed and also two life boat transmitters. The SG radar is provided for surface search and adds to the safety of navigation.

Repairs to Machinery

The turbine casings were raised and rotors and pressure rings examined and correct clearances established. Flexible couplings on main turbines were opened up and repairs or renewals effected. Carbon packings were cleaned and refitted.

Main boilers were cleaned and thoroughly overhauled. All leaky tubes, joints and valves were repaired. Superheater drain and vent valves and all main and auxiliary stop valves were reconditioned. Defective insulation was removed, soot blowers repaired and smoke detectors adjusted. All boilers, as well as the main and auxiliary steam lines were hydrostatically tested.

Substantial changes were made in the plumbing and sanitary systems, deck drains and hot and cold fresh water lines. Operating gear was installed to all scupper valves throughout the vessels.

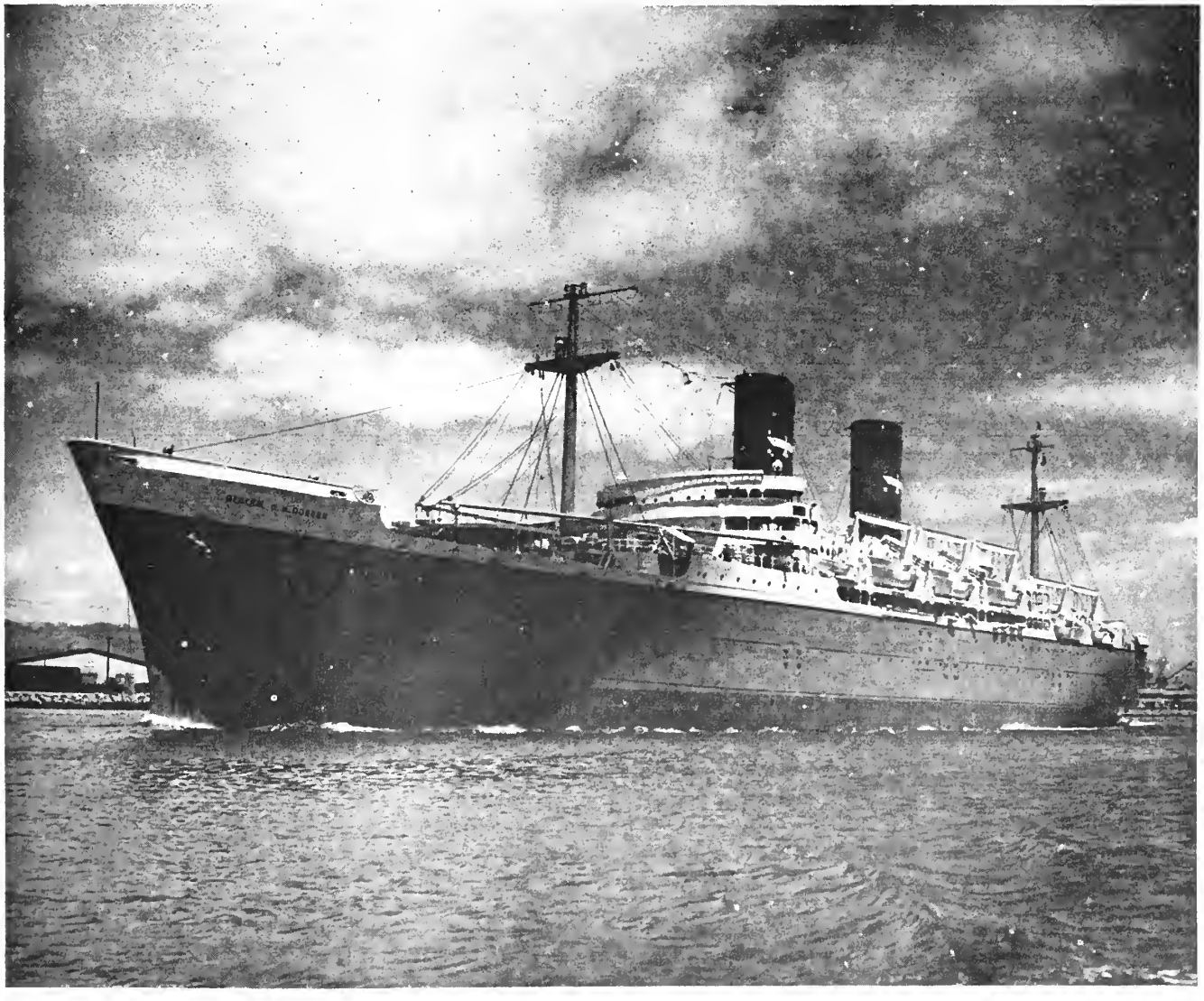
Both vessels were dry docked and bottoms painted and all sea valves and strainers overhauled. The General W. H. Gordon was inclined under the supervision of the U. S. Coast Guard, to demonstrate complete stability of the vessels.

Upon completion of repairs all machinery was given a dock trial and proved in good working order.

After the performance of all physical changes and installations the vessels were substantially painted throughout, including all exterior surfaces.

Although this was an interim conversion of the vessels preliminary to their ultimate complete conversion, the work accomplished has been performed in conformance with special requirements of the American Bureau of Shipping, U. S. Public Health Department, the U. S. Customs Department and the U. S. Coast Guard, and complete documentation has been effected.

General W. H. Gordon leaving Moore Dry Dock Company after interim conversion.



The Stake of Business and Industry in Coastwise Steamship Service

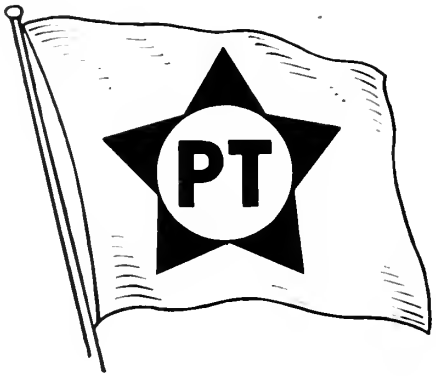
by R. F. BURLEY, Freight Traffic Manager, Pope & Talbot Lines

Business and industry, always striving to stem rising costs, have a much greater stake in the rehabilitation and full development of Pacific coastwise steamship service than is generally appreciated. Transportation is a definite part of the cost of a Los Angeles-manufactured article sold in Seattle; or the price paid by a San Diego consumer for a Wenatchee Valley apple. What needs to be more fully understood by the men concerned with such costs is that Pacific coastwise steamship service is a necessary balance in the overall economy of the entire Coast.

Competition in transportation, as in any other business, is necessary and vital to maintain an economic balance in expansion and development of markets. At the present moment there is danger that the unbalanced condition which has developed over a period of years may be still further deranged through lack of vision and understanding as to the position and significance of Pacific coastwise steamship transportation. Such a service is vital in maintaining a healthy rate structure.

The Changing Picture

During the years when the Pacific Coast was being developed and there was a steady but not phenomenal population increase, coastwise steamship service, both freight and passenger, was the most economical form of transportation between ports such as Los Angeles Harbor, San Francisco, Oakland, Portland, Seattle and



Tacoma. In the early 1920's the all-rail carriers, in order to meet the competition of water lines, sought relief from Section 4 of the Interstate Commerce Act. The relief they sought was an unbalanced rate structure which would grant them permission to charge more on traffic moving to and from intermediate points than on traffic moving between port cities. Such relief was granted. Thus, because of the existence of coastwise steamship service the public was given the opportunity of using rail transportation at rates lower than normal, and in many instances below actual operating costs.

Rail Competition

The rail carriers were, however, not satisfied with the extent of relief granted, contending they did not feel they were sufficiently competitive. On a renewed application in 1930 the Interstate Commerce Commission granted even further relief and rail carriers became so competitive with coastwise water lines that there was very little difference in the rates of the two forms of transportation.

This marked the beginning of the decline of the Pacific coastwise steamship industry. The public secured lower railroad transportation costs, but at the cost of the prosperity of coastwise water carriers.

Two other factors entered the picture to speed the decline of coastwise shipping. With the establishment of the all-rail route of the Great Northern-Western Pacific via Bieber, California, an additional competitive condition was set up between all-rail and all-water transportation. This again afforded the public additional service . . . at water-compelled rates. The second factor was the development, at about the same time, of truck transportation, bringing further transportation facilities to Pacific Coast interests and at rates that were competitive to the water and rail carriers.

Increased Costs

With all these competitive transportation units available to the shippers of the Pacific Coast, and with a narrow relationship between rates, the steamship lines began to suffer still greater losses in volume. Rates are supposedly based on the cost of doing business, but steamship operating costs began to skyrocket without rate structure benefit. Not only were the longshoremen given a wage increase but the steamship in-

dustry was subjected to a 6-hour straight time day. This is a condition not prevalent in other industry and particularly does not apply to rail or truck lines. This increase in longshore wages was followed by increases granted seagoing personnel. Work stoppages, strikes and wage increases piled one on the other, hampered the carriers to a point where it became more and more difficult to profitably operate steamship service.

The first sign of what this might mean was the drying up of the coastwise passenger service between Pacific Coast ports. Many people will recall with considerable pleasure the voyages they made in those days on the Yale and Harvard, or trips to the ports of the northwest on the Admiral ships. Such service is now but a memory.

Lessened Volume

As a result of these happenings, industry and business became less and less certain as to the dependency of the remaining coastwise steamship services and frequency of sailings. Consequently, volume dropped off and revenues sagged to a dangerously low point. Increases in water rates were necessary, but these were not sufficient to offset the double burden of increased costs and lessended volume. As a result, with the coming of World War II, Pacific Coast steamship service was at its lowest ebb in years.

World War II brought the entire steamship industry into public service. On land, the movement of all commodities by rail and truck were at rates which had been established as a result of the prior economical steamship service.

Since the end of the war, the coastwise carriers have been assigned certain diesel vessels to operate on behalf of the War Shipping Administration for the purpose of determining the extent to which industry and the public will resume the shipping of freight by water, and the utility of these particular vessels in coastwise service.

A number of months have passed in this operation. The results as to traffic volume, revenues and net return to the Government have been extremely disappointing.

The sound solution to the whole problem of transportation should, like in all industry, be predicated almost wholly on the cost of doing business, plus a reasonable profit. Instead of rates being established on the basis of competition they should be founded on actual costs of operation. Bring this about and competitive points as well as intermediate points will enjoy rate structures in

Ray F. Burley

conformity with well-balanced economics. The intermediate points on the Pacific Coast will for the first time in many years enjoy the fruits of justifiable lower rates and not be at the mercy of non-competitive carriers.

There is reason to believe that a new rate structure based on the full cost principle will be given early consideration. The United States Maritime Commission and the War Shipping Administration have recently filed with the Interstate Commerce Commission a petition urging an investigation of rail rates which are unreasonably low due to the past existence of water transportation. Steamship companies are hopeful that the Interstate Commerce Commission, under its mandate from Congress to foster all forms of transportation, will grant the petition and conduct the necessary investigation to determine the proper rate basis for rail transportation. If this is done the water carriers may then ascertain their properly related rate level to determine how much they can afford to pay for war-built vessels for operation in coastwise service at a reasonable profit.

Business and industry have a great stake in the fine harbors and excellent port facilities of the cities of the Pacific Coast. The coastwise carriers have been the balance wheel of economical transportation, and the rehabilitation of this vital industry is of paramount importance in the further development and economy of the West.

From a study of the facts of transportation costs, it is quite evident that there is a rightful place for railroad, steamship and truck carriers. But, Western industry will enjoy equitable rates only when competitive forms of transportation have a fairly determined and properly related rate structure.

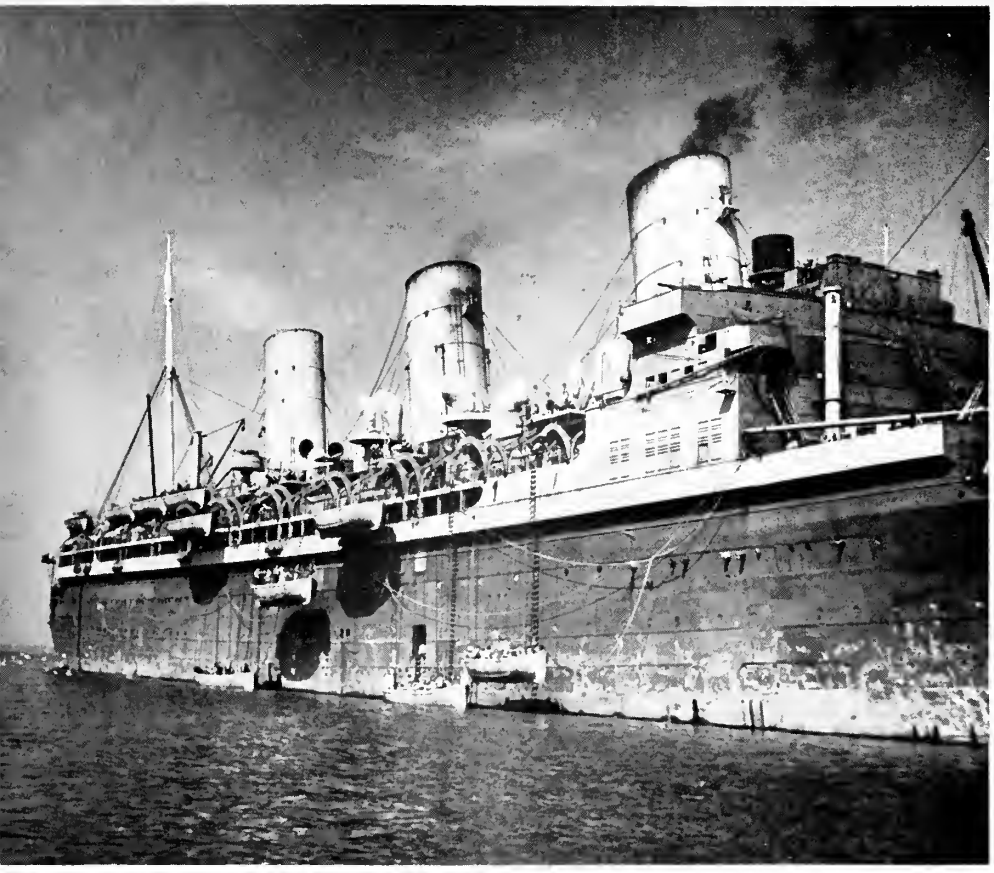
The time is indeed opportune for industry and business, through their chambers of commerce and trade associations, to make every effort to assist the water carriers in re-establishing coastwise water transportation on a par with earlier years.

Bank of America Opens Branches in Far East

The first Pacific Coast banking house to open facilities in the Far East, Bank of America, announced recently that it will open branches in Shanghai and Manila. These branches will be opened under authority recently received from the Federal Reserve System.

In annnouncing his company's expansion to the Orient, L. M. Giannini, president, said, "There is a general agreement that much of the future growth of our Pacific Coast rests upon the development of trade with the Far East. This contemplated extension of actual banking operations to the Orient is one further step in Bank of America's plans to foster such international trade."

The opening dates of Bank of America Far Eastern offices and the nature of operations, together with personnel appointments, will be made known at a future date, an official of the company stated.



Coast Guardsmen Check Ship's Boats

Lifeboats are being lowered away aboard this transport for the Coast Guard Inspectors just before the ship prepares to sail.

Safety at Sea

IN ORDER that we will have some basis for a mutual understanding of our problem, let's say we are talking of maritime safety; that is, the **overall** safety of merchant vessels as they function in the complicated distribution network of modern man. This assumes, of course, that we are still going to have water-borne vessels in the foreseeable future and that they will not be rendered entirely obsolete by the airplane or the rocket. With this understanding we can begin to analyze our problem in four phases, or sectors: Maritime Safety Standards, Aids to Marine Navigation, Maritime Rescue, and Maritime Safety Recommendations.

When the first log was hollowed for a means of water-borne transport, the instigator must have had some preconceived ideas of what type of log to use and what shape he was to give it. He also had to select one group of men to cut and hew the log and another group to propel and maneuver it. Compare this crude over-simplification of prehistoric maritime standards with those of today.

All photographs courtesy of the U. S. Coast Guard

Marine Safety Standards

Before a keel is laid, the blueprint image of a modern vessel is subjected to extensive scrutiny by representatives of various maritime organizations. Each group has its own field of interest. One group is interested in the overall efficiency of operation of a vessel including economy of the propelling plant, speed of vessel through water, cargo gear that will facilitate rapid turn-around and adequate carrying capacity to make the venture profitable. Other representatives are interested in the adequacy of crew accommodations, culinary arrangements and other factors which enhance the comfort of the crew, such as light, heat, ventilation and sanitary facilities. An additional group of representatives checks for compliance with statutory construc-

tional standards, particularly in regard to materiel specifications, electrical and machinery installations, firefighting and lifesaving equipment, sanitary arrangements and communications installations.

It is undeniable that the interests of each group do approach and often conflict, with each other. As a result thereof, we can appreciate the complexity of the blueprint stage of a modern merchant vessel.

In the construction and fitting-out stage of a modern merchant vessel, representatives of each group interest are present to satisfy themselves that the vessel is built to previously exchanged ideas and approved arrangements. This includes a constant check on such matters as quality of welding, and/or riveting, materiel tests, machinery tests, hydrostatic tests on tanks and piping, electrical tests, hose tests against water-tight bulkheads and doors, load tests on cargo gear and lifeboat installations, check on layout and convenience of crew's

quarters, steering gear tests, and many others. Conformity of the new product to the blueprints is practically assured upon the completion of an inclining test and satisfactory sea trial.

The principles above are also applied in the places of manufacture of marine equipment—equipment actually used aboard a vessel. Some notable examples are: pressure vessels, lifeboat davits, lifeboats, certain high-pressure piping, life preservers, signalling apparatus, and others.

Once a vessel is in operating service she is the subject of periodic checks by each of the group interests. This is necessary for maintenance of seaworthy standards. Few in the maritime industry are unfamiliar with the routine of annual inspection, engine overhaul and dry docking. At such times, items on the repair list are varied. This may include renewing a boom, sandblasting an anchor chain, caulking a bulkhead,

Boat Drill Before Sailing

Lifeboat drill is conducted aboard a Canadian transport during inspection of the ship by U. S. Coost Guardsmen before it soils from an East Coast port. The Coast Guard is in charge of the inspection of ships soiling from American ports.

Marine Peril Involves Serious Loss

The cause of such a peril could be due to professional incompetency, insufficient aids to navigation, inadequate routine safety checks on marine equipment and other factors involving materiel and personnel standards

Captain H. C. Shepheard, left, chief of the Coast Guard's Merchant Marine Inspection Division, and his assistant, Commander R. E. Coombs, display some of the life raft equipment designed to help merchant seamen forced to abandon ship. Captain Shepheard is holding an automatic electric water light which is attached to the life rafts and floats, that enables survivors to locate and swim to the raft.

straightening a stanchion, remodeling passengers' quarters, repairing plumbing facilities, overhauling the steering gear, fairing a plate, painting crew's quarters, and a host of other matters. The primary reason for performing this work is that of safety—**safety at sea,** so as to protect life and property for another profitable voyage.

The necessity for safety standards for the physical structure of a vessel and its equipment is paralleled by standards for personnel that build and man the vessel. The men who design the ship must have certain qualifications. We all know that those who build the ship must have certain abilities and experience. The same is true for those who operate and navigate the ship. Without some demonstration of professional ability, either written, oral, or practical, the chances of accidents are increased, and the chances of economy are decreased. We must also recognize that when the demand for maritime personnel (no matter what their capacity) reaches unprecedented proportions there necessarily follows some relaxation in safety standards which cannot help but increase the likelihood of accidents.

An effort to re-establish new personnel standards requires the resources, ingenuity and cooperation of all the major group interests. It is unfortunate but true, that when great technological strides have been made by any industry (the maritime industry is an excellent example) there is an inevitable new wave of casualties. We see it today in the increasing number of burned out boilers and vessel collisions. What's the answer?

It must be understood that until enough **new** experiences are compiled, evaluated and passed on to personnel who will build and man the ships of the future, safety and competency of personnel will remain an objective rather than an actual fact. It should be obvious, therefore, that the need for professional qualifications never diminishes. Standards must be revised from time to time so as to include the lessons learned from new experiences. This is desirable, as standards cannot be established until there are experiences upon which to base them. When the types of ships are new, the experiences must be new.

We can be proud of the fact that the maritime profession has its own designations of competency. We have licensed masters and mates, licensed engineers, certificated lifeboatmen, tankermen, A.B.'s, Q.M.E.D.'s, electricians, motorboatmen, stewards, pursers, welders, shipfitters, shipwrights, riggers, architects, and so on.

NEW TYPE LIFE RAFT TESTED: The raft, floating in the water, is the subject of rigid tests by U.S.C.G.'s Merchant Marine Division in its efforts to find perfection in lifesaving equipment.

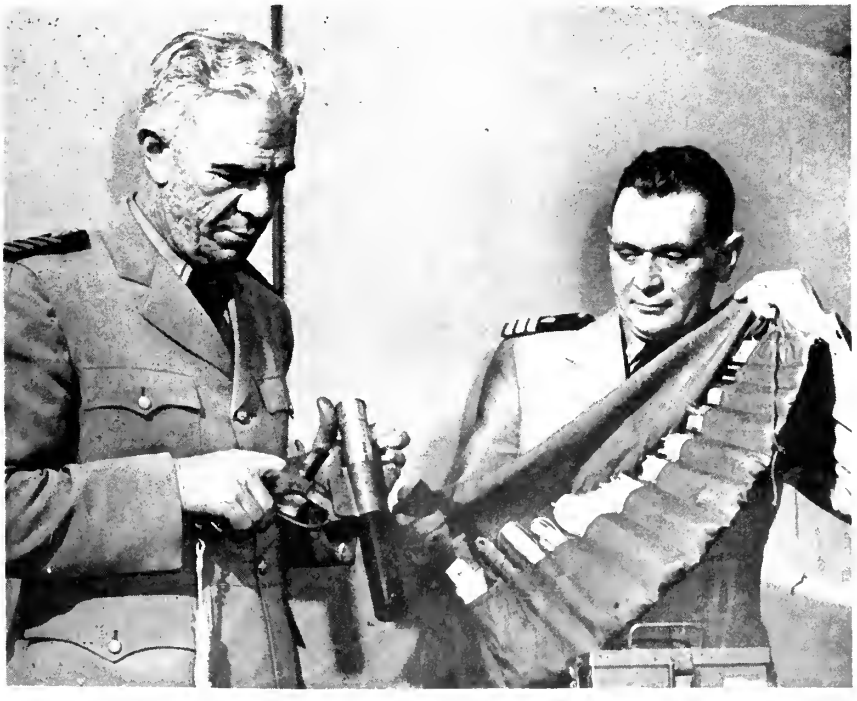
Where professional demonstrations are not required by law, they are required by custom and competition. And, like recurrent checks for maintenance of safety standards for vessels and equipment, maritime personnel must periodically demonstrate their continued proficiency. These matters have been recognized as essential for safe and economic operation of a vessel. When a vessel has been constructed and fitted out in accordance with reasonable standards, and manned with personnel who are reasonably competent, then aids to Marine Navigation are of next importance.

SOS BY MIRROR FROM LIFE RAFT: Sunlight reflection from mirrors have been found practicable in rescue tests made by the Coast Guardsmen attached to an East Coast Air Station

Aids to Navigation

Today, we have an elaborate and intricate system of aids to navigation which includes both physical and personal aids. The former group can be divided roughly into shipboard aids and non-shipboard aids; but due to the very close relationship between all safety aids, it is difficult to permanently sectionalize them. All of the traditional aids have proved their value. Does anyone challenge the safety-at-sea value of lighthouses, lightships, radio direction finder stations, buoys, or beacons? It is true that the advent of electronic navigational aids (radar beacons, loran stations and fluorescent buoys) will point to new types and designs, but their basic value remains unchanged. Shipboard aids, likewise. Would not such items as the radio direction finder, fathometer, ship's radio, sextant, chronometer, gyro compass, and of late, radar and loran equipment, be considered aids to safe marine navigation?

NEW LIFEBOAT EQUIPMENT. A parachute flare pistol, part of Merchant Marine lifeboat equipment, is examined by Captain Shepheard, while Commander Coombs holds the new type fishing kit.



In the field of personal aids we find charts (offshore, coastwise, and harbor), pilots charts, coast pilots, sailing directions, light lists, notices to mariners, list of radio aids to navigation, meteorological reports and so forth. Even the ship's log book is a personal aid to navigation. So are instruction pamphlets on the operations and maintenance of the fathometer, gyro compass, sextant or direction finder. Obviously, then, personal aids are inseparable from physical aids. And, if they are always used with intelligence, there should be little need for rescue services at sea.

Rescue at Sea

Quite often in the past, the functions of rescue at sea have been interpreted as being exclusively synonymous with safety at sea. Actually, there is a synonymity between

"service at sea" and "rescue at sea," but "safety at sea" implies a much broader viewpoint on the whole problem of maritime safety. Rescue services always have been emergent, adventuresome and exciting, and therefore had greater appeal to the reading public. The annals of the sea are filled with heroic stories of man versus the elements. Few people would fail to read an eye-witness account of a dramatic rescue of women and children being taken from a grounded vessel, or one engulfed in fire, off a rocky coast in a raging gale and blinding blizzard. No wonder rescue was easily misconstrued with safety at sea. Technically, one is the antithesis of the other. If there were perfect safety, there would be no rescue.

In connection with rescue, it is only fair to point out that the airplane has modified our concepts of service at sea. There is little airplanes cannot do to save life and property. Modern advancements in aircraft design and communications have accelerated dispatch to, and location of,

(Please turn to page 150)

Modern Air-Sea Rescue Trends

CAPTAIN M. H. IMLAY, U. S. Coast Guard.

A summary of modern trends in the saving of life at sea through air-sea rescue was recently given to the Institute of Navigation by Captain M. H. Imlay, USCG, of the Office of Air-Sea Rescue, U. S. Coast Guard, Washington, D. C.

Captain Imlay recently completed an 18 months tour of duty as Air-Sea Rescue Officer on the staff of the Commander, Eastern Sea Frontier. Citing numerous incidents to prove his contention, Captain Imlay attributed numerous air accidents to faulty navigation.

With the entry of the United States into war, the importance of rescuing pilots forced down at sea was foreseen, and the need for an air-sea rescue organization was realized. In 1943, a Joint Operations Center was developed in the 11th Naval District. Under the guidance of Commander Black, USN, and Commander Burton, USCG, air, surface, communications and radar facilities of the Army, Navy, Marines, and Coast Guard were coordinated under the operational control of a Joint Operations Center. The unification of facilities and efforts in the 11th Naval District proved so successful that the plan was placed before the Joint Chiefs of Staff in Washington, D. C., who subsequently established the Air-Sea Rescue organization under the commanders of the Continental Sea Frontiers and the commanders of the Forward Areas in the combat zones. An air-sea rescue agency was also established to study equipment and techniques. This agency is headed by the Commandant of the Coast Guard with a board of officers comprising two Navy members, two Army Air Force members, and two Army Service Force members.

The Navy has stated that peacetime rescue is the primary function of the Coast Guard, and that as operations return to normal the Navy expects air-sea rescue facilities to be entirely Coast Guard-manned, with the Navy assisting in emergencies by making secondary facilities available.

The Merchant Marine often enters into the rescue operation by diverting their ships to the assistance of those in distress.

Captain Imlay stated that at a recent meeting of the Provisional International Civil Aviation Organization it was generally agreed by the representatives from different countries that the term "search and rescue" will replace the present title "air-sea rescue."

Coast Guard Helicopter

On the Chicago river the Coast Guard demonstrates the use of its helicopters in air-sea rescue. A plane accidentally dived into the water and a Coast Guard helicopter "windmills" overhead, dropping a hydraulic rescue device. The plane's pilot climbs into the seat, is hoisted to the rescue plane's cabin, and flown to shore.

The Control of Cargo Fires

TESTS OF MAJOR IMPORTANCE UNDER WAY AT SAN FRANCISCO

During the past two years the U. S. Coast Guard has been making monumental studies of the control and extinguishment of fires in the holds and machinery spaces of vessels. The tests under study have been made at the Fort McHenry Training Station and on San Francisco Bay. The latter test is now in progress, with financing by the Army Transportation Corps, which during the war was the world's largest operator of merchant ships, and active cooperation of other interested agencies.

Fires at sea are more numerous than is generally realized. Happily, the losses are usually measured in money rather than lives, but the money factor looms large when thousands of fires are suffered. And protection against such losses looms large also. Insurance on an average ship (C-2) at the statutory sales price ($1,050,000) is from $35,000 to $50,000 per year. And insurance on the cargo, varying with many factors, is at least $5,000 per voyage. Fire risk accounts for an important part of these costs which in turn are based on fire experience. Ed

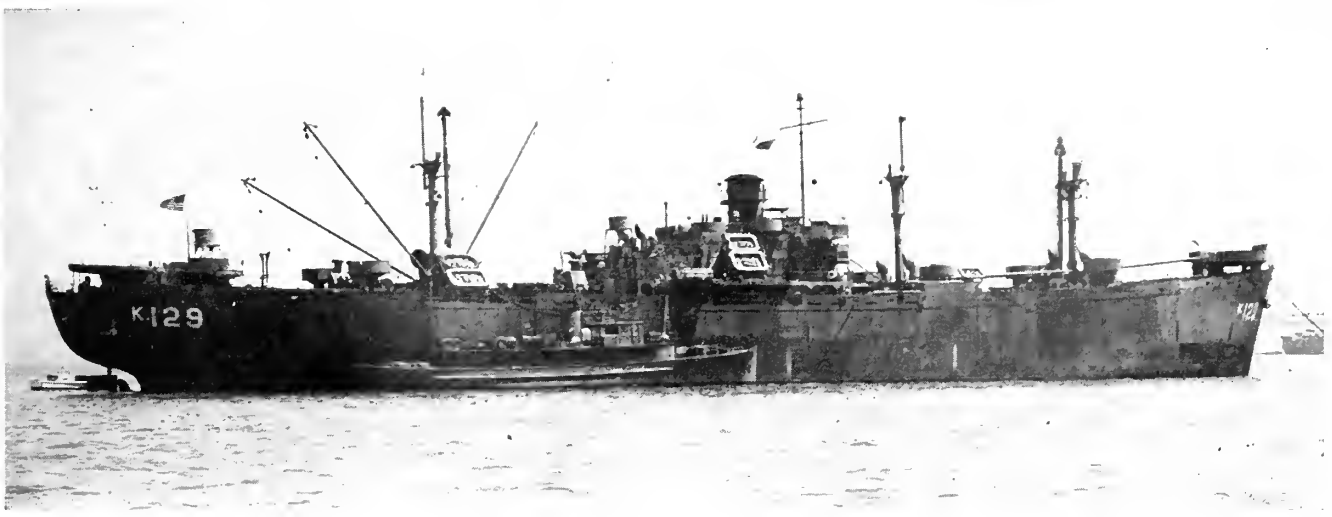
For the first time in the history of American shipping, a concerted and scientific effort is being made to determine the best methods of controlling and extinguishing fires occurring in dry cargo aboard merchant ships. Records show that over a ten-year pre-war period fifty per cent of all cargo fires involved cotton. For that reason cotton is being used in the experiments. The material was declared unfit for reclamation and was turned over to the men in charge of the tests.

The experiments, called "Operation Phobos" from the name of the former Liberty ship used as the test "guinea pig," are now under way at San Francisco.

Sponsors and operators of this forward step toward greater safety and effieiency for cargo vessels are the Army, through the Army Transportation Corps; the Navy, through its Bureaus of Ships and Personnel; the Maritime Commission; the War Shipping Administration; and the U. S. Coast Guard of the Treasury Department, through its Merchant Vessel Inspection Division.

"This project was originally conceived during the war," said Mr.

The United States Coast Guard Cutter Phobos a converted Liberty ship



Top: Taken during a visit to the Phobos while preparations were in progress. Army Officer at left is Colonel Sullivan of Army Transportation Corps, which is financing the tests. Mechanic in work clothes is Carl Frese of Walter Kidde Co., whose equipment is used in the tests.

At left: The type of discarded cotton on which experiments are being conducted.

Commander Layman In Charge

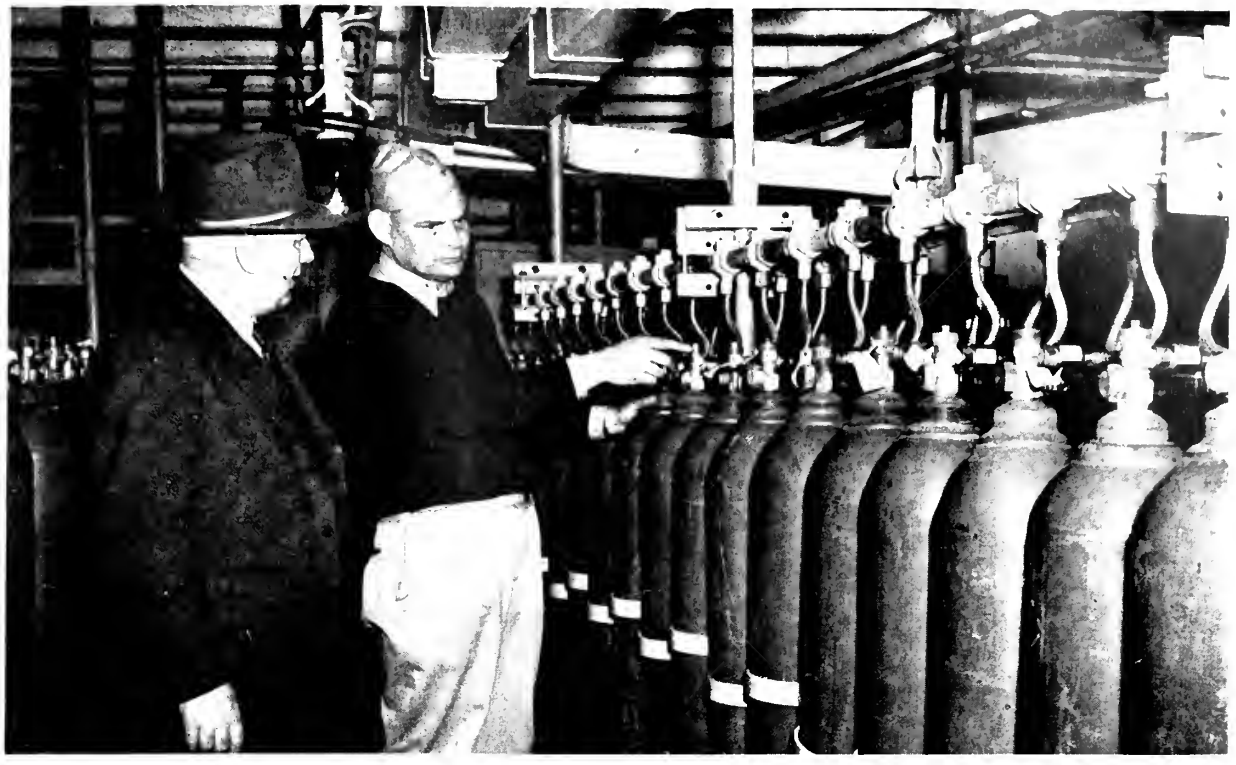
Commander Lloyd Layman, USCGR, former Parkersburg, West Virginia fire chief who handled the Fire Training School of the Coast Guard's Fort McHenry Training Base, Baltimore, Md., during the war, is in direct charge of the San Francisco operations. His staff includes Major Jack Christian, TC, AUS, wartime fire marshal at San Francisco Port of Embarkation; Lt. O. S. Peterson, USCGR, former Fresno, Calif. Fire Department executive who is in charge of the Coast Guard Fire Prevention Detail in San Francisco Harbor; Byron J. Culp, safety and fire expert from the Intelligence and Security Division, Office of the Chief of Transportation; Lt. Com. Basis E. Rice, USNR, Bureau of Ships, Washington; Alan Osbourne, Research Section, U. S. Maritime Commission; A. C. Hutton, National Bureau of Standards; and a team of experienced Coast Guard fire fighters who assisted Commander Layman in similar experiments aimed at control of fire in ship machinery spaces last fall at Fort McHenry. Ed Hough of Hough & Egbert, representing Walter Kidde & Co., has taken an active part in facilitating the tests.

While much special equipment is being used, it is chiefly for checking and testing purposes. Mr. Butler and Commander Layman are aiming, as far as possible, at simulating actual conditions aboard ships at sea when

William T. Butler, Coast Guard explosives expert who heads the Joint Committee. "But it has an even greater application to safety at sea in peacetime and for that reason the four services decided to complete this project.

"It seeks to set up for the first time scientific procedures for combatting one of the sea's greatest menaces, dry cargo fires. Previously there existed only case histories of such fires. Now, with the cooperation of various underwriter agencies and equipment manufacturers, we are aiming at finding out all that can be learned about such fires and at setting down, after checking and rechecking, the results of our experiments so that the Maritime industry can have at hand tried and proved methods of combatting them"

Burned cotton in No. 5 hold after fire was extinguished.



Mr. Butler looks on as Comdr. Layman points out the bank of Walter Kidde Co. CO_2 cylinders installed in connection with the project.

Lt. Bender, Major Christian, Mr. Culp and Commander Layman watching Lt. Peterson prepare to ignite cotton cargo in No. 5 lower hold.

fires break out, using chiefly materials and equipment which ordinarily would be at hand on the average vessel.

The Cost

The experiments are costing little in direct outlay of money. The ship chosen for the project was diverted from a trip to dead storage by War Shipping Administration after the Navy had declared it surplus to its needs. Originally built as a Liberty cargo carrier, the vessel, known in war time the the U. S. S. Phobos, was used by the Navy in the fleet supply train in the Pacific.

"We hope to turn the Phobos back to WSA at the end of the experiments virtually undamaged," Commander Layman said. "There may be some warped plates, easily replaced, but otherwise it should be in as good condition as the day it completed its last voyage."

For the combustible materials needed the committee obtained from the Navy after clearance with the Department of Agriculture, a quantity of short fibre cotton originally designed for wartime mattress stuffing. It is of a quality not suitable for peacetime commercial use without costly reclamation processing.

Each service contributed manpower. San Francisco Port of Embarkation, the the Transportation Corps, arranged for stevedoring and barge services.

The Coast Guard transferred one of its largest fire boats from Southern California. Equipment manufacturers donated their instruments, extinguisher material, and their experts. The 12th Naval District provided an anchorage close to its Treasure Island Fire-fighting School which will serve as an operating headquarters. The Transportation Corps provided what funds were needed from its research allotment.

After several months work, the personnel, the ship, the cotton, and equipment were brought together in San Francisco the latter part of May and by the first week in June the experiments were under way. They will continue indefinitely, according to present plans.

Using Air-mover in port ventilator to remove gases from the hold —steam used as ejecting power.

The Tests

The tests are divided into three main parts. First step was to determine control and extinguishment of a fire in a hold 25 per cent full of cotton. Substeps for this phase consisted of trying to put out the fire by introducing Carbon Dioxide (CO_2) from overhead piping; then from piping laid beneath the fire; and by introducing live steam into the hold. The same three steps were to be followed with the hold practically 100 per cent full of combustible material. Finally similar experiments will be made of fires started in the ship paint locker.

"We chose cotton as the combustible," Commander Layman explained, "because the records show that a high percentage of dry cargo fires in the 10 years before the war occurred in cargoes which were all or partly cotton bales. And it is known that fires in such fibrous materials are the hardest to extiguish.

Through pyrometers, thermocouples, and other instruments and devices the experimenters aim at determining the time required for smoke-detecting devices to indicate presence of fire; the characteristics of

the burning; the temperature developed; the direction of air currents in the fire-filled hold; the nature of gases present; the best methods of sealing the hold; the effectiveness of the various extinguishing agents and methods; the best means of getting to the core of the blaze; the effectiveness of various respiratory devices; the effectiveness of smoke ejectors; the degree of heat transmitted to and through bulkheads and decks; and the most practical methods of complete extinguishment.

"It may prove that none of the agents or methods now known will completely extinguish cotton fires," Layman said. "Then it will be necessary to take the cotton out of the hold and break it open on the deck of a steel barge or at some land point. We'll try to determine the degree of control at which the cargo can be removed and the best methods of handling its removal."

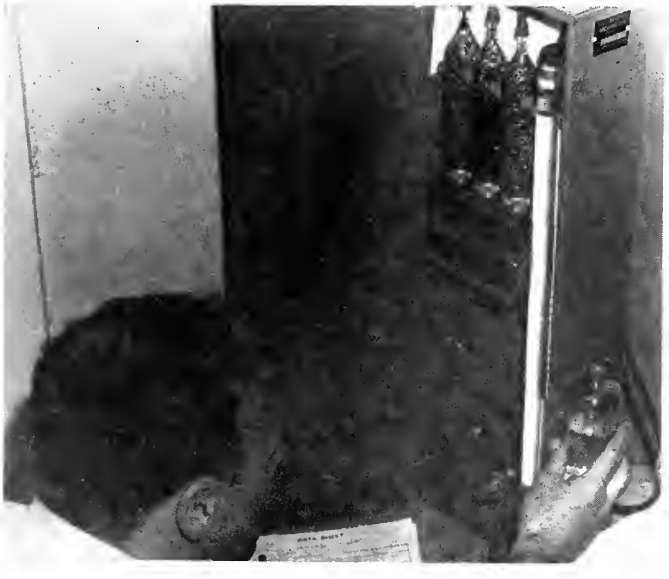
When all that is done, Butler, Layman, Culp, Peterson, Christian and the other experts will follow up the data with laboratory tests, in which the Bureau of Standards and Naval Research Laboratory will co-operate, to obtain confirmatory checks of apparent results. Finally a report covering all phases of the experiments and drawing certain conclusions will be submitted to the services involved for eventual release to interested agencies. This report probably will not be ready for several months after the experiments are completed.

A. J. Toerring, engineer, Mine Safety Appliance Company, is testing for carbon monoxide in No. 5 hold, after the fire was extinguished, but before the smoke had cleared away.

Representatives of shipping firms and naval architects are among those awaiting the report, for its recommendations may involve some changes in the structure of merchant vessels.

Among the commercial and civilian agencies cooperating in Operation Phobos are the following: National Board of Fire Underwriters; National Fire Protection Association and its Marine Section; Board of Fire Underwriters of New York; United States Salvage Associations; Walter Kidde & Company; Photoswitch, Inc.; Cardox Corporation; C-O-Two Fire Equipment Co.; Mine Safety Appliances Co.; and the Mearle Corporation.

When the tests are completed and conclusions reached the report will be published. It is hoped that this very constructive step on the part of the agencies mentioned will be followed by others of similar importance in the cause of safety at sea.



Orsat unit being used to analyze gases during the fire.

FULL SESSION—General view of plenary session of Maritime Conference of International Labor Organization, meeting in Civic Auditorium, Seattle. Each of delegate's desks, center section, was provided with headphones through which came speech translations. Advisers' tables in foreground.

Report on the I. L. O. Conference

by ROBERT N. WARD

Although any standards of working conditions agreed upon at this conference would surely be far below those of American crews, it is obviously important to us that foreign standards be raised, and that the cycle of subsidies, direct and indirect, be checked.

So that the reasoning of foreign delegates might be better understood, the Pacific Marine Review is providing this full report.

There are some interesting sidelights brought out in Mr. Ward's report that will well repay a careful reading.—Ed.

FOR three weeks the Maritime Conference of the International Labor Organization, meeting in Seattle, went a dizzying round of fast maneuvering, clashing interests and heated, frequently acrimonious debate.

And not until the last of the 295 delegates and advisers from 32 member nations had packed their bags and started home were observers able to sit down and begin an unhurried appraisal of just what the conference had accomplished.

They are still appraising.

For it will be months, at least, before actual effects of the conference are fully known. Not one of the many far-reaching maritime proposals adopted by the delegates has, at this time, any more authority than a simple recommendation.

In all, 19 important agreements—or "conventions," as the delegates refer to them—were adopted by the conference, some by a very slim margin, indeed.

But not one of the conventions will mean anything unless it is ratified either by government action on the part of member nations or by collective bargaining between workers and ship operators in member nations.

From the press box it was apparent that two results stood out in importance above the welter of resolutions and statements of national policies.

First, the conference did, whatever its faults, produce the first international accord on wages and hours ever reached in any industry—the recommended $64 minimum monthly wage for seamen.

Second, the United States, most

powerful maritime country on the earth today, came out of the conference with its prestige definitely on the bedraggled side. When British and American influences clashed, the British generally won.

The conference was the first general meeting of the I. L. O. devoted solely to maritime problems since 1936. And the vast increase in total shipping tonnage since that time convinced most of the major shipping powers of the meet's importance.

Each country could send one workers' delegate, one shipowners' delegate and two government delegates, plus as many advisers as it wished.

The British, to whom shipping is literally life, put a top-notch team on the floor. Last winter the British government named four experts as delegates, and added a list of 32 advisers, authorities on labor and shipping. The delegation was united as to objectives and tactics.

Against this smooth-working team the United States brought out a delegation which, except for the employers' representatives, was largely patched together at the last minute.

Maitland S. Pennington, vice president of the National Federation of American Shipping, shipowners' delegate, had to do most of the ball-carrying for the Americans.

America's two ranking government delegates were Congressman Henry M. Jackson of Washington, who was elected president of the meet early and thus lost his floor vote, and Labor Secretary Lewis B. Schwellenbach.

Schwellenbach delivered an opening speech of welcome and several days later a message from President Truman. He did not otherwise appear at open sessions or in committee.

The rest of the American government and labor delegations made practically no splash at all.

Setting up of wage, hour and manning minimums was the conference's biggest task, allotted it by an I. L. O. recommendation.

The conference, by the time its

VETERAN — Emile Deckers, Belgian delegate and president of the employes of the Port of Antwerp. He attended first I.L.O. Maritime Conference in 1920. Talks here to Seattle newspaper reporter.

At right above: Dan Tracy, left, I.L.O. labor counselor, and Maitland S. Pennington, United States shipowners' delegate, talk over a pre-conference point.

ARGENTINE — Capt. Leandro Amado de Fazio, extreme right, whose right to be seated was questioned by conference. De Fazio was Argentine labor delegate. Others are Rear Adm. Carlos Saravia, left, and Commander Juan Teffabet.

TRI-LINGUAL — Everything, including speeches, had to be translated into the three official conference tongues, English, French and Spanish. Technical advisers to India employers' delegates sit behind typical conference sign. Left to right, David S. Erulkar, S. N. Morarji and Capt. Kauas Ookerjee.

PRELIMINARIES—Meeting in committee, members of the employers' delegations thrash out a point before beginning of first plenary sessions of Maritime Conference.

final stormy plenary session was over, had approved also "conventions" setting up certain standards of food and living accommodations aboard ship, holidays with pay, social security and pensions for seafarers, medical care and other objectives.

As far as the American seaman is concerned, the conference was largely of academic interest, since the standards it set, in most cases, were far under those at which he already is working.

Both Pennington and Morris Weisberger, American Federation of Labor seaman's delegate, agreed after the conference had ended that it produced nothing which could be considered a "gain" from the American seafarer's point of view.

Many European and Asiatic delegates, however, took a more optimistic view. The meet had, they declared, laid the basis for improvement of seafarers' wages and working conditions in some nations, particularly the conspicuously sub-standard countries such as China and India.

Conference results might also serve as a lever in collective bargaining in even the countries where wages and conditions are comparatively high, delegates pointed out.

The conference's hottest and most important arguments came over the vital convention concerning wages, hours and manning.

There never was any serious variation from the proposed $64 minimum monthly wage, recommended by the I. L. O. leadership. But debate raged long over the complicated question of hours, particularly on near-trade ships.

On that question the United States had plumped early and hard for a general eight-hour day for seafarers, and gained for its pains the suspicion and downright amusement of many a delegate from Europe familiar with the highly-competitive near-trade setup there.

The British were unalterably opposed to applying the eight-hour day to near-trade runs. And a majority of the delegates lined up with the British, some on the realistic grounds that an eight-hour day proposal wouldn't stand a chance of ratification anyway.

Not until the final plenary session did the conference pass, by just three votes over the necessary two-thirds majority, the proposals of the wages, hours and manning committee. A digested text of the final convention, released by the I. L. O., reads:

"The convention requires the payment of basic wages of $64 or 16 pounds a month to seamen.

"It permits the payment of an adjusted equivalent of this wage in the case of ships in which are employed such groups of ratings as necessitate the employment of larger groups of ratings than would otherwise be employed.

"The convention limits the hours of work of seafarers, with the exception of chief officers, chief engineers, pursers and other officers in charge of departments who do not keep watch.

"In the case of near-trade ships, the normal hours of work at sea are lim-

ited to 24 in two consecutive days, in port they are limited to 8 a day, and at sea and in port to 112 in two consecutive weeks.

"In the case of distant-trade ships, the normal hours are limited to eight a day. In the catering department of passenger ships the normal hours must not exceed 10 in 14. In the catering department of cargo ships the limit is 9 hours in 13."

In deciding on the minimum monthly wage, the delegates had to strike a neat and perilous balance. They had to make it high enough to at least serve as a goal for sub-standard countries, and keep it low enough to have a good chance for ratification.

The second clause, regarding the "adjusted equivalent," is, despite its lenient sound, a direct blow at a long-prevalent practice on British Orient trade ships.

Customarily, British ships go from the homeland to Asia with a British crew. Once there, the British seamen at times are paid off and taken back home as passengers aboard the same ship.

The shipowner then hires Lascars or other native labor to work the ship on its return voyage, paying them so much lower a wage that even with the British crewmen "deadheading" his costs are cut down. British seamen don't like it because they lose wages on the return trip.

The "adjusted equivalent" clause would make it necessary for a shipowner to pay a native crew, no matter what its size, the total equivalent of what he would have had to pay a British crew to make the return trip. Thus there would be no saving, and no point in hiring native seamen. Britishers would serve as crewmen both ways.

When the question of hours came up United States delegates, in committee, put through a provision for an eight-hour day in all ships above 500 tons plying the near-trade routes.

The disapproval, led by Britain and the Scandinavian countries, was immediate and effective. George Russell Strauss, labor delegate and labor member of the British parliament, stormed to the floor. Right behind him came Richard Snedden, British shipowners' delegate and floor leader for the owners' group.

Both questioned the good faith of the American delegates in pushing for the eight-hour day.

Snedden asserted flatly that the American purpose was not to reduce hours of work aboard ship but to force raising of British and other operating costs through overtime pay, thus putting the United States merchant fleet in a better competitive position.

Both Strauss and Snedden insisted that British near-trade ships, and those of most other nations, are not built to carry three crews necessary for eight-hour shifts.

In the end the British won their point, and the convention, as finally passed, was "watered down" considerably.

Longer hours for catering department workers on distant-trade ships were approved because, some delegates declared, the workers themselves wished them. An eight-hour day would decrease the tip take greatly, the delegates said.

The argument over hours was only one of a series of wrangles between American and British delegations. At times the conference assumed the aspect of a private argument.

Stage for the Anglo-American fight was set early in the meet when Charles Jarman, secretary for the British Union of Seamen and a powerful labor delegate to the conference, put forth a resolution calling for creation of a world-wide shipping authority.

The authority, Jarman proposed, would have power to regulate the tonnage under each flag on the high seas.

To U. S. delegates this looked like a bid to curtail the activities of the huge American merchant fleet. There were grim declarations of a "last-ditch" stand.

The curly-headed Jarman merely smiled amiably and added to the British following several more smaller nations who had been made cautious

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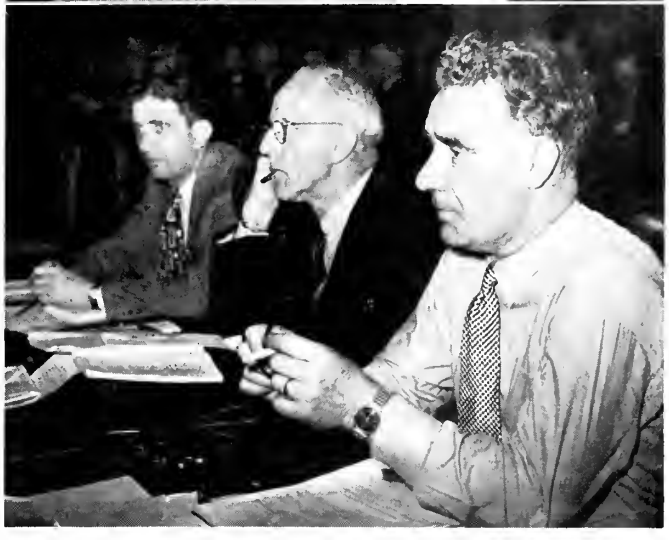
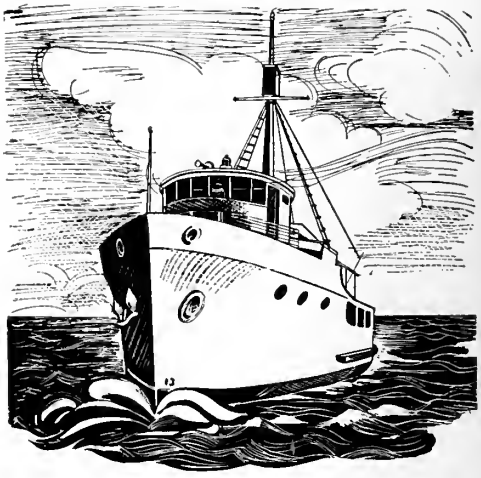
SCANDINAVIANS — Norwegians and Swedes get together in a little pre-conference strategy. Left to right are Ake Stromberg, standing, president Swedish Merchant Marine Officers Association; Ingvald Haugen, Central Norwegian Seamen's Union; Terker Svensson, president, Swedish Seamen's Union; Anders Sore, president Swedish Engineer Officers Union; E. Johansen, Norwegian Seamen's Union, and E. Berg, secretary Norwegian Seamen's Union.



FORTHRIGHT—Charles Jarman, right, secretary of the British Union of Seamen and a powerful labor delegate to conference. He introduced proposal for international authority to set shipping tonnage under each flag. Others not identified.

Coast Commercial Craft



Puget Sound Ferries

Chippewa's Million Miles
Kalakala's Overhaul and Radar Installation
Busch-Sulzer Reports Impressive

On a recent visit to Puget Sound we had occasion to travel on some of the fast Black Ball diesel ferries, and a ride on the famous streamliner Kalakala. After recent overhaul of this ferry we were very favorably impressed with her performance and smooth operation. On her daily run to Victoria this summer this boat with her spacious and commodious passenger and car accommodations is bound to be very popular and we wish her a very successful season.

Raytheon Installed

Captain Louis Van Bogert showed us the recently installed Raytheon radar equipment of which he is quite proud. His is the first commercial vessel to have radar.

Captain Alex M. Peabody, president of the Black Ball Ferry Lines, is very much impressed with his radar and is interested in further installations. Incidentally, the equipment has already paid for itself as there was a potential collision with a small vessel during a light fog, but the radar equipment permitted the captain to continually observe that vessel's course without which aid he admits the appearance of the vessel a few hundred yards ahead would have been a complete surprise, inasmuch as she was not whistling.

The Chippewa

In the Pacific Marine Review of December, 1932, there appeared an article entitled "New Marine Diesel Has Operator's Approval." It dealt with the lately converted motorship Chippewa, which had covered 42,000 miles on her new Busch-Sulzer diesel. Forty-five thousand miles is considered high for a motorship year.

Captain Harry Anderson, vice president in charge of operation, and Neil McCullough advised that their motor ferry Chippewa early in June of this year had completed 1,000,000 miles of travel and 80,600 hours of operation since conversion from

The Ferry Kalakala.

OX-1017, Wheelhouse instruments.

steam to diesel by the installation of Busch-Sulzer engines.

Captain Anderson attributes the complete success of this installation to the careful planning by James E. Murphy, marine superintendent at that time, and A. Tacchella, veteran diesel engineer representing the Busch-Sulzer Diesel Engine Co., on the Coast, and last but not least, to the sound design and construction of the Busch-Sulzer diesels.

The main engine in the Chippewa is one of the first (the second to leave the shop) of the DH type, a solid injection trunk piston engine as sponsored by the former president of Busch-Sulzer, E. B. Pollister, and designed under the able leadership of R. H. Schneider, chief engineer of design for Busch-Sulzer. Mr. Schneider is known to marine diesel engineers on the Coast through his excellent book of instructions on diesel engines written primarily for the Navy.

Conversion

The conversion of the Chippewa from a steamer with a 1200 hp reciprocating engine to a 2200 shp diesel motor ferry represents the progressive spirit of Captain Alexander M. Peabody, president of Puget Sound Navigation Co. As reported in our December 1932 article, this conversion caused no increase in machinery weights, but resulted in an increase in speed from 13¾ to over 16 knots, and a reduction in fuel consumption from 10 barrels to a little over 3 bbls. per hour. With this increase in speed the Chippewa was able to make eight daily round trips to Bremerton instead of five.

With over 14 years of service on the main and auxiliary engine in this vessel we asked Mr. McCullough for information on performance that could be of interest to our readers, and here are his comments:

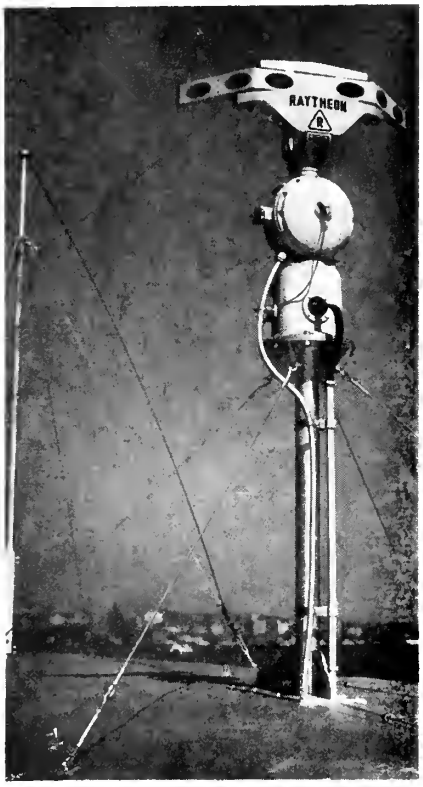
"Ferry service on the Bremerton run presents some peculiar operating problems due to the fact that the propulsion unit is operated at full load for about 50 minutes to be followed by considerable maneuvering operations in docking the vessel, and that again to be followed by operation under slow bell in the slip while unloading and loading. This results in temperature changes in cylinder liners and pistons, and together with the great amount of maneuvering of over 100 engine responses per day imposes very severe service conditions. However, the results from this conversion were so satisfactory that the 8-cylinder Chippewa installation was followed by a 10-cylinder unit of the same type in 1935 for the ferry Kalakala and two 2800 hp units each for the Willapa and Enetai in 1941.

"There were some problems, of course, in the early period of operation and two were particularly serious and had to be overcome without delay. But for the cooperation given us by Busch-Sulzer and the resourcefulness of Mr. Tacchella the venture might have become a very costly experiment for our company and Busch-Sulzer.

"First were the wristpin bearings, which had already given trouble during shop tests and, of course, just as much after installation in the boat. This difficulty was overcome by a change in the oil grooving of the main bearings, which resulted in a better supply of lubricating oil to the wristpins. After making this change the bearings gave very reliable service.

"The other problem which did not show up until after more than one year of operation was the breaking of tap bolts holding the oil covers in the piston heads. To replace these bolts the pistons had to be pulled and disassembled. In one week this happened to five pistons. This was just about the limit the engineers could stand, when Tacchella took over and in his methodical way proceeded to take pressure cards on the piston cooling system. The cards taken showed very high peak pressures up to 400 psi in the system immediately after leaving the dock and until after about

Raytheon OX-1017 radar antenna installation on the Ferry Kalakala. This installation is of modified Navy gear and was made last fall before the new Raytheon Pathfinder was ready.



Puget Sound Navigation Co. auto and passenger ferry, Chippewa.

30 minutes, when they leveled off to about 60 psi. It was apparent that while idling in the slip the piston cooling oil space in the piston filled with solid oil, and the pumping action of the piston cooling tubes (at the increased engine speed after leaving the dock) caused the excessively high pulsating pressures. Mr. Tacchella then fitted an air header along the engine and from it through needle valves fed a small amount of air into the piston cooling inlet boxes, and the trouble was over. Later he proposed that the oil covers should be made to form air chambers. This suggestion was followed by his company with the result that we now have all but forgotten the troublesome experience.

"The performance of other parts of the engine has been as follows:

"Cylinder Heads. This engine has all the original cylinder heads and none had to be replaced. They are of cast iron.

"Fuel Injection Valves. The fuel injection valves in this engine are of the Hesselman type and have given excellent service and we still operate with original valves.

"Piston Heads. The piston heads in this engine are forged steel and while we had some welding and refinishing of worn ring grooves, we still have the original piston heads with years of service left if given proper attention.

"Cylinder Liners. We now are on the third set, and on some cylinders we are on the fourth set of liners. We do not consider it economical to keep liners after they have a maximum wear of approximately .090". The liners are cast iron and we consider the service received satisfactry, although some improvement may be possible particularly for our type of service.

"Working Pistons and Rings. We aim to pull pistons twice per year, but during the war, this was not always possible. The longest period between inspection and cleaning of one of the pistons was 18 months. All pistons are interchangeable and we have a spare assembly. Pulling a piston we immediately install the spare assembly and the pulled piston is then cleaned and becomes the spare.

"At first we had some trouble from broken rings but with proper relief on ports and rings this problem is practically eliminated. We are using an average of 16 rings per year on this 8-cylinder engine.

"Crank Bearings. Our service with so much maneuvering is very hard on crank bearings but we are learning all the time and the average for the last year has been 1½ bearings rebabbitted.

"Scavenging Valves. The reed scavenging valves controlling the upper scavenge ports are no trouble at all. They are being cleaned in rotation about once per year.

"Lubricating Oil. We use a straight mineral oil for cylinder and bearing lubrication. Talpa 50 for cylinders and Talpa 40 for bearings. We have approximately 1200 gallons in the circulating oil sump tank, and from 1933 to 1944 or for over ten years we used the same oil in sump tank, it being continuously centrifuged. We use approximately 12 gallons per day of cylinder oil.

"Exhaust Temperatures. During full load tests at the factory the exhaust temperatures averaged about 430 degrees F. at the cylinders and we are operating in this range and try not to exceed 450 degrees F.

"Cooling Water. We use fresh water cooling and would not consider anything else. For our service of operation we found it best to have a differential between inlet and outlet of not over 10 degrees F.

"Looking back over the years we can be very satisfied with the service we had and were able to give the public with the Chippewa," concluded Mr. McCullough.

Visiting the engine room we found Erling Nilson, chief engineer, who had been in charge for the last two years. Mr. Nilson likes these engines very much and said that they remind him of the song of Old Man River, "they just keep rolling along."

Hydrographic Office Prepares Something New in Atlases

The first complete copy of the "Ice Atlas of the Northern Hemisphere" has just rolled off the presses and been placed on sale at the U. S. Navy Hydrographic Office in Suitland, Maryland. This publication marks a new departure in the field of atlases. It is the culmination of a desire on the part of the Hydrographer that this office publish a volume covering an area that has become vitally important in recent years.

The atlas is approximately twenty-five inches square and contains more than one hundred pages of charts, tables, and bibliography. Charts of the complete Northern Hemisphere are based on an equidistant azimuth polar projection.

Preliminary work on the Atlas was started by Dr. John C. Weaver in 1942, at the American Geographical Society in New York, under the auspices of the Division of Geography and Cartography of the United States Department of State.

The Ice Atlas is as attractive in format as it is scientifically sound and useful. The charts are reproduced in blue and white, and are put together in loose-leaf form.

Nothing quite like the "Ice Atlas" has been published before, and, while it is designed primarily for use by the Fleet and shipping interests, it will be of inestimable value to scientific institutions, libraries and colleges.

Ship Sales Act in Operation

American and foreign response to the ship disposal program of the United States under the Merchant Ship Sales Act of 1946 has been gratifying and encouraging to the Maritime Commission, that agency said in its first report to Congress on activities and transactions under the statute. The report, covers the period from the enactment of the Act through June 30, 1946.

"The magnitude of the demand for war-built vessels under the terms of the Ship Sales Act has been most encouraging to the Commission," said the report, which, as to foreign response, added that this "is also gratifying to the Commission."

Seventy-three American companies have applied to purchase 339 vessels, while 24 American concerns have filed applications for the charter of 211 vessels. In addition six applications have been received for the exchange of 16 vessels. However, the report pointed out that the demand for charters is expected to be increased greatly in the immediate future when interim charters from the War Shipping Administration terminate, about 391 ships now being under such interim charters.

Noncitizen applications cover the purchase of 656 ships, while four Philippine applicants have applied to purchase eight vessels and three Philippine applications cover the charter of 16 ships. It was pointed out that many of the noncitizen applications must be disapproved by the Commission, inasmuch as the ships covered will be required in the American merchant marine or for national defense purposes.

In his covering letter, Vice Admiral W. W. Smith, Chairman of the Commission, said:

"The Commission has devoted a great deal of time and study to the problems incident to the administration of this Act, and believes that substantial progress has been made leading to a satisfactory vessel disposal program, and likewise encouraging the maintenance of an adequate American merchant marine."

Included in Appendix A to the report is a summary of the vessels applied for through June 30, 1946. This Appendix is not reproduced here, but most of the figures included in the table are contained in the body of the report.

"The Commission, under the Merchant Ship Sales Act, is selling high-unit cost capital equipment to a service industry which is subject not only to the usual economic hazards of service industries, but to the uncertainties of international trade as well," the report stated. "Therefore, the market for the sale of merchant vessels is considered generally to be a timid and cautious market.

"The ships are offered to citizens at fixed prices rather than on a competitive bid basis. If the latter method of disposition had been specified in the Act, ships in the 'short supply' category would be sold to citizens submitting the highest bids. This method, had it been adopted, would have resulted in awards purely on the basis of the comparative level of prices bid and might have produced results inconsistent with the objectives of the Act. The method actually adopted, however, placed upon the Commission the task of giving practical effect to the preference provisions contained in Section 7 of the Act and the importance of this task is clearly indicated by reference to Appendix A which indicates that the domestic demand for types designated **C3, C2, Liberty collier, and T3 tanker exceeds the supply.**"

After explaining that the rules and regulations were promulgated by the Commission and published in the Federal Register of April 23, 1946, and further explaining the action of the Commission in adopting the monthly preference procedure, the report continued:

"The publication of the rules and regulations and prices established the Commission formally in the business of selling war-built vessels. Purchasers were then in a position to make application for the ships needed to rehabilitate their fleets under the American flag or to enter as new concerns into the field of merchant shipping. The rules and regulations, however, did not settle many difficult problems of interpretation and policy inherent in the sale of ships under the provisions of the Act. Determinations on these additional problems, discussed briefly hereinbelow, are being completed as rapidly as possible to the end that the actual sale and delivery of ships will not be unduly delayed.

"The ships are being offered for sale at fixed prices irrespective of their physical condition. Unlike many surplus commodities, the war-built vessels are not resting on a warehouse shelf under controlled conditions, but are being operated in overseas and domestic trades by charterers and by the WSA's General Agents. We do not know their exact condition and therefore prospective buyers do not know their condition. In other words, we are selling at fixed prices commodities which do not conform to any definitely known standard of condition. The Commission, therefore, has to give careful consideration to the nature of condition warranties which should be granted to purchasers many of whom will not see the ships until they are ready for inspection prior to delivery; namely, whether they should be sold 'as is,' or whether the vessels should be put in class under Section 12 of the Act at Government expense, or some intermediate position should be taken.

"Another difficult problem is the

(Please turn to page 124)

The Cunarder, Queen Mary

Cunard White Star Line and the History of Modern Shipping

Line Founded in 1840 Has Played Important Role in Development of Ocean Transportation

Fulton's Clermont and The Savannah both deserve mention in a history of the Cunard White Star Line, for these two vessels, crude as they were, served to convince a skeptical world that it was possible to apply steam power to transportation by water. People were slow, though, to recognize the practical superiority of a vessel propelled by steam-driven paddles over ships forced to rely on the vagaries of the wind, and the steamboat made but languid progress. Very timidly the public accepted the new craft in the coastwise trade and in channel service. But it was the general opinion in the thirties, even in some scientific circles, that it was impossible to carry enough coal for a transatlantic voyage!

One of the first shipping men to realize the practical advantages of steam packets over sailing vessels was Samuel Cunard, a leading merchant and a ship owner of Halifax. For several years Samuel Cunard had been operating a fleet of ships carrying on the mail service between Boston, Newfoundland and Bermuda. For a long time he had entertained the thought of developing a line of steamers to cross the ocean.

At that time the mails between England and America, carried by more or less obsolete government sailing vessels, were irregular and uncertain. Mr. Cunard formulated a plan in 1830 to substitute a regular steamship mail service between the continents, but capital was not obtainable and the project was delayed.

In 1838, the British government, convinced of the feasibility of steamship service by the voyage between Bristol and New York of the paddle steamer Great Western, invited bids for a speedier and more regular steam carrier system for ocean mails. Here was Samuel Cunard's opportunity to develop his dream under the auspices of the British government.

Merchants of Halifax did not look with approval on his scheme, so Mr. Cunard sailed for England to raise the necessary capital. Letters of introduction led to a meeting with George Burns of Glasgow, and David MacIver of Liverpool, two of the ablest shipping men in England, both engaged in the coasting trade between England, Ireland and Scotland.

These three maritime pioneers soon perfected their plans, raised the required funds, and Mr. Cunard submitted his tender to the Commissioner of the Admiralty. His offer was better than one made by the owners of the Great Western and was accepted. It called for the conveyance of the mails once a fortnight between Liverpool, Halifax and Boston.

The original intention to maintain this service with three steamships was altered to provide four steamships, fixed sailing dates, and certain other provisions calculated to insure regularity.

On July 4, 1840, the Britannia, ancestor of the whole Cunard fleet, steamed out of Liverpool and proceeded to sea. The Britannia was a vessel 207 feet long, with a 34 foot beam, and she carried 115 cabin passengers and 225 tons of cargo. After touching at Halifax she steamed into Boston on July 18, fourteen days and eight hours out of Liverpool. A grand celebration awaited Samuel Cunard,

who arrived in the ship, and within the week he had received 1,800 invitations to dinner.

Between the early Cunard ships and the Queen Mary and Queen Elizabeth the gulf is wide, but it has been constantly bridged by ships which have each in turn been as staunch, well equipped and safe as the Shipbuilders' art could ensure, while a steady progressive policy has always been maintained in providing passengers with ever and greater increasing comfort in the way of accommodations and catering.

Exemplifying this policy in the first 43 years of the company's existence noteworthy links in the chain of development were the Persia (1856), the first iron Cunard liner, the Scotia (1862) 3,871 tons, in her day the largest steamer in the world; the Gallia (1879) 4,800 tons, regarded as the grandparent of the modern liner; the Servia, 7,392 tons, built in 1881, the first steel Cunard liner, larger and faster than any other ship then in commission, and the Aurania (1883), the first liner to be fitted with suites of rooms.

During the fifty years from 1884 onward the rate of progress made was more rapid than ever. The Umbria and Etruria launched in that year in circumstances which afford a striking parallel to conditions on the North Atlantic as they exist today, were sister ships of over 8,000 tons and an instantaneous success.

Within a very short time both these vessels broke all existing speed records and became the most popular vessels in the North Atlantic.

Another decade passed by and the achievements of the Umbria and

Sir Samuel Cunard

Etruria were eclipsed in 1893 by the first Cunard twin-screw steamers Campania and Lucania whose speed of 22 knots made them the ships of the day.

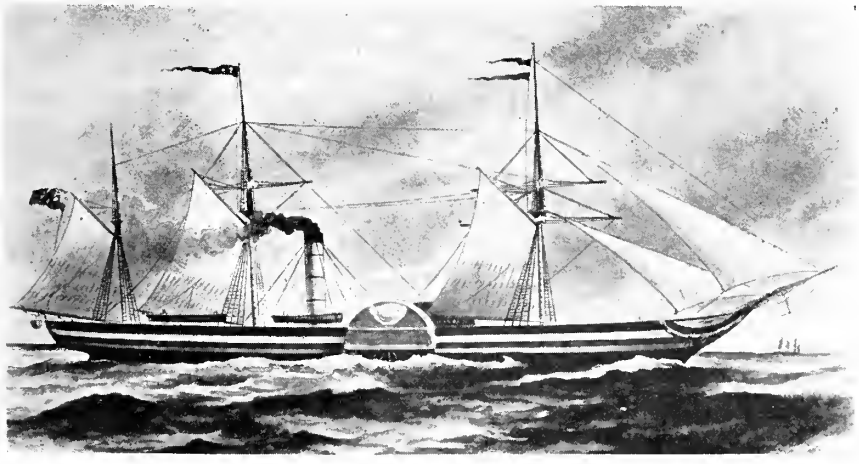
Meanwhile the fortnightly Cunard service to Boston had been maintained by five ships. In 1900, however, new tonnage was required and accordingly the Saxonia and Ivernia were built.

At the same time the company was closely watching experiments being carried out by Signor Marconi and in 1901 the Lucania was the first Atlantic liner to be permanently equipped with a wireless system.

The year 1905 marked a further development in the company's North Atlantic service. This was the commissioning of the 20,000 ton liners Caronia and Carmania. The former was a twin-screw vessel while the Carmania, a triple-screw ship, was one of the first Atlantic liners to be fitted with turbines.

They were both 20,000 ton ships and for many years were extremely popular on the Atlantic. In addition they marked a pioneer stage between the first Atlantic greyhounds and the great liners which were to mark

(Please turn to page 122)



R.M.S. Britannia, 1840.

HIGHLIGHTS OF CUNARD HISTORY

July 4,

1840—Britannia, ancestor of the whole Cunard fleet, steamed out of Liverpool to Halifax to Boston, on first regular steamship mail service.

1856—Persia, the first iron Cunard liner.

1862—Scotia (3,871 tons) — the largest steamer in the world in her day.

1879—Gallia (4,800 tons—regarded as the grandparent of the modern liner.

1881—Servia (7,392 tons) — the first steel Cunard liner, larger and faster than any other ship then in commission.

1883—Aurania — first liner to be fitted with suites of rooms.

1893—Compania and Lucania were first Cunard twin-screw steamers with a speed of 22 knots.

1901—Lucania was first Atlantic liner to be equipped permanently with a wireless system.

1905—Carmania (20,000 tons) triple-screw ship was one of the first Atlantic liners to be fitted with turbines.

1907—Lusitania (30,396 tons) and Mauretania (30,704 tons). Mauretania held the Blue Ribbon of the Atlantic, symbol of the fastest passage until August, 1929; a period of over 22 years.

1913—Aquitania (46,000 tons).

1924—Inauguration of Tourist Class.

1934, July—Cunard Co. merged with the White Star Line.

1934, Sept. 26—Launching of Queen Mary.

1936, May 27—Queen Mary (80,775 tons) started on her maiden transatlantic voyage to New York.

1938—Queen Mary won Blue Ribbon, breaking all records for transatlantic crossings.

1939—New Mauretania (34,000 tons) entered the service.

1940—Queen Elizabeth, sister ship to Queen Mary, entered the service.

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Extended Arrangements For P. & I. Insurance Coverage

Arrangements for extension of protection and indemnity insurance on vessels owned by or bareboat chartered to the War Shipping Administration for six months commencing 12:01 a. m., E. S. T., July 1, 1946, have been completed by the WSA with four American protection and indemnity insurance underwriters, the WSA has advised in Supplement No. 9 to Wartime Insurance Instructions No. 2. At the same time, the WSA advised owners of ships time chartered to the Government shipping agency that the same concerns are prepared, upon request, to extend their P. & I. Insurance coverage for a similar period of time. The latter advice was contained in Supplement No. 11 to Wartime Insurance Instructions No. 9.

Supplement No. 9 to Wartime Insurance Instructions No. 2 is headed "Vessels Owned by or Bareboat Chartered to the War Shipping Administration," and reads as follows:

The WARTIMEPANDI Agreement (1/1/45) between the War Shipping Administration and the following American Protection and Indemnity Insurance Underwriters:

American Steamship Owners Mutual P. & I. Association, Inc., Shipowners Claims Bureau, Managers; Fireman's Fund Insurance Company; Fulton Ship Operators P. & I. Service, Inc.; The Marine Office of America, has been extended to continue Protection and Indemnity Insurance on vessels owned by or bareboat chartered to the War Shipping Administration for six months commencing July 1, 1946, 12:01 a. m., E. S. T., subject to the present form of policy.

Questions WSA On Policy

The Association of American Ship Owners has directed to the WSA a series of questions with respect to the basic merchant marine policy which it intended to pursue. Since most of these questions involve major policy issues which will confront the Maritime Commission after the WSA has been discontinued, it appears quite appropriate to enumerate them:

"1. Is the 'over-all program' based upon a chosen instrument theory?

"2. Does the 'welfare of the American merchant marine in general' require discriminatory treatment in favor of some American shipowners against other Americans?

"3. Are the emergency powers contained in the Ship Warrants Act to be used for any purpose other than to secure needed priorities to assure the use of facilities by ships carrying essential cargoes?

"4. Does WSA plan to use any extra-legal methods of controlling ships and the business judgment of shipowners, such as compulsion under threat of withdrawing agency appointments?

"5. Does WSA consider that the public interest requires the protection of the tax-exempt, subsidized operator in the foreign trades against possible competition of an American owner who may wish to operate without tax exemption and without subsidy?

"6. Does WSA consider that a private owner may operate his vessels only in the routes or services previously operated although such routes or services cannot now be operated except at a loss?

"7. Will WSA refuse to charter its ships when privately owned ships are available?

"8. Will WSA give preference in allocating cargoes to privately owned ships and to vessels chartered for replacement purposes."?

Matson Application Denied

United Air Lines, Inc., has been granted a certificate of public convenience and necessity to operate an air service between Honolulu, T. H., and San Francisco. In granting this certificate, the Civil Aeronautics Board announced that further consideration will be given to authorization of a second air carrier to operate between Los Angeles and Honolulu. The only steamship company applicant for a grant to operate air service in the United States Pacific to Hawaii trade—Matson Navigation Company—was one of those denied the right by the CAB. Adopted on May 17, 1946, the CAB ruling was approved by the President on June 29, and evoked sharp criticism from the Sea-

Air Committee of the National Federation of American Shipping immediately upon release of the ruling.

Increased Foreign Demand For U. S. Ships

The international demand for purchase or charter of war-built American merchant ships grew to a total of 1,246 vessels during the second preference period ended June 30, 1946, under the Ship Sales Act of 1946. This was an increase of 222 ships over the total covered by applications filed during the first preference period which ended May 31.

The report showed foreign applications for purchase have grown to a total of 664 from 24 nations. The largest number of applications—162—came from China. Other totals were: France 85, Norway 84, Panama 67, Italy 50, The Netherlands 46, Great Britain 46, Honduras 29, Argentina 15, Greece 12, India 12, Denmark 12, Peru 8, Philippines 8, Yugoslavia 6, Canada 4, Chile 4, Egypt 4, Union of South Africa 3, Poland 2, New Zealand 2, Brazil 1, Venezuela 1, Sweden 1.

Applications for 92 vessels were received from foreign applicants during June.

Prospective American purchasers have applied for a total of 355 vessels, including 36 during the last month. During that period Americans applied for charters for 91 vessels, raising that total to 211.

Non-citizen applications for purchase of Liberty ships increased by 24, to a total of 256, while similar applications for coastal vessels rose by 14, to a total of 164.

Citizens have made applications to exchange 14 ships, representing an increase of four during June.

Charter applications from Philippine citizens, whose charter preference over other non-citizens ends July 4, now cover a total of 16 ships, an increase of three.

In conformity with terms of the Ship Sales Act, the Maritime Commission promulgated regulations which guarantee uniformity and equal treatment of applicants, all citizen applications received in a calendar month being considered together, and ahead of foreign applications. The next preference period expires July 31.

Rail Rates Alleged To Be Unlawful

Individual railroad freight rates and practices which the Maritime Commission and War Shipping Administration contend are unfairly competitive with domestic water carrier rates have been itemized by the two Government shipping agencies in a letter and appendices filed with the ICC. The action is in response to a letter from ICC Chairman George Barnard, who advised WSA and the Maritime Commission on June 14, 1946, that the previous petition of the Maritime Commission and WSA dated March 21, 1946, did not identify with sufficient particularity the individual rail rates and practices to which objection had been made.

Investigation by the ICC of the water-competitive railroad rates is sought by the Maritime Commission and WSA. The four appendices now filed with ICC specifically identify railroad rates and practices materially and adversely affecting Atlantic Coastwise, Atlantic-Gulf of Mexico, Intercoastal (Atlantic and Gulf to and from Pacific Coast), and Pacific Coastwise water-borne traffic. The two Government shipping agencies pointed out in this announcement of the request to ICC for investigation of the specified rail rates and practices, that the March petition was accompanied by letters from the Secretary of War, the Secretary of Navy and the Secretary of Commerce urging an early inquiry into water-competitive rail rates.

The letter, signed by Chairman W. S. Smith, of the Maritime Commission, and Capt. Granville Conway, War Shipping Administrator, was dated June 28, 1946. The two officials called attention to the statement by the head of the ICC that the earlier petition did not "identify with sufficient particularity the individual rail rates and practices referred to therein so as to enable you to accept it as a basis for a proceeding of investigation and inquiry on your own motion," and then cited the specifications in the four appendices of the items affecting the respective water trades.

The communciation to the ICC also stated that certain Fourth Section (long and short haul) Orders are included in the appendices where the existence of such Orders materially affects a substantial amount of water-borne traffic. It also pointed out that there are instances cited where the propriety of the relationship between rail-water rates and all-rail rates is involved, and added:

"We believe that this letter specifies rates with sufficient clearness to permit delimitation of the scope of the proceeding, and a determination as to whether separate investigations would expedite final decisions in certain particular situations. Should it not in any particular, we will be glad to supply promptly any greater particularization that your Commission may need for proper consideration of the matters before you."

Avoiding Heavy Weather Damage

With a view to minimizing heavy weather damage to vessels owned by or under bareboat charter to the War Shipping Administration, that agency has issued instructions pointing to the loss of propellers by WSA ships and detailing methods whereby such losses may be prevented.

The instructions are contained in operations Regulation No. 119, Supplement No. 1, and read as follows:

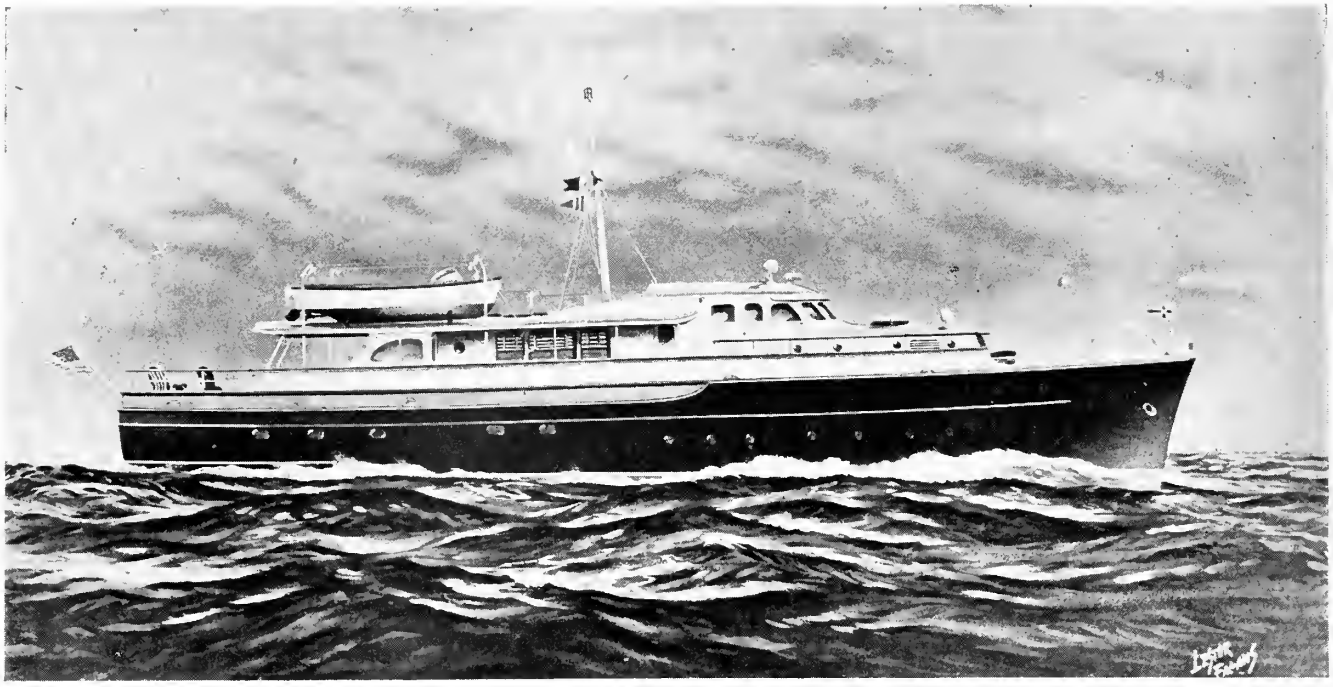
OPERATIONS REGULATION No. 119—Supplement No. 1—PERTAINING TO ALL VESSELS BY OR UNDER BAREBOAT CHARTER TO THE WAR SHIPPING ADMINISTRATION (Dry Cargo Vessels and Tankers)—SUBJECT: **All Vessels: Minimizing Heavy Weather Damage.**

In the past twelve months 15 War Shipping Administration vessels have lost their propellers at sea and the principal contributory cause is careless, indifferent operation.

Since vessels are no longer operating under convoy or other wartime requirement, Masters and Chief Engineers are expected to exercise their best judgment at all times in the interest of safety and economy. Masters should do everything possible to prevent severe pounding, excessive roll or pitch of their vessel in heavy weather as very often a change of course or a reduction in speed will avoid or minimize the condition.

Chief Engineers are to be instructed to enforce throttle watches particularly under adverse weather or

(Please turn to page 167)



Architect's view of the new Cyrus McCormick yacht Nambay.

Cyrus McCormick's New Yacht

Among the interesting features of a yacht now being built for Cyrus McCormick of International Harvester fame at the Julius Peterson yard, Nyack, N. Y., is the attempt to build a power houseboat having an exterior simulating that of lighter cruisers of her length. Because of the excellent job of proportion which John H. Wells has done, this craft may look lower than she really is, when there is no other object close by for comparison. The extra freeboard of about six inches which this vessel will have is due to the height of Mr. McCormick, who is 6-ft. 5-in. and needs plenty of headroom below deck. His yacht is having another unusual feature, namely, a four-poster bed in the owner's personal stateroom.

Mr. McCormick, who will use the Nambay, as she will be named, for cruising mainly in eastern U. S. waters, has shown very considerable attention to the details of her design. Under his direction, the plans have developed from a 67-footer to the present dimensions of 87-ft. over-all; 82-ft. 11-in. on waterline, by 19-ft. 5-in. beam and 5-ft. 8-in. draft, and call for a speed slightly in excess of 12 knots.

In view of the owner's experiences as director of a very large engineering and internal-combustion manufacturing organization, he obviously knows what it takes to design and build a good diesel engine, so it is not surprising that his choice of a propelling plant for the Nambay is the economical and efficient Model 268A diesel unit, built by Cleveland Diesel Engine Division, General Motors Corporation. A pair of these units is being installed.

The Model 4-268A Cleveland diesel is a 4-cylinder, 2-cycle unit, 6½-in. bore by 7-in. stroke developing 250 bhp. at 1300 rpm. Being non-reversing, it is equipped with clutch, two-to-one reduction gear, and mechanical reverse gear. Because of its smooth and quiet running qualities, it forms ideal power for yacht drive where absence of vibration and noise is a very desirable feature. The engines are completely enclosed, allowing a spotless engine room to be maintained. Often guests on a yacht like to be invited down to see the power plant, in which case a clean machinery room is important.

The Nambay is of the trunk-cabin houseboat type. Aft of the forepeak is the crew's toilet; then comes the

forecastle equipped with three fixed berths and one sofa. Aft again are two cabins, one for the captain and the other a spare on the starboard side, while facing these compartments is the crew's mess.

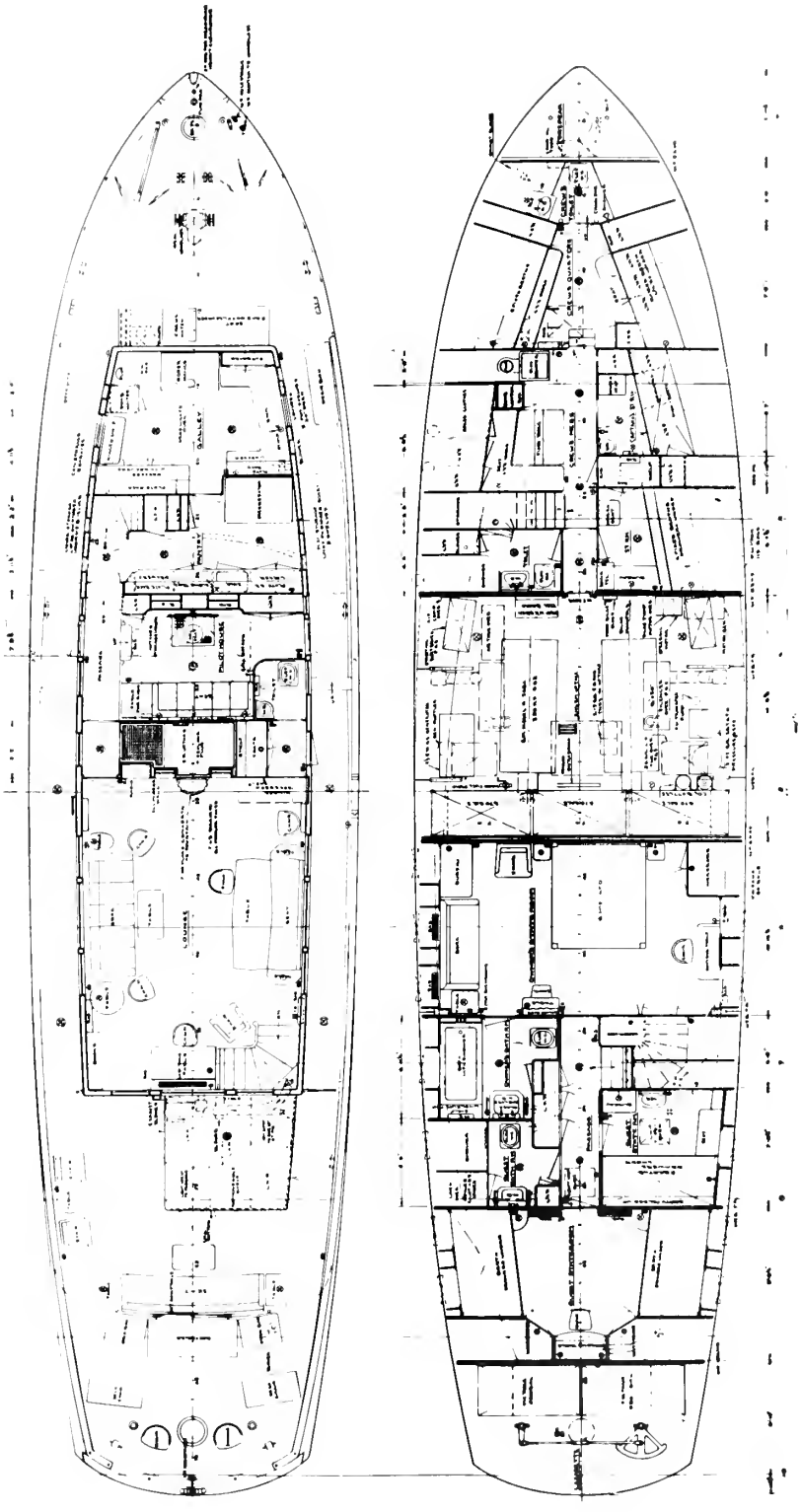
The engine room is amidships, and is 14-ft. 6-in. long by 19-ft. wide. Seeing that the main engines are only 9-ft. 8-in. long by 2-ft. 10-in. wide each, it will be appreciated that a maximum amount of room is available to the engineer. In fact, it has been possible to locate the 2000-gallon capacity fuel tanks at the after end of this compartment without interfering with ample space.

The owner's stateroom is aft of the engine room and extends the full width of the hull, which at that point has 16-ft. interior width. Its length is 10-ft. 6-in. Next aft, and on the starboard side, is arranged the owner's bathroom, followed by a guest's bathroom. Across the passageway is a two-berthed guest cabin occupying a space about equivalent to the two bathrooms. Another two-berthed guest's stateroom follows, and this one is 8-ft. long by 14-ft. 6-in. wide, so extends the width of the after part of the yacht. At the extreme aft are the fresh water tanks.

All the daytime accommodations are located in the trunk over the foregoing described compartments. First comes the galley and pantry and refrigerator space, as well as a companionway to the quarters below. The lounge, also in the trunk, is 19-ft. by 13-ft. On the deck aft of the lounge is a Hikai, or mattress, for relaxation.

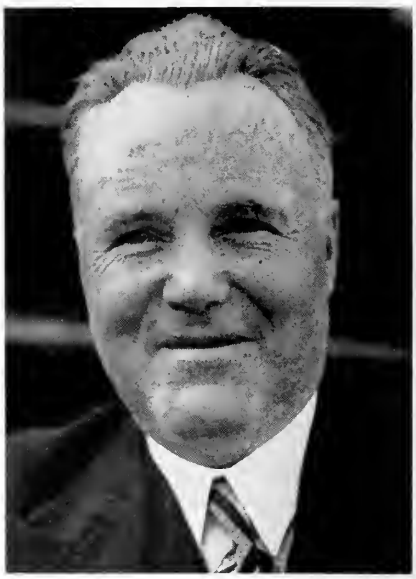
The pilot house is over the galley and pantry and is equipped with all modern navigation instruments, including a photo-electric pilot (eye) for keeping the yacht on a straight course. On the boat deck over the lounge is an electric blower for ship's ventilation, an 18-ft. motor launch, and a 12-ft. dinghy.

A study of the plans indicates that Mr. McCormick will have a very practical and comfortable cruiser, sturdy and seaworthy enough for all waters and weathers, and a power plant upon which he can rely at all times to take him wherever he wishes to go.



Deck plans of the Nambay

Almon E. Roth, president, National Federation of American Shipping.



M. J. Buckley, vice president in charge of Traffic, American President Lines.

UNITED MARITIME CONSULTATIVE COUNCIL

During the war, the merchant vessels of all allied countries were brought under the control of the United Maritime Authority and the disposition of ships in this great pool was managed in the interest of the war effort by the U. S. Maritime Commission. Under the agreement which created it, the United Maritime Authority officially expired on March 2 of this year.

There has been great uncertainty and concern in the minds of marine interests of many countries over the future of their respective fleets and with certain functions of the Authority scheduled to continue for perhaps years to come, the necessity for a continuing authoritative group has been met by the appointment of a committee to study and plan such control, especially during the period during which the United Nations Relief and Rehabilitation Program continues.

This Committee met in Amsterdam, Holland, on June 24 and was attended by Huntington T. Morse, assistant to War Shipping Administrator Granville Conway, and Julius J. Rosenberg, executive assistant. These two represented the WSA. Industry consultants were M. J. Buckley, vice president in charge of traffic of American President Lines, and Almond E. Roth, president of the National Federation of American Shipping. The conference continued through June 25, as the United Maritime Consultative Council. An interim committee will continue to work out problems presented to the council and will meet for action early in October.

One of the problems that worries other countries and their shipping interests, especially the British, is the future of the dominant fleet of American vessels which on July 1 totaled 5829 ships of nearly 58,000,000 deadweight tons. These were on that date distributed as follows:

U. S. owned ships, under WSA control, of which 287 were allocated to carry UNRRA cargo, 523 to carry International Programs cargo and 151 troop ships, a total of	2,892
Ships controlled by other countries under lend-lease	424
Army	256
Navy	642
Reserve fleet, including 3 dry cargo and 24 tankers in unfinished condition, totaling	905
Vessels returned, sold, or interim chartered to U. S. private citizens	710

There was much discussion at the Amsterdam session over relative costs of operating ships under the cost systems of the United States as compared with others. Much was made of the fact that the crew cost on a Liberty ship under U. S. standards amounts to over $12,000 per day, while under British standards the cost would be something over $2000 per day and under other European standards, less than that. Foreign representatives were anxious to have their vessels back in their trade channels at **their** cost standards in order that they might not lose their competitive position permanently. As long as the trade routes and tonnages established by the United Maritime Authority continue and as long as U. S. merchant tonnage so far exceeds that of all others, there will continue to be problems on a high diplomatic level for the U. S. representatives to solve. They plan to work out these problems in fairness to the allied countries who lost their major fleets in the war and at the same time to protect the reasonable interests of the United States at every turn. These problems are not easy of solution.

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

Matson Begins Special Air Service

The history of the Matson Navigation Company's plans for air transportation began in 1929, which was not long after the Lindbergh flight to Paris. In that year Matson and Inter-Island Steam Navigation Company commenced studies looking toward inauguration of air transportation between Pacific Coast and Hawaii when conditions justified.

By 1934 they were preparing for operation when Pan American approached Matson and suggested that Matson participate with it, in development of Transpacific air service.

In 1935 Matson and Inter-Island contracted with Pan American to act as Pan American agents, and otherwise assist it in establishing and operating Transpacific air services; to form a separate company and jointly supply the capital to operate a local air service between the Pacific Coast and Hawaii as soon as potential business justified; and to acquire right to purchase stock of Pan American in an amount exceeding $1,000,000.

In 1936 Matson purchased Pan American stock paying $508,750 therefor; and at approximately the same time Inter-Island exercised its like option.

On October 21, 1936, Pan American made the first passenger flight from San Francisco to Manila.

Matson, Inter-Island and Pan American contract of June 20, 1935, was filed with Civil Aeronautics Board for approval.

During the same year Matson and Inter-Island notified Pan American of the exercise of contract right to form joint company to establish and operate local service between Pacific Coast and Hawaii.

In July of this year were the first Pan American mail and passenger

Flight crew on the skymaster: E. L. Sloninger, James Farris and L. J. Forsey.

Sydney G. Walton, vice president, secretary and general passenger manager, Matson Navigation Co.

flights to New Zealand, Matson acting as solicitation and traffic agents in New Zealand and giving general assistance.

On July 29, 1942, Matson-Pan American-Inter Island agreement was disapproved by CAB upon the grounds that it did not allow opportunity for competitive services.

On September 22, 1943, Matson filed application for certificate to operate air service to Hawaii, and purchased 38 acres adjoining Mills Field, San Francisco Airport, in anticipation of operating Hawaiian air service, employed air personnel and contracted with the U. S. Navy to operate modification centers. After all these years the CAB has just turned down the Matson application and awarded the route to United Air Lines.

But the spirit that put the Matson Navigation Company in its strong position on the Pacific has found a way.

Taking off on July 5 with three passengers and a cargo of fresh strawberries, fish, wearing apparel, and flowers, a DC-4 Skymaster arrived back at the Oakland Municipal Airport on Tuesday, July 9, to complete the first nonscheduled round trip flight of the Air Transport Division of the Matson Navigation Company to Honolulu.

The big ship, piloted by E. L. Sloniger, former chief pilot of the American Air Lines, left the Oakland runway at 10:40 p. m. on July 5, and arrived in Honolulu the following morning at 8:54 a. m. The passengers to Honolulu included Ted Schmidt, manager of the Air Transport Division of Matson; Paul Hodges, the company's public relations director, and Colonel George Hansen, an Army officer en route to the Philippines.

On the return trip the ship left Honolulu at 6:00 p. m. July 8 with nine passengers, and arrived back at Oakland Airport at 8:37 a. m. on July 9 after a routine flight. On the return trip the plane carried Betty Tharp as stewardess. The passengers included members of the Honolulu Police Department pistol team and relatives who will take part in the invitational matches at San Francisco July 19, 20 and 21.

In a statement issued before the flight, the Matson company said: "Matson is engaged in a non-scheduled common carrier air transport service, operating four-engined transport planes as company business and available traffic warrant. These planes are DC-4 Skymasters of the type which made such an outstanding war record transporting troops and cargo throughout the world. Matson has two of these aircraft. They will operate between various mainland points and between mainland points and Hawaii, on an 'anywhere for hire' basis. They will have no fixed destinations or schedules, as this is not possible under the Civil Aeronautics Board's definition of non-scheduled common carrier service. They will operate between such points and at such times as traffic requires."

The first sea-air rendezvous in the history of America is believed to have taken place on Sunday, July 14, 1946, in mid-Pacific between passenger liners of the sky and of the surface under common ownership and management.

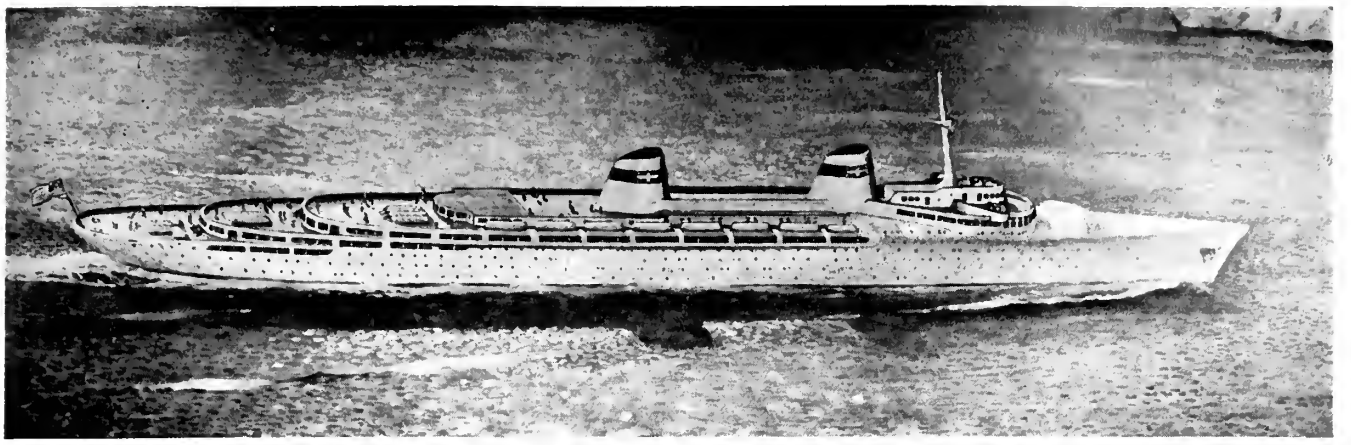
The Matson luxury liner S.S. Matsonia was circled and saluted shortly before noon approximately midway between Hawaii and San Francisco by the Matson Lines' Sky Matsonia, a four-engined plane which was carrying seventeen passengers and several hundred pounds of cargo. Both sea and air liners were enroute to San Francisco from Hawaii.

This practical demonstration of the combination of sea and air facilities under common management took

(Please turn to page 148)

DC-4 Skymaster loading cargo for Honolulu. Cargo included fresh strawberries, flowers, fish and wearing apparel.

Pacific WORLD TRADE



Giant Express Liners for the Pacific

Invitations to bid on construction of two 920-foot express passenger liners, larger and faster than any ever built in this country, have been authorized by the United States Maritime Commission. They will be built for the transpacific service.

These vessels, known as Great Circle Liners, will be of the Maritime Commission design P5-S2-E1, which the Technical Division of the Commission has had under preparation for several years. Capable of transporting 1200 passengers on each sailing, they will be able to reach Japan over the northern route in eight days.

With more than twice the horsepower of the hitherto largest liner built in the United States, the SS America, they will have a service speed of 30 knots under average sea conditions. All accommodations will be on a luxury scale, including three swimming pools, complete air conditioning, and a theater. A crew of 590 will be required for operation.

It is expected that these ships will be built for the Commission's own account, and chartered rather than sold to the American President Lines, whose insignia appears on the stacks in the artist's drawing below.

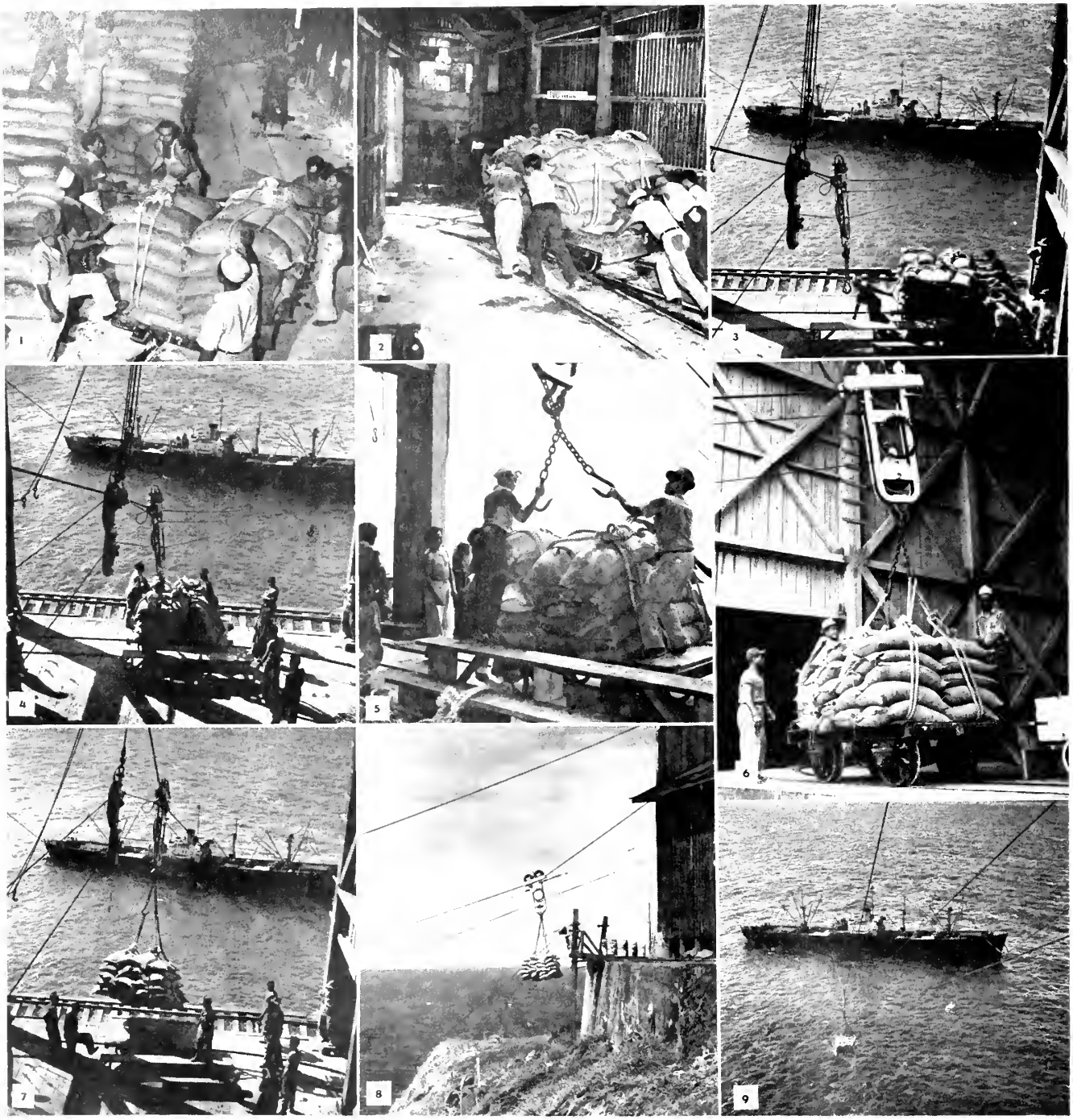
OLD TIME PICTURES of present day foreign traders

Above: O. G. Caldwell, executive, Food Machinery Corporation.

At Left: M. F. Cropley, freight traffic manager, Matson Navigation Co.

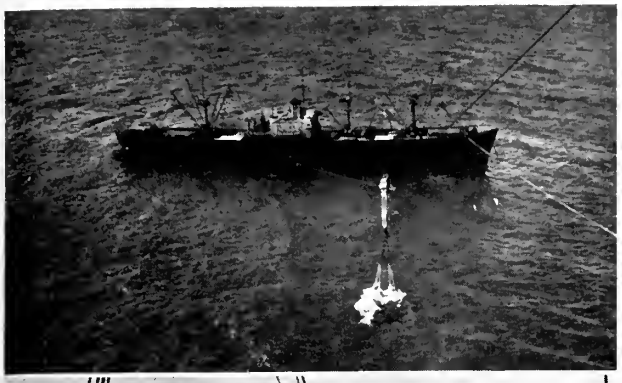
At Right: W. E. Hague, now secretary of a Building Contractors Assn., San Francisco, formerly inspector of oriental rugs.

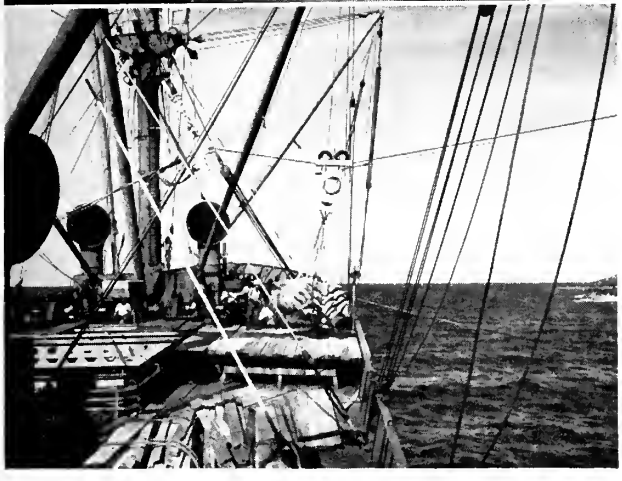
Pacific WORLD TRADE



Matson's Handling of Sugar

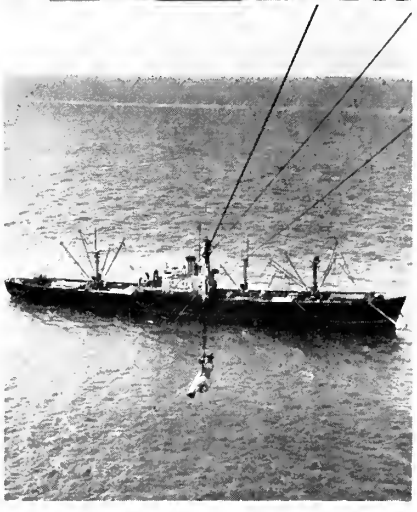
(1.) Bagged sugar is stored in the warehouse adjoining the loading platform. Small flat railroad cars are loaded in the warehouse by stevedores. The load is 40 bags of 100 pounds each. (2.) Stevedores push the loaded cars from the warehouse out to the loading platform. (3.) Loaded car moves toward the hook, with the ship and gear in the distance. (4.) Stevedores attach hooks to the load, working from two-step platforms alongside cars. (5.) Stevedores attach hooks to the load, working from two-step platforms alongside cars. Each load is made up of four units of 10 bags each. Each is fastened to individual hooks as indicated in the photo. (6.) Each load is made up of four rope slings around 10 bags each. The pulley gear for lowering the load to the ship is equipped with two hooks as shown in the photo. Each hook accommodates two sling-loads of 10 bags each. (7.) The load is hoisted, swings clear of the car and heads down toward the ship. This picture was taken from the winch-driver's platform where the direction and speed of the loads are controlled. (8.) A side view of the loading platform showing the load of sugar starting down to the ship. (9.) Shows loads on the way to the ship. During the operations photographed two lines were in use, each being fed from warehouses on opposite sides of the loading platform. The lines were rigged to drop the loads near the hatches as indicated in the photo.





These pictures were taken by telephoto lens from the ship, and show: a load on the way down from the platform while another load that has just come out of the warehouse is waiting the return of the hook; the load arriving on the ship and about to be lowered to the platform near the hatch for transfer to the ship's hook; the load approaching the hatch (the slings will be removed from the hooks shown in the picture and attached to the ship's hook, whereby the load will be lowered into the hold); the load, transferred to the ship's gear, is lowered into the hold.

Johnny Kanaha, veteran stevedore long familiar with the Kukuihaele operations, rides the hook up from the ship. Some of the veterans are willing to travel to and from the ship in this manner, but most of the personnel who travel back and forth prefer to use a box which is rigged for passengers.



The moving of materials from one part of the world to another often has ramifications that are little appreciated by the public who use such materials. They may be carried by almost every known means of transportation between the point of production and the point of use. The installations of machinery that are to be found in remote parts of the earth may start by rail or truck, then by sea, more rail or truck, by mule or camel or elephant, by barge and bareback to final destination. It takes careful planning in many traffic departments to route some shipments all the way.

And so also with imported products, especially those handled in bulk. Rubber, coffee, copra, wool, pulp, bauxite and miscellaneous ores and dozens of other materials require special handling and often special vessels.

One of these is **sugar.** Two of the sugar handling methods of the Matson Navigation Co. are described here—off-shore loading and bulk unloading.

Off-Shore Loading

The recent tidal wave at Hilo interrupted normal sugar loading operations there and necessitated the revival of off-shore or "open port" loading at Kukuihaele on Hawaii, where the 1946 crop of five northern plantations is estimated at 84,000 tons.

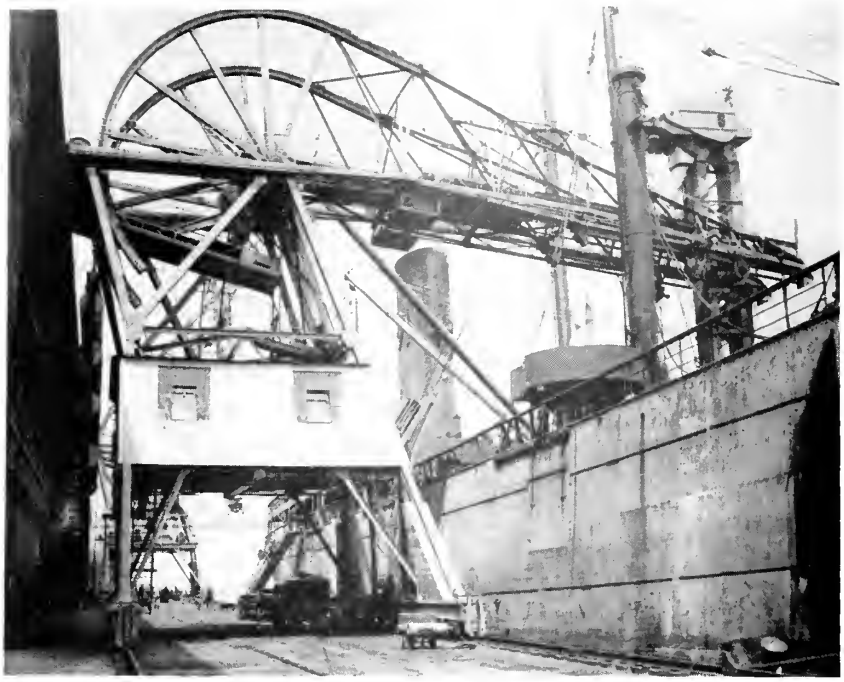
The pictures on these pages tell the story.

Since the days of sandalwood and whaling, the history of Hawaii has been shaped by sugar and that commodity's transportation to the American market.

Likewise, the production of the history-making cane has seen great development in Hawaii through endless research, and has become one of the wonders of the agricultural world. However, when produced, the sugar still lies 2400 miles from American mainland shores.

Bulk Sugar Handling

During the war the supply of bags, largely a product of India, almost disappeared, and methods of handling sugar in bulk became a very pressing problem. As it turned out, the matter of bags was only one problem that was solved by the bulk operation. Ship turn-around time



Raw sugar wharf at Crockett, California—showing the "Marine leg" and the conveyor system in horizontal position. A stream of sugar passes over this structure and into the warehouse.

was also lessened materially, and at a time when a saving in ship time was a contribution to victory.

With the establishment of new sources of sugar near to this market, Hawaii finds it desirable to shorten the economic and physical distances that lie between the Hawaiian cane fields and the consumer's dining table. Hawaiian sugar must still come to market by steamer, and steamers have practical limits in size and speed, so the only means of shortening these distances is by modernizing the handling methods at mill, terminal, ship, and refinery.

As is well known, economic and regulatory limitations require that only the raw brown sugar be exported from Hawaii. The raw sugar crystals are bagged, the bags passing through many costly handlings between mill and refinery.

The problem of bags and transportation pointed to a solution through new methods of handling, and bulk shipment seems to be the answer. The Matson management, realizing this, set the wheels in motion with the collaboration of plantation, terminal and refinery.

The time required for port operations has seriously cut the available steam tonnages, and has nullified the time that may be saved at sea through pressing the vessels to their highest speeds.

The total time saved by five vessels operating with bulk handling is equivalent at least to another steamer—a very important saving.

The handling of sugar in bulk represents some interesting problems of development. Raw sugar has characteristics peculiar to itself, and its handling does not respond to the more simple engineering formulae as do most other bulk commodities.

The plantations and terminals must meet new problems in handling, weighing, storage, and transport. The ships must be especially prepared for stowage; for protecting the sugar from loss, contamination, and physical change; and for facilitating rapid discharge.

These changes involve the removal of the now outmoded systems and the installation of new and elaborate conveyor and storage facilities.

Perhaps the most spectacular part of the system is that of the ship unloading machine. Its type is usually referred to as a "marine leg." It is supported by the wharf and resembles a bascule bridge mounted upon a traveling tower. The outboard or boom end of the span is fitted with a chain-and-bucket elevator.

These units, of which there are two, have towers, the bases of which are approximately 55 feet long and 30 feet wide, their 24 wheels supported by rails spread 28 feet apart. The boom is mounted in bearings 45 feet 6 inches above the wharf and reaches outward 65 feet. The boom and elevator are counterbalanced by horizontally suspended cylindrical counterbalances totaling 50 tons.

The elevator is designed to travel transversely over the vessel approximately 24 feet on screws. It is 81 feet over-all length and is fitted with two rows of buckets on three chains, all housed from the weather. The designed maximum capacity of the elevator is 250 tons per hour.

When the boom is raised to clear the ship's berthing space, the top of the elevator stands over 130 feet above the wharf floor.

The beginning of the unloading procedure finds the marine legs clear of the ship's berth; when the vessel is made fast, each leg moves abreast the hatch it is to serve. The boom and elevator is then lowered into the hold, the elevators excavating the sugar over the area of the hatch and to the bottom of the hold.

When the hatchway has been cleared, the elevator is set down over four anchoring pins temporarily set into

the hold bottom, and a scraper system, mounted on the unloader, is placed in operation. Two 3-drum hoists located on the tower are remotely controlled from the elevator base, the hoist wires running out on the boom, down the elevator, and out into the holds over "tail blocks" or sheaves; thence secured to a crescent-shaped scraper. The scraper moves the sugar to the base of the elevator, the anchoring pins preventing the elevator from swinging.

Each leg has a total weight of approximately 150 tons, and the various traction, hoisting, conveyor, and elevator motors total 230 horsepower. The electricity is supplied through protected trolleys.

All movements of the machine are controlled by a remote portable push button station carried by its operator at hatch side or on the wharf. All sugar-handling equipment is electrically interlocked to prevent flooding of any conveyor on the unloader or in the warehouse, due to the stopping of any conveyor.

Bulk sugar handling is not new but has never been developed as highly as in this project. Some Cuban sugar is so handled. In Cuba the stevedores carry the standard 300-pound bags on their backs onto the ship and to the edge of the hatch where the bag is cut and emptied. The sugar is shoveled back into the holds and the vessel is thus filled.

At the port of discharge of Cuban sugar, elevators are suspended from cargo gear into the hold and the sugar is moved to the elevator. A scraper gear is used in this operation also.

The initial movement of bulk sugar is between one Hawaiian port and Crockett and employs five especially fitted steamers. Extension of the plan is anticipated and will include other Hawaiian ports, other vessels, and additional refineries.

Bottom post of elevator which raises sugar from hold.

Oil Production in Europe

Although world production of crude oil reached new highs during 1944 and 1945, European output fell well below 1938 levels, according to reports received by the Office of International Trade, Department of Commerce.

Lower output by the major European producers—the Soviet Union and Rumania—far offset increased production in the small oil producing areas of Austria and Hungary.

For decades Russia has been the largest European producer of crude petroleum and the third among world producers, outranked only by the United States and Venezuela. Rumania, with a fraction of Russia's output, has led the other European countries by a wide margin. Austria, Hungary, and Germany are next in line, but no one of these three has produced a twentieth of Europe's oil.

Russia, Rumania, Austria, Hungary, and Albania, at full production, can produce enough petroleum to provide for their own needs and for some export. In no other European country does production cover more than a small part of national requirements.

During the war, oil production figures by countries were rough, meager, and none too reliable, OIT points out.

A summary of oil production in Russia, Rumania, Austria and Hungary, based on reports received by OIT, follows.

The Soviet Union's new Five-Year plan calls for an increase in Russia's annual crude oil production to 35,500,000 metric tons by 1950, with a target of 60,000,000 metric tons a year as the ultimate goal. (Although the weight of crude oil varies considerably, one metric ton generally equals about 7 barrels. All tonnage figures herein are in metric tons.) Production figures in recent years are not available here. Premier Stalin recently, however, said that 31,000,000 tons were produced in 1940.

The tendency has been to credit Russia with an annual production

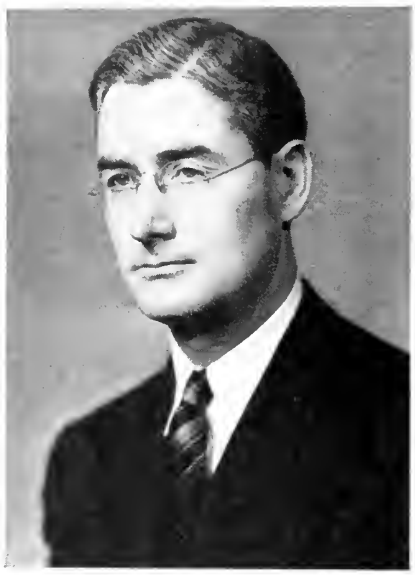
(Please turn to page 135)

Many American Firms Opening in China

Well over one hundred American companies have established branches or representations in Shanghai during the past several months, according to a report addressed by Arthur B. Foye, president of the China-America Council of Commerce and Industry to H. D. Collier, chairman of the board, Standard Oil Company of California, and chairman of the China-America Council's California Regional Board. A recent questionnaire circulated among the approximately four hundred members of the council reveals that 115 member firms are now directly represented in China, 40 of them through branch offices and 75 through permanent agencies or representations. Many other member companies are also transacting export and import business with Chinese private concerns or government agencies. San Francisco companies are well represented in this list, according to Mr. Collier..

"The record of the past few months," Mr. Foye said, "shows that trade does not necessarily have to wait upon the establishment of complete political unity. Despite the extremely difficult conditions, American enterprise and ingenuity and the acute need in China for all types of American merchandise have resulted in a substantial volume of business. Some members of the China-America Council have reported that the volume of their business in China has far exceeded expectations and that the prospects for future business are good. This applies to small concerns new to the China field as well as to the large companies that were established in China before the war.

The progress made in breaking the log jam of trade, Mr. Foye pointed out, is confirmed by the first post-war statistics of imports into China made available in this country. These figures, cabled from Shanghai by the representative of the China-America Council, show that commercial shipments received at the Port of Shanghai in April amounted to 81.5 billion Chinese dollars, valued at approximately U. S. $40,000,000 at the present rate of exchange. These imports were exclusive of UNRRA shipments valued at sixteen billion Chinese dollars. The commercial receipts in April were double those of the preceding month, with the United States accounting for the bulk of the trade.



Blackwell Smith, member of Board of Directors and Chairman, Executive Committee, China-America Council, Vice President of the Kudner Company, New York Office.

●

During the past few months the China-America Council has received hundreds of inquiries from Chinese private manufacturing and trading concerns desiring to be brought into contact with American companies for the purpose of importing American goods, exporting Chinese commodities, or establishing joint enterprises in China. Requests for quotations on American goods for import into China have made up most of the inquiries so far received.

"These facts show," Mr. Foye said, "that despite the unsettled political and economic conditions in China and strict foreign exchange control, it is possible to do business at the present time. At the same time, it must be made clear that the resumption of regular trade relations between the United States and China on a large scale depends on the establishment of normal conditions in China and the creation of satisfactory credit arrangements in this country, which will no doubt follow such a development. A disturbing element in the present situation is the failure of Chinese exports to revive as rapidly as imports. Currency instability, lack of transportation facilities and raw materials, price inflation and high labor costs have so far prevented any substantial developments of shipments from China, which have been running far below the imports. This is an unhealthy situation which cannot long continue. The China-America Council is hopeful that as economic recovery in China proceeds — and there are some signs that progress is being made — the trade between our two countries will really be a two-way affair."

Interested in Importing From Japan?

Firms interested in importing goods from Japan should communicate with the U. S. Commercial Company, Commercial Transactions Staff, 14th and Constitution Ave., Washington 25, D. C. Inquiries should indicate what commodities are wanted, quantities, quality specifications, etc., etc. Upon receipt of such inquiries the U. S. Commercial Co. will endeavor to locate desired commodities in Japan.

Pacific World Trade

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

ELECTROMAGNETISM

In the July issue we distinguished between several kinds of force, calling attention to three particular types: (1) gravitational force, measured in pounds and its associated mechanical and physical forces; (2) electrostatic force measured in volts; (3) magnetomotive force measured in gilberts.

Any force, by reason of its nature, is capable of doing something: (1) pounds of force, to overcome friction; (2) volts of electrostatic force, to cause electric current to flow around an electric circuit, and overcoming the electrical friction or ohms resistance; (3) gilberts of magnetomotive force to cause magnetism to be set up within a field of space or in a solid, liquid, or gaseous matter.

Most of the forces we are familiar with are restricted to guided channels, as: (1) in the tension or compression in a rod or beam; (2) the prevention of the current-flow along any path except the conductor by the insulation of the conductor, which may be the surrounding air or the rubber, mica, fibre or other material in physical contact with the wire. But, there is no insulation for magnetism, at least in the sense that we have "force" insulation.

Force in pounds is insulated or guided to a specific path or rod by making sure that all other paths in parallel with it are soft and yielding and do not take any of the strain. We can easily insulate against voltage,—or at least the conductivity of metals is millions of times better than rubber. Or the resistivity of mica in ohms is millions of times better than copper. But the conductivity of iron for magnetism is only perhaps a thousand times better than air, and then only for a limited amount of the magnetism. An attempt to force more and more magnetism only increases its resistance to magnetic flow, until the additional amounts we are trying to force through the iron pass out and through the air or space around the iron. It is this lack of being able to have a guided channel for magnetism which makes its understanding and calculations so difficult. Yet, on the other hand, it is the reasonable conductivity of all substances, including air and iron, which permits us to have rotating machines and electromagnets. The necessary air space between the moving rotor and stationary parts, to provide mechanical clearance, is quite easily threaded or passed through by magnetism.

While electricity can be forced to pass through air, it requires a relatively high voltage. At atmospheric pressure it takes upwards of 1000 volts to jump the smallest possible air gap. It takes about 3000 volts to jump one-sixteenth inch and 20,000 volts to jump an inch. At high gas pressures very much higher voltages are needed, which explains the short air gap of the automobile spark plug, about .030 inch; yet, at room pressures the ignition system will spark at perhaps .750 inch. Also at high vacuum, space is a non-conductor at any voltage. Furthermore, electricity in passing through air liberates a great amount of heat and very high temperature.

This lack of a guided channel for the flow of a medium is similar to heat flow problems, in which a difference in temperature causes a flow of air, and while insulation to a great extent is possible it is not absolute or complete.

Fields in Space

We, as engineers, dealing with things we can see, feel, hear, and so on, must form some new concepts to guide our thinking. We may cast off ideas about intangible things as being only theory and not practical, but some of these new concepts have real and practical results, such as with radio, atomic energy and the electric light burning now in your stateroom.

We must understand the special properties of space. First, we note that space may be empty, or occupied by matter. But whether empty or occupied, space has the property of transmitting, if that is the proper word, forces through distances.

Gravitational force is an example of the transmission of pounds, or physical force.

The electrostatic field is empty space between two bodies having a difference of voltage between them. This electric force is transmitted through the space which exhibits different properties when the force is present from those properties when the force is absent. One concept is to think of the space as being strained or loaded. In fact it is possible to release too much voltage strain and the space breaks down or ruptures, and a spark jumps. Scientists call this strain of the space surrounding a body, at a different electrical voltage from another, being "charged" and say that the bodies are charged with electricity.

And finally, space exhibits the property of transmitting magnetic force. Perhaps it would be better to think of the space surrounding a magnetized body as being strained.

With respect to this property of being strained, scientists refer to the space surrounding a body which causes the strain as a "field" and if it is strained by gravitational force they call it a gravitational field; if strained by an electric force they call it an electric field or electrostatic field; and finally if strained by mag-

netic forces they call it a magnetic field.

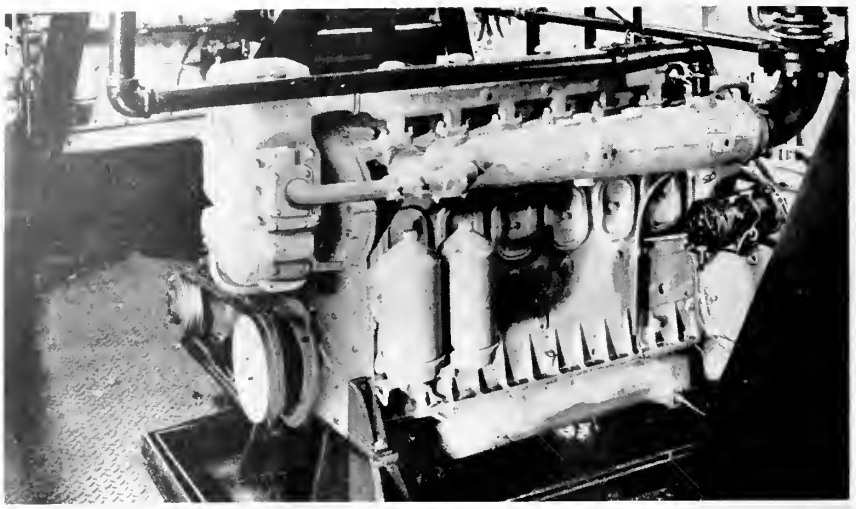
While this strain in space, in all of these fields, theoretically may exist on out to infinite distances, it is generally considered safe to think of the dimensions of the active workable field as being determined by the dimensions of the body which causes the strain. The earth's gravitational field reduces very noticeably when observed at distances of 3 or 4 times the earth's diameter. The electrostatic field intensity reduces rapidly as we take measurements at distances of several times the size of the body which is electrically charged. And the magnetic field intensity reduces rapidly as observations are made at distances of 3 or 4 times the length of the magnetized body.

Careful and scientific methods show measurable magnetic fields at much greater distances, such as perhaps 100 times or more. Detecting the magnetism in a permanent bar magnet, a foot long at a distance of 100 feet, would be very difficult. But detecting the magnetism in a ship 400 feet long at a distance of 800 feet would not be too difficult.

This use of the term "field" for the air space around a magnet, readily leads to this name for the magnetizing parts of a generator and we now know why the field of a generator or motor is so named. It is the magnetizing part.

Light and radiant heat transmitted through space do not require a light field or a heat field. Light, heat and the radio wave through space are transmitted on or via the stress in both the electric field and the magnetic field. They are therefore called electromagnetic waves.

The electromagetic fields of space are therefore extremely useful to us.



Upper: Engine room on o borge.
Lower: Harbor Tug & Borge Co.'s Borge No. 1.

Huge Barge Emptied by its Own Pumps in Six Hours

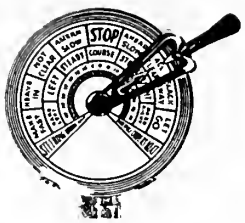
San Francisco's Harbor Tug and Barge Company Barge No. 1, whose rated capacity of 487,836 gallons is kept busy transporting fuel oil, stove oil, gasoline or kerosene in the Bay area. She is at present operated under charter by the United Towing Company, and is towed as far as Stockton, California on the San Joaquin River and up the Sacramento River to the city of Sacramento.

This large oil barge is emptied in an average of six hours by two 10" Kinney gear-type pumps, each of which has a capacity of approximately 1,000 barrels an hour. The pumps are driven by two General Motors Series 71 engines through a 3:1 reduction gear. The 2-cycle engines are standard 6-cylinder marine units, heat-exchanger cooled, with Roots type scavenging blowers, unit injection system and water cooled exhaust, each rated at 165 HP at 1850 RPM. Partial view of the engine room is shown herewith. The starboard engine also drives a 3KW D.C. auxiliary generator through V-belt drive from pulleys attached to the front of the crankshaft.

The barge has been in operation about four months and the United Towing Company reports entirely satisfactory operation of the pumping equipment. The engines were furnished and installed by the Moore Equipment Company, General Motors distributors, with offices in San Francisco and Stockton.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE SEXTANT

Chapter Six

HOW TO TAKE SIGHTS

In the previous chapter we learned that fundamentally there are two types of sights: (1) observed altitudes, taken at any time the body is visible; (2) meridian altitudes, taken only at the time of transit of the body. It is really easier to observe the latter but they only occur once a day. Let us, however, discuss the way to take ordinary observed altitudes first.

(1) Observed Altitudes Taken Any Time Body Is Visible.

(a) To Observe an Altitude of the Sun.

The beginner should practice continually bringing the sun down to the horizon, and at first the telescope may be dispensed with—just look through the telescope collar, thus getting a much larger field. A position on the ship should be chosen where it is steadiest—generally near the center of the ship, where there is less motion.

First remove the sextant carefully from its case with the left hand, grasp the handle with the right hand and hold the sextant vertically **in the right hand.** Clamp the index arm at approximately zero (0°) on the arc.

Before taking any observations of the sun the shades must be adjusted to eliminate glare. When observing the sun it is always necessary to use the index shades, otherwise the sun's rays produce such a glare that it is impossible to see the sun at all. Experiment, using one or more shades, until the best results are obtained. When the sextant is pointed directly at the sun it will be found necessary to use one or more horizon shades.

Hold the sextant vertically and point the telescope collar and horizon glass directly at the sun. The actual or true sun will now be seen through the unsilvered half of the horizon glass, while coincident with it (or superimposed upon it)—but not visible because the sextant is in adjustment—is the sun's image reflected to the eye from the index mirror by way of the silvered portion of the horizon glass. The clamping screw should now be loosened sufficiently to allow the index arm to slide easily along the arc. Keeping the eye fixed on the sun, by applying gentle pressure to the index arm, the true and reflected suns will separate rapidly. By gradually lowering the telescope, follow the sun's image, which slowly descends toward the sea horizon. With the sun at or near the sea horizon, which can be seen through the plain part of the horizon glass, the reading of the sextant will be the approximate observed altitude. Clamp the index arm to the arc and by means of the tangent screw slowly bring the sun down until it just "kisses" the horizon. **This operation should be repeated frequently until it can be done quickly and accurately.** Once you have had experience you will dispense with the above method; point the sextant at the horizon directly beneath the sun, and, by moving the index arm slowly forward, gradually bring the sun down to the horizon.

The procedure ordinarily followed in taking a sight properly is to **first determine the index error of the sextant which you are using. (Never take a "sight" until and unless you have first checked the sextant for index error.)** Insert a telescope—the ordinary erect or star telescope should be used. Be careful not to "burr" the thread when screwing the telescope into its collar. Modern sextants have telescopes with interrupted threads whereby the telescopes can be fixed in the collar simply by a half turn of the telescope. Having fixed the telescope, the eye piece should be pulled out until the telescope is focused to suit the eye of the observer. It is best to focus it on a distant ship, land, or the point

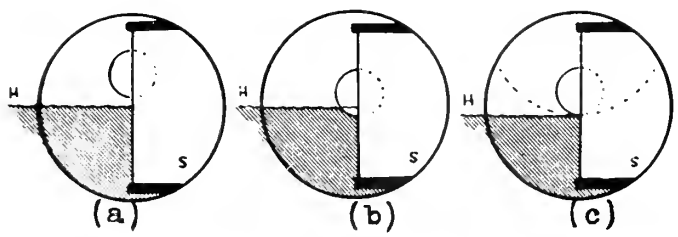


Fig. 17: (a) Reflected Sun too high. (b) Reflected Sun too low. (c) Reflected Sun correctly kissing the horizon.

farthest away from the ship. Keep both eyes open. Adjust the index and horizon shades properly to shut out any glare and insure a well defined horizon. Direct the sextant straight at the horizon beneath the sun and move the index arm along the arc until you bring the sun down near the horizon. Clamp the index arm. By use of the tangent screw move the index arm slowly until the lower limb of the sun just "kisses" the horizon.

Figure 17 gives three views of bringing the sun down to the horizon.

(2) Meridian Altitudes Taken Only at the Time of Transit of the Body.

(a) To Observe Meridian Altitude of the Sun.

As far as the sun is concerned, we know that it appears to climb continuously from the time of sunrise until noon during the a. m. hours, after which time it appears to "dip" and continue to fall to the westward until sunset. Noon is the instant that the sun reaches its highest altitude when it is on the observer's meridian (i. e., the instant of time when a. m. changes to p. m.). The highest altitude which occurs when it is on the observer's meridian is called its meridian autitude, and occurs thus only once each day.

On most ships it is customary some little time before noon, generally at "one bell," to bring the lower limb of the sun in contact with the horizon. At this time the sun should bear a little to the eastward of true south or true north (depending, of course, on whether the observer is north or south of the sun). The sun's upward progress can now be watched, following it by slight movements of the index arm by means of the tangent screw, so that the sun's lower limb is kept constantly "kissing" the horizon. Every few moments higher readings on the sextant will be noticed. Eventually the sun appears to stop rising, and there will be no visible change in its altitude for a minute or two. Now when the sun appears to stop rising a little before noon (this is sun time—called apparent time), the main point to remember is **on no account to reverse the motion of the tangent screw,** but to watch the sun intently while it remains stationary—until it suddenly dips; that is, when it commences to fall and laps over the sea horizon and its altitude starts to decrease. The instant the sun appears to dip is accepted as "noon," and the ship's clock should show 12 o'clock, if it is set to apparent time. The captain will probably say "she's away—make 8 bells," and read the sextant angle which will be the meridian altitude. **It should be noted particularly that as the altitude is required when the sun is perpendicular to the observer's meridian, the reading must be obtained just as it dips.**

After a meridian altitude has been taken it must, of course, be corrected for index error; height of eye; parallax and refraction and semi-diameter. These corrections, with the exception of index error, are no part of this series of articles on the sextant.

To Observe an Altitude of a Star

Stars should always be observed during morning and evening twilight, when the horizon is clearly defined, although occasionally during the night the horizon can be so clearly seen that star sights may be taken at times other than at morning and evening twilight.

The procedure for observing stars is somewhat different from that adopted for the sun. When taking sights at dusk only the brighter stars will be visible before the horizon is "lost" (i. e., too dark to be clearly defined). At dawn, however, the stars have probably been visible to the observer for some time, so one may have been able to take the approximate altitude some time previously. In any case at dawn, provided there is clear visibility, the navigator can more readily decide what stars to use and see their position.

There are really two ways of observing stars, (1) when you can see the star easily, **and there can be no mistake in its identity,** and (2) when the star is nearly invisible or ill defined. No sextant mirror shades are required for observation of a star.

When you can see the star easily, clamp the sextant at zero, insert and focus the star telescope. The rising piece should be screwed well down to the frame, as this will tend to increase the brightness of the star. This done, the star can be brought down to the horizon in the same manner as has been described for the sun, and the three stages of doing this are shown clearly in Figure 18 (a, b and c).

When the star is nearly invisible or ill defined, one may not be able to recognize the smaller stars before darkness falls and renders the horizon too ill defined for accuracy. In this case the **approximate** altitude of the star should be calculated in advance and the sextant set to this angle.

The sextant is now directed towards the point of the horizon directly underneath the star then, by "sweeping round" a little to the right and left, the star should be seen near the horizon, when exact contact may be made with the tangent screw in the usual way.

A star, of course, has no appreciable "limb," so the center of the star itself is brought to the horizon and made to cut as accurately as possible.

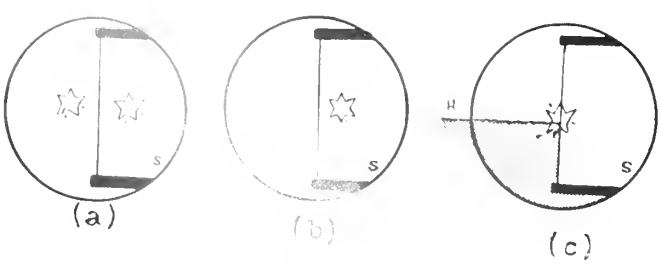


Fig. 18: (a) Looking directly at the Star. (b) The Star coming down. (c) The Star exactly cutting the horizon.

Historical Data Wanted

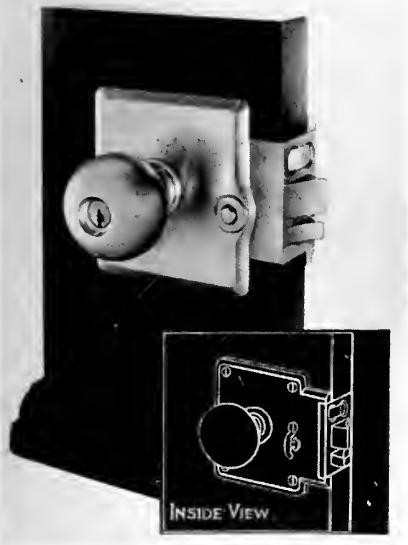
The Mariners' Museum, Newport News, Virginia, is compiling an historical and pictorial record of the activities of United States ships, both combat and non-combat, during World War II.

For this purpose the museum would welcome receipt of a copy of any souvenir pamphlet, book or ship's paper such as has been produced by personnel aboard many ships as a memento of their service.

This museum has one of the largest collections of ship lore in this country and its library is much used by those doing research work on naval history and kindred subjects. We heartily commend this disposition to any of our readers who may have such souvenir material.

Keep Posted

New Equipment and Machinery for Yard, Ship and Dock



Cabin Lock.

Corbin Anti-Panic Marine Lock

A new anti-panic marine unit lock which should attract the interest of those specifying and buying for the shipbuilding industry is now being made by P. & F. Corbin of New Britain, Connecticut.

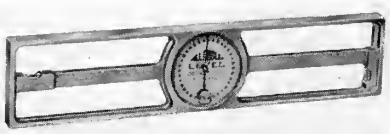
Employing the Corbin designed unit lock principle, this marine unit lock meets all the requirements of shipboard use. Assembled at the factory with knobs and escutcheons attached, this strong, smart looking, easy to apply lock is a distinct contribution to better U. S. shipbuilding.

Made to withstand severe and long service, the internal moving parts, accurately machined, are attached to heavy one-piece cast bronze frame and so arranged as to give a direct and smooth action with an easy spring. Ample bearing surfaces for the knob shank eliminate any weakness between the outside knob and the lock proper, protecting the ball bearing mechanism contained in the outer knob that guarantees the security of the lock itself.

An exit may be had at any time by a normal turn of the inside knob. Entrance by emergency key which operates the lock under all normal conditions is provided in the event entry is made necessary by sudden illness or injury of room occupant, or for the purpose of rescue.

For privacy and security, operation of the inside thumb knob, used to lock the door, "pushes out" a button indicator in the face of the outside escutcheon, signaling that the room is occupied. This action automatically "shuts-out" the use of steward's master key and permits outside entry only by purser's emergency key. Auxiliary latch deadlocks main bolt and acts as a safeguard against "picking."

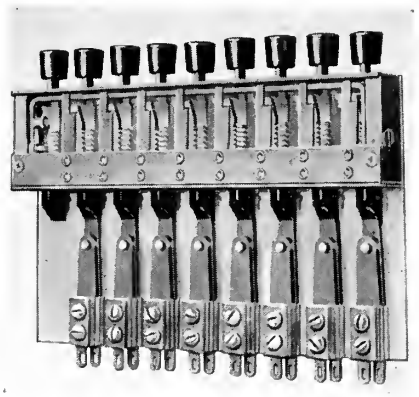
Designed for quick application, there is no mortise made in the door; instead a rectangular piece to the exact size of the lock case is cut out of the door stile. After the cut is made, the entire unit is slipped into place and bolted through the door. This unit is ideal for use on hollow metal joiner doors.



All-Angle Level.

New Spirit Level with Dial Indicator

Of particular interest to carpenters, shipbuilders, construction men, surveyors, inspectors, jig makers, and hobbiests is a new all-aluminum spirit level with a dial indicator in the center. Known as the All-Angle Level, this heat-treated aluminum tool weighs less than one pound, is rustproof, and may be used in any position. The dial indicator (guaranteed accurate to within one-half degree) is protected by an unbreakable crystal and is calibrated in degrees through a 360° range for accuracy far exceeding that of any spirit level in use today. Two air bubble tubes, one for horizontal use and one for plumb testing have been built in (one on each end). Length 14⅝", width 3", thickness ¾". The all-angle level is manufactured by the Brand Tool Company, Pasadena, California.



Push-Button Switch.

Nine-Position Push Button Switch

General Control Co., Boston, Massachusetts, announces the new Master model MPB, a nine-position push button switch made in both locking and non-locking frame types. The locking frame type has eight positions and one reset position. In this type, any switching combination which has been set can be released by one operation of the reset button.

The switch is of sturdy construction, with all the parts made of non-corrosive materials. The contacts are fine silver, permanently riveted to the phosphor-bronze contact springs.

The rating of the Master model MPB switch is 5-10 amperes, 125 volts, 60 cycles a.c. (non-inductive load). It is especially designed for use on electronic and communications equipment.

Radiomarine Revives Its Rental Contract Service

One of the popular Radiomarine Corporation of America's services which was curtailed during the war is now available to ship operating companies, fishing craft, work boats and other boat owners. It is the Rental Contract Plan.

Under its provisions Radiomarine radiotelegraph transmitters and receivers, radio automatic alarms, lifeboat radios, radio direction finders, radiotelephones, or other marine communication equipment may be rented on a flat-rate annual fee basis, payable monthly. The boat owner is relieved of the expense of purchasing equipment and the details of making application for an FCC license.

Radiomarine installs the equipment and keeps it in first class operating condition. Inspection, emergency service and maintenance at ports where the company maintains branch service stations are all part of the contract.

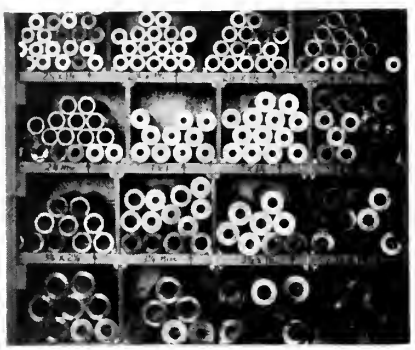
In addition to this plan there is a Service Contract Plan covering marine communication equipment of any manufacture which is owned outright by the ship or boat owner. Radiomarine will apply for the FCC license; periodically inspect the equipment; audit and adjust the radio traffic accounts between the ship radio station and shore communication systems, both domestic and foreign. Also at moderate additional cost, Radiomarine will take care of maintenance of the equipment, make calibrations and adjustments, repairs and replacement of tubes and parts.

Many of Radiomarine's branch shore service stations have been established more than 25 years. They are manned by experienced personnel holding FCC operator's license. Radiomarine maintains these stations in 22 cities in the United States. Service is also available in foreign ports through world-wide affiliates.

Details are available on request.

Torrance Standard Bronze Now Available

"Torrance Standard Bronze," a tough centrifugally cast aluminum bronze bushing stock, is now available nationally through jobbing outlets. The product has been used extensively in the aircraft, automotive, ordnance and maritime industries by large consumers on government contracts. Since the release of critical materials for general industrial use this same heavy-duty stock bronze has been made available to machine shops and manufacturers with limited stock bronze requirements. Sizes range from 1½" to 6¼" outside diameter with practical inside diameters.



"Torrance Standard Bronze" bushing stock.

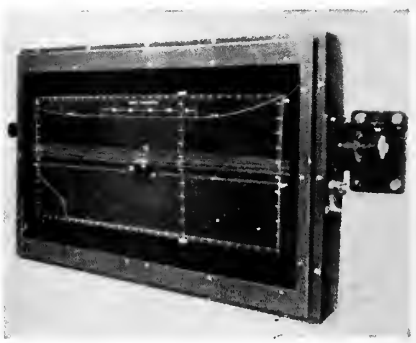
Pitometer Draft Indicator and "Pitlog" Now Available

Paul W. Hiller of Wilmington, Calif., southern California representative of the Pitometer Log Corp. of New York, announces that the Pitometer Draft Indicator and the new "Pitlog" are now available for commercial installation. Until recently these items were in the "Navy Restricted" classification.

The new mechanical draft indicator clearly shows the ship's draft fore and aft at all times on a large indicator card upon which is etched a foreshortened outline of the ship. No electrical or hydraulic connections are necessary as the card is dependent for its movement upon the change in level of 7¼" pounds of mercury.

The new "Pitlog" is a precision-built instrument for accurately measuring the speed of a ship through the water and totaling the nautical miles traveled. Designed especially for the merchant marine it is based on the same principles used in the Navy type rotary log.

Pitometer draft indicator.



(Please turn to Page 156)

On the Ways — SHIPS IN THE MAKING

Bids Called on Transpacific Liners

On July 14 U. S. Maritime Commission invited American shipyards to bid on construction of their P5-S2-E1 design of large express passenger liners for transpacific service. Bids are to be opened September 20.

The specifications and dimensions of these vessels dwarf anything in the passenger vessel class ever before built in an American shipyard. As given in a paper read last December at the New York meeting of the Society of Naval Architects and Marine Engineers by J. L. Bates, Director Technical Division U.S.M.C., the principal characteristics of this design are:

Length O. A.	920 feet
Length W.L.	895 feet
Beam	85 feet
Depth strength	71 feet
Displacement	37,500 tons
Weights Fuel Oil	9,500 tons
Fresh Water	800 tons
Salt Water	200 tons
Baggage Provisions	1,000 tons
Dry Cargo	1,350 tons
Reefer Cargo	150 tons
Total Deadweight	13,000 tons
Speed (mean sea)	29 knots
Shaft horsepower	100,000
Cruising radius	14,500 miles
Passengers 1st Class	435
Tourist Class	207
3rd Class	596
Crew	590

Many innovations in the way of luxury and convenience in passenger accommodations are incorporated in this design. For instance: a great circular verandah 72 feet in diameter located on the sundeck 55 feet above the waterline; a complete theater on the main deck to seat 304 persons; three swimming pools, one for each class, and dimensioned 16 ft. x 60 ft., 22 ft. x 32 ft., and 16 ft. x 29 ft.; all accommodations fully air conditioned; all first and tourist class staterooms with private baths; all cargo handled through side ports; four complete dining saloons with a total seating capacity of 826, and served by three complete electric galleys; and the superstructure built of 770 tons of aluminum alloy.

These ships to be known as Great Circle Liners will be completely streamlined in design and will be the largest and fastest transpacific liners under any flag. It is expected delivery will be possibly by March of 1949.

Argentina Calls for Bids

Approval of the United States shipyards contracting with the Argentine Naval Commission to build five ocean-going vessels for the Argentine State Merchant Fleet has been granted by the U. S. Maritime Commission, it was announced July 13. Such permission is required, under the Shipping Act of 1916, while a state of war or national emergency exists.

The vessels planned by Argentina are three 485-foot steam turbine passenger-cargo ships and two diesel-propelled 365-foot refrigerator cargo ships. The former will have a speed of 18 knots and the latter 16 knots. Refrigerated ships will be applied to the inter-American traffic and, eventually, to the traffic between the River Plate and Europe. Bids closed on July 15 with delivery to be made in 1948.

Demands for American Tonnage

A report from the U. S. Maritime Commission indicates that the international demand for purchase or charter of war-built American merchant ships grew to a total of 1246 vessels during the second preference period under the Ship Sales Act of 1946, which ended June 30. This was an increase of 222 ships over the total covered by applications filed during the first preference period ending May 31.

S.S. President Cleveland just before Launching.

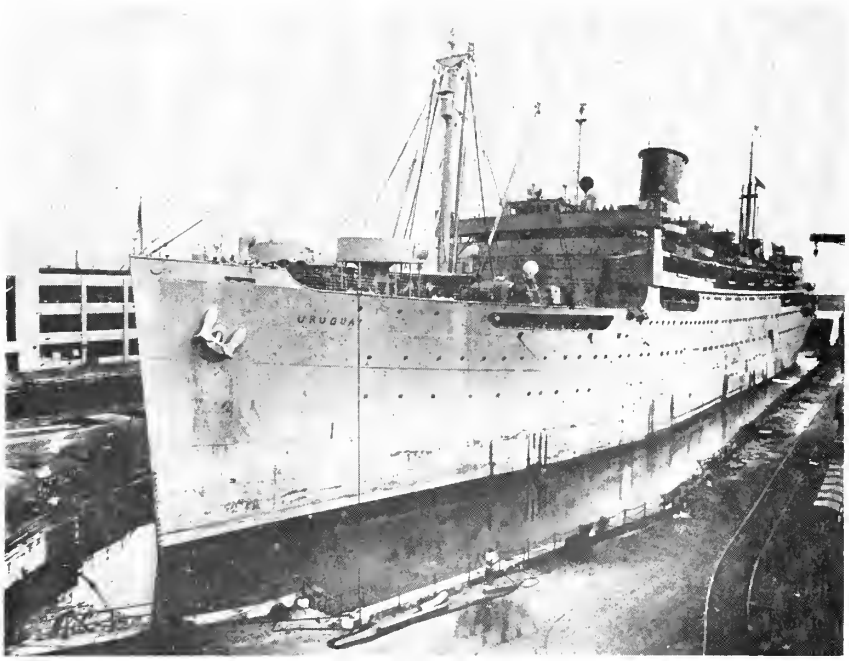
Foreign applications for purchase have grown to a total of 664 from 24 nations. The largest number of applications came from China, 162. Other totals were: France 85, Norway 84, Panama 67, Italy 50, The Netherlands 46, Great Britain 46, Honduras 29, Argentina 15, Greece 12, India 12, Denmark 12, Peru 8, Philippines 8, Yugoslavia 6, Canada 4, Chile 4, Egypt 4, Union of South Africa 3, Poland 2, New Zealand 2, Brazil 1, Venezuela 1, Sweden 1. Applications for 92 vessels were received from foreign applicants during June.

Prospective American purchasers have applied for a total of 355 vessels, 36 during the last month. Americans during the period applied for charters for 91 vessels, raising that total to 211.

Non-citizens applications for purchase of Liberty ships increased 24 to a total 256. Similar applications for coastal vessels arose 14 to a total of 164.

Citizens have applied to exchange 14 ships, an increase of four during June. Charter applications from the Philippine citizens, whose charter preference over other non-citizens ends July 4, now cover a total of 16 ships, an increase of three.

In accordance with the Ship Sales Act the Maritime Commission pro-



U. S. Transport Uruguay enters Todds graving dock at Brooklyn.

mulgated regulations which guarantee uniformity and equal treatment of applicants, all citizen applications received in a calendar month being considered together, and ahead of foreign applications. The next preference period expires July 31.

Half a Ship as a Power Plant

The turbo-electric tanker S.S. Sackett's Harbor, delivered July, 1943, from the Swan Island yard at Portland, Oregon, and operated by Pacific Tankers, Inc., of San Francisco, broke in two March 1 during a storm off the Alaska coast. Both sections of the vessel remained afloat and the stern portion under its own power started for the nearest land, making a speed of two knots. The captain and nine members of the crew who were on the stern had at first been taken off by the Navy patrol frigate Orlando, but had reboarded the stern portion and were navigating it. The balance of the crew and officers on the bow section were taken off by other vessels and that portion of the vessel was sunk by naval gun fire, as being a menace to navigation.

A naval tug, the Sarsi, made a line fast to the stern portion of Sackett's Harbor and towed it to Adak, Alaska.

The city of Anchorage, Alaska, put in a request backed by cooperation of the Department of the Interior, with the Maritime Commission for the use of the stern portion of this ship as a power plant for temporary or permanent use by the city. This request was granted and the after half of S.S. Sackett's Harbor was towed to Anchorage and is now supplying Anchorage with electric light and power.

Boat Yard Notes

Sausalito Boat Works, Sausalito, California, is delivering a 38-foot combination fishing boat to Tony Ferrante, Monterey fisherman. She is powered with a 225-hp Gray diesel engine.

Grandy Boat Co. of Seattle, Washington is building a 75-foot yacht for Chas. W. Myers of Portland. Two General Motors diesel engines, each of 200 shp, will drive this craft.

Avondale Marine Ways, New Orleans, La., has two steel tuna clippers under construction. These vessels were designed by E. Bruce Newby, Long Beach, California, for San Diego owners. One will have an 1120-shp 8-cylinder engine and the other an 840-shp engine, both Superior diesels.

J. K. Welding Co., Brooklyn, N. Y., has had its contract renewed with the U. S. War Department for the completion of two 80-foot, 650-shp steel tugs, work on which had been previously stopped. On completion these tugs will be turned over to U.S.S.R.

Uruguay Reconversion

The former turbo-electric intercoastal passenger and cargo liner California (now the Uruguay), after four years' grilling experience as a troop transport, is being reconverted into a passenger liner for Moore-McCormack Lines. The plans for this reconversion were prepared by Joslyn and Ryan, marine engineers and naval architects of San Francisco, and were fully described in the June issue of Pacific Marine Review.

On July 12 she was moved to the Brooklyn Division of the Todd Shipyards Corporation, the only privately-owned dry dock in the New York area capable of taking this ship. Preliminary inspection and work was done in that dock and then she was moved to the Kearny, New Jersey, yard of Federal Shipbuilding & Dry Dock Company, successful bidders for the major job of reconversion, at a cost in excess of four million dollars.

Two sister vessels, S.S. Brazil and S.S. Argentina, will undergo a similar reconversion in the immediate future.

Stock Barges at Richmond

Richmond No. 3 Yard is building for owner's account eight all-welded steel barges which are for sale to shipping lines or anyone who can use such craft. Dimensions are: length 120 feet; beam 41 feet 3 inches; depth 10 feet 3 inches amidships; dry cargo capacity 904 long tons; liquid cargo capacity 7545 barrels. Work on these barges is being used to absorb off-time on repair work and reduce lay-offs.

Bethlehem to Convert three P-2's

Bethlehem Steel Company's West Coast yards have been awarded the U. S. Army contracts for the conversion of three P-2 Navy troopships into Army troop transports. These are the largest conversion jobs undertaken by Bethlehem's West Coast Yards since the war, and the ships are scheduled for completion in the unusually short time of 70 days per vessel.

Two of these P-2 class ships, largest non-combatant vessels ever to be built on the Pacific Coast, are the Admiral C. F. Hughes and the Admiral W. S. Sims, now being converted at the San Francisco yard.

Bethlehem's San Pedro yard will perform a similar conversion job on the Admiral Benson, and four of the remaining five transports will be converted in the company's eastern yards.

These vessels are seven of eight such troopships, constructed under a U. S. Maritime Commission contract at Bethlehem-Alameda Shipyard, Inc., in Alameda, which were turned over to the Navy during the war and operated under a Coast Guard crew to transport Army troops to the far-flung Pacific war theaters.

The Army is having these vessels converted to transports. As such, their personnel capacity will be reduced from 5000 to 2500. This will allow staterooms with private bathroom facilities to be constructed where before there was open berthing space. Troops will continue to occupy open berths in holds and between decks, but families will be able to enjoy the privacy and comfort of staterooms.

Galley facilities will be increased to take care of the more varied demands of Army personnel and civilian passengers.

These ships have separate forward and after machinery rooms, each containing two main boilers, a main turbo-generator and various auxiliaries. Cables bring the generated current to the two 10,000-hp motors in the motor room aft of number 5 hold. The motors, each directly coupled to its own propeller shaft, will drive the big ships through the water at an estimated maximum speed of 21 knots.

Wartime safety measures required that the three separate machinery compartments be water-tight subdivisions of the ship. This resulted in a certain amount of inconvenience to the operating crew, as it was necessary for them to climb to an upper deck before they could cross over to the other machinery spaces. Tunnels, 7 feet high and 3 feet wide will now be provided between the after engine room and the motor room. The first tunnel will run through existing fresh water deep tanks, and second through number 5 hold. Water-tight doors at the bulkheads will maintain their water-tight integrity during times of emergency. The tunnels will make the three machinery spaces more readily accessible to the operating crew.

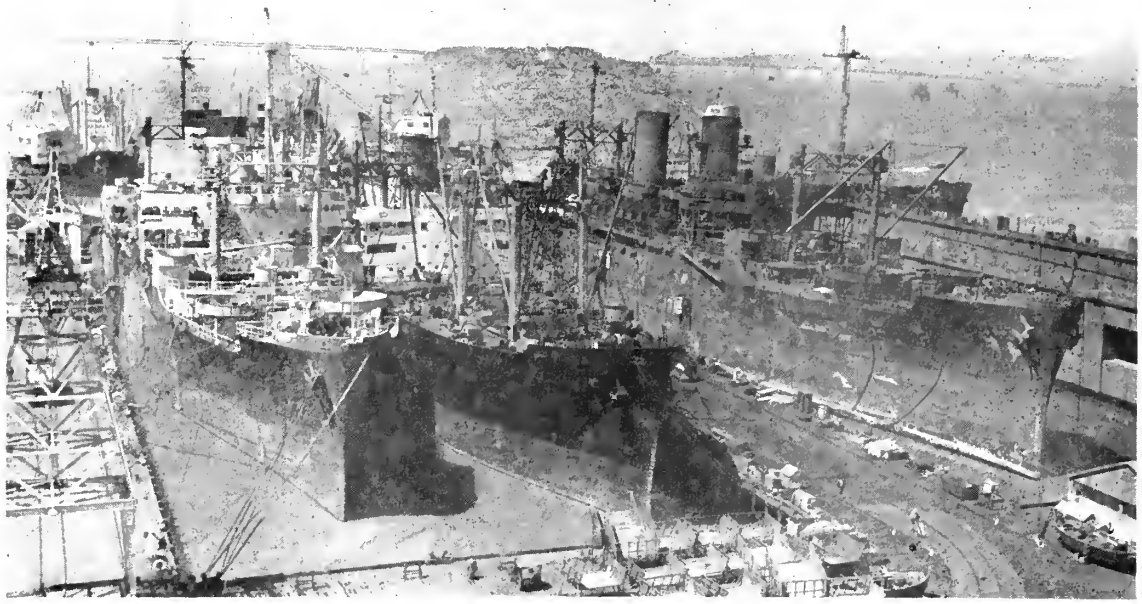
Fish Boats for China

UNRRA has awarded contracts to two Tacoma firms for the construction of 17 trawler-seiner type fishing boats to be assigned to China.

Tacoma Boat Building Co. is to build five steel boats 85 feet long and four wooden boats of the same length, for a total contract of more than $1,000,000.

Pacific Boat Building Co. has a contract to build eight of similar dimensions.

Contracts have been let also to Bellingham yards for an additional 18 similar craft.



Left and right: Navy transports Admiral C. F. Hughes and Admiral W. S. Sims at Bethlehem's San Francisco yard. Between them the A.P.L. cargo vessel Celestial.

New C-4 Army Transport at S. F. Port of Embarkation.

Conversion to Army Style

U. S. Army Transport General D. E. Aultman, one-time Navy C4-type troopship, was taken over by the San Francisco Port of Embarkation at its Fort Mason piers March 15, and is the first of a dozen troopers, formerly operated by the Navy to take to sea under San Francisco Port of Embarkation colors.

The General Aultman was converted to Army style at Kaiser Yard No. 4, Richmond, California, under supervision of S.F.P.E. water division inspectors. The job included complete reconditioning of machinery, installation of new bulkheads and elimination of many watertight doors, conversion of ship's crew quarters to merchant marine style, division of many large compartments into staterooms with bath between, and installation of hospital, post exchange, lounges and smoking rooms.

About half of the wartime capacity can now be accommodated, the space being divided as follows: First class, 96, second class, 40; unaccompanied male passengers, 150; troops, 2033. Officers and crew and Army ship's company will total 226.

Gun tubs, an outstanding characteristic on ships during the war, are retained, primarily to provide extra deck space for passengers. The heavy armament on troopers necessitated platforms of large size, and some of these provide enough space for badminton games.

Although very comfortable and nicely appointed when compared to wartime troopships, no effort has been made to compete with civilian-operated passenger liners in respect to luxury accommodations.

Conversion of Troopships

Joslyn - Ryan have recently been awarded a contract to prepare specifications and drawings for the permanent conversion into passenger liners of the P-2 type transports General M. C. Meigs and General W. H. Gordon. These transports have already had a preliminary treatment and are in operation under the American President Lines flag on the transpacific run. The permanent job will be much more thorough, will take several months' time, and will cost probably over $4,000,000.

Sperry Yacht Makes Radar Entry into Cleveland

Climaxing a 2300-mile voyage from Long Island Sound, the Sperry Gyroscope Company's floating laboratory, Wanderer, made a "blacked-out" entrance through the breakwater at Cleveland, Ohio, on June 26, as Sperry radar guided the vessel safely to dock. The Wanderer was welcomed by Lee Howley, law director, representing Mayor Thomas A. Burke, and members of the city's Sesqui-centennial Marine Committee.

The vessel, which had been operating out of Oyster Bay, New York, is demonstrating the Sperry true-bearing radar and many other marine devices to Lakes' operators in Cleveland, Detroit, and Buffalo. It remained in the Lakes area until mid-July. O. B. Whitaker, Sperry marine sales manager, was in Cleveland to meet the yacht on her arrival.

Indicative of the interest in radar and other Navigation of Tomorrow techniques, is the announcement by Frank H. Phillips, manager of Sperry's district office at Cleveland, that "every major operator in the Great Lakes will cruise on the Wanderer with us to view the merits of our modern equipment." Phillips forecasted substantial savings to Lake shippers, as radar eliminates dropping anchor due to poor visibility and reduces other hazards of piloting in close waters.

Arrival at Cleveland marked a return home for the yacht which sailed the lakes with her former owner, R. W. Allen, prior to the war. Following service with the U. S. Navy in defense of the Atlantic seaboard, the Wanderer was acquired by the Sperry Gyroscope Company for a conversion to a floating laboratory. All equipment aboard received ample testing on the long voyage from New York to Cleveland via the St. Lawrence River. The trip was made in varying weather via Sound, Ocean, River, Canal and Lakes.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

Bilge Club 17th Annual Barbecue

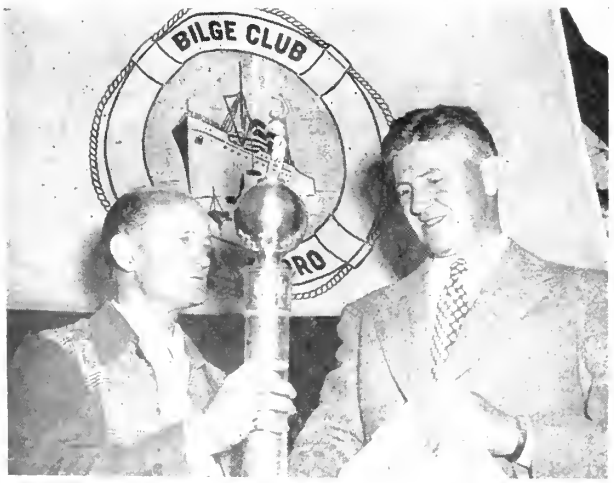
Arthur Pegg and Sherwood M. Summ of Sumco Products, Inc.

Not many maritime clubs could boast an attendance of 673 members at their annual outings, but that is just what the Bilge Club of Los Angeles Harbor did. Members and their guests enjoyed the big event of the year on June 22 at Palos Verdes Country Club. One hundred and fifty-seven played golf and nearly that many won prizes. The baseball game was won by the "Greens" who trounced the "Reds," score of 10 to

Bilge Club baseball —The "Greens" triumphed over the "Reds" 10 to 7.

At the left: J. L. McBride "tees up" amid help from H. P. Mack, T. D. Rosner and Russell Turner.

Above: The foresome standing behind Gene McMahon and Al Boro, skipper of the Club, are: Tom Reese, Joe "Cordage" Barry, Bailey Abbott and Ollie Flood.



General Chairman Al Boro turning over the mike to John C. "Nip" McHose, master of ceremonies.

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The Golf Foursome: William Cranston, Arthur Pegg, Jr., Keith Jacobs, and C. R. Harding.

●

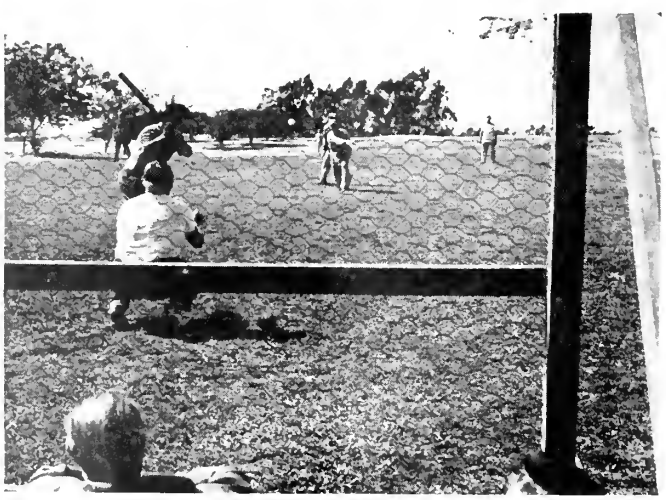
Action shot of the baseball game. "Buck" Buchholz did great umpiring job!

7. Captain Theo. Peters staged the tug-of-war, which everybody seemed to win!

Here are the Bilge Club members who worked long and hard and successfully to make the 17th annual event one of the club's best gatherings of all time!

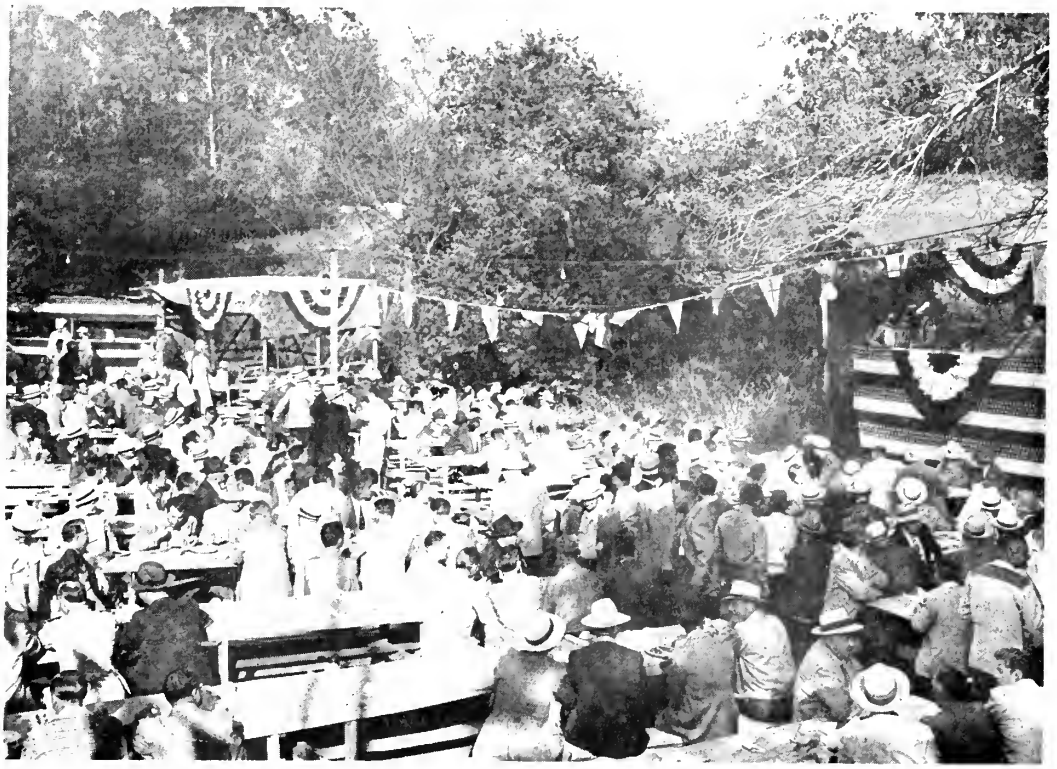
Committee Chairmen

Billy Wickersham, honorary general chairman; A. F. Boro, general chairman; Walter C. Richards, Sr., asst. general chairman; Walter C. Richards, Jr., chairman — Barbecue; Ed Marshall, Jr., chairman—Enter-



Captain Theo. Peters, one of founders of The Bilge Club, presents his ticket to Reception Committee, which included William Courtiour, Robert R. Snodgrass, secretary; and Commander William Mason.

tainment; Charles Houghton, chairman—Golf Handicap; Hal Bowen, chairman—Prizes; Com'dr. W. Mason, chairman—Attendance; William Courtiour, chairman—Reception; Ed Whittemore, chairman—Baseball; Capt. Theo. Peters, chairman—Tug-of-War; Jim Craig, chairman—Rules; Carl Morabito, chairman—Grounds; Winn Rash, chairman—Finances; Ed Marshall, Jr., chairman—Publicity; Robert R. Snodgrass, chairman—Secretarial; and John C. McHose (Nip), Master of Ceremonies.



Bilge Club's 17th Annual Barbecue.

Shoreside Personalities

William E. Knox, president and general manager of Westinghouse Electric International Company.

Knox Elected President of Westinghouse International

Election of **William E. Knox** as president and general manager of the Westinghouse Electric International Company was recently announced. Mr. Knox, who first served as a sales clerk with the company 24 years ago, succeeds **John W. White,** who has resigned to become Director General of Industria Electrica de Mexico, one of Mexico's largest privately-owned enterprises.

Knox has been vice president of the International Company since March, 1944, and before that was assistant general manager of the company since 1937.

Born in Somerville, Mass., in 1901, Knox spent his boyhood in New Hampshire, and was graduated from the University of New Hampshire, with a Bachelor of Science degree in Electrical Engineering, in 1921, at the age of 20.

In 1921, he joined the Westinghouse student course at East Pittsburgh, Pa., and worked in the shops building motors and circuit breakers. Because of a deep interest in foreign affairs, he soon asked to be assigned to the Westinghouse Electric International Company, the wholly-owned subsidiary of the Westinghouse Electric Corporation which handles its foreign business, and in 1922 was transferred to the New York offices of the International Company as a sales clerk.

He specialized in the application of electricity to the oil industry and power plant equipment in this country and abroad, and is the author of a manual on electrical equipment for oil fields.

In 1932, he was appointed assistant to the general manager of the company, and was raised to assistant general manager five years later. He was made a director of the company in 1940.

Widely known throughout Latin America where he has traveled extensively, he has worked closely for many years with the Latin Americans to help further the industrialization of their countries. In 1942 the Chilean government, in recognition of his services, awarded him the Chilean Order of Merit, with the rank of commander.

Mr. Knox also holds the Westinghouse Order of Merit, highest award made by the company to its employees, which was granted in 1940.

Researcher Advanced

M. C. Nelson, 27, who has been active in hydraulic marine control work for Ellinwood Industries, Los Angeles, has been advanced to the position of Central Works Manager. He is one of the country's youngest.

Commander D. B. McMichael, USMS.

New Head of U. S. M. S. Pacific Coast Area

Commander D. B. McMichael, USMS, former executive officer, Pacific District Operations Office of the U. S. Maritime Service, is the newly designated Enrolling Officer of the Pacific Coast Area. In addition to his duties as Enrolling Officer, Commander McMichael has retained administrative supervision over the Pacific Coast Stewards, Cooks and Bakers Examining and Retraining Units. Functional supervision of those units are now performed by Lieutenant Commander C. Bruckner, USMS, in addition to his duties as Steward Training Officer, U. S. Maritime Service Training Station, Alameda.

Commander McMichael is stationed at the U. S. Maritime Service Enrolling Office, 1000 Geary Street, San Francisco. He is a graduate of the California Maritime Academy and was on the first 'round-the-world training cruise of the school ship Golden State of the Academy. During the war, he has held varied posts in the U. S. Maritime Service including training ships and last year was executive officer of the U. S. Maritime Service Officers' School, Alameda, California.

A check of the record of 41 years' service in the U. S. Navy of Vice Admiral William Ward Smith, chairman of the U. S. Maritime Commission, show that most of his Navy life has been principally in the operating and ship repair field.

Left to right: Standing, Herb Pickering, Ernie MacMahon, new helmsman of the Club, Admiral Marshall, Edgar Wilson, Howard Woodruff, Captain Mare, and Leaver Mill.

NEW OFFICERS ELECTED BY SOUTHERN CALIFORNIA PROPELLERS

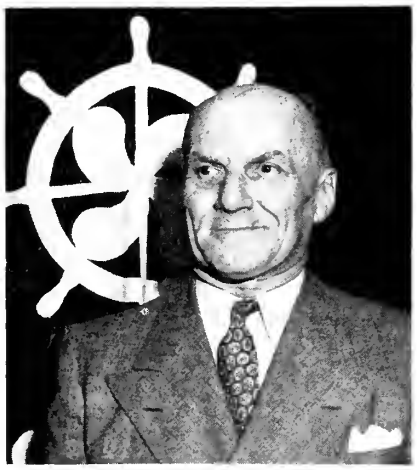
The annual meeting and election of officers of the Port of Los Angeles-Long Beach was held on June 26, and the following members elected to governing posts.

E. A. MacMahon of Luckenbach S. S. Co., Inc., was elected president; Leonard T. Backus of Fireman's Fund Insurance Co. was installed as 1st vice president; Hugh Middleton, of De La Rama S. S. Co., Inc., 2nd vice president; Stafford Harlow of American-Hawaiian S. S. Co., 3rd vice president; and Howard W. Woodruff of the Marine Exchange, as secretary-treasurer.

The Board of Governors for the ensuing three years are as follows:

The term expiring in 1947 has on its board Fred A. Hooper, district manager of American-Hawaiian Steamship Co.; Rear Admiral I. C. Johnson, USN (Ret.); E. A. MacMahon, district manager of Luckenbach Steamship Co.; Harold R. Pauley, executive vice president, Petrol Corporation; and William A. St. Amant, manager, Grace Line.

The term expiring in 1948: Alvin L. Allyn, in business for himself; Leonard T. Backus, manager, Fireman's Fund; James G. Craig, treasurer, Craig Shipbuilding Corporation; Arthur Eldridge, general manager, Los Angeles Harbor Department; Max G. Linder, president, Transmarine Navigation Corp.; Edgar M. Wilson, general agent, American President Lines.

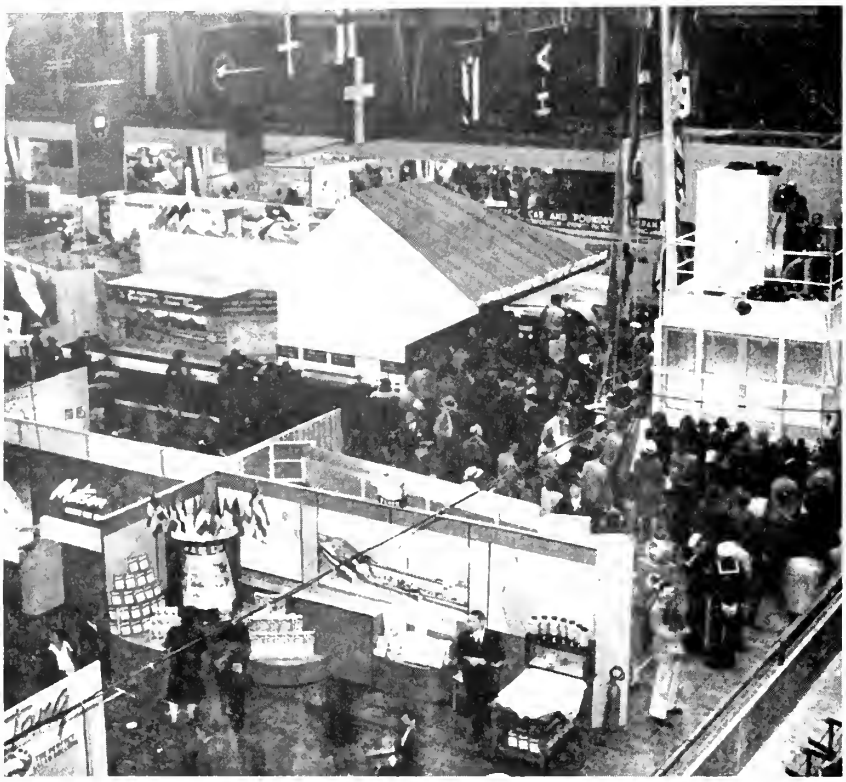


Ernie MacMahon, newly elected president of the Los Angeles - Long Beach Port of the Propeller Club of the United States.

The term expiring in 1949; Eloi J. Amar, port manager, Long Beach Harbor Department; Harold A. Black, attorney, McCutcheon, Thomas, Matthew, Griffiths & Greene; Ralph J. Chandler, vice president, Matson Navigation Co.; Stafford Harlow, assistant district manager, American-Hawaiian Steamship Co.; Hugh Middleton, assistant Pacific Coast manager, The De La Rama Steamship Co., Inc.; and H. E. Pickering (past president of this club) of W. H. Wickersham & Co.

Head table (left to right): Captain Couvert, Captain Perkins, Fred Hooper, Ralph Chandler, Jimmie Brougher, Comm. Louis L. Bennett, speaker, Herb Pickering, and Admiral Marshall at the rostrum.

Northwest Parade Exposition



General view of the Exposition floor showing house flags of member companies of the Pacific American Steamship Association. To the bottom left of the picture may be seen part of the Matson Navigation Company exhibit.

More than 100,000 persons visited the special exhibits sponsored by the Pacific American Steamship Association and the Matson Navigation Company at the Northwest Parade of Progress Exposition in Seattle, Washington, held from June 8 to June 16, it was reported by Frank DiMarco, representative of the Pacific American Steamship Association.

Sponsored by the Seattle daily papers, the Exposition was held in connection with the ILO (International Labor Organization) confer-

Special visitors to the Pacific American Steamship Association exhibit at the Northwest Parade of Progress Exposition included Maitland Pennington, vice president of the National Federation of Shipping, and employers delegate to the International Labor Organization Conference, as well as several advisors to the delegation. Pictured here, left to right, are T. G. Plant, American - Hawaiian S. S. Co.; J. E. Phillips, Pacific American Tankship Assn.; C. E. Shaw, National Federation of Shipping; Mr. Pennington; W. E. Maloney, American Merchant Marine Institute; and J. A. Gibson, Luckenbach Steamship Company.

# of Progress in Seattle

ence, also in session in Seattle in June. The conference featured colorful exhibits and decorative house flags of every description, exemplifying progress and developments in things cultural and industrial.

Headliner on the entertainment program was Actress Jane Withers, who, together with Eddie Miller and his orchestra, provided three one-hour shows daily.

Member companies of the Pacific American Steamship Association represented at the Exposition included the Alaska Packers Association, Alaska Steamship Company, American-Hawaiian Steamship Co., Alaska Transportation Co., American Mail Line, American President Lines, Coastwise (Pacific Far East) Line, Grace Line, Hammond Shipping Co., Luckenbach Steamship Co., Matson Navigation Co., Pope and Talbot, Moore-McCormack Lines, Sudden & Christenson and Weyerhaeuser Steamship Company.

The Pacific American Steamship Association exhibit at the Northwest Parade of Progress Exposition, featuring a photographic mural of ships operated by member companies, as well as samples of products imported from all parts of the world.

●

Jane Withers, popular young screen and stage star, who headlined the entertainment program at the Exposition, and Captain G. G. McLintock, USMS, one of the advisors to the American delegation at the International Labor Organization Conference, inspect the global map, which is one of the features of the Pacific American Steamship Association exhibit. The globe, incidentally, was loaned by the San Francisco Marine Exchange.

●

The Matson Navigation Company exhibit.

Cremer and DiMarco in this act portraying the future of the Marine Exchange.

Marine Exchange Day At Mariners Club

In a tricky little skit at the July meeting of the Mariners Club at San Francisco, Mac Cremer and Frank DiMarco undertook to show, through the medium of a series of telephone conversations, the important place the Marine Exchange occupies in the life of the industry and the community.

Through the device of post-dating the scene to 1956, it was possible to assume a wider public acceptance of the importance of the Merchant Marine and a greater recognition of its vital place in the port. The Marine Exchange, as the "service bureau" to the industry, was in demand from numerous spots around the country and not even hardly ever was it unable to give service.

Members and guests at the meeting got a much needed reminder of the importance of the Marine Exchange and the part it is playing in the development, as well as in the welfare of all maritime groups.

The Mariners Audience.

Shoreside Personalities

Clifford A. Patch, Joshua Hendy Iron Works.

CLIFFORD A. PATCH has been appointed sales manager, Western Division of Joshua Hendy Iron Works, succeeding Clarence Jensky, resigned.

Patch has been successively assistant chief engineer, turbine sales manager, and chief project engineer at Hendy. He will supervise sales of all products made at the company's Sunnyvale and Torrance, California, plants—Diesels, turbines, gears, valves and custom built machinery.

Sales of electric motors and generators made at Hendy's Crocker-Wheeler plant, Ampere, New Jersey, remain under the direction of L. D. Warner.

ALUMNI ASSOCIATION of the U. S. Merchant Marine Cadet Corps, Inc., have announced the new National offices of the Alumni Association which are now located in lower Manhattan at 147 Fulton Street, New York 7, N. Y.

Admiralty Decisions

by HAROLD S. DOBBS of the San Francisco Bar

U. S. Supreme Court Reverses

I have from time to time reviewed in this series personal injury decisions concerned with the claims of seamen who were employed aboard vessels owned by the United States and operated by general agents for the United States. These operations, of course, merely covered the war years. Although these cases have offered many ramifications of the employer-employee relationship they have all held without distinction that the United States is the employer. As I have explained in previous articles, the seaman is entitled to bring suit against his employer under the Jones Act either in the state or federal courts with the benefit of a jury, provided he is able to show an employer-employee relationship. In the vast number of personal injury suits during the war years, suit was generally filed against the United States of America upon the ground that they were the employers and, of course, the cases were therefore filed under the Suits in Admiralty Act which act, you will recall, provides the method by which the United States may be sued with its consent. Very recently the United States Supreme Court decided the case of **Brady vs. Roosevelt Steamship,** 317 U. S. 575, the decision of which appeared to upset the previous history of relationship between the employee, the United States and the general agent. Upon a more careful analysis of the decision, it was thereafter noted and confirmed that the theory upon which the Brady case was decided was that the general agent was held liable for its own torts* and suit as not one under the Jones Act or, in other words, based upon the employer-employee relationship. There is nothing unusual about the Brady decision in that an agent under common law principles has always been held liable for his own acts resulting in damage to third persons.

Due to the fact that the United States was held to be the employer of the hundreds of thousands of seamen employed during the war, personal injury suits filed under the Suits in Admiralty Act against the United States were filed and tried in the Admiralty Division of the Federal courts. Under the Suits in Admiralty Act, the libelant is not entitled to a jury trial.

The Supreme Court of the United States, however, has just reversed the point of view and procedure set forth above by its decision No. 625, October Term, 1945, decided June 10, 1946, entitled **Hust vs. Moore-McCormack Lines, Inc.,** on Writ of Certiorari to the Supreme Court of the State of Oregon. This case arises by virtue of the fact that during most of the Second World War substantially our entire merchant marine became part of a single vast shipping pool, said to have been the largest in history, operated and controlled by the United States through the War Shipping Administration. So huge an enterprise necessarily comprehended many intricate and complex readjustments from normal peacetime shipping arrangements. These were executed largely through broad powers conferred upon the Administration.

Eventually almost every vessel not immediately belonging to naval and other armed forces came under the Administration's authority. Otherwise than by direct construction and ownership, this was accomplished by transfer from private shipping interests to the Administration, pursuant to requisition or other arrangement.

Inevitably the industry's transfer from private to public control was achieved to a very great extent by making use not only of private property but also of private shipping men, both in management and for labor. This too was brought about in various ways, but chiefly two, for presently pertinent purposes. One was by time-chartering of privately owned vessels with crew, in which case the men remained the private employees of the vessel's owner. The other was by either bareboat-charter or outright ownership by the Administration. In such instances, as will appear, master and seamen became technically employees of the United States.

The difference is important for the issues and the decision in this case. They concern the broad question whether seamen employed in the latter capacity, as members of the United States Merchant Marine, lost during the period of such service prior to March 24, 1943, some of the American Seamen's ordinary and usual protections in respect to personal injury or death incurred in the course of employment, or retained those rights. Specifically, in this case the question is whether petitioner Hust retained the seaman's usual right to jury trial in a suit against the respondent, pursuant to the provisions of the Jones Act, for personal injuries incurred in the course of his employment as a seaman on the S. S. Mark Hanna. This was a Government-owned Liberty ship operated under a so-called General Agent Service Agreement between respondent and the Administration.

The Mark Hanna had been torpedoed in the Atlantic Ocean on March 9, 1943. Early on the morning of the 17th, the day of Hust's injury, the vessel was being towed to

* Torts: Injuries or wrongs.

port. He was ordered to go to the ship's locker in the forepeak of the second deck and bring out a mooring line to be used in towing. The electric bulb lighting the locker room had burned out and the room was dark. While crossing it to get the line, Hust fell through an unguarded hatch about twelve feet to the third deck. In landing he struck a steel manhole cover projecting some six inches above the deck, and incurred the injuries for which this suit was brought on September 24, 1943, in the Circuit Court for the County of Multnomah, State of Oregon.

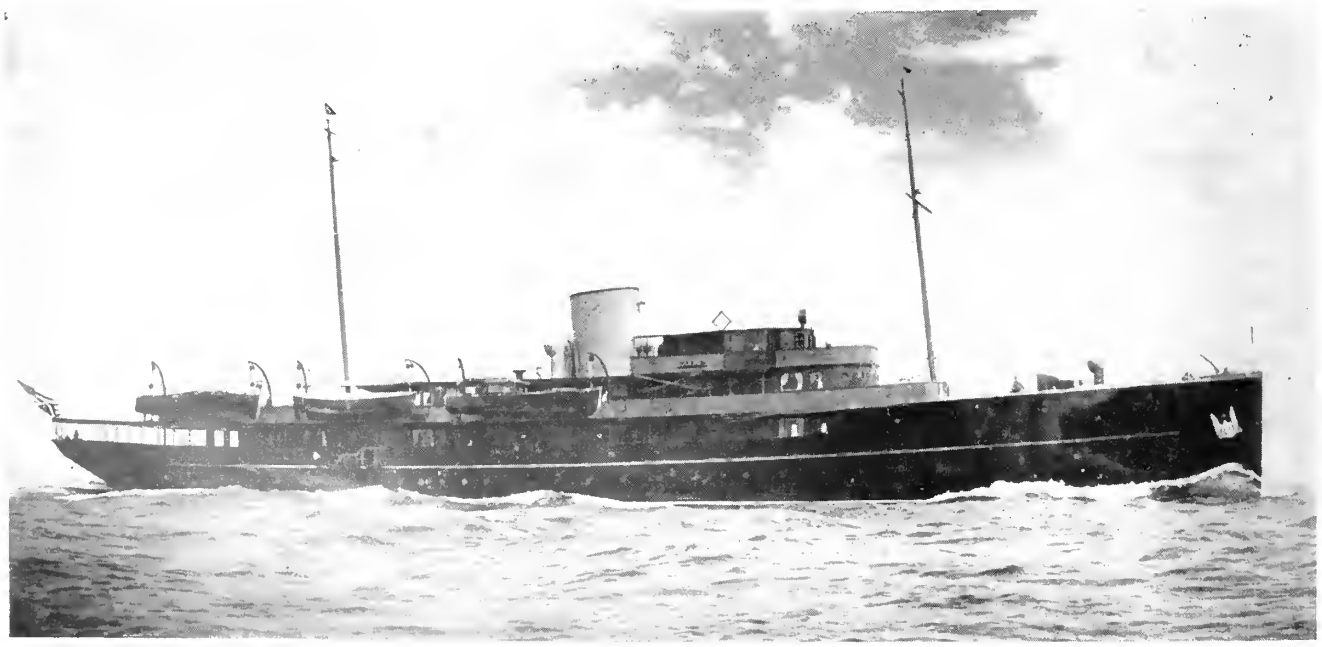
The complaint alleged that Hust was respondent's employee, was injured through its negligence, and that the suit was brought pursuant to Sec. 33 of the Merchant Marine Act of 1920. Trial before a jury brought a verdict and judgment for Hust. On appeal to the Supreme Court of Oregon the judgment was reversed and an order was entered for the cause to be remanded, with directions to enter judgment for the respondent notwithstanding the verdict. The Supreme Court held that, as a matter of law, petitioner was an employee of the United States, not of respondent, and therefore he was not entitled to recover from it under the Jones Act for the injuries alleged and proved.

The Supreme Court of Oregon considered that the controlling question was whether Hust was respondent's employee when the injuries were incurred; and that "it must be assumed * * * that the case is governed by the rule of the common law" to determine this question and thus the outcome of the case. Accordingly it examined with great care the arrangements which had been made between respondent and the Government for operation of the Mark Hanna, with special reference to the provisions of the General Service Agreement to which the Administration and respondent were parties. From this examination the court concluded that respondent was an agent of the Administration for only limited purposes, not including control, authority or principalship of the master and crew or responsibility for negligent occurrences taking place at sea and not attributable to the manner of discharging any duty of respondent while the vessel was in port. Hence, applying the common-law "control" test, the court came to its conclusion that Hust was not respondent's employee as that relation is contemplated in the Jones Act.

The Jones Act was the culmination of a long struggle by seamen to secure more adequate relief in case of injury or death, incurred in the course of employment, than had been afforded by pre-existing law. We do not stop to review that history. But the history of the Jones Act since its enactment has been distinctive in that, at all subsequent times, seamen have opposed substituting for its provisions other forms of relief which have been tendered as being more in accord with modern trends of legislation for these matters. Wisely or unwisely, they have steadfastly preferred the traditional remedy of jury trial for negligence to workmen's compensation based on liability without fault. By 1942, when the Government took over the merchant marine, that remedy had become a thoroughly established incident of the seaman's contract of employment, as much so as the historic relief afforded by the general maritime law for maintenance and cure or maritime tort. It was one which attached to every seaman's contract.

Now it is argued that this favored

U. S. S. Williamsburg, The Presidential Yacht



Recently overhauled at the Norfolk Navy Yard, the U.S.S. Williamsburg (ex Aras) has been recommissioned for service as the presidential yacht. She wos built in 1931 by Bath Iron Works Corporation, Bath, Maine, for Hugh J. Chisholm of New York, taken over by the U. S. Navy during World War II, served as a gunboot on high speed convoy duty and as a flagship in convoy and patral wark in the vicinity of Iceland.

position was altogether inverted when the Government took over control of the entire merchant marine under its war powers in 1942. For it is maintained and the Oregon Supreme Court has held, in effect, that this transfer stripped seamen of many, if not all, of their protections, including the remedy under the Jones Act, for the duration of the war and six months. True, the decision applies specifically only to Jones Act proceedings. But it is equally applicable to all other maritime rights and remedies dependent upon existence of the "employer-employee" relation, such as the right to maintenance and cure, etc. Whenever, in such cases, it might be found that technically the Government is the employer, the necessary result would be to remit the seaman to the "exclusive" right to sue under the procedure provided by the Suits in Admiralty Act. In short the combined effects of the Act and of the transfer of American shipping to governmental control, for the temporary period of the war, would be to confine merchant seamen altogether to suits under the Act, except in the cases of men employed on vessels under time-charter and possibly as to injuries incurred by others through the general operating agent's failure to discharge some specific duty imposed by the General Service Agreement while the vessel is in port. With those possible exceptions the various rights of seamen, enforceable by various proceedings in admiralty and at law, in state and federal courts, are swept into one hopper, the suit against the Government or governmental corporation under the Suits in Admiralty Act.

The majority opinion in this case stressed the fact that suits against the Government under the Suits in Admiralty Act provide a two year statutory limitation of action while suits under the Jones Act allow a three year statute of limitations and that, therefore, there was a discrimination against the seamen in that the time in which he had a right to institute an action was materially reduced to his detriment. The court listed other so-called uncertainties and complexities that follow the state of the law up to this decision by the Supreme Court of the United States. The court said:

> "Were respondent's position to prevail, a seaman would be forced to predict, before instituting his suit, whether at the end of the litigation it would turn out that the cause of action alleged should have been asserted against the Government or against the private operator. Thus, it might often be difficult to foretell whether the negligence alleged to have caused the injury would be attributed ultimately, as the proof should turn out, to some act of the master or a member of the crew, in which event only the Government, not the operating agent, would be liable, or to some default of that agent in discharging its specially limited but various duties, in which case it, and at least in some instances, not the Government would be responsible. The only safe course for a claimant in doubt —and obviously many such situations might arise—would be to file two suits, one a libel in personam against the Government, the other an appropriate proceeding against the agent; and possibly even so the risk might remain that the division of remedies would result in loss of relief altogether.
>
> "In addition it should be mentioned that under the practice of the industry seamen frequently would move back and forth between vessels of the same owner moored side by side, from ships under time-charter to others under bareboat-charter to the Administration. With each such shift, under respondent's view of the law, responsibility for the seamen's injuries would shift from the agent to the Government or the other way around, with corresponding shuttling of remedy. The confusion thus resulting was one reason which led to adoption of the Classification Act.
>
> "These are at least some of the uncertainties and complexities which would result from acceptance of respondent's view. It is hardly too much to say that substantive rights would be lost in an incalculable number of cases by the disruption such an acceptance would bring for rights long settled. The result also would be to throw large additional numbers into confusion which in the end could only defeat many of them."

Williamsburg Under Way

The Williamsburg, built as an ocean-going yacht, has an over-all length of 243′ 9″; beam, 36′; mean draft, 14′ 6″; maximum draft, 15′ 3″; displacement of maximum draft, 1770 tons. Twin propellers are driven by the two 8-cylinder, 1100-hp, 4-cycle General Motors diesel engines. The generator has been replaced with a 3-cylinder G.M. 100-kw diesel generator set. This vessel has been equipped with four guest staterooms, two baths, and an office, bedroom and bath for the President, with adequate accommodations provided for ship's officers and crew and for Secret Service personnel.

In discussing some of the respondent's contentions, the majority opinion recites the following:

> "We are told, however, that the Jones Act applies by its specific terms only in the presence of the relation of employer to employee, to give the latter a remedy for the employer's negligence; and, since the effect of the General Service Agreement was to make the seaman technically an employee of the United States, the necessary result was to remit him exclusively to the Suits in Admiralty Act for remedy to enforce the substantive right given by the Jones Act.
>
> "The premise is not controlling. We may accept the Oregon court's conclusion that technically the agreement made Hust an employee of the United States for purposes of ultimate control in the performance of his work, although the meticulous differences in this respect between its term and the corresponding provisions of the Maritime Commission's standard contract make it hardly more than dubious that respondent did not stand pro hac vice† as employer with the Government. But it does follow from the fact that Hust was technically the Government's employee that he lost all remedies against the operating "agent" for such injuries as he incurred. This case, like National Labor Relations Board v. Hearst Publication, 322 U. S. 111, involves something more than mere application to the facts of the common-law test for ascertaining the vicarious responsibilities of a private employer for tortious conduct of an employee.
>
> "Here indeed is the respondent's fallacy, for it assumes the case would be controlled by the common-law rules of private agency. It is true these are applied in the normal everyday applications of the Jones Act. But in those situations this is done to determine who comes within, who without the covered class in the Act's normal operation, not to exclude that class entirely or in large part. Here the application is made to defeat the Act for all except the smaller number of men whom it was enacted to protect. No such application of the common-law 'control' test can be justified in this temporary situation unless by inversion of that wisdom which teaches that 'the letter killeth, but the spirit giveth life.' "

The majority of the court's appraisal of the standard general agency agreement is best summarized by the following portion of its opinion:

> "The mere fact that the terms of the standard agreement were changed to omit the provision for manning the ship and substitute the provisions relating to employees contained in the General Service Agreement was not, in these circumstances enough to deprive seamen of that remedy. We do not think either Congress or the President intended to bring about such a result by the transfer of the industry to temporary governmental control. If this made them technically and temporarily employees of the United States, it did not sever altogether their relation to the operating agent, either for purposes of securing employment or for other important functions relating to it. Nor did it disrupt the long-established scheme of rights and remedies provided by law to secure in various ways the seaman's personal safety, either to deprive him of those rights altogether or to dilute or reduce them to the single mode of enforcement by the Suits in Admiralty Act procedure.
>
> "This result is in accord with the spirit and policy of other provisions of the General Service Agreement. The managing agent selected the men, and did so by the usual procedure of dealing with the duly designated collective bargaining agent. It delivered them their pay, although from funds provided by the Government. It was authorized specifically to pay claims not only for wages, but also for personal injury and death incurred in the course of employment, for maintenance and cure, etc. It was responsible for keeping the ship in repair and for providing the seaman's supplies. For all of these expenditures not covered by insurance the contract purported expressly to provide for indemnity from the Government.
>
> "With so much of the former relation thus retained and so little of additional risk thrown on the operating agent, it would be inconsonant not only with the prevailing law, but also with the agreement's spirit and general purpose to observe and keep in effect the seaman's ordinary and usual rights except as expressly nullified, for us to rule that he was deprived of his long existing scheme of remedies and remitted either to none or to a doubtful single mode of relief by suit against the Government in personam in admiralty. Our result also is in accord with the general policy of the Government and of the War Shipping Administration that those rights should be preserved and maintained, as completely as might be possible under the existing law, against impairment due to the transfer."

The court reversed the judgment of the Supreme Court of Oregon with the majority opinion written by Justice Rutledge and a concurring opinion upholding the judgment written by Justice Douglas with whom Justice Black concurred. The dissent was written by Justice Reed and concurred in by Justice Frankfurter and Justice Burton. In view of the fact that Justice Jackson took no part in the consideration of the decision of the case and the further fact that former Chief Justice Stone died before the decision was rendered, it is difficult to understand how the majority decision prevailed unless Justice Murphy concurred with the majority although his name was not mentioned. In any event it is a four to three decision with the usual arguments presented by the dissenting judges, arguments which have been presented many times in this article before, which unequivocally show that the seaman was employed by the United States and not by the agent. The Hust decision is certainly a complete reversal of what we have come to know as sound and accepted principles and procedure.

† Pro hac vice. For this occasion.

BOOK REVIEW

Fluid Measurement, New Engineer Handbook

By Louis Gess and R. D. Irwin, flow meter engineering department, Brown Instrument Company, division of Minneapolis-Honeywell Regulator Company. The Flow Meter Engineering Handbook is published by Brown Instrument Company of Philadelphia, priced $2.50 per copy—151 pages with 38 figures and 55 tables included.

Here is a complete yet concise treatment of fluid measurement, including related factors, equipment, equations and computations in terms of steam, water, oil, and gas flow, replete with information for students as well as engineers. Its authors preface their efforts in this second edition with the following comment:

". . . The second edition has been written to expand the original information and to include suggestions made by users of the first edition to improve its usefulness.

"Wherever possible the authors have used the same symbols for fluid measurement as the American Society of Mechanical Engineers' research publication, 'Fluid Meters, Their Theory and Application.' . . . Derivations of formulae include those of a universal formula for fluid measurement with a thin plate orifice, practical working equations, and the use of Reynolds' Number Recommendations of the Joint American Gas Association, American Society of Mechanical Engineers' Committee on fluid measurement for orifice installations are included. Separate chapters have been devoted to compressibility of gases, orifice calculations for various fluids, and the application of correction factors."

Shoreside Personalities

(Continued from page 112)

Commodore C. A. Berndtsen

Captain C. A. Berndtson, master of the S. S. Lurline and commodore of the Matson fleet, has been named marine manager of Matson Navigation Company, according to an announcement by Vice President Hugh Gallagher. He succeeded to the post left vacant by the death of Captain Andrew G. Townsend.

William A. Weber, who served during most of the war as aide to the late Vice Admiral Howard L. Vickery, is now affiliated in an executive post with the Alcoa Steamship Company.

Prior to leaving the U. S. Maritime Commission, Weber was a director of the Division of Vessel Disposal and Government Aid.

R. A. Murphy, well known in Pacific Coast shipping, is now district manager of the Deconhil Shipping Company's New York offices. The company recently opened in the Whitehall Building, 17 Battery Pace. The Company is also agent for the Hillcone Steamship Company.

Robert W. Horton, director of the Office of Information for both the War Shipping Administration and the U. S. Maritime Commission during the past three years, resigned on June 1. No successor has been named, but his assistant, Robert W. Straus, is acting head of the division.

E. P. (Jack) Lewis, after four years with the U. S. Maritime Commission's regional office, has become associated with Sudden & Christensen. Lewis, well known in marine circles, served with the old Pacific Coast Steamship Company and Pope & Talbot (McCormick Steamship Co.) for 20 years before joining the Commission.

Joseph Wadsworth, formerly advertising and publicity director for The California Shipbuilding Corp., has been named to the same position with Joshua Hendy Iron Works. He is well known to the shipbuilding fraternity up and down the Pacific Coast.

Frank B. Kester, after serving as assistant information officer with the U. S. Maritime Commission in the San Francisco regional headquarters, resigned on July 1, to enter private fields. Kester, a veteran marine writer, was for nearly 25 years Shipping Editor of the Oakland Tribune. He is one of the best-known marine scribes on the West Coast.

The appointment of Buckley M. Byers as assistant manager of the A. M. Byers Company of Pittsburgh, Pa., manufacturers of wrought iron, has just been announced. He will be located at the New York Office and will be in charge of export sales.

A grandson of the founder of the firm, Mr. Byers recently returned after nearly four years service in the U. S. Navy.

Buckley M. Byers

Saul Belilove

Enterprise appoints Belilove: Enterprise Engine and Foundry Company announces the addition of Saul Belilove to the sales department of the company's diesel engine division. Belilove formerly headed the Application Section of the Enterprise Engineering Department.

Ferguson elected new Bendix president: Malcolm P. Ferguson of South Bend, Indiana, was elected president of Bendix Aviation Corporation to succeed Ernest R. Breech, who has resigned, effective June 30, to become executive vice president and director of the Ford Motor Company, it was announced following a meeting of the Bendix board of directors.

S. G. Coppel to join Pacific Transport Lines: It was jointly announced by **Richard A. McLaren,** president of the Pacific Transport Lines, Inc., and **Donald Watson,** manager of the Weyerhaeuser Steamship Company, San Francisco, that **Stanley G. Coppel,** who is presently assistant operating manager for the Weyerhaeuser Steamship Company, will join the Pacific Transport Lines, Inc., as assistant traffic manager and assistant operating manager, about August 15, 1946.

Cunard White Star Line

(Continued from page 85)

the next decade in the progress of North Atlantic travel.

The first of these great liners, the Lusitania, 30,396 tons, constructed at Clydebank, was delivered in September, 1907, to be followed a few months later by the Mauretania, a 30,704 ton ship. Within a very short time these ships achieved the purpose for which they were designed.

The Mauretania held the Blue Ribbon of the Atlantic, symbolic of the fastest passage, until August, 1929, a period of over 22 years.

The next great milestone in the history of the company was the launching of the Aquitania (46,000 tons) at Clydebank, Scotland, on April 13, 1913. Scarcely had the great vessel taken her place in the company's service in 1914 when war was declared, and once again the value and importance of a well equipped and manned Merchant Service unit (such as the Cunard Company) in time of national emergency was fully demonstrated.

Throughout the four years from 1914-1918 the Cunard ships transported nearly 1,000,000 troops, 10,000,000 tons of foodstuffs and cargoes and 100,000 tons of oil fuel for the British Navy.

After the Armistice the company embarked upon an extensive shipbuilding program to replace war losses and thirteen new vessels amounting to 214,000 tons were ordered, while the opportunity was taken to convert all vessels already in service from coal to oil burning.

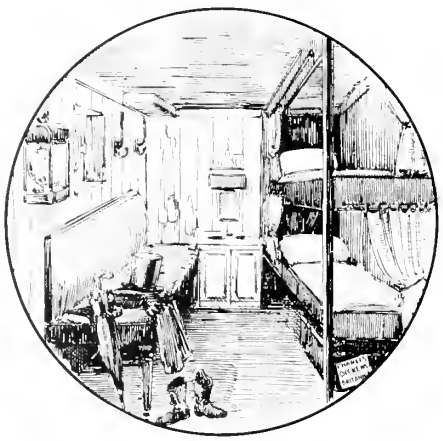
The company also acquired the Berengaria and this 52,000 ton vessel together with the Aquitania and Mauretania established in 1919 the Cunard Express service between Southampton, Cherbourg and New York.

In August, 1921, Scythia, the first vessel of the Cunard post-war fleet, made her maiden voyage and the remaining ships, including four other 600-foot, 20,000-ton liners, were delivered in rapid succession.

During the year that followed these ships played an important part in the tremendous eastbound travel movement from America, an important feature of which was the development of Cabin Class of travel and the inauguration of Tourist Class in 1924.

In addition, the winter months saw many of the ships engaged in luxury cruises. The ships included the Franconia and Carinthia which had been specially designed for cruising as well as the North Atlantic run.

During the depression in the thirties the company adapted itself to the abnormal conditions prevailing on the North Atlantic. One important factor was the development of short holiday cruises, both from this country and England in which the Cunard Company was a pioneer.



The stateroom of Charles Dickens in the Britannia. He crossed in 1842.

In July, 1934, the Cunard Company merged with the White Star Line under the name of the Cunard White Star Line, linking two great companies into one whose vessels cover nearly every important port in the world. The merger marked another step of progress in Twentieth Century business and ocean trade and travel. Meantime the great liner "Number 534" was being constructed at John Brown's Shipyard at Clydebank, Scotland. Construction upon Number 534 had begun in December, 1930, but owing to a 28-month suspension of work, her launching and christening came two months after the merger, officials from both companies joining in the ceremony and celebration of September 26, 1934, when the vessel became the Queen Mary.

On May 27, 1936, the Queen Mary, 1019 feet long and registering 80,775 tons, started on her maiden transatlantic voyage to New York. In 1938 she captured the Blue Ribbon, breaking all records for transatlantic crossings.

In the summer of 1939 the new Mauretania, 34,000 tons, entered the service, followed in 1940 by the Queen Elizabeth, sister ship to the Queen Mary.

When the war broke out in 1939, the British Government requisitioned all C. W. S. ships but permitted the company to man and operate them. The ships, of course, were stripped of all their luxurious furnishings and they started moving British and Colonial troops to the various fronts.

The value of the big, fast transports in the time of crisis was demonstrated sooner than expected. In the early summer of 1942, the North African campaign was going badly. Rommel was striking for Suez. He had to be stopped and it became necessary that reinforcements for the Eighth Army be shipped to Suez immediately. The Queen Elizabeth and Queen Mary leading a huge convoy rushed troops to the scene and the tide of battle was turned. If it had not been for these ships, capable of quickly moving large numbers of men, Rommel might not have been checked, with, of course, disastrous results.

When the United States entered the war the passenger capacity of the Queens was built up to 15,000. To accomplish this every nook and cranny was availed of, but, of course, the fitting-out had to be in accordance with U. S. Army regulations which are worked out on a per man area formula. Even the promenade decks were equipped with metal cots secured to the bulkheads. Miles of pipes had to be installed to service the extra toilet facilities, shower baths, wash places and such like. Sterilizers of the approved U. S. Army type were fitted in the ships for the washing of mess kits before and after meals. Miles of electric wiring, all of the approved armored cable type, were added for gun installation. Extra ventilation was installed, both for intake and exhaust. All the public rooms were converted either into sleeping quarters or mess halls. The Main Dining Room accommodated over 2,000 G. I.'s at a sitting and there were six sittings to each meal.

San Francisco Starting Point

Then, together with the Aquitania, veteran of World War No. 1, and the new Mauretania, the Queens

Cunard White Star Line

started to move U. S. troops from San Francisco across the Pacific. Later they were shifted back to the Atlantic to move Eisenhower's Army overseas.

When hostilities were over the ships were then assigned to the task of repatriating troops from all theaters of the war and to bringing to these shores the brides of G. I.'s, which made it impossible to re-institute normal civilian services for many months after the close of the war.

Units of the Cunard White Star from the beginning of the war in 1939 transported to the end of 1945 over 3,000,000 souls and over 11,000,000 tons of cargo, contributing in no small measure to final victory.

The company suffered losses to its fleet from enemy action but due to their great speed the main units managed to dodge the submarine wolf packs.

New Ships

Now Cunard White Star is engaged in a post-war building program with five new ships under construction. None will be as large as the Queens since these ships will provide for the company's express service. Instead these ships, somewhat smaller but up to date and modern in every respect, will fill the gap caused by casualties to some of the intermediate units of the fleet.

KEEP POSTED

WYPO Tip Cleaners

The Wypo Tip Cleaner distributed by Thermacote Co. of Los Angeles is a valuable tool for the cleaning of acetylene and welding tip orifices. Continuous use of these cleaners eliminates tremendous spoilage in burner and welding tips. This is particularly true of the oxygen tip hole in the lance, which has a tendency, unless frequently cleaned, to become enlarged and tapered thus losing its efficiency for deep cutting.

Over 35,000 Wypo cleaners were used at one California shipyard during the war effort resulting in a very favorable record for that yard in the life of torch tips.

Boiler Water Treatment in a "Package"

A real packaged unit for boiler water treatment has just been announced by "Proportioneers, Inc.", Providence, R. I., manufacturer of chemical proportioning equipment.

This new unit, the result of over a decade's plant experience in boiler water conditioning, includes the company's Adjust-O-Feeder compactly mounted with a motor on the same base with a chemical tank and agitator. It automatically feeds all treating chemicals and compounds and offers the features which have proved most successful in hundreds of plants. This packaged unit feeds chemicals for the effective control of scale, pitting and corrosion and thereby prolongs the life of boilers, improves heat transmission and reduces the need for costly shut-downs for repairs and cleaning.

All-Metal Ball-Pein Hammers

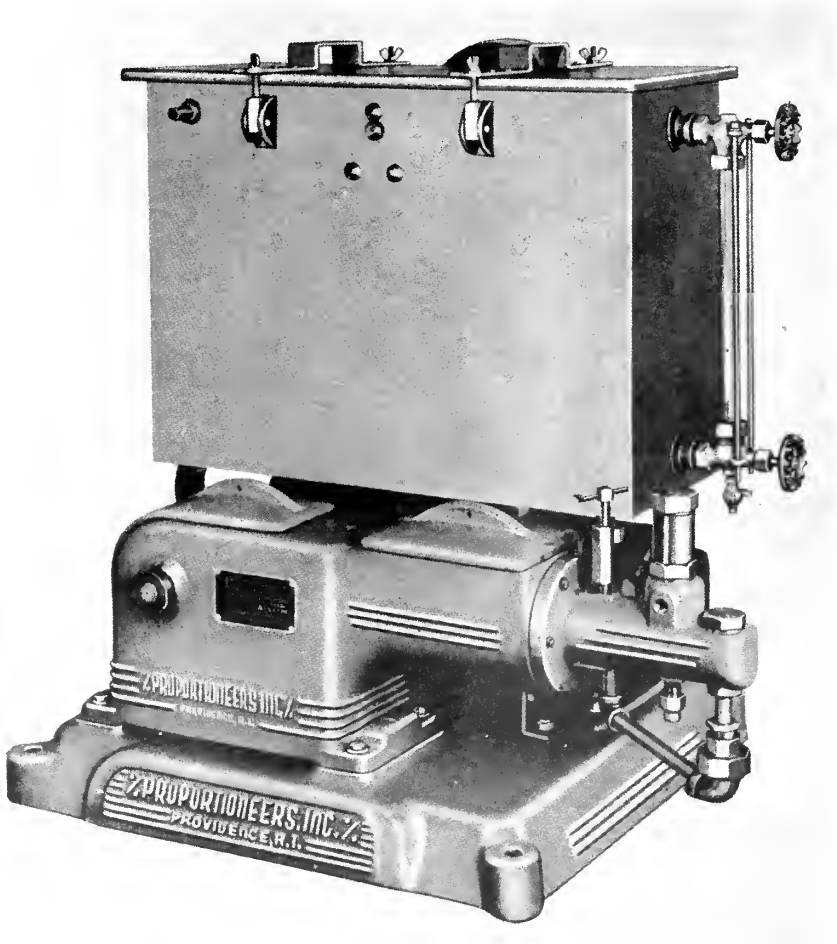
In eliminating the weakness of the conventional wood handles, the Ball-Pein hammers, manufactured by Atlas Welding Accessories Co. of Detroit, Michigan, give greater prolonged life, greater safety and pack more "wallop" with less muscular effort due to balanced weight distribution.

The hammer heads are of finest alloy tool steel, flame-hardened for toughness. The flex-o handgrip, shaped to fit the hand, absorbs shock of the blows. The all-steel handle is unbreakable, can not burn or split, and will never come loose from the hammer head or get out of alignment.

Several models are now available in a variety of sizes. The cost of these hammers is slightly more than the conventional type, but they represent economy due to prolonged life of service.

(Please turn to Page 156)

A real packaged unit for boiler water treatment introduced by "Proportioneers, Inc."



Ship Sales Act in Operation

(Continued from page 83)

extent of reduction to be made in statutory sales prices of war-built ships to reflect the extra depreciation in value resulting from war use. Careful study has been given the practicability of making such determination on an individual ship basis—by inspecting the vessel's logs and other operational data for each ship. Because of (1) the great difficulty of tracing the activities of individual ships due to security regulations during the war imposed particularly when ships were under the control of the military departments, and (2) the fact that the varied employment of ships under extraordinary wartime operating conditions exposed practically all of them to the effects of war use, the Commission may consider it desirable to apply standard schedules of rates for extra war service depreciation.

"The C3 and full scantling C2 type vessels which are in heavy demand for merchant use were likewise the types of ships most needed by the War and Navy Departments. The majority of ships in these classes were converted to troop transports or attack transports. The Commission, in order to establish the total availability of such types for sale under the Act, has been engaged in the difficult problem of first establishing the cost of effecting reconversion for merchant use, and then in determining whether, in the light of the limited net recovery to the Government, their reconversion for sale would best serve the objectives of the Merchant Ship Sales Act of 1946. In the C3 category of ships, for example, the American demand totals 114, whereas the supply totals 91, consiting of twenty-three merchant type and 68 military types, the latter being available only if reconverted.

"One of the most difficult problems in interpretation and policy is the basis for valuation of old vessels offered in exchange for an allowance of credit on the purchase of war-built vessels. The Commission is now considering studies made by its staff with respect to the weighing of the five valuation factors set forth in Section 8 of the Act and presently will be in a position to deal effectively with applications for the exchange of vessels.

"Under Section 6 of the Act, the Commission is authorized to sell certain types of vessels to noncitizens upon terms or conditions not more favorable than those at which such vessels may be sold to citizens. In this connection, the Commission has been considering, first, whether it should prescribe a one-price policy for sales to citizens and noncitizens, and secondly the terms and conditions, particularly with respect to the extension of credit, governing sales to noncitizens. Realizing that the Commission has been empowered to extend substantial amounts of credit in connection with the taking back of mortgage notes on vessels sold to noncitizens, it has consulted with the Treasury Department and the National Advisory Council so that policies adopted will be consistent with the overall policy of Government lending agencies engaged in the extension of credit to foreign governments and citizens of foreign governments.

"The Commission has also initiated discussions with the Secretary of the Navy pursuant to Section 6(a)(2) of the Act to the end that clearance of specific numbers of vessels by types may be agreed upon, so that sales to noncitizens may be carried out in accordance with the provisions of the Act. The importance of these matters relating to sales to noncitizens is clearly evident by reference to Appendix A to this report which indicates a very substantial demand by noncitizens for the purchase of vessels, including types whose retention may be required for national defense purposes.

"Because of the heavy citizen demand for the better types of vessels; the restrictions imposed by the Act precluding the sale of other types to noncitizens; and the self-imposed limitations with respect to sale of other types which will result from the consultations with the Secretary of the Navy referred to above, this foreign demand will be effective primarily with respect to the marginal classes of vessels which we are particularly interested in selling, notably the Liberty, Victory, and coastal cargo ships. It is expected that the Commission's policy in these matters will be resolved within the very near future.

"The magnitude of the demand for war-built vessels under the terms of the Ship Sales Act has been most encouraging to the Commission. Applications for the purchase of 339 vessels have been received from 73 American shipping companies, and applications for the charter of 211 vessels from 24 American shipping companies, together with five applications for the exchange (under Section 8(d) of the Act of 16 vessels. It is anticipated that the number of charter applications will increase greatly in the immediate future, when interim charters from the WSA terminate. Some 391 vessels are now on interim charter, and it is believed that most companies will wish to continue to employ the vessels under Ship Sales Act charters.

"A summary of the vessels applied for through June 30, 1946, compared with the supply of vessels available for disposal, is included as Appendix A. It will be noted that American demands for the purchase of several types exceed the supply, even including military conversions of each type, which vessels will have to undergo reconversion for merchant use. It appears that the C3 and C2 standard cargo vessels, the Liberty colliers, and T3 tankers, will all be sold to American shipping companies. These are, generally speaking, the most efficient war-built vessels for peacetime competitive service.

"The Commission believes that the extent of the demand for purchase, together with the known and anticipated demand for charter, from American shipping companies, augurs well for the future of our merchant marine.

"In addition to American demands, there have been received four Philippine applications to purchase eight vessels, and three Philippine applications to charter 16 vessels, together with 117 addition noncitizen applications to purchase 656 vessels.

"The foreign response to our ship disposal program is also gratifying to the Commission. While the sale to noncitizens of many of the vessels applied for cannot be approved by the Commission, as such vessels will be required in the American merchant marine or for national defense purposes, there is assurance that the government will secure a considerable return from other nations on its wartime shipbuilding expenditures."

60-Ton Floating Cranes To Meet Shipping Conditions

by H. J. KING

One of the problems confronting our armed forces at isolated bases during the war was that caused by the lack of floating cranes for the handling of heavy cargo from ships, the clearing of harbors, harbor construction, and similar jobs calling for heavy lifting capacity.

The lifting capacity for the floating cranes described here was 60 tons. A unit of this size would obviously have to be sent to the point of operations in subassemblies and put together there. The boom capacity on the ships that would carry these cranes frequently ran as low as 5 tons. At the isolated bases where the cranes were to be used erection facilities usually consisted of crawler cranes of around 5-ton capacity. Therefore the controlling factor in design was to make these large machines in subassemblies of no more than 5 tons each.

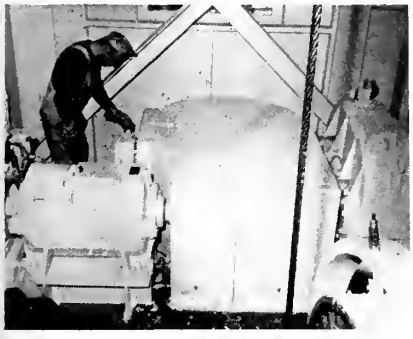


Fig. 4. Rotating mechanism in machinery house.

To serve this end a contract for the design and fabrication of suitable 60-gross-ton capacity full revolving diesel electric floating cranes that could be shipped in subassemblies weighing not more than 5 tons each and arranged for bolting at final assembly was awarded by the U. S. Army Transportation Corps jointly to the Dravo Corporation of Pittsburgh, Pa., and to the American Steel Dredge Company of Ft. Wayne, Indiana. The design and fabrication of a sectional hull arranged for bolting at final assembly with such equipment as tanks, deck fittings, anchor windlasses, etc., for the cranes was assigned to the American Steel Dredge Company. The design of the crane proper, which this article will describe, was assigned to the Dravo Corporation. A total initial requirement of 40 such cranes resulted in the placing of contract for fabrication of the cranes to the Dravo design with the Dravo Corporation, Wellman Engineering Co. of Cleveland, Ohio, and the Morrow Manufacturing Co. of Wellston, Ohio.

The principal dimensions and operating data are as follows:

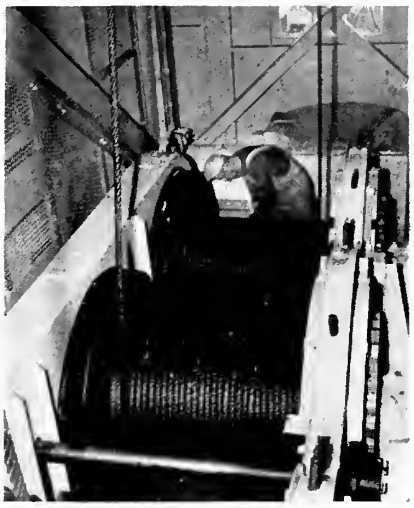


Fig. 3. View in machinery house.

Main hoist capacity	60 gross tons at 73′ 0″ radius
Auxiliary hoist capacity	15 gross tons at 100′ 0″ radius
Main hoist speed	22½ feet per minute
Auxiliary hoist speed	60 feet per minute
Minimum operating radius for main hook	42′ 6″
Boom luffing speed	from 73′ 0″ radius to 42′ 6″ radius with maximum rated load on main hook—1½ minutes
Rotating speed	with maximum rated load on main hook—one revolution in 2½ minutes
Deck winches	5000# rope pull at 25 fpm on two drums simultaneously or 10,000# rope pull at 25 fpm on one drum
Roller circle diameter	28′ 0″
Height from deck to boom foot pin	30′ 8½″
Length of boom from boom foot to main block	82′ 6″
Max. height of main hook above hull deck at 73′ 0″ radius	70′ 0″
Reach of hook below deck at minimum radius	30′ 0″
Hull length	120′ 0″
Hull width	60′ 0″
Hull depth	10′ 0″

Fig. 2. Revolving structure of crane is supported on live rollers.

All of the equipment necessary for the operation of the crane is installed in the house on the deck of the rotating structure, with the exception of the deck winches. Within this house there are also enclosures for the protection of electric control panels and for the storing of spare parts required for maintenance of the crane over a

(The author is Mechanical Design Engineer, Crane and Bridge Department, Dravo Corporation.)

long period at an isolated base. One of the outstanding features of this crane is the location of the operator's cab, where all motions of the revolving structure are controlled, which at its elevation will provide the operator with a clear vision of the deck on the average freighter.

Welding was used exclusively throughout in the shop fabrication of the structural parts and wherever possible in the design of mechanical equipment. All joints in the structure that are exposed to the weather were seal welded to protect the faying surfaces of the joint against corrosion. Except for purchased equipment the only castings used were principally those required for gears, brake and clutch drums, sheaves, center stediment assembly and the quill for supporting the rotating pinion. All machining on the weldments, regardless of size, was accomplished by either portable or stationary equipment after the subassembly had been completely welded. Assembly of the structural items at final erection was by means of body bound bolts requiring only the use of spud wrenches. The 5-ton limitation for weight on structural and mechanical units was maintained throughout the design, except for the main diesel generator set.

The revolving structure of the crane

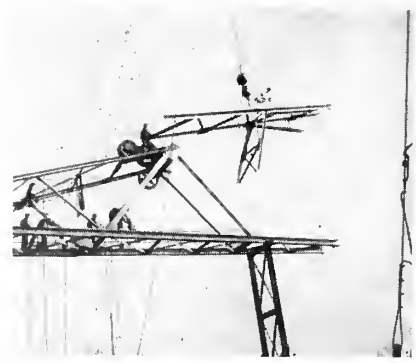


Fig. 6. Three sections were bolted together to make up the 3492-pound assembly here being positioned for bolting to the boom.

is supported on a system of live rollers, as shown in Fig. 2, and held on its center of rotation by a rugged stediment assembly. Additional protection against accidental uplift is provided by a large king bolt included in the stediment assembly, which extends through the deck of the rotating structure and crane base. Figure 2 also shows the arrangement of the deck winches, of which there are two, one fore and one aft of the crane base.

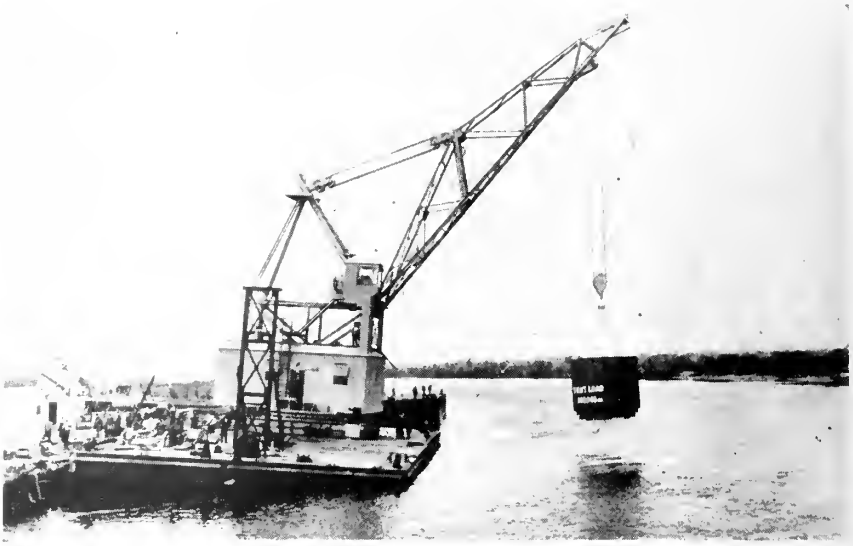


Fig. 1. Sixty gross ton floating crane undergoing test with 168,000 lb. 26 73' radius.

The main power plant for the crane consists of a 150-kw 230-volt direct current generator operated by an Atlas-Imperial diesel engine. An auxiliary 5-kw generator set operated by an Atlas-LaNova diesel engine was installed for standby purposes. All generators, motors, and controls were the product of the General Electric Company.

The hoist engine illustrated in Fig. 3 is the conventional 3-drum friction type with the drums arranged in tandem. The engine is of welded construction throughout, except for gears and drums for the frictions and brakes. In order to reduce maintenance, adjustment, and wear of the many moving parts involved in conventional frictions, air flex clutches with detachable shoes were used. The air supply for these clutches was furnished by an automatic operated air compressor furnished by the Westinghouse Air Brake Company. Each drum is equipped with a flat band emergency brake controlled from the operator's cab and also a ratchet and pawl for locking the drum in any position, which also is controlled from the operator's cab. The load block for the main hoist is reeved in eight parts with one line leading to the drum, and the rope for the boom hoist is reeved in 19 parts with one part to the drum.

In Fig. 4 is shown the rotating drive, which is arranged in the conventional manner with a motor driving a vertical rotating pinion through a commercial speed reducer and a set of bevel gears. The rotating pinion meshes with a large circular segmental rack bolted to the crane base.

All the subassemblies, mechanical and electrical equipment and necessary tools for erection were prepared for export; however, due to the course of events it was found expedient to place some of these cranes in service in this country, and many of them can now be seen operating in harbors on either the East or West Coast.

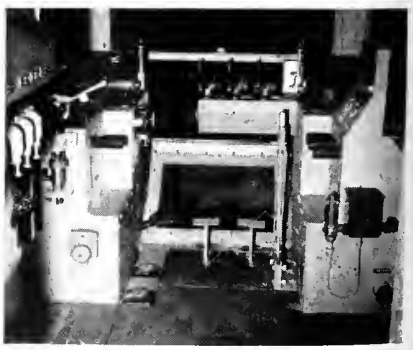


Fig. 5. Operator's station, showing controls.

Roger E. Montgomery, president, National Marine Expositions, Inc., looks on as Brigadier General W. P. Boatwright, vice president of Globe Wireless, Ltd., signs contract for display space in Second Annual National Marine Exposition to be held in San Francisco Civic Auditorium next year.

Globe Wireless Signs for S. F. Marine Exposition

Globe Wireless Ltd. is the first Pacific Coast firm to sign a contract for display space in the Second Annual National Marine Exposition to be held in the San Francisco Civic Auditorium, May 12-17, 1947, under the sponsorship of The Propeller Club of the United States.

This announcement was made by Brigadier General W. P. Boatwright, vice president in charge of all Globe operations, both communications and manufacturing, as he handed Roger E. Montgomery, president of National Marine Expositions, Inc., the contract he had just signed for 400 square feet of display space.

According to General Boatwright, the Globe Wireless exhibit will feature Radiotype, the high-speed electronic typewriter method of handling written communications, invented by Walter S. Lemmon, and recently acquired by Globe from International Business Machines Corporation.

At the exhibit, a Radiotype machine will be in operation demonstrating its many applications for basic users of communications, such as: press associations, newspaper "chains," major banking houses, manufacturing firms, steamship companies, exporting and importing firms, brokerage houses, public utilities companies, airlines and railroads, etc.

Founded in 1928 by the late Captain Robert Dollar, "Grand Old Man of the Pacific," as the Dollaradio, and used in conjunction with his vast fleet of Dollar ships continually sailing around the world, the present Globe Wireless system entered the public correspondence field on April 20, 1934, with the opening of the Manila station.

In addition to its international radiotelegraph system concentrating in communications to the Pacific Far Eastern area, Globe Wireless offers a marine radiogram service to and from ships at sea in every ocean.

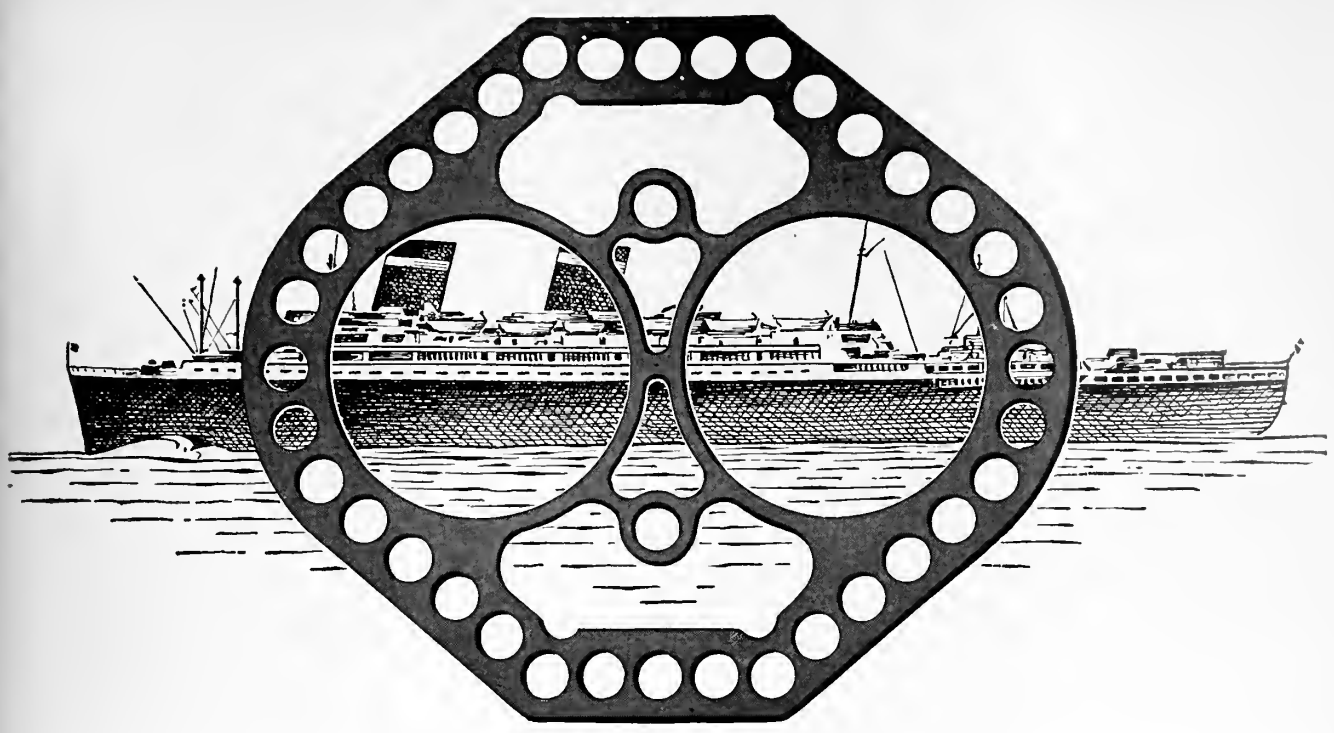
Today the Captain's son, R. Stanley Dollar, is president of Globe Wireless Ltd., and his grandson, R. Stanley Dollar, Jr., who served more than five years in the Army of the United States and was recently discharged with the rank of Major, is a member of the Board of Directors.

"The National Marine Exposition," says its president, Roger E. Montgomery, "is dedicated to serve the American Marine Industry. The first exposition, held in Grand Central Palace in New York City, May 22-25, 1946, proved such an outstanding success that it was decided to make it an annual event, alternating between the great port cities on the Atlantic and Pacific Coasts."

In sponsoring the Second National Marine Exposition, to be held in San Francisco May 12-17, 1947, The Propeller Club of the United States is performing a double service to the American Marine Industry. First: it will provide the means for a panorama wherein every branch of maritime activity will be represented. Leading American ship designers, steamship companies, shipbuilding and repair concerns, manufacturers of every kind of marine equipment, dealers in marine supplies and purveyors of service will display their products and demonstrate the part they are prepared to play in the operation of the new American Merchant Marine. Second: it will add to the prestige of the industry by attracting public attention to the importance of the American Merchant Marine and its accomplishments in war and peace.

A program of special events centering around the Exposition is being planned to intensify public interest in American shipping.

The Advisory Committee of the Second Annual National Marine Exposition includes the following nationally prominent marine industry executives, all of whom are members of the Advisory Committee of The Propeller Club of the United States: Chairman, Arthur M. Tode, honorary president, The Propeller Club of the United States; Harold J. Harding, national secretary, The Propeller Club of the United States; Benn Barber, Admiralty Attorney, Waterman Steamship Agency; C. W. Bryan, Jr., vice president, Federal Shipbuilding and Drydock Co.; John F. Gehan, vice president, American Export Lines; Harmon Lewis, president, Alcoa Steamship Co.; J. L. Luckenbach, president, American Bureau of Shipping; Henry Markwalter, vice president, Luckenbach Steamship Co., Inc.; L. D. Parmelee, president, AGWI Lines, Inc.; Henry Reed, Insurance Company of North America; and O. B. Whitaker, manager, Marine Sales, The Sperry Gyroscope Co., Inc.



When a gasket goes to sea...

When a gasket goes to sea on a refrigeration compressor, it has to be something special.

It *is* something special when that compressor is a G.E.

It's not made of lead alloy that "flows" under pressure. Nor of composition that tends to cement itself to the cylinder block and valve plate. It's a *G-E developed electrolytically plated copper gasket* . . . wear-resisting, pressure-resisting, reliable. This attention to detail is characteristic of G-E marine refrigeration equipment.

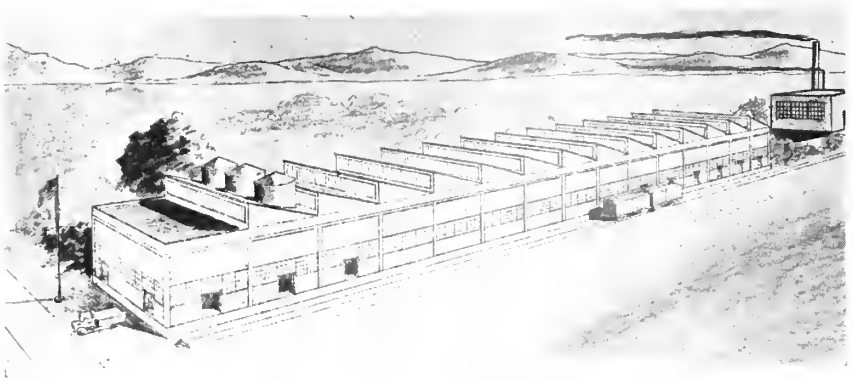
Designs, materials, construction, operation, have all been tested, improved and tested again. That's why G-E equipment stands up under severest shipboard conditions. That's why G-E refrigeration apparatus is turning in such an outstanding record of performance.

To insure cargo profit, passenger comfort and crew morale—specify G. E. for every air conditioning or refrigeration need.

General Electric Company, Air Conditioning Department, Section 6598, Bloomfield, New Jersey.

GENERAL ELECTRIC

Marine Refrigeration



Architect's rendition of new million dollar Asbestos Cement Products Plant to be erected at Redwood City by The Paraffine Companies, Inc., through its wholly-owned subsidiary, Plant Rubber & Asbestos Works.

New Million Dollar Building Material Plant in West

A new million dollar Asbestos Cement Products Plant, which will furnish substantial quantities of building materials to alleviate the supply shortage which is bottlenecking veterans' and general housing and industrial construction, will be erected by The Paraffine Companies, Inc., through its wholly-owned subsidiary, Plant Rubber & Asbestos Works.

The new factory will adjoin Plant Rubber's existing Redwood City manufacturing department where magnesia insulation products are made.

The announcement of the factory expansion was made by R. H. Shainwald, Pabco's executive vice president, who is also president of Plant Rubber & Asbestos Works, which will operate and manage the plant.

Many of the products to be turned out by the new plant facility will be made in the West for the first time. The output will include:

Asbestos cement siding shingles, whose specifications emphasize beautiful graining, permanent white water-proof finish, and a variety of sizes.

Asbestos roof shingles of various designs, water-proof, everlasting, in a line of colors architecturally correct.

Corrugated asbestos siding in sheet form, highly compressed, providing structural strength, fireproof and water-proof.

Asbestos lumber or flat board in large sheets for structural purposes, to be used as a siding or sheathing.

All of these asbestos products will be fireproof, everlasting, vermin-proof, attractive, will not require painting, and will appeal to all classes of users and the building trade—industrial, farm, residential and commercial.

Manning-Mitchell Staff Additions

New additions to the staff of Manning-Mitchell, Inc., San Francisco manufacturers of Racing Copper and Shipping Copper, anti-fouling bottom paints, are **Harold M. Brez,** who was recently released from the Navy where he served as a commander, and **William Ashby,** former Army captain.

Prior to the war Brez was with the California Ink Co. of San Francisco. During the war he was the senior laboratory officer at Mare Island Navy Yard paint laboratory. During the atomic bomb research at Bikini, he was the Navy Department paint specialist, studying the effect of atomic energy on all types of marine coatings.

Ashby was associated before the war with the True Tagg and Geo. D. Wetherwill Co., paint manufacturers in Memphis and Philadelphia. He was in charge of paint disposal for the War Assets Corporation prior to his connection with Manning-Mitchell.

Pacific Coast distribution for Racing Copper, anti-fouling bottom paint, manufactured by Manning-Mitchell, was recently completed, announces **B. M. Wolfe,** president of the firm.

Coast firms distributing Racing Copper are Pacific Marine Supply Co. in Seattle, Oregon Marine Supply Co. in Portland, Weeks-Howe-Emerson in San Francisco, Marine Hardware Co. in San Pedro and Nuttall-Styris Co. in San Diego.

F. J. Dannenfelser, vice president and sales manager of the company, is now in the East completing distributor representation on the Atlantic Coast.

SPERRY LORAN (LONG RANGE NAVIGATION), one of the most remarkable electronic developments evolved from World War II, is outlined in a new booklet by Sperry Gyroscope Company, Inc., of Great Neck, New York. Loran is an entirely new system for determining the geographical position of ships and airplanes, its operating principle being that of measuring the difference in time of arrival of accurately synchronized radio pulses from a pair of special transmitting stations on shore.

INCANDESCENT SEARCHLIGHTS, another product of Sperry Gyroscope Company, Inc., are described in comprehensive detail in a new catalog. These searchlights have been completely redesigned to improve their operating efficiency and appearance.

YARNALL - WARING COMPANY of Philadelphia, Pennsylvania, presents a new circular on the Yarway line of water column trycocks, Bulletin WG-1815. The circular is available for any readers interested in boiler room equipment.

STEAM JET AIR EJECTORS is the title of a new catalog released by Condenser Service & Engineering Company, Inc., of Hoboken, New Jersey. It illustrates the line of Conseco steam jet air ejectors, showing various applications for power plant, industrial, and marine use. Contains engineering data, specifications, graphs, and tables to help the engineer to select suitable equipment.

AMERCOAT DIVISION OF AMERICAN PIPE and Construction Co. have recently published a brochure on Anti-fouling. It contains instructions for the application of Amercoat to prevent corrosion and fouling and results of competitive tests of its anti-fouling properties.

A NEW 64-PAGE PACKING CATALOG has been announced by the Asbestos Textile & Packing Division of Raybestos-Manhattan, Inc., Manheim, Pennsylvania. Attractively printed in two colors, the catalog contains a short history of the Raybestos-Manhattan organization, and a complete description, with illustrations, of all the various styles and types of mechanical packings in the expanded R/M line, together with charts showing the type of service for which each style packing is recommended.

BETHLEHEM SHIPBUILDING AND SHIP REPAIRS is the subject of a pictorial record of Bethlehem Steel Company's Shipbuilding Division accomplishments during World War II, and the post-war ship conversion program. The booklet contains photographs of all the various types of ships constructed by Bethlehem, with captions giving the number of each, the type of vessel and tonnage. Yard and shop pictures indicate the extent of repair and reconversion work.

PRECISION CLEANING WITH EVAPORATOR D-SCALER is the title of a new bulletin issued by Harry W. Parsons, Inc., of San Francisco, California. Included with the bulletin is a report on tests of Thermosol conducted at the San Francisco Naval Shipyard at Hunter's Point.

CHEMICAL PROPORTIONING EQUIPMENT FOR SEAGOING SERVICE (Bulletin No. 1714), has just been released by "Proportioneers, Inc.". It describes the chemical proportioning pumps manufactured by this company, giving complete specifications on two of the assemblies.

THE GOTHAM INSTRUMENT CO., INC., of New York announces a new catalog, No. C-51, covering their etched stem thermometers and hydrometers. The catalog contains a full listing of the line, with illustrations of the products and methods of manufacture.

UNIVERSAL HEAT EXCHANGER DESCRIBED IN NEW BULLETIN from The Griscom-Russell Co. which describes the Twin G-Fin section, that has been characterized as a universal heat exchanger. The bulletin tabulates 21 features and corresponding advantages of this finned tube unit, and describes in detail the design and construction which have been proven by over 14 years of performance and in more than 40,000 installed sections.

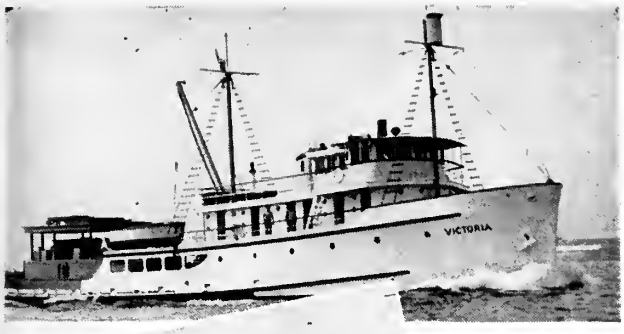
EJECTORS VERSUS PUMPS is the title from the Condenser Service & Engineering Co., Inc., of Hoboken, N. J., new bulletin, which shows the effect secured by substituting their steam jet air ejectors for wet vacuum pumps on ferries and tugboats. It illustrates and gives results of successful tug and ferry conversions.

TWECOTONG ELECTRODE HOLDER: a complete new line of manual arc welding electrode holders known as Twecotong, has just been announced by the Tweco Products Company, Wichita, Kansas, in their 1946 Twecolog. This new line includes full-insulated and semi-insulated models, and the catalog gives full information, together with price and parts lists, which is available from the manufacturer.

A NEW BULLETIN ON EVAPORATORS for distilling boiler feed make-up has just been printed by The Griscom-Russell Co. of New York. Besides describing and illustrating many different types of G-R Bentube evaporators for various capacities and pressures, the bulletin contains several sections of special interest to plant engineers and executives. Included is an explanation of the functions of evaporators, the benefits obtained by their use, the different types of evaporator systems and their association with plant heat balance.

A NEW LOCK NUT FOR INDUSTRY is the title of a brochure put out by the Grip Nut Company of Chicago, Illinois, describing the Gripco lock nut which can simplify production. This new nut is simple in design, of one piece of metal provides a complete self-locking nut, which does away with washers and

(Please turn to Page 134)



142 foot
STEEL TUNA BOAT
"VICTORIA"

Powered by 850 hp Washington Turbo-charged Diesel—owned by Westgate Sea Products, Inc.; Mat Monise, Captain; Ray Allen, Engineer; Clarence Gonzales, Mate.

80 foot PURSE SEINER
"CESARE AUGUSTO"

Recently re-powered with the popular 240 hp Washington Diesel. Owned by John Zuanich; Larry Zuanich, Skipper.

. . because

WASHINGTON DIESELS

pay off in pay loads!

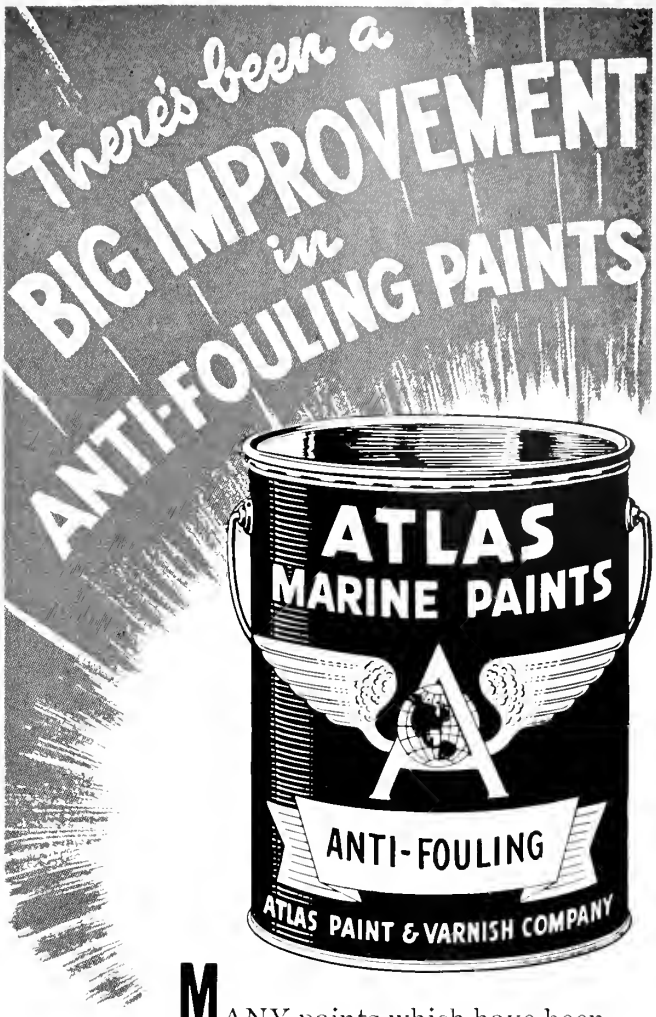
Fishing fleet owners and skippers and commercial vessel operators know how important it is to get back first with the big loads. That's why more and more Washington Diesels are being installed wherever dependable, trouble-free operation is essential. The new "Victoria" is powered with an 850 hp Washington Turbo-charged Diesel and the "Cesare Augusto", built in 1937, has just been repowered with a 240 hp Washington Diesel . . . assurance of **Maximum** performance with **Minimum** upkeep.

WASHINGTON IRON WORKS

THE FIRST WASHINGTON DIESEL EVER BUILT IS STILL IN COMMERCIAL OPERATION!

WASHINGTON IRON WORKS

Seattle 4, Washington



MANY paints which have been accepted for marine use for years have not kept pace with progress.

Newest scientific discoveries and improvements have been incorporated in Atlas Marine Paints, compounded by men with a lifetime of practical experience in specialized marine paint manufacturing.

Atlas Paints, formulated especially for specific marine needs . . such as Atlas Anti-Fouling and Anti-Corrosive paints, will prove upon investigation to be far in advance of old-fashioned formulas.

ATLAS PAINT & VARNISH CO.

Los Angeles, 1922 East Gage Ave., phone KImball 6214
San Francisco . . 201 First St., phone EXbrook 3092
Wilmington 225 N Avalon Blvd., ph Terminal 43251
Galveston, Tex. . . Galveston Ship Supply Co.
Houston, Tex. . . . Galveston Ship Supply Co.
Mobile, Ala. . . . . Seaboard Ship Supply Co.
New Orleans, La. . . Gulf Engineering Co., Inc.

Atlas knows the Marine Field

pins. In this brochure the nation's "oldest lock nut maker" is now offering a lock nut of distinction for general industrial use.

GENERAL CONTROL COMPANY has issued a catalog No. 100, on the various models of their manually operated foot switches. Some of the models illustrated and described are: model MC, the patented "press anywhere" type which is easily operated by foot, knee, hand or elbow; model MI, which has a wide range of applications, is operated by a treadle switch and is ideal for speedy foot control; model MH is for heavy duty application; model MK is a new foot switch developed for long life and trouble-free service and has a wide variety of applications.

LIQUIDOMETER ISSUES NEW MARINE GAGE CATALOG describing a complete, modernized post-war line of tank gages, rudder angle indicators and position indicators for marine craft has been issued by the Liquidometer Corp. of Long Island City, N. Y. This line includes direct-reading and remote-reading hydrostatic, hydraulic or electric liquid-level indicators for fuel, oil and water tanks, and remote-reading hydraulic or electric rudder-angle indicators. The position indicators, with electric or hydraulic transmitting systems, can be used with reverse gear, valve stem position, engine room telegraph and many other installations.

NEW RADIOMARINE LORAN FOLDER: The new RCA loran receiver for shipboard use is described in a new folder published by the Radiomarine Corporation of America. This is the electronic aid to navigation that enables a navigator to determine his position accurately in two or three minutes in any kind of weather. In the folder are a summary of the advantages of navigation by the use of loran, a description of the features of the RCA unit, illustrations of the product and the installations aboard the Waterman liner John B. Waterman and the Swedish American liner Drottningholm, detailed specifications and a list of Radiomarine service stations.

A ROD SELECTOR CHART just received from the Eutectic Welding Alloys Corporation lists the company's products and their suggested applications, and contains factual information which will be appreciated by all those doing welding.

The bonding and remelting temperature is given for each alloy as well as the Brinell hardness. Another column features the strength in psi of these "Low Temperature" welding alloys. Interested readers may secure copies on this 18" x 23" chart on request.

INGERSOLL-RAND COMPANY recently announced their publication of a two-color, 16-page catalog entitled "Two-Stage Centrifugal Pumps." Designated Class GT, the pumps described are offered for general use in chemical plants, paper mills, packing plants, refineries, breweries, canneries and steel mills; they are used on dewatering service and as station pumps in mines, condensate service in power plants, as hydraulic pumps on elevator service. In addition, the GT is widely used on feedwater service for boiler pressures from 100 to 300 lb.

The catalog is well illustrated with cutaway views, types of drive, and typical installations: there are tables of performance, dimensions and pipe friction, and a typical pumping problem is worked out in detail.

LOW PRESSURE EVAPORATORS: A new catalog by Condenser Service & Engineering Co. of Hoboken, illustrates their line of low pressure evaporators and distillers for various industrial and marine applications. It shows the advantages and economies of low pressure evaporation, and gives installation diagrams and cost data.

On the Ways

(Continued from 108)

130 Desirable Ships for American Lines

The Maritime Commission on July 13 authorized the reconversion for sale of 95 C-type vessels, which had been converted during the war into troop and attack transports. Together with 35 vessels of these types which do not need reconversion, this makes available 130 of the most desirable ships. Applications for the purchase of 166 have already been received from American steamship operators for these vessels.

One basis of sale of the vessels needing reconversion requires that contracts of sale to the successful applicants be made concurrently with the signing of contracts with shipyards designated to make the reconversions.

The Commission said that it expects the steamship operators and the shipbuilding and repair industry to cooperate with it in these matters which so vitally concern the future of the American Merchant Marine, and further, that if conversions are not made at reasonable prices, it may be compelled to reopen some of the Commission-owned shipyards in the interest of the American Merchant Marine and the public treasury.

Oil Production in Europe

(Continued from page 97)

considerably in excess of 31,000,000 tons in the last several years. Recent reports from the Soviet Union, however, state that 5,000 wells with an annual yield of 5,000,000 tons were destroyed by the Russians as part of the scorched earth policy, or by the Germans. It will take years to repair such damage. In the Baku area, which produced almost three-fourths of Russia's oil, shortages of equipment and supplies cut production for long periods. In view of these factors and the limited goal set for 1950, it appears that production dropped sharply during the war. British trade estimates set U. S. S. R. production at 23,000,000 tons in 1944 and 25,000,000 tons in 1945.

According to the Russian press, output is expected to rise considerably in 1946. Refineries are resuming prewar standards for petroleum products. Two large, well-equipped oil refineries have been opened in eastern Russia and extensive industrial construction is planned for that area. Oil well drilling doubled in 1945 over 1944 and particular attention was paid to efficient operation and more thorough exploitation of old fields.

One of the major achievements of the Soviet oil industry in 1945 was reported to be the confirmation of oil fields in the Devonian strata near Kuikyshev, in Tuimazy, Severokamsk on the Kama River, and Shugurovo in the Tater A. S. S. R. Intensive development of these areas is expected in the next few years. Many new wells have been opened in the Baku region and a new oil-field is in operation at Buzovny.

Rumania

Before the war, Rumania was the world's sixth largest oil-producing country. Last year 4,640,000 tons were produced, as compared with 3,507,000 tons in 1944. About two-thirds of the 1945 output was exported to Russia. Production in 1946 is expected to be about 4,300,000 tons. The 1941-43 average was 5,600,000 tons.

Drilling during 1945 was half the pre-war average, owing to a shortage of equipment and transportation. There was little exploration, no new discoveries and no important extensions of existing fields.

Refining capacity, more than enough to handle the lower crude production, was rebuilt in 1945. Straight run apparatus was repaired first and by the end of the year there was sufficient cracking capacity to handle production.

Austria

Austria, which began producing crude oil before the war, became Europe's third largest producer in 1944 with an output of 1,210,000 tons. During 1945 production declined sharply under the impact of fighting and bombing. One estimate places 1945 output at 550,000 tons. This year's production should about equal that for 1944.

Oil deposits are being investigated in the environs of Vienna, in the vicinity of Graz in Styria, and in the foothills of the Alps.

Hungary

Hungary's principal oilfields were discovered and developed by a subsidiary of the United States company. Production increased from 1,366 tons in 1937 to almost 250,000 tons in 1940. When the United States entered the war in 1941, the Hungarian government seized the property. Under German pressure, it increased production to more than 800,000 tons a year in 1943 and 1944. This boosted Hungary into fourth place among European producers.

Wells, oilfield installations and pipelines from the fields to the principal refineries were only slightly damaged during the fighting. The refineries suffered from air attack, but all except one are in operation, it is reported.

Oil production declined to an estimated 650,000 tons in 1945, a figure well in excess of the country's normal requirements. Presumably, a considerable quantity of Hungary's present oil production is going to the Soviet Union. Recent reports indicate that oil production will be nationalized.

Atomic Power for Warships

The U. S. Navy Department has just made its first step in the development of atomic power for warship propulsion. A grant of $103,000 has been made to Washington University for research work in this new field. Dr. Arthur L. Hughes, head of the University's Physics Department, will be in charge of the study of atomic power possibilities for war vessels.

Peace Starts Flow of Exotic Cargoes

Have you any need for some salted crocodile skins, or how about ylang ylang oil, greasy wool, mangrove bark, or rabanna? Some people must have, for cargoes of such exotic goods are flowing into the United States daily now that shipping is resuming normal trade. Pyretheum flowers, essential element in insecticide sprays, are again being imported in quantity. Cargo manifests of American ships make interesting reading, the American Merchant Marine Institute reports.

New Shipping Division

The National Federation of American Shipping announced in Washington recently that it would establish a division of tele-communications in August to meet the growing importance of this phase of shipping in this country. The new department will represent American shipping at various international conventions and conferences dealing with electronic aids to navigation, allocation of wave lengths, radar specifications and related questions.

Pacific World Trade

COPPER ALLOY BULLETIN

MARINE AND POWER EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared by Bridgeport Brass Company "Bridgeport" BRASS CO. *Headquarters for BRASS, BRONZE, and COPPER*

Corrosion-Resistant Alloys Increase Efficiency, Cut Maintenance Costs

Although the principal use for tubing in power plants for land stations and ships is in surface condensers there are, of course, many other applications, such as oil coolers, hydrogen coolers, boiler feedwater heaters, jet condensers and other vital equipment, where corrosion-resistant tube alloys are required. Unsatisfactory performance of such tubing can seriously affect operation of the entire plant by interrupting the smooth flow of service and increasing maintenance and replacement costs.

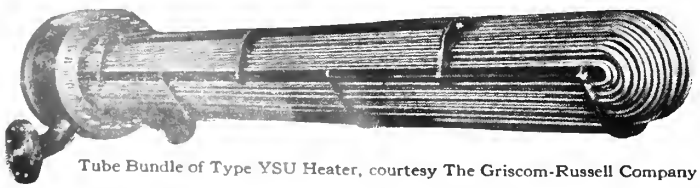
Importance of Alloy Selection

Every power plant engineer realizes the necessity for keeping expenses down, particularly in view of the fact that manpower and materials cost so much more these days. They realize the necessity for greater efficiency to help offset higher costs, and recognize the importance of modern tube alloys, developed in recent years to withstand more severe operating conditions. Although in some cases the first cost may be higher, the added service life and lower maintenance make such tubing more economical in the long run. It will, therefore pay power plant engineers to give the most careful consideration to metal specifications involving engineering requirements. Since water and operating conditions are subject to change with the passage of time, experience has shown that the use of the same tube alloy, which may have been satisfactory before does not always work out. By doing a little spade work in the form of installing several test lots of tubing made from different alloys it is possible to determine more accurately which alloy will best serve existing conditions.

Listed herewith are a number of applications for copper-base alloy tubing in power plants, with the alloys most generally used. Operating conditions, equipment design, nature of the gas or liquid handled and other factors must be taken into consideration.

Applications For Copper-Base Alloy Tubing in Power Plants

- Air Cooled Heat Exchangers (Copper Fins on Admiralty or Copper)
- Auxiliary Steam Evaporators (Admiralty)
- Boiler Blowdown Heat Exchangers (Admiralty, Muntz Metal or Cupro Nickel)
- Boiler Feed Make-Up Water Evaporators (Admiralty or Cupro Nickel)
- Compressed Air Coolers (Admiralty, Copper or Red Brass)
- Compressed Air Lines (Copper)
- Condensate Coolers (Admiralty, Muntz Metal or Copper)
- Diesel Lubricating Oil Coolers (Admiralty, Muntz Metal or Copper)
- Diesel Jacket Water Coolers (Admiralty, Muntz Metal or Copper)
- Economizers (Admiralty)
- Evaporators (Admiralty, Copper, Muntz Metal or Red Brass)
- Evaporator Condensers (Admiralty, Aluminum Brass, Duronze IV or 70/30 Cupro Nickel)
- Exhaust Gas Water Heaters (Admiralty or Aluminum Brass)
- Feed Water Heaters (Admiralty, Copper or Muntz Metal)
- Fuel Oil Heaters (Copper or Admiralty)
- Fuel Oil Lines (Copper, Admiralty or Red Brass)
- Generator Air Coolers (Admiralty or 70/30 Cupro Nickel)
- Gland Steam Condensers (Admiralty, Muntz Metal or Copper)
- Hydraulic Pressure Lines (Copper or Duronze V)
- Hydrogen Coolers (Admiralty or 70/30 Cupro Nickel)
- Instrument Tubing (Copper or Duronze V)
- Intercoolers and Aftercoolers (Admiralty)
- Lubricating Oil Coolers (Admiralty, Muntz Metal, Red Brass or Copper)
- Refrigeration or Cooling Equipment (Admiralty, Copper or Duplex Tubes) made up of a copper-base alloy and steel.
- Steam Condensers (Main or Auxiliary) (Admiralty, Aluminum Brass, Muntz Metal, Duronze IV, Copper or 70/30 Cupro Nickel)
- Tank Suction Oil Heaters (Copper, Admiralty or Muntz Metal)
- Turbine Oil Coolers (Admiralty, Muntz Metal, Aluminum Brass, Duronze IV or 70/30 Cupro Nickel)
- Unit Heaters and Coolers (Copper or Admiralty)
- Vent Condensers (Admiralty, Red Brass or Muntz Metal)
- Water Heaters (Copper, Admiralty or Red Brass)
- Waste Water Heat Exchangers (Copper, Admiralty, Muntz Metal or Red Brass)
- Water Lines (Copper, Red Brass or Muntz Metal)



Tube Bundle of Type YSU Heater, courtesy The Griscom-Russell Company

Wide Range of Alloys Available

Each year Bridgeport supplies to customers many millions of pounds of corrosion-resistant tubing which is subjected to a wide range of operating conditions. For clean fresh water Arsenical Muntz Metal, Red Brass and Arsenical Copper are giving fine service. For good general corrosion resistance to low velocity sea water, Arsenical Admiralty is frequently recommended. Where sea water has particularly high velocity (over 7 ft. per second) which causes ordinary alloys to fail from impingement corrosion Aluminum Brass is giving very satisfactory service. 70/30 Cupro Nickel is recommended for rapidly flowing sea water, and has the ability to function satisfactorily at higher operating temperatures. The U. S. Navy specifies 70/30 Cupro Nickel for war ships and other vessels.

Bridgeport's Duronze IV (arsenical aluminum bronze) is one of the finest tubing alloys made. It has stood up well under such difficult conditions as harbor water polluted by sewage and factory wastes and in tidal estuaries where salt water is mixed with polluted fresh water. Duronze IV also has fine resistance to impingement corrosion.

Bridgeport's Duplex Tubing

Where corrosion is too severe for a single metal or alloy—simultaneous attack on the inside and outside by different corrosive elements—engineers should consider Bridgeport's Duplex Tubing. It is available in combinations such as copper-base alloys with low carbon steel, stainless, monel, aluminum or nickel. Bridgeport's Duplex Tubing is solving many severe double corrosion problems. For example, it is being used successfully in ammonia refrigeration equipment with steel to the ammonia side and a copper-base alloy to the water.

Technical Service Department

To determine the condition and life expectancy of your condenser and heat exchanger tubes our laboratory will gladly work with you. Care in sampling, however, is important and this matter should be taken up with us before sample tubes are removed. To help in the selection of the most suitable tube alloy we also offer the services of our Technical Service Department, composed of laboratory-trained men. In the meantime write for Bridgeport's 112-page Condenser Tube Manual.

BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865

NEWS FLASHES

THE 920-FOOT LUXURY LINERS

In July News Flashes there was an announcement of the bid proposals on two 920-foot express passenger liners for the Pacific. More details are now available.

The bid opening date has been set for September 20, delivery is expected by March 1949. Length will be 920-foot, beam 86 feet, passenger capacity has been given as 1238, divided as follows: 1st class 435, tourist 207, 3rd Class 596. The crew will number 590. With a speed of 30 knots it is expected that sailing time from San Francisco to Japan will be eight days.

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RICHMOND YARD BUILDING BARGES FOR OPEN SALE

Kaiser's Richmond Yard No. 3 announces construction of dry or wet cargo barges which will be offered for sale in the open market to shipping lines, shippers, or tug boat operators. Of all-welded construction they will be 120 feet long, 41 ft. 3 in. wide, and 10 ft. 6 in. deep, with a dry cargo capacity of 904 long tons.

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COMMISSION APPROVES ARGENTINE SHIP DEAL

Maritime Commission announces approval of American shipyards to contract with the Argentine Naval Commission for construction of five ocean-going vessels for the Argentine State Merchant Fleet. Three of the vessels are to be 485-foot steam turbine passenger cargo vessels, and two 365-foot diesel refrigerated cargo type. The former to have a speed of 18 knots and the latter 16 knots. Bid opening was set for July 16 with delivery by 1948.

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MARITIME COMMISSION IS TO CONVERT BEFORE SALE

The Maritime Commission has authorized a program of reconversion before sale of 95 of the best war-built ships. It is expected that most of these will be C-3's and C-2's which are the most popular.

The Commission adds that if the bids are excessive on these vessels the Commission-owned yards may be reopened and do the work.

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TWO SHIPS BOUGHT BY LLOYD

The Lloyd Shipping Company of San Francisco announces purchase of two 14 knot, 1400 gross ton vessels, for operation in a fortnightly service between San Francisco and Los Angeles and the west coast of Mexico and Central America. The ships are the Tyee and Taku and were purchased from the Alaska Transportation Company.

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ARMY TO SHIP ITS FREIGHT ON PRIVATE VESSELS

General McKay of San Francisco Port of Embarkation announced a program of conversion of wartime troop ships into passenger transports with facilities for the families of Army personnel. At the same time he announced that as rapidly as possible freight traffic will be handled by private vessels. To this end the Army has been releasing to WSA for transfer to private companies various cargo vessels which have, during the war, been used for Army purposes.

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WSA TO CONTINUE UNTIL SEPTEMBER 30

Because the Maritime Commission was being reorganized under its new chairman the planned liquidation of the WSA on June 30 was postponed and it now expected that all WSA functions, powers and duties will be referred to the Maritime Commission on September 30.

PASSENGER TRAFFIC HEAVY

San Francisco steamship passenger vessels are quoted as being able to book about 1/10th of the applicants for steamer travel and they add that they are for the most part sold out into mid 1947.

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COMPETITIVE RAIL RATES

In response to a suggestion by Interstate Commerce Commission the Maritime Commission has compiled a list of rail freight rates which definitely affect water-borne traffic. Support of the steamship companies' and the Maritime Commission's demand for relief from the unfair rail rates is forthcoming from the Secretary of War, Secretary of Navy and Secretary of Commerce, all of whom urge early inquiry.

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SUBMARINE SIGNAL MERGES WITH RAYTHEON

On an exchange of capital stock the Raytheon Manufacturing Company and the Submarine Signal Company have been combined with the latter continuing as the Submarine Signal Division of Raytheon. A number of top officials of Submarine Signal appear in the revised set-up.

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DETAILS OF FOREIGN SHIP SALES AND CHARTERS

The foreign demand for purchase or charter of war-built American merchant vessels reached 1246 by the first of July. Applications to purchase totaled 664 from 24 nations as follows:

China	162	France	85	Norway	84
Panama	67	Italy	50	Netherlands	46
Great Britain	46	Honduras	29	Argentina	15
Greece	12	India	12	Denmark	12
Peru	8	Philippines	8	Yugoslavia	6
Canada	4	Chile	4	Egypt	4
South Africa	3	Poland	2	New Zealand	2
Brazil	1	Venezuela	1	Sweden	1

Included in the above were applications for 256 Libertys and 164 coastal vessels.

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SHIP SUBSIDIES TO GO UP

The Commerce Department in a report on merchant shipping estimates that the pre-war ship operating subsidy bill of $12,000,000 will be increased to $30,000,000 due to the greatly increased wage bill of American flag ships and also, to the fact that the number of vessels under subsidy is certain to be at least doubled.

Since the above report was compiled there have been announcements from many Atlantic, intercoastal and new operating companies that they will seek the assignment of routes now subsidized in the Pacific and the figures quoted above look conservative.

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LIBERTY COLLIERS IN GREAT DEMAND

Liberty-type colliers built during the war for the New England coal trade will find continued peacetime use. There are 45 applications and only 23 available.

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WRECKED SHIP'S POWER PLANT USED IN ALASKA CITY

The 16,000 ton tanker Sackett's Harbor which broke in two during heavy weather in the Pacific while under operation by Pacific Tankers, Inc., has found a new use for its power plant. Under her own power the stern section was brought to Adak and later to Anchorage, Alaska and is there used as a source of emergency electric power until the city can build permanent power facilities.

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NEW NAME FOR EUROPA

Former German liner Europa has been awarded to France as reparations and will be prepared for Atlantic service this year. The vessel will be renamed the Liberte.

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JOSHUA HENDY GETS BIG ORDER

The Bureau of Reclamation has awarded a contract to the Joshua Hendy Iron Works, San Francisco and Sunnyvale, for 1188 racks for the Grand Coulee Dam. Contract amounts to $310,000.

WILLIAM J. BUSH OPERATING WEST COAST TERMINALS

The West Coast Terminals recently formed by William J. Bush, former vice president of American President Lines, is now in operation in Portland as a general terminal and stevedoring business. The Portland facilities were formerly the Oceanic docks and include 3 berths with 400,000 cub. ft. of refrigeration and warehousing space at dock side. The company has been operating in San Francisco for several months and will be set up in other coast cities soon. It is expected that the next terminal to be set in operation will be at Long Beach.

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RECORD BREAKING EXPANSIONS IN LOS ANGELES

The total investment in new and expanding industrial facilities in Los Angeles County in the first six months of the year totaled over $92,000,000. This half year total compares with a full year total of $83,000,000 for 1945.

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BIDS INVITED ON CONVERSION OF 4 ATTACK TRANSPORTS

The Maritime Commission announces that bids will be received until August 12, 12:15 P.M., at its office in Washington for the conversion to merchant vessels of four C-2-S-El attack transports. These vessels are the Navy's Sumter, Warren, Wayne and Baxter, and are now available for inspection through the War Shipping Administration, Port Captain, at Mobile.

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FIVE TYPES OF SHIPS FOR SALE--BOOKLET PLANS AVAILABLE

Five types of ships have been blue-printed by the Maritime Commission in booklets which have been made available for purchase. All of the booklets are on sale by the Maritime Commission at a cost of $5.00 per copy, with each showing the stowage and capacity of the respective ship types. They include the C-types, Victory ships, Liberties, tankers, and coastal cargo vessels. The Commission declared that booklet plans for additional types of vessels will be placed on sale from time to time.

"For the most part," the Commission said, "the ships available for disposal are presently in operation and will continue to be operated for some time, or until delivered to purchasers or charterers. In general, therefore, it is impossible to arrange for particular vessels to be inspected prior to application for sale or charter.

"Inquiries addressed to the Division of Large Vessels Sales and Charters, Maritime Commission, will receive prompt attention."

Addressed to "All Prospective Applicants for the Acquisition of War-Built Merchant Vessels", the Maritime Commission announcement was signed by W. W. Smith, Chairman of the Commission. It listed the following ship types as to which stowage and capacity booklet plans are now available, and asserted that checks must be made payable to the United States Maritime Commission:

"C" TYPES: C1A Diesel (Shelter Deck); C1B-Turbine (Full Scantling); C2-S-BL (Shelter Deck); C3-S-A2 (Shelter Deck).

VICTORY TYPES: VC2-S-AP3, 8,500 SHP Cargo.

LIBERTY TYPES: EC2-S-C1, Standard Cargo; Z-EC2-S-C5 (Boxed Airplane Carrier); EC2-S-AW1, Collier.

TANKER TYPES: T2-SE-A1, 6,000 SHP, 141,000 bbl; T2-SE-A2, 10,000 SHP, 141,000 bbl; T3-S-A1, 7,000 SHP, 133,000 bbl; T1-M-BT-1, Coastal, 31,000 bbl.

COASTAL CARGO TYPES: C1-M-AV1, Diesel; N3-S-A2, Reciprocating, oil fired.

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PACIFIC TRANSPORT-HAWAIIAN LINK

The Inter-Island Steam Navigation Company of Honolulu has purchased a substantial interest in San Francisco's recently organized Pacific Transport Lines. Richard A. McLaren, President of Pacific Transport Lines, said the Honolulu firm acquired its interest through purchase of stock and that the interest was not a controlling one.

Inter-Island, a typically Hawaiian enterprise, operates 8 ships of up to 3,000 tons. Alignment of the two interests adds still more Hawaiian flavor to the Pacific Transport lines. The directorate, which now includes Stanley Kennedy, also includes Walter Dillingham, Paul Fagan and J. B. MacCargar. The latter three are Trustees for the Irwin Estate, long identified with Hawaii.

GRACE LINE ASKS ORIENT PERMIT

Grace Lines is applying to the Maritime Commission for permission to operate freight and passenger service between San Francisco and the Orient. It is expected that service will start within four months after approval.

The Company will use modern freighters, carrying 12 to 50 passengers, which will call at Japanese, Chinese and Philippine ports. The company will not seek a subsidy, believing that the California-Orient trade can be built up without it.

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GIANT CONSTRUCTION PROJECT IN CHILE

Preliminary findings on a Transandean tunnel project, prepared by an Argentine-Chilean technical commission, have been released, according to the Office of International Trade, Department of Commerce. A 12½ mile all-year tunnel, the longest mountain tunnel in the world, is planned, the average altitude of which will be about 8,465 feet above sea level.

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MATSON IN THE AIR

The Matson Navigation Company has commenced service by air to Hawaii by flying non-scheduled planes with passengers and cargo. This is permitted under CAB rulings. The "Sky Matsonia" circled the liner Matsonia midway between San Francisco and Honolulu on July 14. It is expected that a second plane of similar type will soon be in operation.

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NEWLY FORMED PACIFIC FAR EAST LINE

Plans for still another transpacific steamship service by the newly-formed Pacific Far East Line to begin operations within the next 60 to 90 days were disclosed by Thomas E. Cuffe, who is resigning as vice president of American President Lines to organize the firm.

Other persons associated with Cuffe in the new American-flag venture, on which further details will be disclosed later, are William T. Sexton, co-owner of the Coastwise Line, and Kenneth D. Dawson, vice president of the United States Lines with offices in San Francisco.

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THIRTY-TWO TRAWLERS FOR FRANCE

The Bath Iron Works, Bath, Me., has received a contract from the French Supply Council, Washington, D. C., for 32 large trawlers. Six of the vessels will be powered with Danish-built Diesel engines of 1,320 hp and will be 240 ft. long. Six other trawlers will have a length of 152 ft., while the remainder will be 117 ft. long. This new fleet will operate off the Grand Banks and deliver the fish catch to French ports. The loaded speed will be 17 knots.

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HIGH POWERED BRITISH TANKER

The world's highest powered turbo-electric propelled tanker is now completing at Swan, Hunter and Wigham Richardson's Wallsend yard, England, where she was recently launched. She is powered with a double British-Thompson-Houston turbo-electric propelling motor unit of 13,000 hp on a single shaft, and has a deadweight capacity of 17,860 tons. This motor is supplied with current from two sets of BTH turbo-alternators. Steam pressure will be 450 lb. at a temperature of 750°F.

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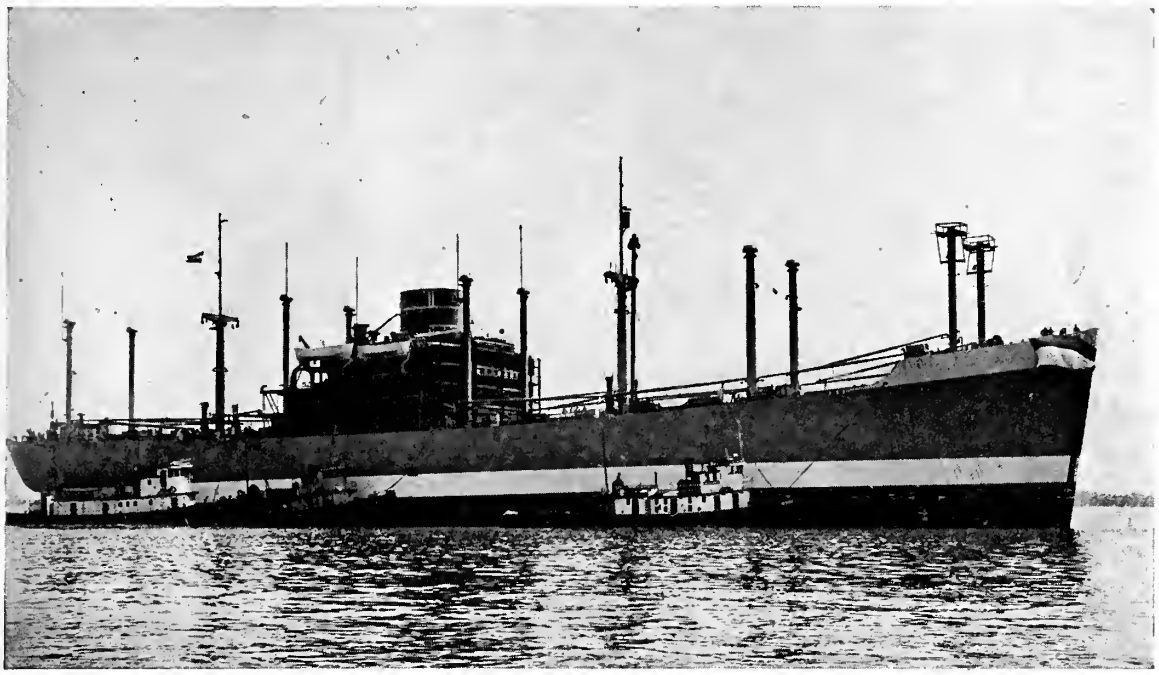
JOSLYN & RYAN PLAN BIG CONVERSION JOBS

The General Meigs and General W. H. Gordon, P-2 vessels, whose interim conversion from transport to passenger and freight carriers for APL was recently completed at Moore shipyard--will undergo complete overhaul and conversion next year. Contract for preparing plans and specifications has been given to Joslyn and Ryan of San Francisco. It is expected the job will run to several million dollars for each ship.

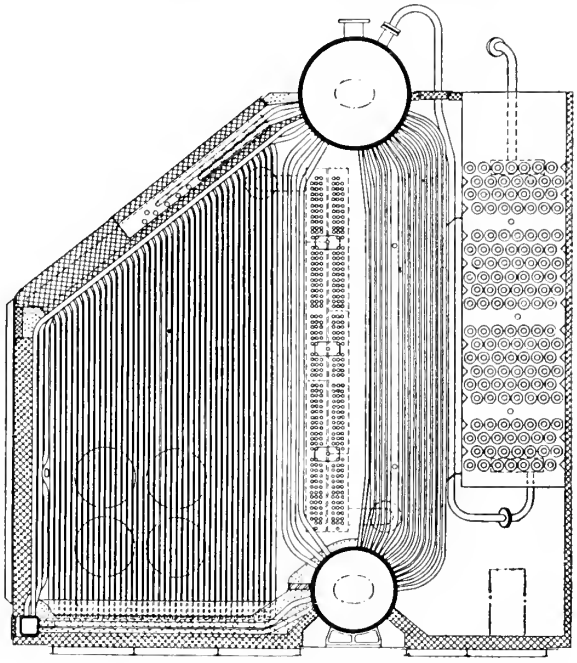
Modern Merchant Fleets...



S. S. Overijsel, one of 10 cargo ships being built for the Netherlands government by Sun Shipbuilding & Drydock Company at Chester, Pa.

THE United States Maritime Commission's C-3 design, with some modification, has been selected by the Royal Netherlands Shipbuilding Commission for the first 10 vessels to rebuild Holland's merchant marine. These modern cargo carriers are 465 ft. B.P., have a beam of 69 ft. 6 in., and are 33 ft. 6 in. deep. Geared steam turbines develop 8,500 shaft horsepower.

Two Foster Wheeler cross-drum marine steam generators installed in each of six of these ships will supply all power for propulsion, heat and light. In addition to steam generators, each of the six will be fitted with FW superheaters and extended surface marine economizers.



"D" type marine steam generator. Two units will be installed in each of six ships now under construction in the Netherlands.

FOSTER WHEELER CORPORATION

San Francisco 4	Los Angeles 15	New York 6
206 Sansome St.	714 W. Olympic Blvd.	165 Broadway

FOSTER WHEELER

Winter Company Appointed Sims Pump Agent

The Eugene V. Winter Co., engineers and manufacturers' representatives for the past 30 years, have just been appointed sole representatives for the Sims Pump Valve Co., of New York. The Sims pump valves are thoroughly proven practical valves of a scientific patented design, adaptable to any and all reciprocating pumps in all kinds and conditions of service.

Other Sims products are: "Simsite" graphitic packing rings, which are of non-metallic composition snap-rings for liquid end pistons. The "HusHeater" or "Silent Preheater" for installation in hotwells, feed water heaters, or wherever a liquid is to be heated by live steam; the "HusHeater" is guaranteed to stop all noise so common in hotwells, filter boxes, and increase heat transfer efficiency.

The Eugene V. Winter Co. invites inquiries on the above products, on which they have complete data and samples on hand. They are also district representatives for such well-known products as American Hammered Piston Rings, Maxim Silencers, National Transit Pumps, and Red Hand Paints.

The Company is located at 15 Drumm Street in San Francisco.

New Officers of Northern California Section of the N. A. M. E.

Morris Weitzner, Chief Engineer of Bethlehem, San Francisco, is 1946 president of the Society of Naval Architects and Marine Engineers.

Bud Stewart, director of the Society.

New Officers of Northern California Section of the Society of N. A. M. E.

H. E. Kennedy, vice president of the Society.

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Gordon Colberg, Standard Oil Co. of California, new secretary of the Society.

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Educational Lectures Offered by Maritime Service

"The U. S. Merchant Marine, Its Effect on Economic Stability," is the subject of an address being given in Northern California cities, it was announced by U. S. Maritime Service.

The speaking itinerary is being arranged by Lt. Comdr. Frank L. Dwinnell, U.S.M.S., regional information officer of the U. S. Maritime Service. The object of the series of addresses is to better acquaint the business and civic leaders of the interior cities and towns of the importance of an efficient merchant marine and what it means to every community.

Groups or organizations interested in having a speaker address their members should write to Lt. Comdr. Frank L. Dwinnell, at U. S. Maritime Service, 1000 Geary Street, San Francisco.

Among the first to request a speaker were the following organizations: Lions Club, San Rafael, California, July 18; Kiwanis Club, Healdsburg, California, July 30; Lions Club Dinner, Vallejo, California, August 1; Alameda Breakfast Club, Alameda, August 7; Kiwanis Club, Monterey, California, August 14.

Commander D. B. McMichael, U.S.M.S., enrolling and liaison officer for the U. S. Maritime Service, will be the speaker at the Alameda Breakfast Club and Lt. Comdr. Dwinnell will address the other groups.

Improved Facilities for National Tube Co. Plants

An extensive program of improved new facilities at the plants of National Tube Company at Lorain, Ohio, and Gary, Indiana, to enable that company better to meet the estimated future demands for steel pipe was announced by C. R. Cox, president of this Nnited States Steel subsidiary.

An entire new Bessemer steel plant, including three Bessemer converters and all necessary auxiliary equipment, will be installed at Loan to replace the existing Bessemer steel facilities in that city.

Completion of these two projects, scheduled to start soon, when completed will require about two years.

Harry Martin, port engineer, Moore McCormick Line.

To Veterans Interested in Sea-Going Career

Honorably discharged veterans of the armed forces who desire to school for a sea-going career in the U. S. Merchant Marine will be given special preference, it was announced by Commander D. B. McMichael, U. S. M. S., enrolling officer. Youths 16 years of age and men 18 to 50 who are not eligible for military duty may apply also. Trainees receive salary, clothing and quarters at the U. S. Maritime Service Training Station, Alameda, California, while in training.

Applicants should write or call at the U. S. Maritime Service Enrolling Office, 1000 Geary Street, San Francisco, California, for further details.

In Case You've Forgotten!

For the benefit of sailors who are soon to be civilians again, the following definitions are given:

Deck—52 playing cards.

Head—The part of a nail you hammer on.

Yard—Attached to a house and needs raking constantly.

Flat Top—A deceased Dick Tracy character.

Sack—A paper receptacle for groceries, etc.

Dog Tag—A biting permit for a canine.

Quarters—Four to the dollar.

Chow—A dog with lots of fur.
—Mare Island Grapevine.

Naval Ordnance Development Award To Flintkote

The Flintkote Company is the recipient of the Navy Department Bureau of Ordnance Development Award for distinguished service to the research and development of naval ordnance during World War II. This was especially for testing and use of the cavity lining compound for thin-walled ammunition.

Flintkote did more than develop a suitable material for lining the cavities of thin-walled ammunition. Late in 1939 and early in 1940, when the British Government started its ambitious Empire training program whereby thousands of its combat fliers and ground crews were trained in Canada for the European and Pacific war theaters, many of the airport runways at the numerous airfields which literally sprang up overnight in Canada, as well as the runways and roads at important bases like Argentia, Newfoundland, were paved with asphalt emulsions and "Colas," manufactured and distributed in the United States and in Canada by Flintkote's subsidiary company, Colas Roads Limited.

In 1941, when the United States began to mobilize for defense, the Company introduced a full line of camouflage paints in approved Army and Navy colors as well as blackout materials for civilian use. In 1943, when the Army needed a material to cover faulty wood floors, the company's technicians developed a suitable cantonment flooring.

As a further contribution to World War II, they built new manufacturing units at East Rutherford, N. J., New Orleans, La., and Los Angeles, Calif., to produce a confidential war material widely used by the United States and British Navies and the U. S. Maritime Commission. Known as "plastic armor" this Flintkote composition material was effectively used as a protective blanket on steel placed around the wheelhouses, anti-aircraft turrets and other areas of both naval and maritime craft to provide protection against projectile fragmentation and ricocheting of shells. Later this material was used in tanks and was available as a covering for machine gun crews on beaches had it been necessary to invade Japan proper.

Shoreside Personalities

CAPTAIN V. P. MARSHALL is ashore once again as Port Captain for Deconhil Shipping Company in the new office recently opened in New York.

CARROLL E. GRAY, JR., has been elected chairman of the board of Sterling Engine Company, it was announced by Addison F. Vars, president.

Mr. Gray is president and director of Doyle Manufacturing Corporation and chairman of the board and director of Pittsburgh Metallurgical Company, Inc.

ROBERT W. HORTON, director of Information for the War Shipping Administration and the U. S. Maritime Commission since 1944, retired on June 1. No announcement was made of his plans for the future.

F. K. McDanel, president, American Bridge Company and Virginia Bridge Company.

McDanel New Head of American Bridge

Announcement was made of the election of **Frank K. McDanel** as president of American Bridge Company and Viriginia Bridge Company, almost 42 years to the day since he began work as a shopman's helper at American Bridge, world's largest fabricator and erector of steel structures. He succeeds **Leon A. Paddock,** whose retirement as president of these two United States Steel subsidiaries was announced.

Arthur J. Paddock has been elected to replace Mr. McDanel as vice president in charge of manufacturing operations of American Bridge. He has been manager of the company's Gary, Ind., plant.

Traffic Man Joins Bethlehem Pacific Coast Steel

Bethlehem Pacific Coast Steel Corp. has just announced the appointment of Carl Wadsworth as district traffic manager for the company's Southern Area operations. He will maintain his headquarters at Bethlehem Pacific's Los Angeles Plant in Vernon.

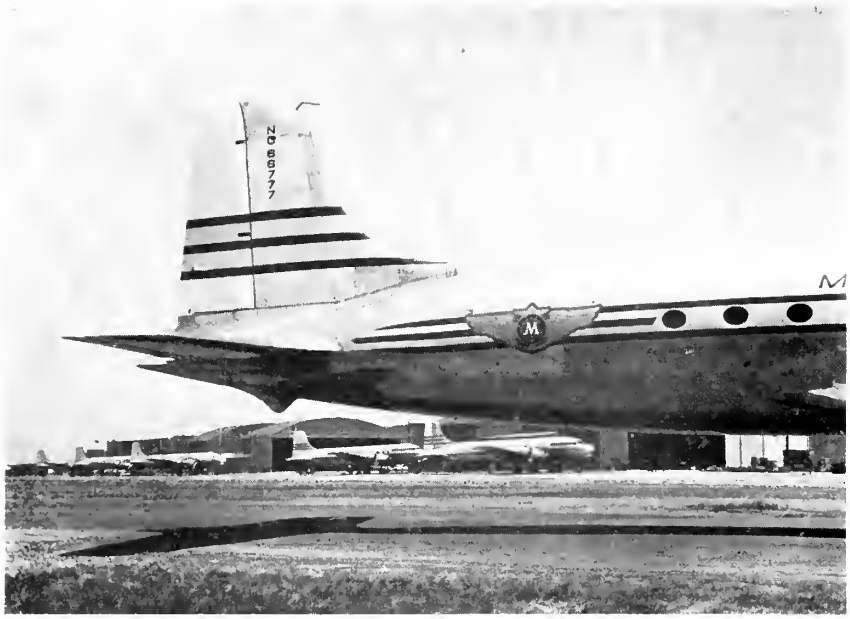
Carl Wadsworth, district traffic manager in Southern California for Bethlehem Pacific Coast Steel Corp.

Wadsworth, a native of Cleveland, Ohio, began his traffic career with the Ford Motor Company in 1935 and since that time has had a wide and varied experience in this field.

During his years in traffic work, he helped organize and was president of the Harbor Transportation Club of Long Beach and Los Angeles Harbor and is an active member of the National Transportation Fraternity, Delta Nu Alpha.

R. P. Strough, assistant director, West Coast area, U. S. M. C.'s Oakland Construction office, announces that **R. Ticnor** has been designated Acting Chief, Engineering Technical Section.

GEORGE F. NICHOLSON, consulting engineer, recently returned from military service and has announced the re-opening of his former offices in Los Angeles and Washington, D. C., on June 1, 1946. He is following the same policy as prior to the war in specializing on harbor and waterfront engineering, construction and beach preservation. Nicholson's offices are located in Washington at 518-19 Union Trust Building, and in Los Angeles at 817-18 Foreman Building, at 7th and Hill Streets.



Tail end of skymaster, showing Matson's Air transport emblem.

Matson Begins Special Air Service

(Continued from page 92)

place under a cloudless sky as the Sky Matsonia dropped from 9000 to 500 feet above the sparkling blue surface of the Pacific to circle and salute, by dipping its wings, the surface liner S.S. Matsonia.

Messages had been exchanged by radio between the two Matson passenger carriers prior to the rendezvous and hundreds of persons aboard the Matsonia crowded the upper decks to observe the mid-Pacific meeting.

The Sky Matsonia arrived over the S.S. Matsonia precisely at the moment forecast by the airplane's navigator and the surface craft was circled twice by the Sky Matsonia with passengers aboard both vessels waving to each other and the steamer's whistles tooting lustily.

The "Sky Matsonia" carried several passengers who had earlier been booked to travel by surface but decided to go by air when they discovered that Matson offered both surface and air facilities. Their heavy baggage came by surface vessel.

The big airplane made the trip from Honolulu to the San Francisco Bay Area in twelve hours while the surface vessel covered the distance in four and one-half days.

Throughout this and other trans-pacific crossings the "Sky Matsonia" used the Matson surface vessels as homing points for navigational purposes in the long over-ocean flights. As full service is restored to Matson routes the planes will have ready access to such service.

Pacific World Trade

Babassu Nuts Are Coming In

Two consignments of babassu nuts, once restricted by the Government and diverted from the Pacific Coast because of their use in the making of explosives and in industrial processes related to the war, have passed through the Port of Oakland and are expected to be processed again in large quantities.

The pale yellow oil secured by crushing the nuts is still restricted by the Government for industrial use, such as in the making of plastics, safety glass, and the tanning of leather, and as a basis for soap, although it can be used for margarine and hundreds of other uses similar to that of cocoanut oil.

The nuts are found in great clusters like bananas on a jungle tree which grows in great profusion in the Amazon Valley and throughout equatorial Brazil, and are divested of their extremely hard shells before being shipped to the United States. There are between three and five kernels in each shell, and some clusters often have as much as 600 pounds of the nuts. Because of the unlimited jungle supply, no attempt has been made to grow the nut domestically. The oil derived from crushing the nut is high in glycerine content, and it is estimated that two-thirds of each kernel is made up of oil.

Although the nut is declared to be edible and is similar to the "nigger toe" familiar to American children, it is not recommended as a food because of its tough fibrous nature. The first commercial lots of babassu nuts were brought into the United States about a decade ago. Hundreds of uses are expected to be found for it during the years to come.

APL Advancement

Russell Lutz, executive vice president of American President Lines, recently announced the promotion of W. K. Varcoe, assistant freight traffic manager, to the position of freight traffic manager, with headquarters in San Francisco. Mr. Varcoe has also seen long service with the company, having begun his shipping career in 1924 as a mail clerk for the Dollar Steamship Lines.

Announcement was also made of the creation of the position of general manager, Atlantic District, with headquarters in New York. **A. A. Alexander,** who is at present general agent, New York, has been appointed to fill this new position. Mr. Alexander, too, is an old time employee with a service record dating back to 1920, at which time he joined the Canadian Robert Dollar Company in Vancouver as a messenger.

Cuffe Leaves APL to Enter New Venture

E. Russell Lutz, executive vice president, American President Lines, announced the resignation of **T. E. Cuffe,** vice president in charge of the Eastern United States territory and freight traffic manager, to accept a very substantial assignment with a new enterprise. In his twenty-five years with the company, Cuffe rose from clerk in the Freight Department of the Robert Dollar Company in 1921 to vice president of American President Lines in 1943. He has established an enviable name in the shipping fraternity in all parts of the United States as well as abroad, which should form the background for important development in his future career.

Wilber & Son Expands Plant Facilities

Wilber & Son (since 1919), one of Pacific Coast's largest life preserver manufacturers, again expands to meet increasing demands for its products.

The company takes pleasure in announcing the completion of a new annex to its original plant. The additional production and warehouse facilities add more than 50 per cent to its original floor space and production capacity.

In line with the expansion program, the company has also opened a warehouse in St. Louis, Missouri, in order to facilitate deliveries to its many eastern accounts.

The sales and national advertising program of the firm emphasizes the policy of the company, which calls for sales to jobbers only throughout the entire nation.

Wilber & Son or its sales representatives will be more than pleased to answer inquiries regarding new jobber territories, a few of which still remain open.

R. C. King & Co., 1112 Second Ave., Seattle 1, Wash.; Jack Waddell & Sons, P. O. Box 1316, Nashville 7, Tenn.; B. J. Hicks, 585 Mission St., San Francisco 5.

Safety at Sea

—continued from page 70

any person, or vessel, imperiled at sea. Aircraft, with specially developed lifesaving equipment, can drop rafts, exposure suits, life preservers, fuel and provisions to those in need. When helicopters are used, means are available for hoisting injured personnel into the plane. This may be done from the water, or by basket from a ship. Planes can also be used to collect meteorological data and, by use of aerial photographs, make charts. Despite these advantages, however, no demonstrations have shown that an airplane can tow a ship or help it fight a fire.

Safety Recommendations

All recommendations are the profits of experiences which have been recorded, compared and evaluated into new, or revised, standards. In other words, we correct in our new product the mistakes we made in the old. This applies to men as well as ships. But to ascertain noteworthy recommendations, investigatory procedures must be undertaken.

Speaking of the materiel side now, the man-hours of investigatory work in connection with a collision, shipwreck, or burned-out boiler are numerous. The time consumed in uncovering the technical details attributing to such hazards, recording them and making seasoned recommendations is great. The selection of the best recommendations for incorporation into new or revised standards is a tedious task requiring consultations with all major interests in the industry. When the modified recommendations are finally approved, we are ready to begin phase one of our orbit over again. This same process is equally applicable to maritime personnel.

No investigation of a marine casualty or disturbance of any type could be successfully terminated without, at some time, interrogating the personnel most familiar with its occurrence. The primary purpose of such interrogation is to seek remedial measures so as to minimize the likelihood of recurrence of the conditions. Facts thus uncovered can be re-expressed in terms of professional standards for succeeding candidates. For the same reason, should it be found that the personnel involved in a maritime irregularity were acting with negligence, incompetence, misconduct, or willful violation of law, punitive measures must be taken. These steps also are necessary to insure the operation of a safe, efficient and economical merchant marine.

Relience on experience alone is not sufficient by itself for ascertaining remedial measures. In addition to experience, modern recommendatory processes should be accompanied by systematic research and development. Members performing such work usually have inquiring minds and by their intensive research can often uncover an unseaworthy condition while in its embryo stage. We have seen this process produce some definite advantages during the war when new materials, new techniques, new designs, new equipment and new standards were developed and applied to the maritime industry at large. Thence, the lessons learned from experience, together with the results of research, are fed back as Maritime Safety Standards.

It is apparent from the foregoing that safety at sea is a vital and growing factor in the maritime industry. It comprises the utilization of life and property for the universal welfare of man. Accordingly, no one organization can claim exclusive credit for the origination and dissemination of the principles of maritime safety. All of the principles are the result of mutual cooperation which has been fostered through generations of maritime interests.

Safety at sea is a natural process. We build a ship with all known safety standards. We man it with personnel whose competency is based on the experiences of predecessors. We send that ship to sea. In order that it may proceed with safety, we establish terrestrial aids to navigation and shipboard personal aids. But because an element of risk is always present when traversing the sea, we must have rescue means available should a hazard ensue. Then, upon effecting maximum rescue of life and property, we delve into the causes behind that casualty to make recommendations for preventing its recurrence. Safety at sea, therefore, involves a very broad application of all the principles of maritime safety. These principles, when divided into four sections, create an orbit of harmonious balance. Without such balance, the interests of maritime industry could never be fulfilled.

Merchant Marine Honorable Service Button

Distribution of the Merchant Marine Honorable Service button, showing a spread eagle over a Merchant Marine Service Emblem in bronze, which may be worn by every American Merchant Marine veteran who has a Certificate of Substantially Continuous Service, began on June 28, the War Shipping Administration said.

Application letters for the button must give the date and number of the seamen's Certificate of Substantially Continuous Service and must be addressed to the Merchant Marine Decorations and Medals Board, WSA, Washington 25, D. C.

Presentation of Charter to Propeller Club No. 98, Port of the Pennsylvania Maritime Academy, Morrisville, Pa.

Left to right: Lt. Comdr. John F. Charlton, USNR, commanding training ship Keystone State of the Academy; Lt. Comdr. Arthur M. Tode, USNR (ret.), honorary president of The Propeller Club of the United States, who presented the Charter on behalf of the national organization; Captain B. M. Dodson, USNR, superintendent of the Academy, accepting the Charter; Cadet-Midshipman B. S. Long, student president of the Penn. Academy Propeller Club; and Cadet-Midshipman E. E. Moore, battalion commander.

Above: Two hundred Cadet-Midshipmen and faculty assembled to hear Arthur M. Tode explain the purposes and objectives of the organization.

West Coast Man Appointed V. P. of Trumbell Electric

Announcement has just been made of the appointment of Carroll D. Hepler as vice president of Trumbull Electric Manufacturing Company, with headquarters at Plainville, Connecticut. He will continue to serve as president of the Pacific Division, in addition to his new duties.

Mr. Hepler was recently transferred to the East from San Francisco. He joined the Trumbull organization in 1928 at time of purchase by Trumbull of the A. G. Manufacturing Company of Seattle, Washington and Los Angeles, California. On January 1, 1945 he was made president of the Pacific Division of the Trumbull Company, moving from Seattle to new headquarters at San Francisco.

An electrical engineer and graduate of the University of Washington, "Curly" Hepler is well known in West Coast electrical circles. He is a professional engineer in the State of Washington, and a past president of the Washington Electrical Club.

Mr. Hepler has named Willis I. Downie as manager of the Seattle plant, C. E. Barkis as manager at San Francisco and J. W. Barry at Los Angeles.

J. P. WILLIAMS

Williams Is Conference Secretary

John P. Williams, who since 1920 has been secretary of the Pacific American Steamship Association, has retired from that position and become secretary of the Pacific Coast Australasian Tariff Bureau and of the San Francisco Bay Carloading Conference.

With the restoration of private ship operations, the Pacific range is rapidly becoming the most important in the world, and with costs entirely realigned from pre-war the freight rate structure is a problem of immediate importance. Mr. Williams brings to this work 45 years of steamship experience. Coming from his home town of St. Louis in 1901 he started with the Pacific Mail Steamship Company and associated companies in San Francisco, including a period as San Francisco agent for the Panama Railroad Company which operated vessels from the Atlantic Coast to Panama to match Pacific Mail's service on the West Coast. This connection continued until the opening of the Panama Canal, at which time he went to the Orient for four years for the China Mail, spending one year each in Yokohama, Kobe, Manila and Shanghai.

Sales Manager To Visit Coast

Amor R. Klotzbach, vice president and sales manager of the U. S. Gasket Co., Camden, New Jersey, will travel extensively in the far Western states during August and the early part of September in order to ascertain at first hand the gasket needs of West Coast industry and the merchant marine. Much of his trip will be devoted to visiting with the various members of the company's distributor organization from Vancouver to Los Angeles. His knowledge, gained from almost 20 years' experience in the gasket field, should prove of value in the many personal contacts he will make.

Report on the I.L.O. Conference

(Continued from page 79)

by the United States' sudden reaction.

Another running battle, one that went on more or less throughout the conference, concerned the matter of American government subsidies paid ship operators.

No wonder the Americans were for higher wages and shorter hours, Jarman said sourly, as long as "the United States government foots the bill for ship operators."

U. S. delegates arose to deny that the subsidies were being used competitively, and the argument was broadened to include hidden British subsidies; such as high unloading taxes for non-British ships in British ports, and "light dues" imposed on non-British vessels.

The conference was enlivened by various minor flurries. Jarman and M. A. Master, Indian shipowners' delegate, each walked out of the conference, Master as the result of a personal feud with Jarman.

A credentials flurry brought about the questioning of seating of the Argentine labor delegate, Capt. Leandro Amado de Fazio. Objections were raised that de Fazio represented a supposed Fascist regime. Finally he was seated but given no vote.

On the other major conventions passed by the meet the battles were neither so hard, nor so spectacular, as that raging around the wages, hours and manning proposal.

The conference passed a convention that pensions be paid to seafarers having completed a prescribed period of sea service at the age of 55 or 60—one and one-half per cent of his wages for each year of service at 55 and two per cent at 60.

On holidays, the conference apssed a convention providing that after 12 months continuous service masters, officers and wireless operators shall be entitled to not less than 18 working day holidays, while other crew members shall be entitled to not less than 12 working day holidays.

Concerning crew accommodation, the conference passed a convention providing that before construction, blueprints of vessels of 500 tons and over be submitted to "competent authority" for approval of crew quarters and facilities.

The conference's convention on social security for seafarers reads in digest: "Resident seafarers shall be entitled to medical benefits and cash benefits in time of incapacity to work, and during unemployment periods. Benefits shall not be less favorable than those extended to industrial workers . . . " Limited protection is given non-resident seafarers.

In an auxiliary convention the conference urged that members of the I. L. O. enter into agreement so that seafarers of one country employed on board a vessel belonging to another country will be protected so far as social security benefits are concerned.

Toward the end of the conference, when nerves were wearing thin, threats to bolt the meet came so fast and frequently that delegates were joking about them. The American delegation let it be known it was considering, wearily, walking out. So did the British.

And then finally, from the floor, the shipowners' delegation declared it had a withdrawal under consideration.

The situation arose when worker and government delegates voted to recommend that governments be included in representation on the International Joint Maritime Commission, which has long negotiated employer-worker disputes in the industry. That body now permits government representation only in an advisory capacity, and the new recommendation, as passed, would authorize government voting power.

When the vote was announced Snedden, the shipowner leader, asked for a 10-minute recess, telling Congressman Jackson:

"The shipowners' delegation wants to decide whether any useful purpose will be served by their remaining in this conference."

The owners' delegates caucused, came back and informed Jackson they had decided not to bolt. But they continued to be overrun by the labor-government vote steamroller to the end of the conference, two days later.

New Bareboat Charter Regulation No. 1

To insure continuous uninterrupted flow of Relief and Rehabilitation cargoes from the United States to devastated areas for which the War Shipping Administration is responsible, complete coordination of the maximum use of port facilities and necessary control over vessel berthings for shipments of coal and grain cargoes to all European, North African, Indian and Asiatic destinations must be maintained by the War Shipping Administration, according to a recent announcement by Granville conway, administrator. To guarantee such coordinated control it is essential that all U. S. government-owned ships, including those under bareboat charter to private operators, be allocated for such cargoes by the WSA.

Accordingly, effective immediately, any WSA vessel under bareboat charter and available for coal or grain cargoes to European, North African, Indian and Asiatic destination must be nominated and offered to the Division of Allocations for voyage allocation to meet cargo requirements and berthing requirements. Such nominations should be made through P. F. Tunison, WSA, New York, for vessels on the Atlantic Coast; through W. E. McCardell, WSA, New Orleans, for vessels in the Gulf; and through R. Pries, WSA, San Francisco, for vessels on the Pacific Coast.

After allocation of vessel by the Division of Allocations, charter shall be arranged between bareboat charterer and the cargo shipper or claimant on the following basis:

1. Rate of freight to be not higher than the current WSA rate and to be not lower than 10 per cent less than the current WSA rate.
2. WSA voyage charter terms and conditions to apply.
3. Total brokerage commission to be not more than that allowed under WSA General Order No. 45 on bulk cargoes of coal and grain, namely, a sum not to exceed an amount equal to 1¼ per cent of a freight revenue calculated at $4.00 per ton on the total number of cargo tons, or five cents per ton. No other commissions shall be payable by vessel.

KEEP POSTED

(Continued from Page 104)

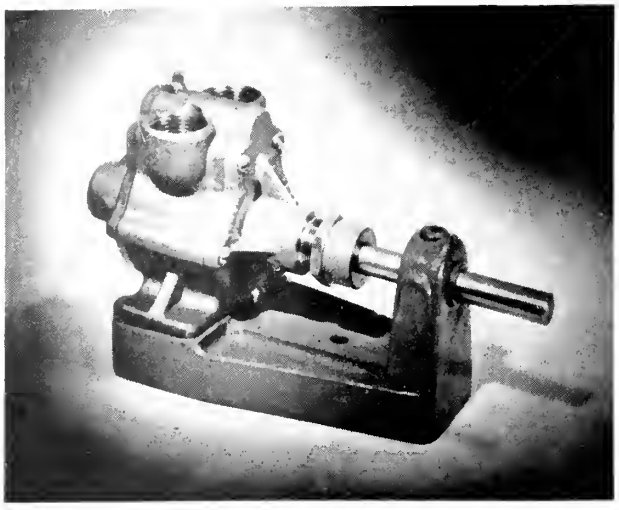
Electronic Dust Precipitator Units

Raytheon Manufacturing Co., of Waltham, Mass., has just announced a new line of electronic dust precipitator equipment. It is manufactured by the Industrial Electronics Division and is available for immediate delivery.

Electronic precipitation brings an entirely new conception of efficiency to air cleaning. Raytheon's precipitator, when installed into duct work systems of industrial air-circulating and air-conditioning installations, removes 90 per cent or more of all airborne dirt, smoke, dust, pollen, oil mist and other contaminating particles. It thoroughly cleans air in metal, textile, precision instrument, food, pharmaceutical and other industries. It cleans bacteria-laden dust and smoke from offices, stores, hospitals, and theaters, removing health hazards and lowering cleaning and maintenance costs. Similar Raytheon equipment is used to clean recirculated air of forced ventilated rotating machinery systems.

The precipitator consists of three parts: the dust-collector cell, the ionizer unit, and the power supply. The ionizers are energized by the power pack with high voltage d.c., creating a strong electrostatic field. As the air passes through this field, every particle of foreign matter, regardless of size or make-up, receives a positive charge. Within the area of the cell are parallel plates, separated by an air gap, alternately charged with the high voltage d.c. The positively charged dust particles are attracted to the negative plate and become firmly attached to this collecting medium.

The collector plates are periodically washed down to remove the dirt. On some units, washing equipment will be completely self-contained; on the other models the collector plates are removed for cleaning. The washing of these collector plates depends on the amount of dirt in the air, but generally it is not oftener than once each month.



Eco Gearless 1-inch pump.

ECO Gearless Pumps

A new double-impeller gearless pump, with standard one-inch connections and an outboard driveshaft bearing and base assembly has been developed for the circulation of fresh water, salt water, or bilge by the ECO Engineering Company, Dept. 224, Newark 1, New Jersey.

Designed to eliminate the most common causes of pump failure, gear jamming and stripping, the ECO pump employs double impellers made of several layers of pressure-vulcanized, laminated material, and can pump equally well in either direction.

The driveshaft bearing and base eliminates the side-pull when the pump is powered by a belt-drive and pulley, and rules out the necessity of constructing and installing an improvised bearing. In addition, it furnishes a solid base on which to mount the pump.

These impellers pass sand, mud, scaley particles, and grit without stalling or jamming and without damage to the bronze pump body, and are easily replaced when the six-screw face plate is removed.

ECO gearless pumps can be mounted at any angle, and will pump in either direction. No adjustments or lubrication are needed, except on the outboard driveshaft bearing.

The overall dimensions of the new double impeller model, with standard one-inch connections and outboard driveshaft bearing and base assembly are 10½" x 4¼" x 5¾". Its capacity varies from 7.5 gallons per minute at 600 rpm to 23 gallons per minute at 1800 rpm.

New Hercules Fence-Master Replaces Whole Kit of Tools

The new Hercules Fence-Master, distributed by the Metals Division of Plastic Molded Products, Inc., Los Angeles 14, California, is an ideal combination tool for home and workshop, farms and ranches, telephone and power linemen, and marine use.

This handy gadget can be used as a wire cutter, wire stretcher, wire splicer, staple puller, pair of pliers or a hammer. Weighing only 1½ pounds and being but 10¼ inches long, it is particularly suited for carrying in car compartment, saddle bag, tool box.

Made of heat treated, drop forged chrome-molybdenum steel with attractive rust-proof finish, the Fence-Master is virtually indestructible.

KEEP POSTED

New Uses Found for Gasket Tool

The Persson Flange Jack, originally designed for quicker and safer gasket replacement on pipe lines has been acclaimed by engineers and maintenance mechanics as ideal for opening all types of flanged surfaces, sectional tanks, evaporators, condenser heads, valve bonnets, heat exchangers and the like. These flanges are the products of T. G. Persson Company, Bloomfield, New Jersey.

This new tool opens flanged surfaces for gasket renewal or other maintenance jobs quickly, easily and safely, thereby eliminating the hammer and chisel method. With Flange Jacks, flanges may be opened or closed without damage to flange faces, with no danger from sparks and no danger from flying wedges or chips.

Flange Jacks exert tremendous pressure smoothly and evenly and there is no shock or vibration, or the possibility of causing new leaks in nearby joints. Bolt holes are maintained in perfect alignment.

The jaws of the Flange Jacks are of heavy, one-piece steel forgings; screw tips are hardened. The standard size Flange Jacks open standard flanges from 2″ to 24″. For large pieces three to four jacks are recommended.

The advantages of these jacks is that they eliminate long, costly shutdowns; make fast, economical repairs possible in hard-to-get-at locations; and offer a high factor of safety to personnel and plant.

Continental Full Opening Escape Air Port

This emergency air escape port was designed for installation aboard ship to provide an emergency escape for a person trapped in a stateroom or compartment. It can be operated by any person capable of turning a crank handle. It meets all government requirements for Safety of Life at Sea, according to its manufacturers, the Continental Engineering Corp. of New York.

Pivot Type S-90 Escape Air Port is adaptable to any living space aboard ship where an open or closed type of air port can be fitted. Deadlight covers and/or screens can be provided on such units where this requirement is necessary. This air port was installed on the S. S. America of the U. S. Lines.

Operation

The window is under control of the crank handle at all times. It operates through worm gear and quadrant connected to a shaft onto which a yoke carrying the light is fixed. By continuously turning the handle in one direction, the glass is swung out to full open position, thus providing an unobstructed opening for positive escape. By reversing the rotation of the crank handle, the light can be locked in windscoop position.

Maintenance

Maintenance is reduced to a minimum in this escape air port by:

1. Providing a design of simple, rugged construction, with non-corrosive material.
2. Providing a design with a minimum of moving parts.
3. Providing a leak-proof grease-packed housing for worm and quadrant.
4. Providing a design that readily can be inspected or dismantled without removing any stateroom panelling or any other part of the ship structure.
5. Providing a design that can be operated by a passenger without danger of personal injury.

Illustration shows two pieces of aluminum brazed with new Mauk flux.

Mauk Flux Now Available

A new, superior flux for efficient brazing of aluminum with X716 wire has been introduced by A. K. Mauk, Pittsburgh, Pa. Designated as "Flo-Well" No. 2, it is equally useful in either furnace brazing or torch brazing aluminum.

"Flo-Well" and X716 may be employed alone in brazing 61S and, in combination with hydrogen and oxygen, may be used in brazing 2S, 3S, 24S, and 52S. The X716 wire can be obtained wherever aluminum is sold, or direct from A. K. Mauk.

The new flux is packaged in ½ lb. and 1 lb. glass jars for protection from moisture, and is also available in larger quantities.

Lubrication for Longer Lasting Marine Lines

by TED COATES

When wire rope is used under water for lifts, on small and large craft for derricks and hoists, and for dry dock hoist work, proper attention to lubrication pays off with much longer life.

For the past twenty years I have worked on boats, and on boat repair at dry dock. Ten years ago it was more or less the general policy to put on a new rope, factory lubricated, and run that rope until it was no longer safe to operate. Then retire it. No lubrication at all except the initial factory job.

Operators contended that a greasy line was too hard to handle; that no amount of lubrication would seal a rope being used under water. In other words, a short wire rope life was accepted.

Today, at our dry dock, we use around 400 feet of half inch preformed wire rope on our lifts and 250 feet for the outside hoist used for lifting masts and motors.

The lift line was put on in 1941. It has been regularly greased with a factory recommended sealing lubrication every three months. Once a week it is given a partial lubrication. This, when bearings are greased and drums and four-purchase blocks are inspected.

This lift line shows no wear after five years of service under water. A careful examination will yield a few broken surface wires at points of heaviest use. But because of being the preformed type wire rope, these broken wires hold their original position. There is no flaring or barbing. The rope is safe to handle without leather gloves.

The same holds true of our 250 foot hoist line, which is also preformed type wire rope.

For the regular four times yearly lubrication of the lift line we use a bath, and apply the lubricant heated.

For the weekly partial lubrications, we apply the grease at each drum before the line is run out. Then at each of the six four purchase pulls (three on each side of the cradle), we place a can on a block, so set that the grease will run out a small side hole in the can onto the line as it goes over the pulls.

With this method, all sheave grooves are thoroughly lubricated, which helps to give 100 per cent sealing for the line.

For the regular weekly lubrications in the winter months we heat the lubricant so that it will flow easily. Heating is not necessary in the summer.

We follow approximately the same lubrication routine for the 250 foot outside hoist line.

Ted Coates applying grease to wire rope lines on drum as lines go out. Only preformed wire rope is used.

This is a three-eighths inch line, hemp center. Because it is necessary for workmen to handle this line a great deal, we use a much lighter lubricant.

If frequently and properly lubricated, there is practically no "wear-out" to such a line. Our present line has been in used for more than ten years and is in as good condition as it was when bought.

I think that the war has taught us all a lesson in lubrication value. During the war, wire rope care and lubrication was a "must" because we frequently could not make replacements, even with priorities. The same was true for nearly all metal replacements.

We found that with a little more work and a few gallons of lubrication we could get double safe life for a great deal of our equipment, including wire rope.

I believe that increased emphasis on maintenance of all types is an operation lesson we've learned and will hold.

(Mr. Coates has been in ma[illegible] work in the Northwest for the past 20 years. A [illegible] shop foreman for Sells Marine Service [illegible]

A New Economy Line of Tube Expander

The Model 16 Dudgeon tube expander serves for all general boiler work, railroad maintenance, boiler making and boiler repair. It is a high quality tool which has been designed with a minimum of parts—frame, rolls and mandrel. It is manufactured by Richard Dudgeon, Inc., New York, N. Y.

The expander may be readily dismantled and new rolls quickly inserted. The frame holding the rolls is one-piece heat treated steel, hardened and tempered for toughness and durability. Mandrel and rolls are hardened tool steel equal in quality to those in the higher priced lines. Rolls are extra long and reversible for double length of service. They are set at an angle with the mandrel for self-feed. Reversing the mandrel releases the expander from the tube.

Model 16 expanders are compact, permitting them to work close to the boiler shell, rivet lines or tubes grouped together. They bear on the end of the tubes; do not draw tubes out of the tube sheet and roll the tube ends for their full length. They are furnished for hand or combination hand and power use.

Fig. 4. View of overhead, Fiberglas insulation secured by Nelson nails.

S.S. President Cleveland

Keel laid: August 28, 1944
Scheduled Delivery Date: December 1946
Length Overall: 610', Beam: 75'
Load Displacement: 22,574 tons
Propulsion: 20,000 hp turbo-electric drive
Estimated Cruising Speed: 19.0 knots
Estimated Maximum Design Speed: 21.0 knots
Estimated Cruising Range: 17,600 nautical miles
Fuel Oil Consumption: .59 gal. per shaft hp
Fuel Oil Capacity: 4342 tons
Total Number Passengers: 552
Total Number Crew: 338
Sponsor: Mrs. Henry F. Grady, wife of president of American President Lines.
Matron of Honor: Mrs. M. J. Buckley, wife of APL vice president in charge of freight traffic.

Class "B" Bulkheads on the President Cleveland

finish characteristics of the Aetna bulkheading and lining panels. Lighting fixtures and other accessories are secured to the structural members of the ceiling thus eliminating the necessity for reinforcing or stiffening of ceiling panels. Maximum strength is thus maintained at all times.

Bulkhead fixtures and attachments are secured to Aetna all-steel bulkheads and lining without the necessity for additional reinforcing and stiffening due to the internal construction of the panels and strength developed at the joints by their interlocking connections. Where ceilings abut the linings and bulkheads, ceiling structural members perform the dual function of ceiling members and upper panel-retainers.

Flush metal joiner doors and frames are used throughout the crews' spaces to maintain the fireproof, strong, lightweight, durable, flush and easily cleaned characteristics of the bulkheading, linings and ceilings. Designed, manufactured and installed by Aetna Marine Corporation, full advantage is taken of the strength characteristics of the Aetna all-steel bulkheading with necessity for special reinforcing posts or pilasters reduced to a minimum or eliminated completely. Flush panel doors are used throughout which, in conjunction with the flush bulkheads, lining and ceilings leaves no cracks, void spaces, or crevices for entrance of undesirable materials.

Fig. 5. Cross sectional view, from hold of "A", "B" and "C" decks. "C" deck — Aetna all-steel class "B" bulkhead and metal joiner door frame installed ready for hanging of flush metal joiner door. "B" deck —Class "A" structural coaming and bulkhead welded into hull. Preliminary door cut-outs made.

Oil Refiners for Marine Engines

An oil refiner which is capable of restoring used lubricating oil to the quality of new oil is announced by the Youngstown Miller Company, a subsidiary of Walter Kidde & Company, Inc., of Belleville, New Jersey. A model designed especially to serve marine diesel engines is now in production. It removes not only solid suspended impurities but dissolves contaminants, acids, and fuel dilution as well. It is also claimed to impart remarkable anti-varnish and anti-ring-sticking qualities to the oil.

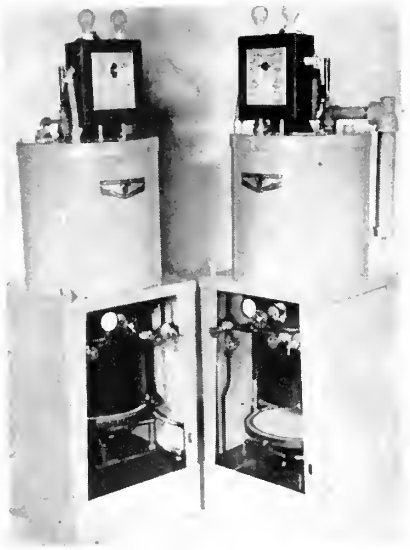
Re-refining

According to the manufacturer, the common methods of "reclaiming" used lubricating oil in recent years have been based principally upon the removal of solid suspended impurities. However, many harmful impurities, such as moisture, solvents, asphaltines, etc., do not yield to extraction by ordinary methods of reclaiming. Until these contaminants are eliminated, the oil can not be used as satisfactorily as new oil because it will lack essential characteristics.

The refiner is said to remove both the solid and the dissolved impurities and to employ a process that goes far beyond ordinary reclaiming methods. Re-refining employs the time-tested process of contact filtration—simulating the process used in the refining of crude oil. It is recognized as the most economical and efficient method of applying absorbent materials.

In this process, the dirty oil is pumped to a heating chamber under automatic float control and absorbent earth is added in suitable proportion. The two are then thoroughly mixed by means of an agitator and are heated by electricity. Heating and mixing are of sufficient duration to fully utilize the absorbent material and to drive off volatile contaminants.

The removal of volatiles is hastened by the evaporative effects of a continuous stream of fresh air which



These models are especially adapted for refining lube oil aboard tugs, work boats, yachts and other vessels where heavy duty machines are not required.

is passed across the oil surface, permitting lower operating temperatures than would otherwise be possible.

Heaters are under thermostatic control and go off automatically at the proper temperature—a signal light indicating this occurrence to the operator.

The oil and earth mixture is next dropped to a transfer tank from which it is forced into a two stage filter press by air pressure. Here all solids, including the absorbent materials, are removed. The clean oil may be piped from the filter press to any suitable storage facility or returned to engines under pressure of the air.

New Slide Rule Provides Greater Dimensional Stabilty

To fill the need for a slide rule of greater dimensional stability, the Charles Bruning Company has recently introduced a new 10-inch slide rule made of a plastic material that is said to have remarkable dimensional stability. The precision graduations are not affected by temperature change. The glass indicator is mounted in a polished stainless steel frame that holds it firmly in place.

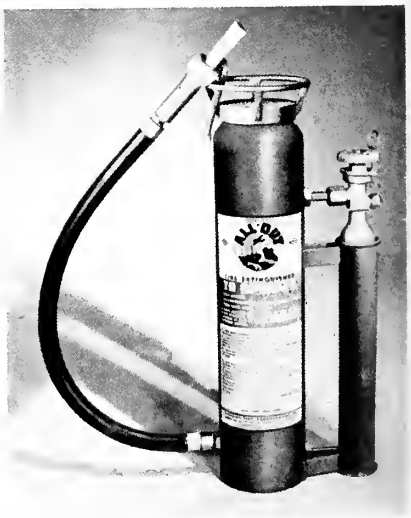
The graduations are precise and will not lose visibility through use. The CI scale shows numerals and graduations in red to provide ease of reading.

New Dry Chemical Fire Extinguisher

The All-Out dry chemical fire extinguisher, a product of Pressurelube, Inc., of New York, is designed to combine high efficiency under most conditions with maximum protection to the user and to equipment installations. All-Out performs effectively under all climatic conditions, in extreme temperatures, and in the presence of winds or drafts.

The dry chemical is ejected, under pressure, in a flat stream, that separates the flame from the burning material. This instantly forms a dense, fire smothering cloud over a flaming area up to a distance of 18 feet. It creates an insulating barrier between the operator and the flame providing protection from radiant heat. On hot metal surfaces the dry chemical forms an insulating film, helping to guard against dangerous re-flash.

The important features are as follows: it forms no toxic gases; it is non-conductor of electricity; it is non-abrasive, harmless to finished surfaces, easily removed with a brush; and it is easily refilled, requiring no special tools or equipment and its lighter weight permits easy carrying and use by men or women operators. The twenty-six inches of ½-inch 1D pressure hose permits rapid maneuverability of dry chemical stream.



Washington Digest

(Continued from page 87)

sea conditions, especially on vessels with reciprocating engine propulsion, and to so note in their engine log. This further is applicable to vessels on which fixed ballast has been removed to increase deadweight, and to vessels in light or unballasted condition, i.e., with little or no cargo and no compensating dry ballast.

The purpose of this Regulation is to reduce to the absolute minimum heavy weather damage to structures, bilge keels, propellers, tail shafts, stern tubes and thrust bearings.

War Secretary to Exercise Certain Functions For Panama Canal

Authority for the Secretary of War to exercise certain powers vested in the President in connection with the making and amending of regulations governing operation of the Panama Canal, the passage and control of vessels, and other matters pertaining to the Canal, has been granted under terms of an Executive Order (No. 9746), signed by President Truman on July 1, 1946, and appearing in the Federal Register issue of that date.

In addition to granting the Secretary of War certain authority over the Canal, the Executive Order also authorizes the Governor of the Panama Canal to perform certain regulatory and enforcement functions within the Canal Zone.

Larger Post-war Ship Subsidy Payments Forecast

Post-war ship operating subsidy payments by the United States Government are expected to be more than double the payments made to American shipping operators in the pre-war period, according to an Industry Report dealing with merchant shipping by the Transportation Division, Bureau of Foreign and Domestic Commerce, Department of Commerce. The report was prepared by Paul M. Zeis, of the Division, which is headed by James C. Nelson.

Pointing out that the average annual operating subsidy payments for about 150 ships prior to the recent war was $12,000,000, Mr. Zeis predicts in his report that the post-war payments by the United States will be in the neighborhood of $30,000,000 per year, on the basis of an estimated operation of more than 300 ships by subsidized lines.

Mr. Zeis calls attention in the report to the redistribution of world tonnage as a result of the war and to the predominant position of the American merchant fleet, as well as to the benefits to be derived by American shipping operators from the Merchant Ship Sales Act of 1946. He sees the possibility that some of the "quality vessels" will be sold to foreign operators, although stresses the belief that most of those sold foreign will be of the Liberty or Victory types.

Pacific MARINE REVIEW

INDEX TO Regular Advertisers

Pacific MARINE REVIEW

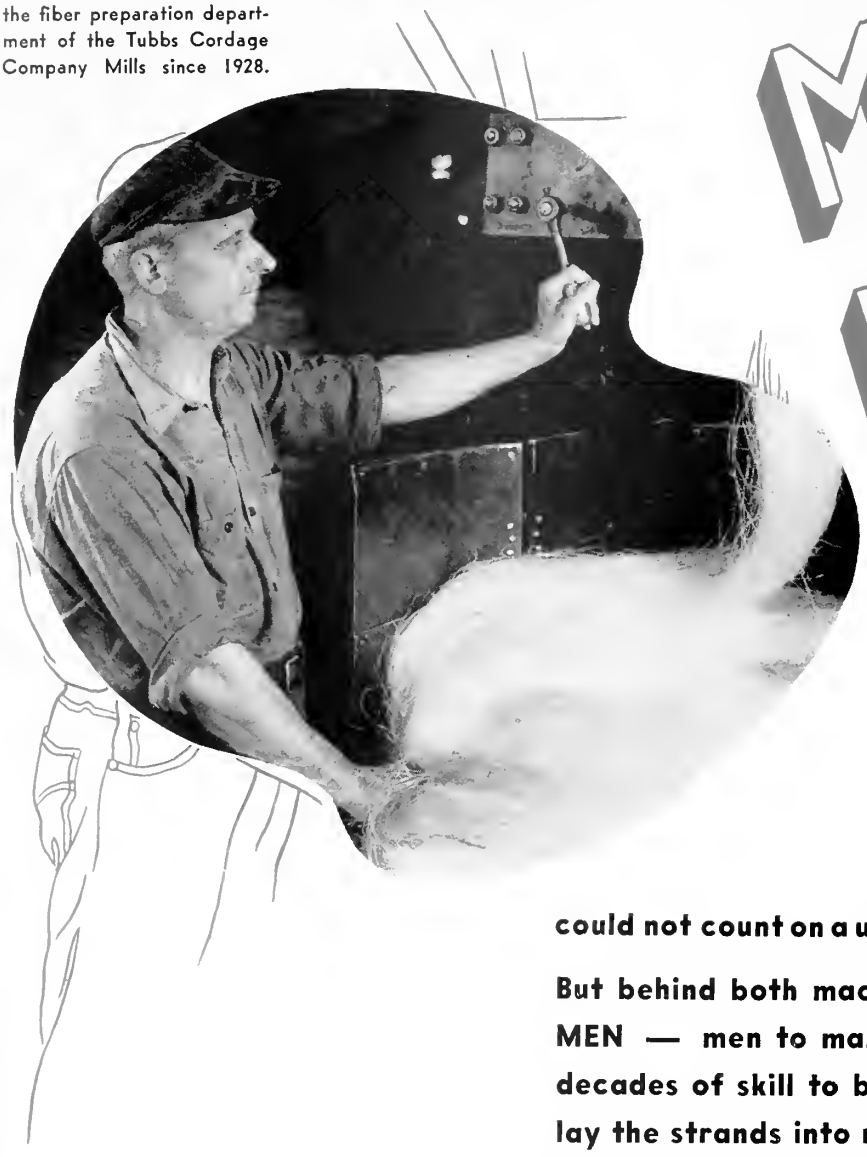
SEPTEMBER, 1946

Balanced ROPE MUST HAVE ALL FIVE.

Strength

WATERPROOFING
ENDURANCE
FLEXIBILITY
APPEARANCE

"Gene" Bianco, operator in the fiber preparation department of the Tubbs Cordage Company Mills since 1928.



MEN and ROPE

Of course there must be great mechanical skill in the making of good rope. And without fiber carefully selected from the choice of the world's markets, you could not count on a uniformly dependable product.

But behind both machines and raw materials are MEN — men to man the machines — men with decades of skill to blend and comb the fiber and lay the strands into rope that will stand the hardest punishment and give *Extra* wear and service.

These are the men in the Tubbs Cordage Company Mills that for nearly a century have made the Tubbs trademark one that has stood for utmost dependability. It is this MEN and ROPE combination that is your assurance of *plus value* when you specify TUBBS to your supplier.

When the *finest* Manila fibers are once more available, look for this famous rope trademark.

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EXTRA SUPERIOR MANILA
CORDAGE COMPANY

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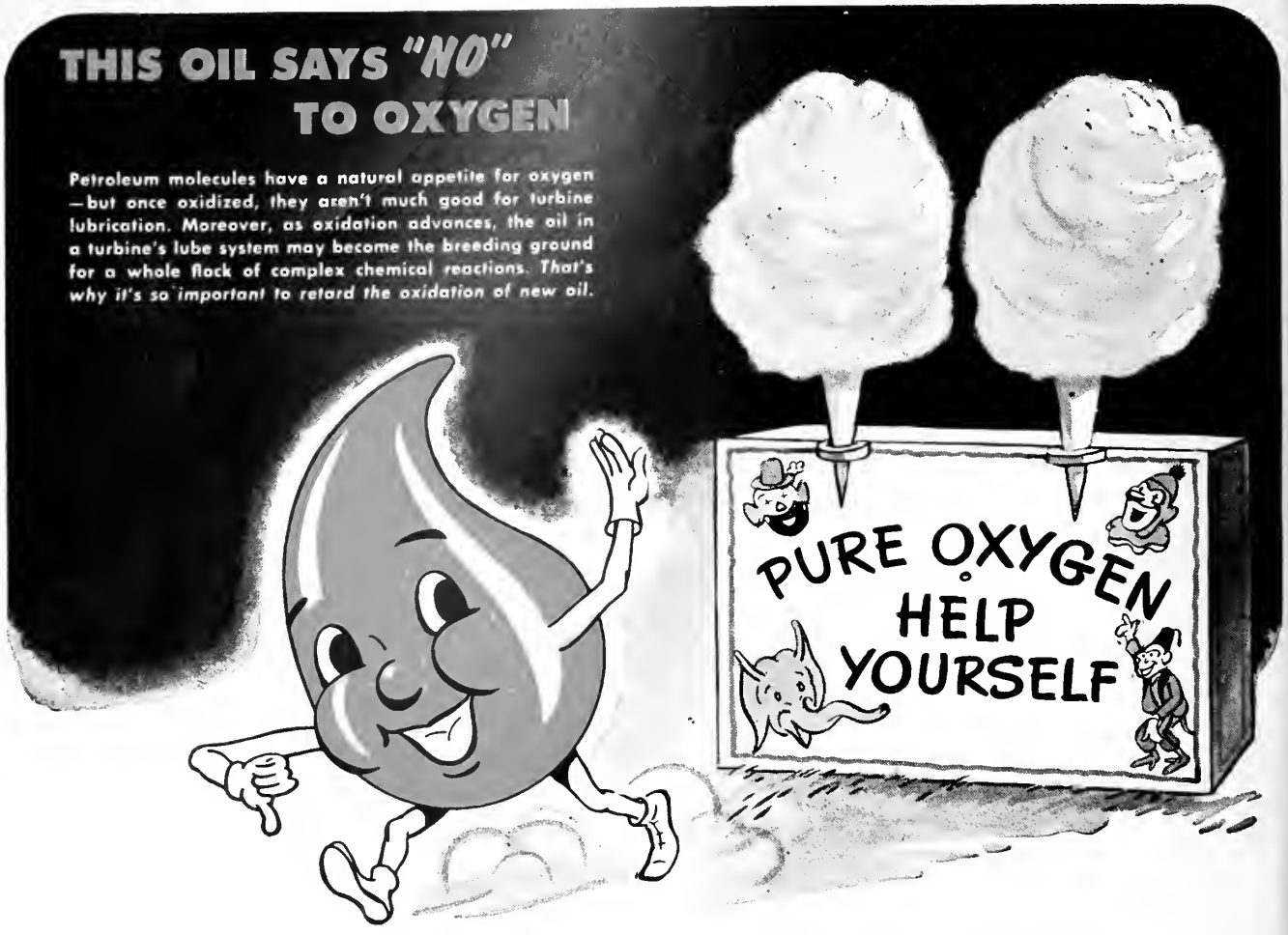

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COUNTERACT OXIDATION AND RUSTING
in your turbine's lubricating system

SHELL MARINE TURBO OILS show little or no oxidation after years of service in the turbines of ships of almost every type and size. They have successfully prevented rust in these installations.

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1. Shell employs scientific selection of crude stocks.
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3. Shell fortifies Marine Turbo Oil with an effective anti-oxidant. Again, by retarding oxidation, better demulsibility is retained.
4. Shell fortifies Marine Turbo Oil with a rust preventive. The elimination of rust is vital to the oil as well as the machine.

The Shell Lubrication Engineer will give you sound advice about your marine turbine lubricating problems.

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Pacific MARINE REVIEW

Build More Ships!

An Editorial

T. Douglas MacMullen

WE URGE THE PRESIDENT, and all of the Goverment, to expand, not reduce our Merchant Marine. We urge that every facility of the Maritime industry be studiously developed, for the welfare of America requires it. There are evidences of misinformation in high places, due to cleavages within the industry and attacks from those who would destroy it. The industry must unify, *and build ships.*

In neither group are those who point to five thousand war-built ships and say, "We have enough for all the world!" But note Britain rushing to lay down 2,000,000 tons this year; Belgium seeking yards even in Italy; France, Holand, Sweden, Norway, Canada, China, and others large and small, crowding their efforts to restore their shipping. There are reasons. Good reasons.

World trade is vital to all commercially important countries, and it is vital to America. It is vital to every port city where it may, as in San Francisco, influence every dollar earned and spent by its people. It is vital to every industrial center where 10, 20, or 30 per cent of the products—and of the earnings of the people—are dependent upon world markets, and on world imports. It is vital to every farm area where perhaps the fruit of every other tree is exported, or the farmers' needs supplied by imports or by industries that live by trading. It is vital to world affairs, where goods and gold that revitalize stricken lands are the "exchange" of world politics. World trade needs shipping. World trade *is* shipping. *American* shipping!

America does not have 5000 ships—nor 500—of the types the industry needs. Already there is a shortage. We must build more, including passenger ships—ships really built for passenger needs. There are only two passenger vessels over 15,000 tons now building in American shipyards—the President Cleveland, and the President Wilson nearing completion on San Francisco Bay.

The framers of the Merchant Marine Act of 1936 did not foresee our war production, but they did foresee the need for a continuing program of ship construction. The Maritime Commission is charged with carrying out that program. We trust there will be no diversion. Economy is found in the wise husbanding of the values we won by heavy costs and sacrifice. Gentlemen, we need a strong merchant marine. Ships and shipyards, *and shipbuilders* must always be ready—and busy.

Propulsive Efficiency

An Editorial

A. J. Dickie

EFFICIENCY IS A RATIO—the ratio of the product to the cause, of the output to the input.

In a complicated assembly of mechanisms and power producing items, like a modern cargo-passenger liner, the over-all efficiency is made up of the individual efficiencies of a large number of power producing and power using machines, each of which contributes its share, plus or minus, to the final result.

Propulsive efficiency, from the marine engine point of view, is the ratio between the horsepower in the propeller shaft and the effective horsepower needed to drive the hull. This ratio is also known as the propulsive coefficient. Effective horsepower required to drive a hull through the water is a product of the total resistance to the movement of the hull and of the speed desired, divided by a constant the magnitude of which depends on the units used. If resistance be in pounds and speed in knots the constant will be 326.

For the majority of new ships there will be special model touring experiments to determine the best form for propulsive efficiency or there will be the results of previous towing experiments on a model sufficiently similar to form a basis for design, from that point on to the final accepted design shaft horsepower. Designing a propeller to effectively apply that horsepower is part of the preliminary recommendations as to power plant.

From this point begins a series of compromises between Operations Department on one side and Naval Architect and Marine Engineer on the other, until usually Operations is almost satisfied and the technical group think this is the worst one yet.

In a few well-organized shipping firms the Operations Department writes much of the preliminary specifications, setting forth their minimum requirements based on experience. The naval architect's preliminary design must then include these minimums unless he is prepared to show some compelling reason for departure therefrom.

This method saves many headaches for both sides and should result in a vessel reasonably close to ideal propulsive efficiency under both definitions. The best propulsive efficiency for any hull is attained when that hull carries its rated capacity over its scheduled route at the least over-all expense to its operators.

C-4 Army transport — Kaiser - Richmond Yard No. 3

C-4 Peacetime Army Transports

General Characteristics	
Length B. P.	496′ 0″
Length O. A.	523′ ¼″
Beam	71′ 6″
Depth	43′ 6″
Draft designed (Load)	32′ 0″
Gross Measurement	10,700 Tons
Deadweight	14,500 Tons
Power normal	9,000 s.h.p.
Steam Pressure	450 psi
Steam Temperature	750° F.
Probable Speed	18 knots plus

by GEORGE H. HARLAN

WITH THE THUNDER CLOUDS OF WAR almost entirely vanished from the international skies, the United States has turned its attention to peacetime problems, one of which is the maintaining of a peacetime Army supply line to the occupational forces all over the world. The most scattered outposts of the Armies of Occupation are the Pacific Islands, most of which will require total support from the American mainland.

The Army has designated four permanent mainland bases or "Ports of Embarkation", one on the Eastern Seaboard in New York, one on the Gulf at New Orleans, and two on the West Coast, Seattle and San Francisco. Seattle will, as during the war, handle the Alaskan garrisons, while San Francisco, with its excellent facilities, will be the neck of the funnel which shoots supplies and men to the entire remainder of the Pacific Area.

The increased burdens placed on the Army due to maintaining large occupational forces overseas has of necessity demanded a larger Transport Service for ocean duty than ever before. The facilities of commercial carriers are not entirely adequate for this purpose, and can only be called upon to augment a strong, centralized nucleous of transports and supply ships which will be directly under Army operation and control. Pacific Transports, prior to the war, had very few ports of call other than Honolulu and Manila, and the Republic, U. S. Grant, Leonard Wood, and St. Mihiel were well able to handle the passenger loads required of them and were able to pack many tons of freight besides. But these staunch warhorses, most of them survivors of their second war, have deserved a well earned rest in the quiet pasture of a protected harbor, and even were they in their prime, they could not hope to carry the Army's post-war burden alone.

Successors to the red, white and blue funneled veterans of Army sea duty are the C4-S-A1 troop carriers built by the Kaiser Company, Inc., Yard No. 3 at Richmond. These

ships were originally planned for the Army but were commissioned by the Navy and operated by that branch of the service during the war. Upon their de-commissioning as attack transports they are being returned to the Army and converted to peace-time troop carriers. Ten of these vessels will be assigned to the San Francisco Port of Embarkation, a complete list of which appears below.

Name	Yard No.	M. C. Hull No.
General W. M. Black	6	658
General C. G. Morton	12	661
General A. W. Greeley	22	664
General H. F. Hodges	25	667
General W. F. Hase	10	703
General E. T. Collins	11	704
General J. H. McRae	14	706
General M. M. Patrick	16	707
General A. W. Brewster	26	712
General D. E. Aultman	27	713

Play [illegible] children with woven wire enclosure

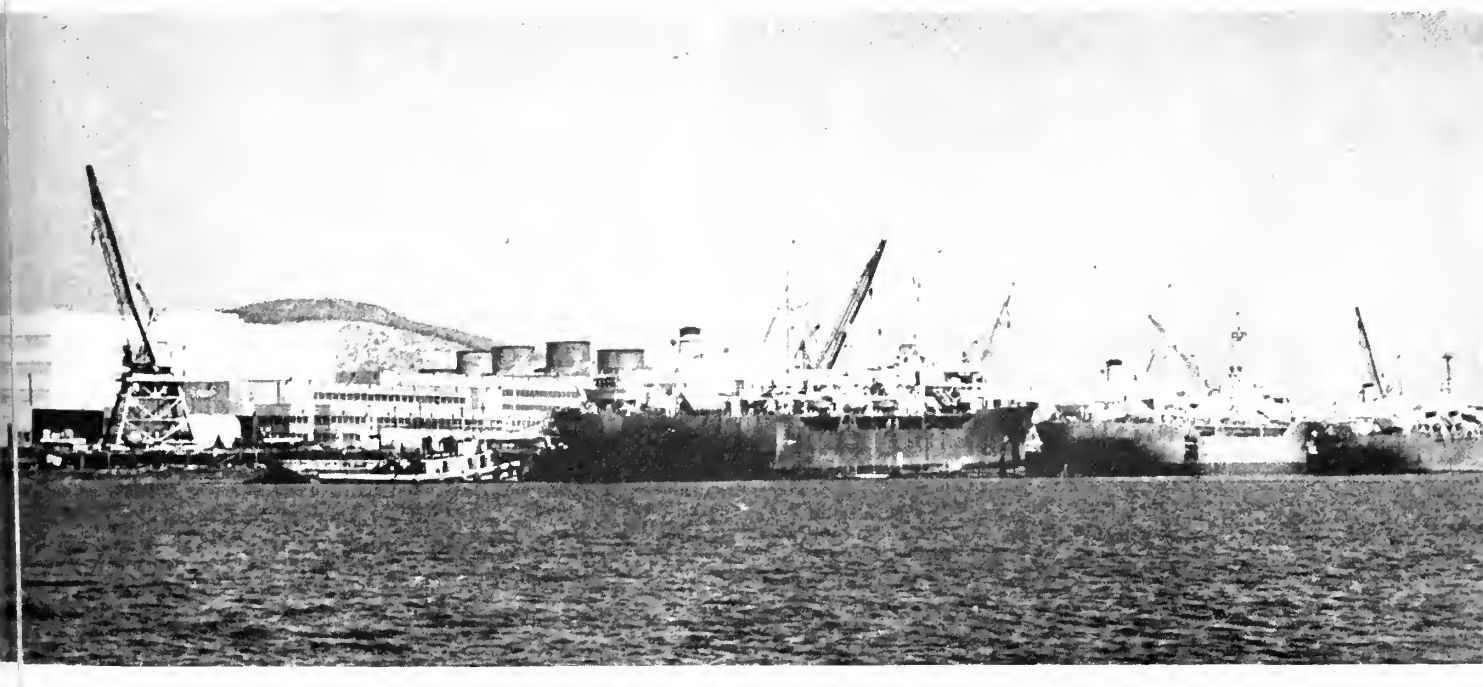
All of the above mentioned ships save the General W. M. Black and the General J. H. McRae have been or are being converted to peacetime transports at the builder's yard, the two exceptions having been partially converted in New York. The conversion of the entire number of vessels is expected to be completed by the end of September, 1946.

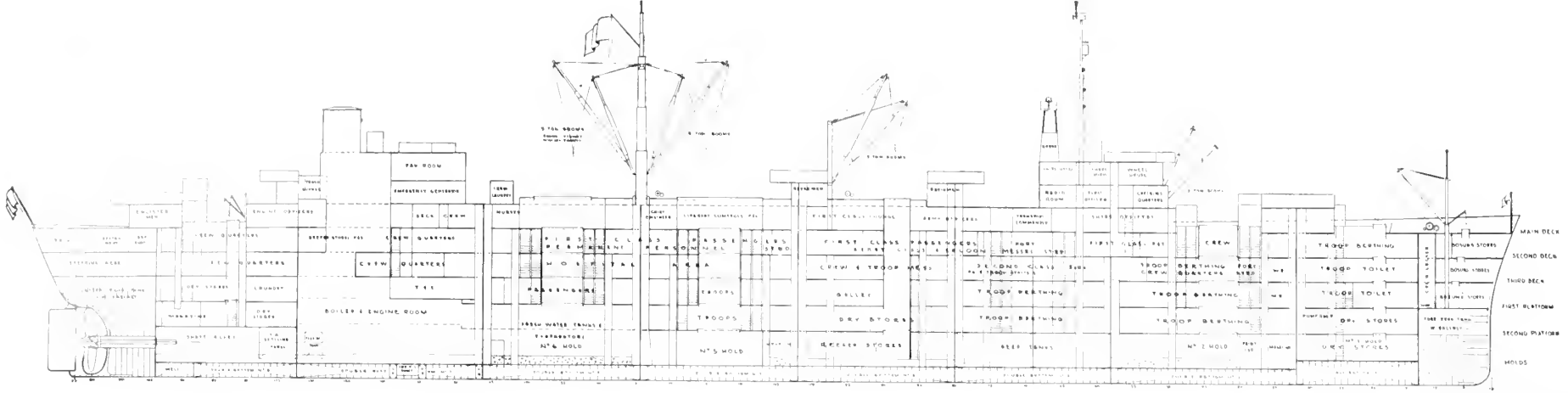
The principal problems involved in converting the ships have been the provision of staterooms for traveling Army personnel, which are comparable to quarters customarily assigned for ordinary peacetime travel, and provision for additional cargo space aboard the vessels now that munitions and other war supplies are no longer carried.

As Navy transports, these ships carried vessel personnel in their limited number of individual staterooms, and Navy enlisted crew were carried in large dormitory areas similar to troop compartments. As the Army peacetime civilian crew is only a small percentage of the Navy attack-transport crew, and as the Army civilians pay subsistence for their board and lodgings, crew requirements for sleeping and eating quarters differ on the different types of ships. Additional quarters and mess-rooms had to be built to accommodate the civilian crew, and in the exchange of space between Navy crew and Army crew, a good deal of space was released for use as passenger accommodations.

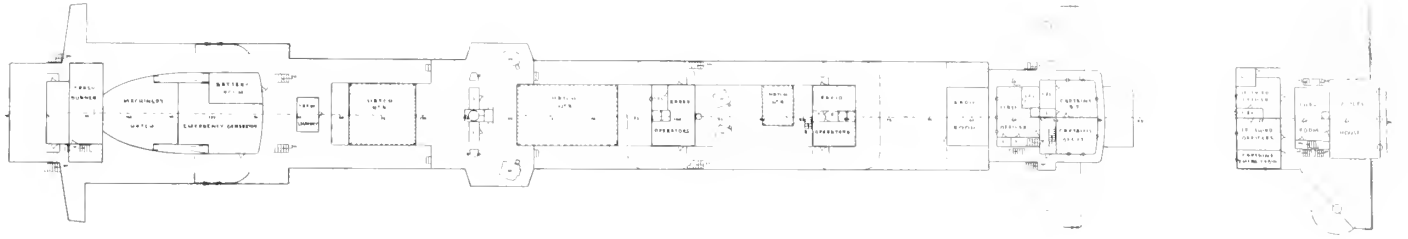
The bridge deck and boat (main) deck are devoted almost entirely to crew accommodations, both for deck of-

Several C-4 Army transports along the piers at Richmond Yard No. [illegible]

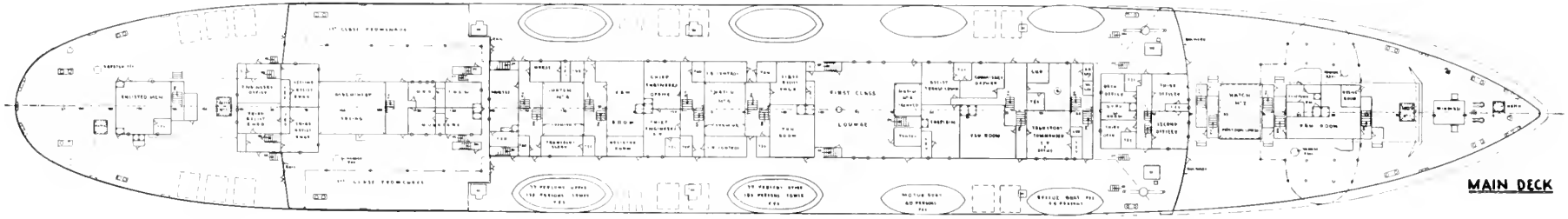




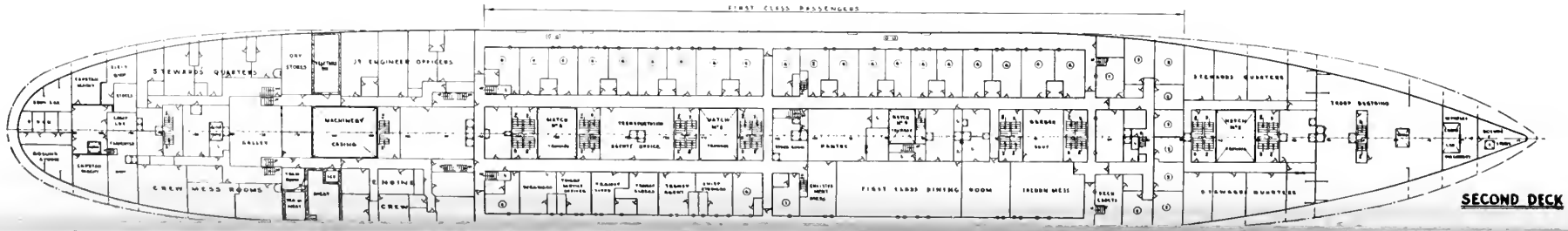
INBOARD PROFILE



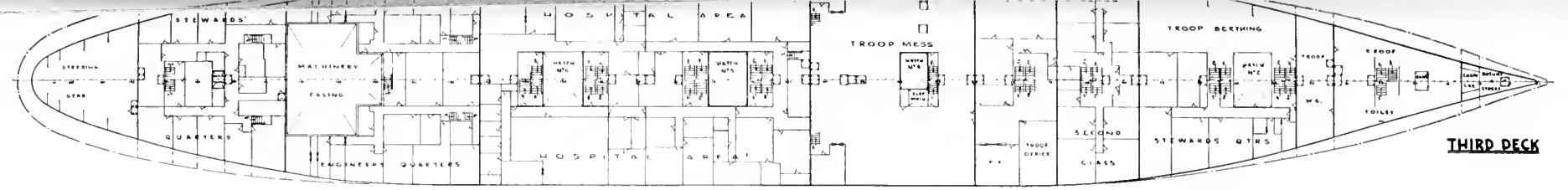
BRIDGE DECK & NAV. BRIDGE

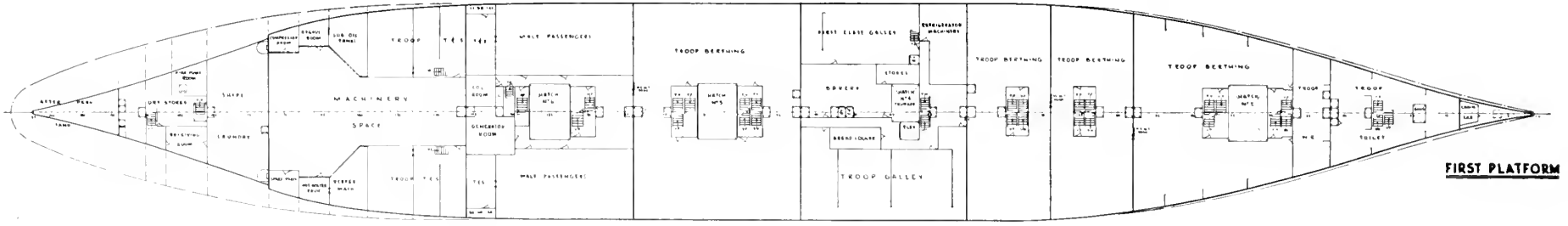


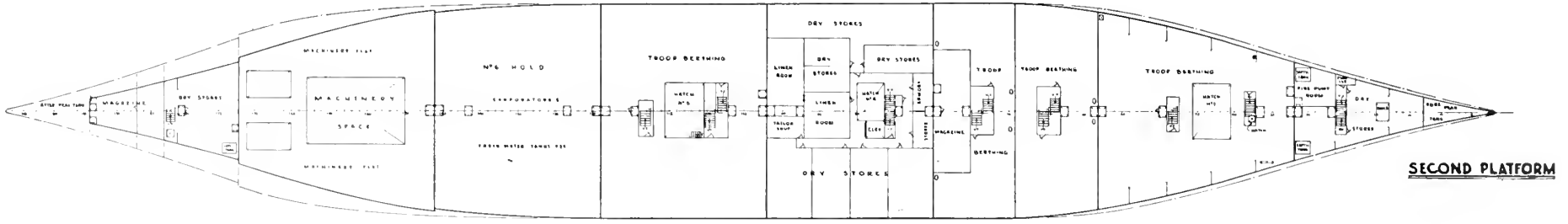
MAIN DECK

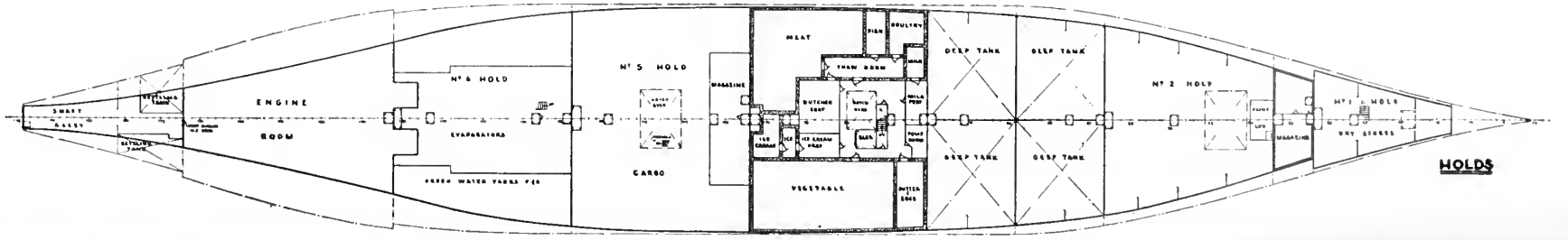


SECOND DECK

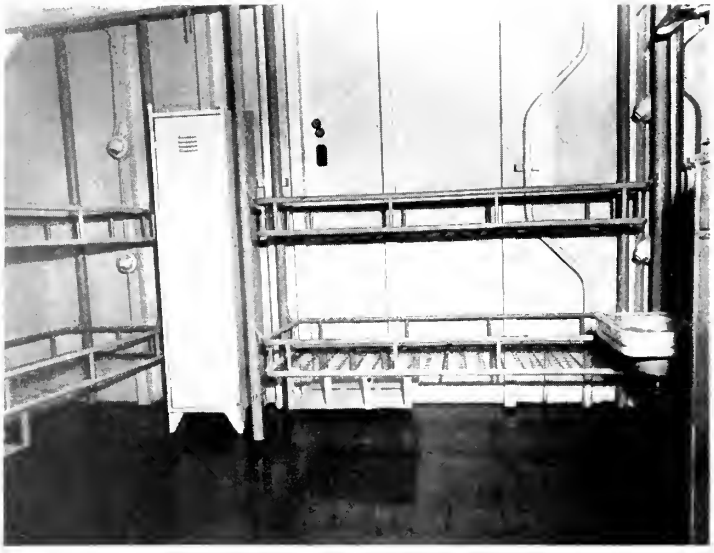

STEWARDS'
QUARTERS
STEERING GEAR
MACHINERY CASING
ENGINEERS' QUARTERS
HOSPITAL AREA
HOSPITAL AREA
TROOP MESS
TROOP OFFICE
SECOND CLASS
TROOP BERTHING
STEWARDS' QTRS
W.C.
TOILET
THIRD DECK


AFTER PEAK TANK
DRY STORES
LAUNDRY
SHAFT
MACHINERY SPACE
TROOP MESS
MALE PASSENGERS
GENERATOR ROOM
MALE PASSENGERS
TROOP BERTHING
FIRST CLASS GALLEY
REFRIGERATOR MACHINERY
STORES
BAKERY
BREAD LOCKER
TROOP GALLEY
TROOP BERTHING
TROOP BERTHING
TROOP BERTHING
W.C.
TROOP
TOILET
FIRST PLATFORM


MACHINERY FLAT
AFTER PEAK TANK
MAGAZINE
DRY STORES
MACHINERY SPACE
MACHINERY FLAT
No 6 HOLD
EVAPORATORS
FRESH WATER TANKS P&S
TROOP BERTHING
DRY STORES
DRY STORES
LINEN ROOM
LINEN ROOM
DRY STORES
TAILOR SHOP
STORES
MAGAZINE
TROOP BERTHING
TROOP BERTHING
TROOP BERTHING
FIRE PUMP ROOM
DRY STORES
FORE PEAK TANK
SECOND PLATFORM


SHAFT ALLEY
ENGINE ROOM
No 6 HOLD
EVAPORATORS
FRESH WATER TANKS P&S
No 5 HOLD
CARGO
MAGAZINE
MEAT
DISH
POULTRY
SCALE
TRAIN ROOM
BUTCHER SHOP
ICE
ICE CREAM PROD
BAKER
VEGETABLE
BUTTER EGGS
DEEP TANK
DEEP TANK
DEEP TANK
DEEP TANK
No 2 HOLD
No 1 HOLD
DRY STORES
MAGAZINE
HOLDS

Typical Rooms Peacetime Army Transport Standards



UPPER: Typical room for four, with locker standee, two high berths and wash basin.

LEFT: Arrangement of two berth room with bureau-desk locker and wash basin. Note fan, pipes, electric cables and ceiling fixture.

LOWER: A different arrangement of two berth cabin with bureau-desk lockers, and wash basin. Note joiner work on bulkhead.

Inboard Profile And Deck Plans

On pages 44 and 45 appear the detailed general arrangement plans of all the decks of these vessels and the inboard profile showing all the compartments of the hull. Note that there are four decks below the main deck and that a large portion of the hold space is devoted to troop accommodation.

★

One of the converted transports ready to sail from the S. F. Port of Embarkation.

Photograph Courtesy U. S. Army Transportation Corps

ficers, radio and radar operators, and permanent Army personnel. One stateroom for four passengers exists on the boat deck.

The entire second deck bounded by the promenade is devoted to passenger staterooms with the exception of the first class dining salon and quarters for the chief steward and administrative personnel. These staterooms are provided with four berths each, and suitable chiffoniers, tables and chairs for use as day rooms. A bath is accessible from every room, although the bath is shared between two rooms. A small percentage of the rooms have fewer berths and private baths and will be used as priority rooms, but the interior furnishings of all rooms are uniform. Navy type metal joiner furniture is used throughout the ships in both the passenger and crew quarters. All bulkheads in passenger and crew quarters are of the metal joiner type with the exception of those in way of toilet and shower rooms where steel plate is used throughout. Deck covering is magnesite in staterooms and passageways, and tile in the bath rooms.

The total number of first class accommodations available on the ships is 107 per vessel. On the third deck between frames 58 and 80 are staterooms and public rooms for second class passengers, providing sleeping quarters for 40 persons. First class staterooms are generally reserved for commissioned officers and families, Second class staterooms are reserved for non-commissioned officers and families. Bachelor officers travel in officers' dormitories, and enlisted men unaccompanied by families travel troop class. This assignment of quarters in general only, for space is assigned according to the demands of the traveling quota. Since all rooms are furnished alike in both first and second classes, surplus rooms in any one class thereby become overflow rooms for the other class.

The after sections of both the second and third decks are devoted to accommodations for the chief petty officers, petty officers and men. Staterooms, galley, and mess rooms occupy these spaces. Many additional rooms, bulkheads, and baths had to be provided for the Army civilian crew, and all rooms were re-equipped with Navy metal joiner furniture in order to render the living spaces more comfortable. Air ports were installed on some of the ships in all crew spaces, but due to the urgent need of the vessels for established runs, it is not contemplated that the job of installing all air ports will be completed in this first conversion.

The hospital area on the third deck will remain intact for the present time although it is recognized that a hospital which will accomodate 99 patients is excessive for this vessel. It is expected that the Hospital will be cut down at some future time to allow more second class passenger stateroom to be built.

The C-4 design was originally contemplated as a

CHARACTERISTICS OF THE C4-S-A1

Length over all		522′-10½″
Length bet. Perpendiculars		496′- 0″
Breadth Moulded		71′- 6″
Depth Moulded		43′- 6″
Gross tonnage	About	14,300

A corner of one of the pantries.

straight freight vessel, and even these ships, with their additional houses and passenger quarters are basically fine freighters. Number 1 hold which is not served by conventional cargo gear will be retained as a space for baggage and mail. Number 2 hold will be converted from stores space to a cargo hold. Dry stores and refrigerated stores will be kept in number 4 holds and platform decks, and so that these stores may more readily be loaded aboard ship, the Army has added a mast and set of cargo booms of a three ton capacity. Number 5 hold remains the ace cargo hold of the ships and provision is being made to turn No. 6 hold into cargo space at a future date. At the present time this hold contains evaporator equipment capable of manufacturing 160 tons of water per day in four plants each rated at 40 tons. These bronze solar-shell units will be removed to a new evaporator room which is to be built in the after end of No. 6 hold and the six existing cylindrical water tanks will be removed from the ships leaving the balance of the hold for cargo. The vessels are capable of carrying a minimum of 5,000 tons deadweight cargo, and this figure may be increased to approximately 10,000 tons when the ships are not carrying troops. Standee bunks may be removed from the troop compartments to create additional cargo space.

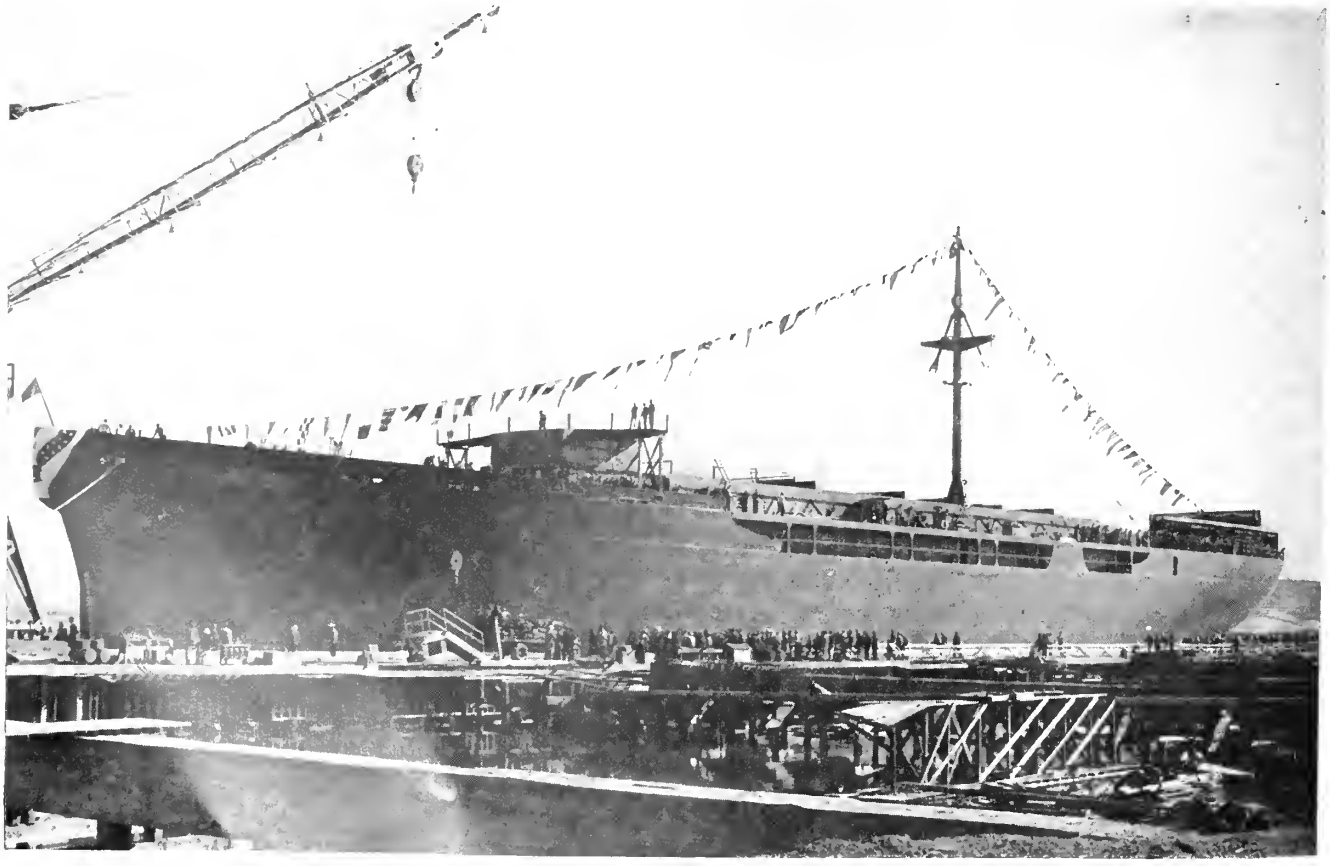
The troop carrying capacity of the ships will be greatly reduced for peacetime operation. Troops will be carried on three decks only, no troops to be assigned to the hatch squares and all berths to be no greater than three high. Eighteen hundred troops may very comfortably be carried by each ship, and this reduction will permit the usage of fresh water for washing for all classes of passengers, a decided improvement over the wartime troop carrier.

Finishing touches will be added by the Army's new painting scheme. Inside decks will be maroon, deck heads will be green and all interior bulkheads will be a light yellow. The shell of the ship will be painted a light grey with the name lettered in black on bow and stern. All superstructure above the main deck will be painted white on the outside, and all deck fittings, masts, davits, ventilators, booms and railings will be buff color. The ships will have the distinctive Army stack painting consisting of a band of black around the top, followed by three bands of red, white, and blue with the remainder of the stack a buff color down to the housetops. The emblem of the Transportation Corps, a ship's wheel with a shield in the center, will be placed on either side of the stack.

No alterations are contemplated in the mechanical end of the ships. Each vessel has a single screw geared turbine propelled hull, the main engines developing 8500 ihp and capable of driving the vessel at a constant speed of about 17 knots.

These ten C-4's will be the beginning of the Army's post-war fleet which will be augmented with P-2's and Victory ships to maintain the lifeline in the Pacific.

The S. S. General George O. Squire on the ways at Richmond Shipyard No. 3, November 25, 1942, just before floating.



Profuse evaporation of chestnuts shipped to the U. S. from the Mediterranean area.

Cargo Damage From Moisture

WHEN ENGINEERS FIRST THOUGHT of adapting refrigeration to cargo ships, they ran up against a stiff wall of opposition. Everyone said just about the same thing: it wouldn't work, it was too expensive, the idea wasn't practical enough, the whole thing just wouldn't last.

The years have passed and those same engineers, by proving that their theory was practical in every sense of the word are today responsible for the fact that through the use of refrigeration, ships were able to bring fresh food to our forces overseas and are now bringing food and meat to starving Europe.

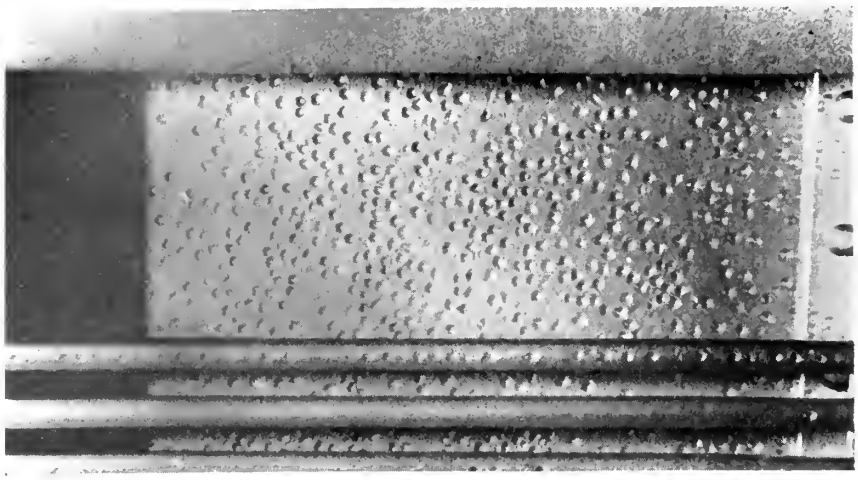
The development and growth of the dry cargo protection system now utilized in the shipping industry closely parallels the pattern originally set by refrigeration.

Up to 1935, the shipping industry had done little to provide effective protection for the cargo in a vessel while its was on the high seas. Although everyone was well aware of the "sweating" problem, caused when moisture condensed on the ship's structure or on the cargo itself, the cargo damage that resulted was always accepted as inevitable.

In the fall of that year, however, the first real approach to the problem along engineering lines was made. Mr. O. D. Colvin, a prominent naval architect who had resigned from the Navy in 1930 conducted an investigation into what was then a much neglected field. Up to that time, the only method used to combat this type of cargo damage was through the use of tarpaulins and dunnage around the cargo with increased ventilation in the holds. Colvin first became interested in the problem while working as a plant engineer in a large western grain company. He found as others had before him, that if grain or corn was not promptly unloaded from the ships, it rapidly heated and spoiled.

His experience in shipping grain led Colvin to conduct a survey on cargo damage in all the ports on the West Coast. The survey was to determine whether ships that carried general cargo also were susceptible to "sweat" damage. After talking to shippers, shipowners and the men who actually sailed the ships, he found that all cargo vessels suffered from this particular type of damage. Colvin found that the old-fashioned methods then in use were totally inadequate and that while the thought behind them was good, the problem had to be approached along scientific engineering lines. Realizing that dew point, humidity and other aerological factors could be controlled, Colvin then conducted a series of tests based on his findings in the survey to determine the best method of controlling them.

After several years of study and tests, Mr. Colvin presented a paper before the Society of Naval Architects and



A Good example of ship sweat. Notice moisture forming on bulkhead.

Bags of tobacco after a six weeks voyage on a Cargocaire protected vessel. Notice the dust formed on the steel.

Marine Engineers entitled: "Care of Cargo at Sea—An Investigation of Sweat and Other Airborne Damage." This paper, which received wide acclaim, was the first clear cut presentation on the subject.

An analysis of the various forms of cargo damage from airborne moisture was included in the paper, such as the corrosion of metals, tainting and staining, bacteria and fungi, vermin, spontaneous heating, fire and damage from many forms of moisture. The fundamental aerological factors discussed in the paper included dew point, ship sweat, cargo sweat, hygroscopic moisture and free moisture.

Following a detailed discussion of the way in which all forms of moisture damage begin and grow, the then present methods of cargo protection were portrayed. Finally, there were suggestions for improving those methods through mechanical ventilation and dehumidification. These methods were developed into the modern cargo protection system and the Cargocaire Engineering Corporation was founded to design and manufacture the necessary equipment for the system.

The purpose of the Cargocaire System is to *prevent* damage to cargoes by condensation and high humidity and to provide a vigorous circulation of air in the holds of a ship under all conditions. Condensation forming on a ship's structure or on the cargo itself causes rusting, corrosion, staining or mildewing while a high humidity fosters and accelerates this damage.

Prevention of the causes of these damages can only be accomplished by the removal of moisture from the air in the holds. By removing from the air the normally present excess of moisture, a "sweat" free condition can be maintained in the holds. The vigorous air circulation in the holds provided by the system is essential in sweat prevention, but it has other uses as well. Bad odors or poisonous fumes from certain cargoes can be easily dissipated while complete circulation and final purging can be accomplished when fumigating.

The system consists of three main components:

1. The dry air unit.
2. The hold circulating systems.
3. The recording instruments.

The dry air unit, located in the engine rooms, is the heart of the system. This unit produces dry air and injects it into the holds. The full capacity of the unit may be directed to one hold, or divided between two or more holds as required. Under average moist summer conditions, the unit is capable of removing three-quarters of the moisture from the air, and in cooler weather an even greater proportion removed.

The hold circulating systems provide an air flow in excess of requirements through the holds at all times. Located at opposite ends of each hold are a supply and an exhaust fan, connected to duct systems arranged to permit distribution of air to the wings as well as to the hatch area in each deck level. These fans may be used to ventilate the holds with outside air when weather conditions permit, or to recirculate the air in the holds, excluding the outside air, when the weather is not favorable. Readily accessible dampers permit shifting of the hold systems from ventila-

RIGHT: Argentine corn spoiled by sweat damage.

ELOW: A good example of sweat damage—showing canned goods with wrinkled labels and rust spots.

tion to recirculation as required. Dry air from the unit in the engine room is injected into the hold systems at the supply fans and is thoroughly mixed and distributed with air being discharged to all parts of the holds. The dry air is always used when recirculating and with ventilation when a rapid outside temperature drop is encountered.

The recording instruments constitute the control element of the system. A recorder is located at the exhaust end of each conditioned hold and charts a continuous record of the moisture in the air for that particular space. A recorder in the chart room takes a similar record of the outside air, and by daily comparison of hold and outside moisture conditions, the operating officer is able to determine the necessary method of conditioning. A recorder connected to the outlet of the dry air unit charts the condition of the dry air and serves as a check of the unit operation.

The Cargocaire Unit uses silica gel as its drying agent. This gel is a dry crystalline substance with the appearance of yellowish rock salt, and has the ability to remove considerable quantities of moisture from the air. The gel is contained in two 'beds' arranged so that while one bed is drying air for the hold, the other is having its entrapped moisture removed. In this way a constant supply of dry air is assured at all times. Since the removal of moisture by silica gel is a physical rather than a chemical action, the gel never has to be replaced, as long as it is kept clean.

The first practical test of this system under actual service conditions in comparison with other types of ventilation on the same ship proved that the theory was not only sound but that sweat formation could be eliminated.

The report of the maiden voyage of the Exporter of the American Export Lines makes interesting reading since it was the first ship to be equipped with this cargo conditioning system. Only three holds on the ship were equipped and these holds were loaded with tobacco on the maiden voyage. Tobacco is, of course, highly susceptible to moisture damage.

The Cargocaire unit was started when the ship left Lisbon and operated during the entire eight days of the voyage home. The cargo hold fans were used on ventilation whenever the atmospheric dew point and the weather permitted. Recirculation, however, was used about 75 per cent of the time. The non-protected holds of the vessel were ventilated by natural draft or mechanical ventilation.

On the voyage, typical North Atlantic weather was encountered. This included the usual westerly gales, rain passing the Azores, and the sudden transition from comparatively warm to cold air and sea water when the ship approached the coast. Temperature changes amounted to a 20° drop in the atmosphere and a 15° drop in the sea water. While this is not considered too severe a change, it was definitely sweat producing weather.

Upon arrival in New York in December of 1939, it was found that the *protected* holds showed no sign of sweat damage, while the unprotected holds showed considerable damage. The Cargocaire system had proved itself and was a complete success. Since that time, this system of modern cargo protection has been adopted by the United States Maritime Commission and most of the major shipping companies of the world.

Grace Line's Santa Barbara

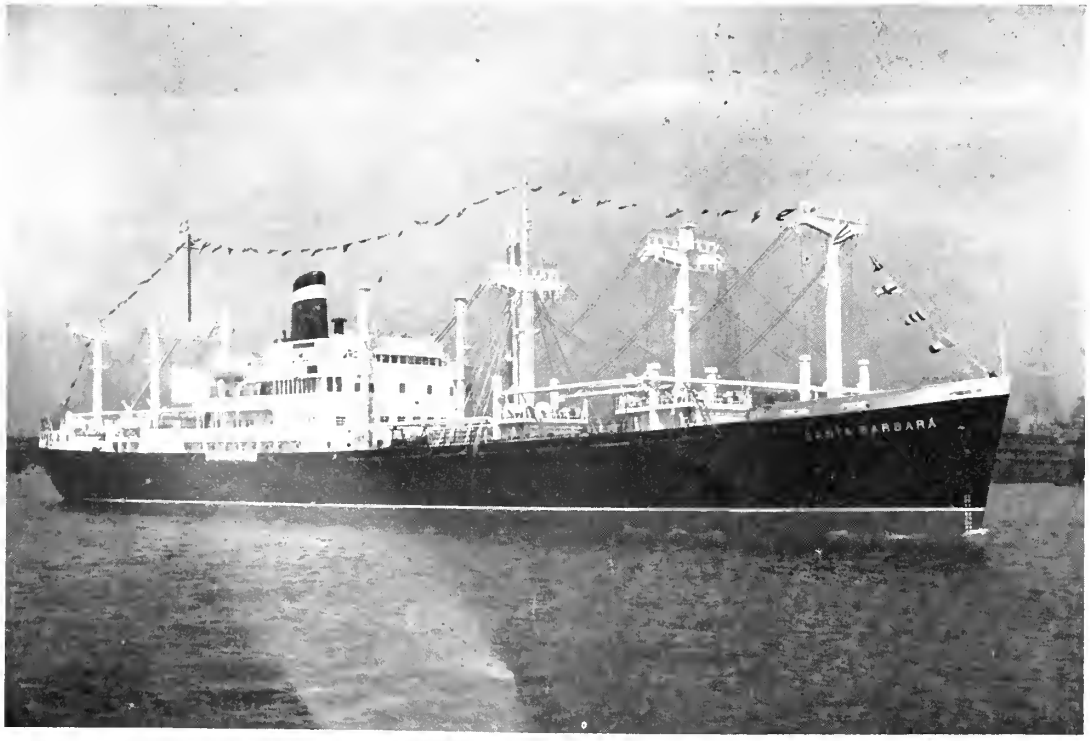
With the recent sailing of the Grace Line's Santa Barbara to the west coast of South America, the first new American post-war passenger ship took to the once-again peaceful sea lanes. This 52-passenger combination liner boasts the latest accommodations for beauty, utility and comfort, with all furniture, furnishings and joiner work supplied by W. & J. Sloane of New York, N. Y.

Her yacht-like appointments include such modern travel comforts as: complete air-conditioning throughout passenger quarters; fullview windows instead of portholes; swimming pool with beach deck; comfortable beds convertible to lounges by day and automatic telephones in each cabin.

The Santa Barbara can accommodate 9,000 tons of cargo in over 500,000 cubic feet of space—one-fifth of which will be devoted to refrigerated goods. The latest types of cargo gear, such as topping-lift winches for each boom, have been installed to insure swift and efficient freight handling.

A novel and interesting feature, designed to offer maximum space and lounging comfort by day, with full sleeping accommodations by night, is reflected in the beds. Their daytime appearance is that of a large sofa with an upholstered back. An easy pull, and the back swings over to disappear in the wall; another berth concealed in the ceiling is dropped down to offer an extra full-size sleeping space. Wardrobes are spacious, as are also the dresser drawers (as in the large suites) which hold dresses without folding. The top drawer center functions as a writing desk; when the panel is lifted, a vanity mirror is revealed. The dresser mirrors are large, and some suites have additional ones full length. Regular windows, rather than portholes, venetian blinds, telephones and airconditioning complete this modern picture.

The public spaces include a dining room, lounge, clubroom and verandah. The lounge and clubroom are separated from the dining room by accordion folding doors which when opened form one large room for afternoon and evening gaiety. Overlooking the built-in tile swimming pool, the verandah with its bright blue and yellow colors presents another spot for relaxation. From here outdoor movies can be viewed at night on a large screen raised above the pool.



With her bow pointed toward west coast ports of South America, Grace Line's new Santa Barbara sailed on her maiden voyage from New York, June 25, with 52 passengers.

The Furniture and Furnishings on the Santa Barbara

View shows stateroom with upholstered back of lower bed swung into wall for night use; upper berth has been lowered out of concealed position in ceiling. The carpet is of looped two-tone beige, the bed covers of canary yellow, the walls a flat oyster white and the curtains a brilliant green, red and yellow floral figures on off-white background, mohair fabric.

The verandah decor. Grey marbleized rubber floors, the chairs are bright dark-blue with canary yellow imitation leather webbing, and the tables are the matching blue with grey Formica tops.

The furnishing of the lounge. The sofas are of powder blue upholstery with curtains an off-white background with two shades of blue embroidered ribbon design.

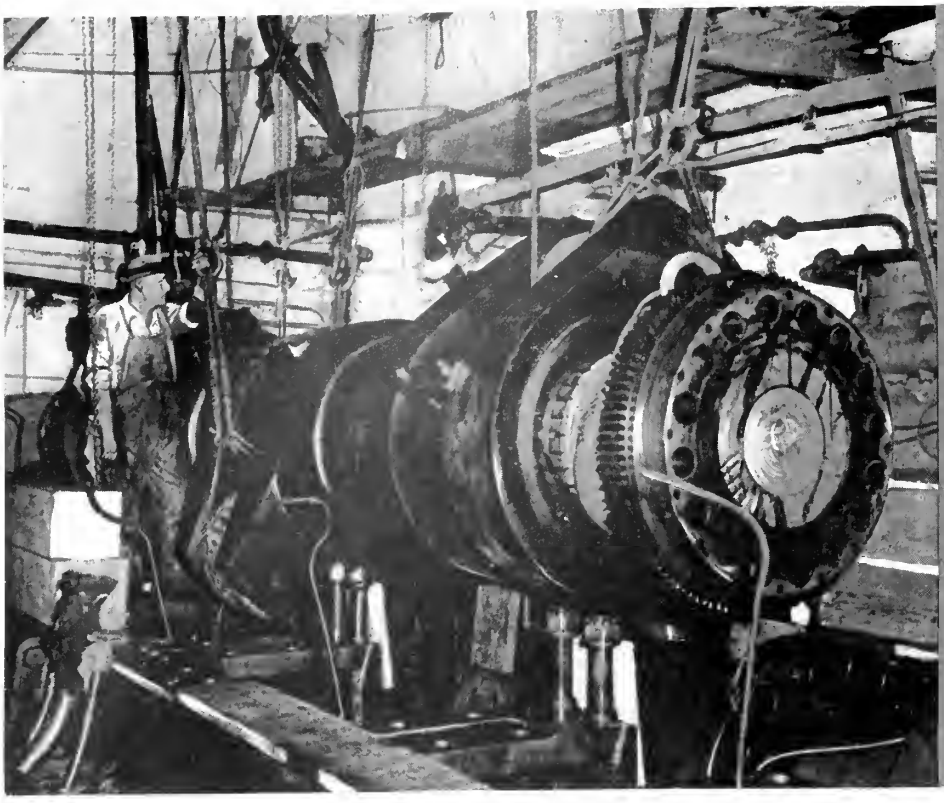


Fig. 1. Crankshaft being removed from bed of motor vessel Poelau Laut. This shaft weighs a total of 92 tons and is divided into two sections, of 46 tons each.

Bethlehem Overhauls Largest Crankshaft

by F. CONLIN

General Foreman, Machine Shops
Bethlehem Steel Company, Shipbuilding Division
San Francisco Yard

BETHLEHEM Steel Company's San Francisco Yard has just overhauled a section of one of the larger crankshafts ever to come into any West Coast machine shop. This section, the largest of its type, was from the M/S Poelau Laut, a 535-foot Dutch vessel powered by a 8000 horsepower Sulzer Brothers motor, one of the three largest diesel engines afloat.

The ship, a three deck combination freight and passenger vessel built at Amsterdam, Holland in 1929, docked at the Bethlehem San Pedro Yard in May 1946. Here the entire crankshaft was removed because of bearing difficulties encountered in service. The forward section was repaired in the San Pedro yard and the after section was shipped by rail to the company's San Francisco Yard. Upon examination the journal pins were found loose and were therefore replaced by new ones.

This section was the after half of an eight-throw crankshaft. It consisted of four crankpins, eight webs, and five journal pins, including two flanged stub ends. The overall length of this section was 26'-3", and weighed 46 tons. The pins were 22-7/8" in diameter. The shaft was designed to have each crankpin and its webs in one solid forging and the journal pins shrunk in the crankwebs.

The photographs show the various operations and machine tools used in dismantling and rebuilding the shaft.

The rebuilt crankshaft has now been reinstalled in the Poelau Laut and the vessel is expected to go on a trial run around the middle of this month.

Fig. 2. Crankshaft being removed from bed of motor vessel Poelau Laut.

Fig. 3. Below: Crankshaft being lifted a height of approximately three decks to a level even with a hole cut in the bulkhead through which it is to be snaked out on the first deck level in one of the main hatchways of the Dutch motor vessel, Poelau Laut.

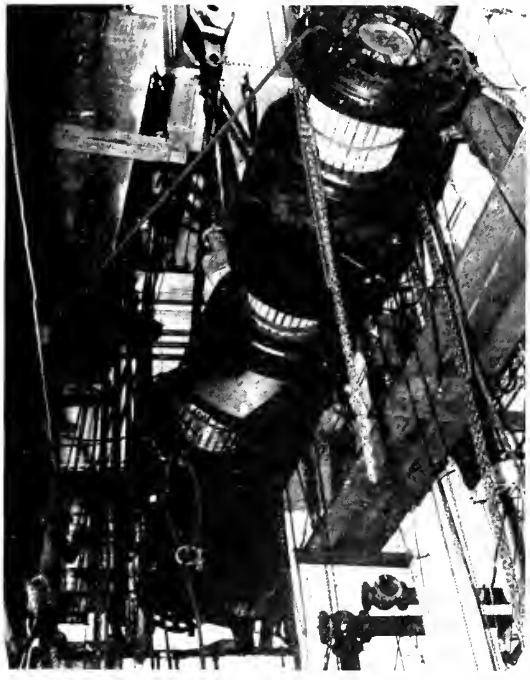


Fig. 4. Crankshaft being hoisted up through the ship's three decks.

Fig. 5. A close-up of the crankshaft of the Dutch motor vessel, Poelau Laut, on the special skid on which the shaft was slid across the open hatchway. The man shown in the left of the picture is Jimmy Henderson, better known as "Jimmy the Rig," veteran rigging boss of the San Pedro Yard.

Fig. 6. The special skid plate on which the shaft was slid across to the open hatchway of the Dutch motor vessel, Poelau Laut.

Fig. 5

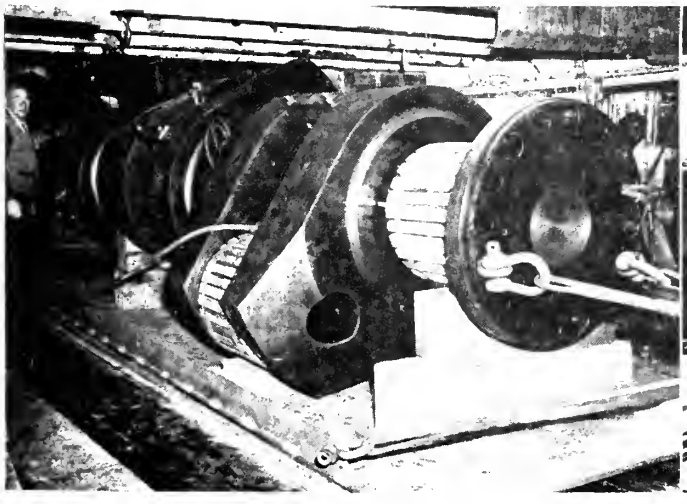
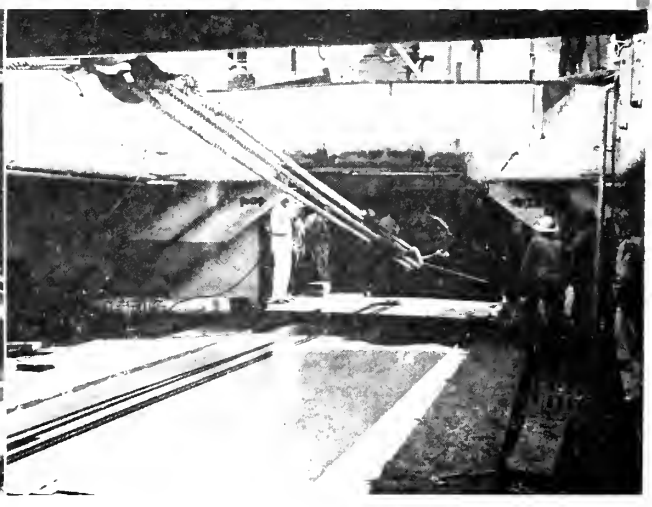


Fig. 6



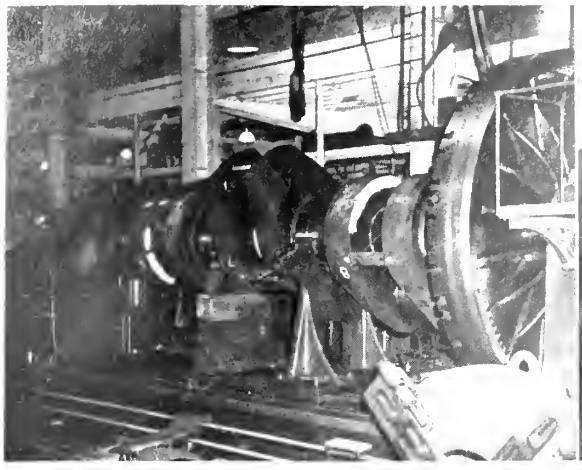


Fig. 6. The shaft on the 125" x 60' lathe, after being shipped to the San Francisco Yard's machine shop, where the survey and inspections were made, after which the journal pins were undercut, as far as was practicable, close to the webs. The final cut was accomplished with a burning torch. Incidentally, this lathe is one of the largest on the West Coast.

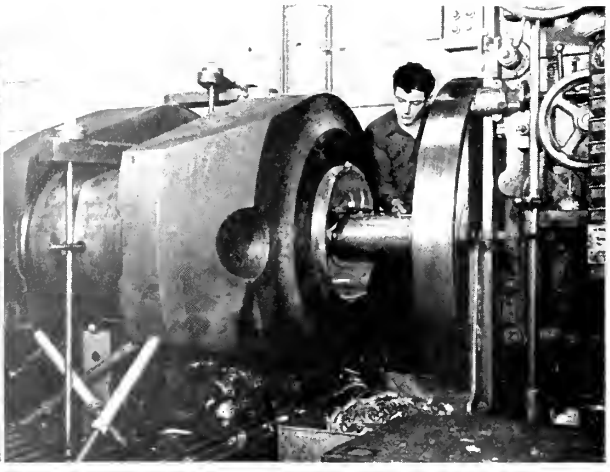


Fig. 7. Stub end of old journal pin being bored out of web on a 7" horizontal boring mill. The webs were also re-bored true and lapped to alignment for the new journal pins.

Fig. 8. Coupling journal pin being roughed out. The web fits were machined, finished and ground on this 60" engine lathe. Approximately .035 inch was allowed on the diameter for the shrink fit.

Fig. 9. Intermediate journal pins being roughed out to approximately 23¼ inch diameter. They were cut off to length from the billet on an 84" x 49' 0" engine lathe.

Fig. 10. Cold journal pin being lowered into heated web.

Fig. 11. Heated web, just after insertion of journal pin. Cooling period which followed was 24 hours. Second journal in pit below floor.

Fig. 12. Web being heated by gas torches to approximately 600° F. Note asbestos protection for diverting heat from the crankpin. A 4-hour heating period was required. Temperatures were checked by means of a hand pyrometer to insure uniformity of heat.

Fig. 13, below. Flanged coupling end journal shrunk in place. The weight on top is to help keep the pin in place during 24 hour cooling period. This is the last heat shrink in the vertical position.

Fig. 14. A tense moment as two center web sections are shrunk together. Inspecting operation are: left, foreground, J. Reurts, superintending engineer from the office of P. Kruyt, marine superintendent of the Netherland Line; right, foreground, Capt. C. T. M. Ouwerkerk, Rotterdam Lloyd Vessels; left, background, F. A. Archbold, senior surveyor Lloyds Register of Shipping; right, background, E. F. Essner, assistant to T. C. Ingersoll, manager of Bethlehem's San Francisco Yard.

Fig. 15. Fourth crank web being heated. Note unit lined up on roller carriage ready to be inserted into web.

Fig. 13

Fig. 14

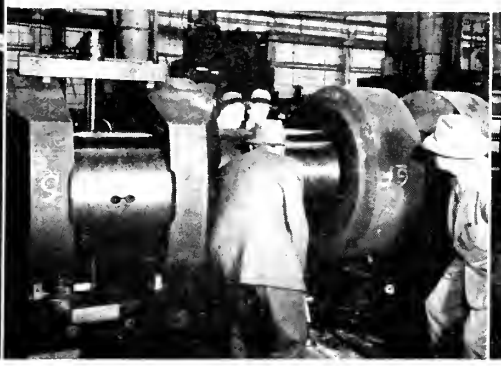


Fig. 15

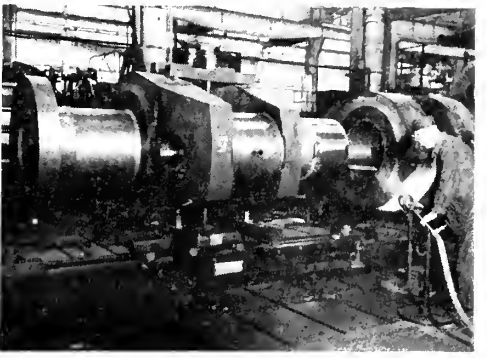


Fig. 16. Third crank pin and web section have now been shrunk in place.

Fig. 17. Checking alignment of pin and web.

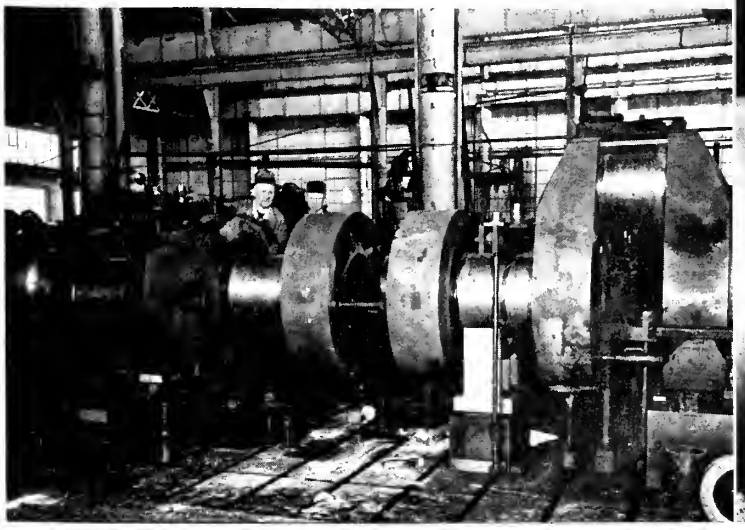


Fig. 18, below, top: 1" oil hole being drilled diagonally from crankshaft to journal bearing. The angle necessitated the use of a drill 5 feet long. This operation is being performed on a #340 Giddings and Lewis horizontal.

Fig. 19, below: Complete shaft after last pin was shrunk into place. This required a total of eight shrink fits.

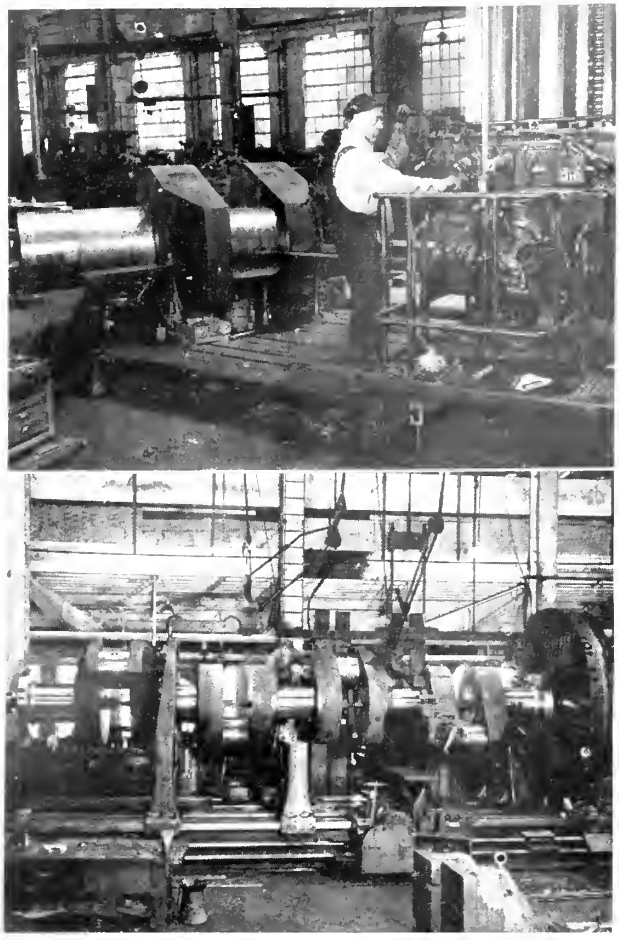


Fig. 20, below, top: Journals and couplings being finished, turned and polished in 125" lathe. This lathe also was used in final checking and inspector's approval. (Author and machinist inspect job.)

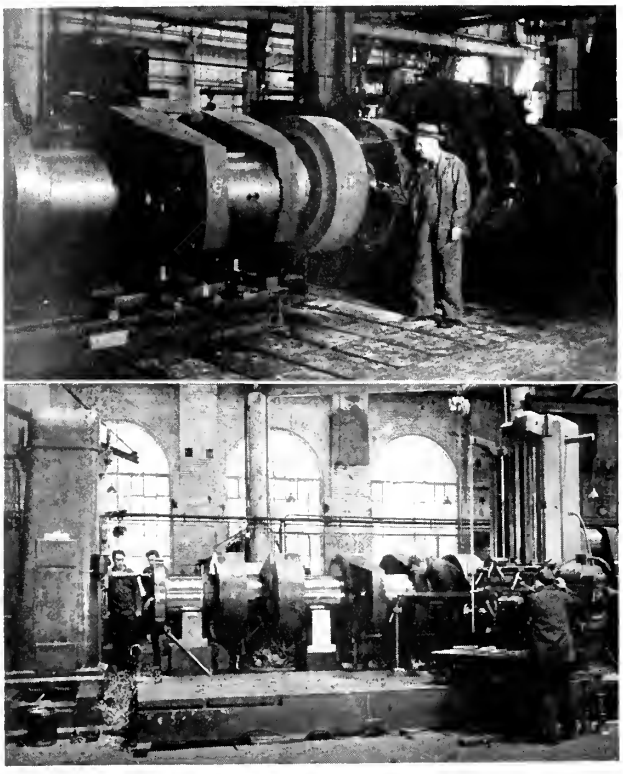


Fig. 21, above: Drilling and spot-facing coupling bolt holes was accomplished on a #340 horizontal mill, while oil holes were being drilled simultaneously by portable horizontal mill. Such twin machining operation is typical of Bethlehem methods expediting ship repair work.

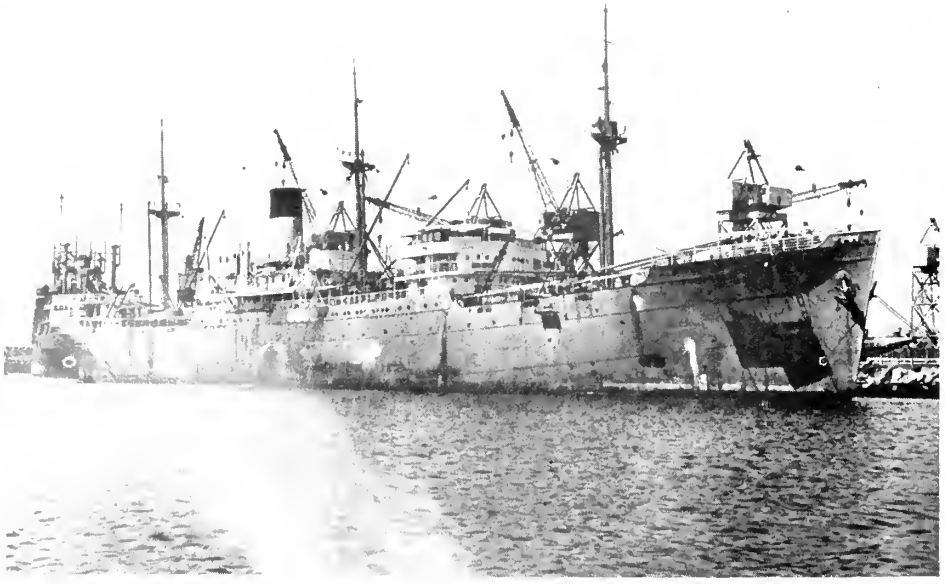


Fig. 22. Motor vessel Poelau Laut, tied up at Bethlehem Steel Company's San Pedro Yard, for repairs. This ship, which was built in Amsterdam, Holland, in 1929, is a three-deck combination freighter and passenger vessel 535 feet long with a beam of 65 ft. It is powered with an 8000 hp Sulzer diesel engine, the largest of its type and the third largest diesel engine afloat.

AGWILINES GEORGE G SHARP NA

AGWI Passenger Cargo Liners

FIVE C-2's BEING CONVERTED FOR WEST INDIES SERVICE

FIVE C-2's, B1 type standard Maritime Commission cargo vessels, delivered to the Atlantic Gulf and West Indies Steamship Lines this summer, are being converted to passenger-cargo liners from designs by George G. Sharp, Naval Architect, New York. These vessels were built by Consolidated Steel Corporation at their Wilmington yard, and four of them were christened: Twilight, Wild Ranger, Crest of the Wave, and Golden Light, after the famous American Clippers of the 1850's.

Our illustrations give some idea of the luxuriousness of the passenger accommodations, and the modern streamlined appearance that will characterize these vessels.

Three of the vessels will be assigned to the Cuba Mail Line on service from New York to Cuba and Mexico. The other two will operate in the Porto Rico Line, on service from New York to Porto Rico and the Dominican Republic.

A streamlined superstructure, four decks high, will be built amidships to house the cabins and the public rooms for passengers. The upper deck houses the pilot house, the chart room, ship's radio, and accommodations for the captain and the radio operators. The three superstructure decks below the pilot house are devoted to passenger cabins and public rooms.

As will be noted on the artist's outboard profile herewith, these several deck levels, at their after ends, are staggered in length, the lower superstructure deck extending aft to the after kingpost, and affording room for a built-in swimming pool and games. Arrangement of cabins is such that there are a total of 28 rooms arranged athwartship forward in such fashion as to give practically a wheelhouse view of the forward deck and the ocean landfall or port ahead of the ship.

Every cabin has private bath, reading lights, intercommunicating phone system, air conditioning, and ultramodern design and styling in drapes and furniture. Each of the 28 wheelhouse-view cabins has two floor beds and a concealed Pullman berth. There are 28 other outside cabins,

Passenger Stateroom AGWI Lines

each of which has one floor bed and one Pullman berth. This adds up to a total of 140 first-class passengers.

Public rooms include: A beautiful main lounge; a dining room equipped with cozy four-seat tables; and a palm court and bar. All public rooms are completely air-conditioned.

An electric galley, with suitable pantries, and equipped with everything necessary to take care of the culinary requirements of the passengers, officers and crew, is installed on the main deck, forward of the dining saloon.

One of the striking features of these vessels is the elimination of the conventional stack. Escape of fumes from the boilers is by way of the midship kingposts. This feature will probably become very popular with naval architects, as it greatly facilitates the modern trend toward streamlining vessel profiles.

Part of the cargo capacity amidships is being used for passenger accommodations, and a large refrigerated space for cargo and stores is being provided. When finished, these vessels will each have 300,000 cubic feet dry cargo capacity, and 160,000 cubic feet of refrigerated cargo capacity. This latter will be divided into many chambers, and will be serviced by refrigeration machinery and controls so that each type of cargo may be maintained at its proper temperature with a range from 0° F. to 40° F.

The hulls are welded steel, 435′ long between perpendiculars, 63′ beam, and 10′ 6″ molded depth, with a total deadweight capacity of 9000 tons. The power plant is the standard Maritime Commission propulsion machinery for the C-2 cargo liner. It consists of two Foster-Wheeler steam generators, fitted with fuel oil burners, air preheater, economizer, force draft fans, and superheaters. These boilers provide steam at 450 psi. and 750° F. total temperature for General Electric Company steam turbine, connected by double reduction gearing to the propeller shaft. This turbine sits on, and exhausts directly into its condenser, which is equipped with an air ejector-inter-after condenser unit, and a condensate pump that maintain a vacuum of 28½″ Hg. The condensate pump delivers the feed through two stages of heating to a combined deaerating heater and hot well, from whence it is drawn by the feed pump for redelivery to the boiler. The majority of the pumps are Worthington.

Auxiliary steam turbo-electric generating sets, furnished by Joshua Hendy Company of Sunnyvale, California, provide electric energy for engine room auxiliaries; cooking; steering; cargo handling; refrigeration load; ventilating fans; boat handling; heaters, and lighting.

The main turbine normally generates 6000 shp., and is capable of continuous 10 per cent overload, or 25 per cent overload for two hours. Its two-hour rating, therefore, would be 7500 shp., and its maximum continuous rating, 6600 shp. On trials, these hulls have made 18 knots. The designed sea speed, fully loaded, is 15.5 knots. It is anticipated that the AGWI liners will have a schedule speed of from 16 to 17 knots.

Safety

All of the passenger accommodation construction, equipment and furnishings are as fireproof, or fire-resistant, as modern design and modern arrangement can make them. The regulations, laid down by American inspection bodies, and by Senate resolutions, are all meticulously followed.

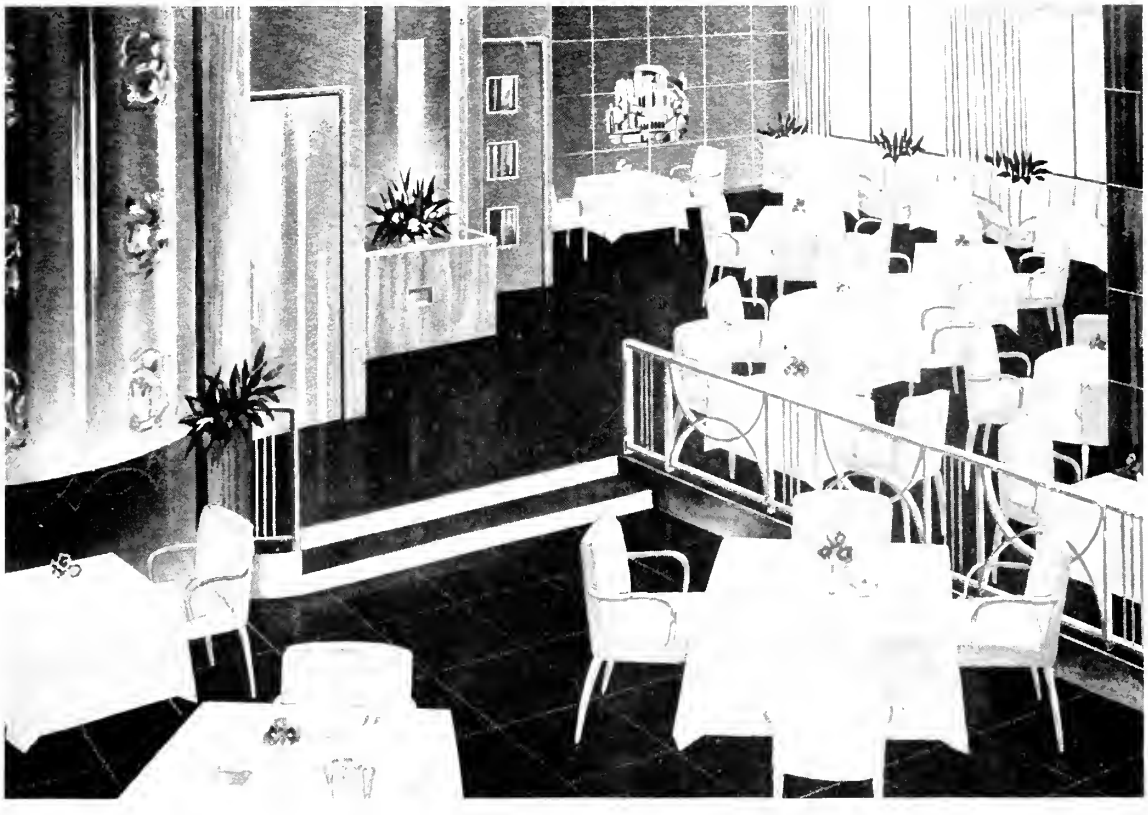
Radio equipment will keep these vessels in constant contact with both ends of their route, and with all other vessels within 1000 miles.

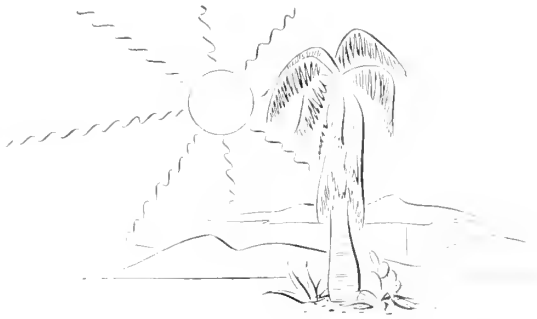
Powerful pumps maintain pressure on fire mains, with strategically placed outlets. Large batteries of CO-2 tanks

(Please turn to page 140)

Main
Lounge
AGWI Lines

Dining Room — AGWI Lines





New Fleet For Inter-Island Service

A NEW FLEET estimated to cost approximately $1,250,000 has been purchased by Isleways, Ltd., ocean-towing subsidiary of Hawaiian Pineapple Company, it was announced by Henry A. White, president of Hawaiian Pines.

The fleet, which will be used in transporting Lanai fruit to the Honolulu cannery, as well as supplies from Honolulu to the pineapple island, consists of two towboats, two harbor tenders, one cargo-passenger vessel, and five barges. The tenders are being purchased from Inter-Island Steam Navigation Company, whose chartered equipment is presently used by Isleways in the Lanai service. The other vessels are being completed in mainland shipyards.

"Isleways has acquired its own fleet because the Lanai operation is not of the commercial common-carrier type, and is one which must be specially fitted to our needs," Mr. White said. "Furthermore the new fleet will provide an improved service for transporting essential materials and supplies to Lanai. Regular steamship service was terminated at the beginning of the war and it is questionable whether it will be resumed."

Originally built for Navy order, and of the type known as "ATA's," the two towboats are now being altered and refitted at the yard of the builders, the Levingston Shipbuilding Company of Orange, Texas. Both of them are new, having been completed after the war. They are single screw vessels, 143 feet long, with 33 foot beam, draft 17 feet, and powered by two 1,000 horsepower General Motors diesels. They displace 600 tons and have a fuel capacity of 1300 barrels. Running free, they have a cruising speed of 15 knots and an average of about 9 knots while under full tow.

Besides developing more power than the boats in present use, the new towing vessels are larger, being of 750 gross tons as compared with 429, and are also longer. A number of this type were built for the Armed Forces and saw service in all parts of the world, in which they proved themselves among the finest ocean-going towboats of their size yet constructed.

Henry A. White, president of Hawaiian Pines.

ATA towboat now being altered and refitted for Isleways Limited.

Alterations to provide better accommodations for members of the crew of 20 officers and men are now in progress. Separate cabins with private washrooms are being provided below decks for the crew, two men being assigned to each cabin instead of a single forecastle in which all bunked together. Separate cabins for engineer officers are being built on the main deck, together with mess rooms for men and officers, while cabins for the captain and deck officers are being installed on the upper boat deck. In addition, a cabin will be set aside for company guests or officials travelling to and from Lanai.

The five large all-steel barges will present a number of new features. Contract for their construction was given to the Dravo Corporation of Pittsburgh, Pennsylvania, and they are being built at the Neville Island yards. Besides being somewhat longer—each barge will be 180 feet—they will replace the traditional barge hull with a semi-molded hull. This new form is a departure from that heretofore used in island service, and was selected as the results of tests of large scale models in the testing tank at the University of Michigan. These disclosed a very substantial actual saving in towing horsepower through molding of the hull lines, as well as a higher speed capacity.

Each barge will be 44 feet wide and will have a capacity of 1,400 gross short tons, including both fresh fruit and containers. After they have been completed they will be towed to the Gulf, through the Panama Canal, and across the Pacific to Hawaii. It is expected that alterations to the first towboat will be completed in time for it to leave New Orleans during the latter part of this year, towing the first two of the five new barges. The 6,100 mile trip to Honolulu is expected to take about one month. The remaining three barges are scheduled to come shortly after the first of the coming year.

The 65-foot diesel-powered Army cargo and passenger vessel was just getting under construction when the war ended. It is now being completed for Isleways at Cambridge, Maryland. When it joins the fleet it will replace the sampan Naia that has been plying between the islands of Maui and Lani for over 10 years, providing transportation and freight service.

Shipbuilding an Old American Industry

Shipbuilding is currently one of America's important industries. It is also one of our *oldest* industries.

The industry was really launched before the Mayflower arrived. In 1607, settlers on the Main coast patiently and painstakingly built the first American ship ever constructed for ocean-going service, the Virginia, a craft of thirty tons, which made at least one profitable Atlantic crossing.

Fair Visitor: "Is there some place aboard where I can get a drink of water?"

Sailor: "Certainly, Miss. At the scuttle-butt, on the starboard side of the gun deck, 'midships, just for-rud of the dynamo hatch."

Abstract of a paper presented before the Northern California Section, Society of Naval Architects and Marine Engineers, on June 27 by—

WILLIAM H. SCHWARTZ,
Design Engineer
Alvin H. Campbell Co.
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ANDREW S. GREEN,
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William H. Schwartz, design engineer of Alvin R. Campbell Co.

Analysis of Cargo Handling Equipment

Profitable shipping depends upon the application of sound principles of cargo transportation and handling. The tons carried per year, the capital invested, and the cost of handling cargo govern a ship's profit producing capacity. Tons carried is controlled by port time and sea time; reduction in port time increases the number of voyages and, of course, the total tonnage.

Profitable shipping depends upon the application of sound principles of cargo transportation and handling. The tons carried per year, the capital invested, and the cost of handling cargo govern a ship's profit producing capacity. Tons carried is controlled by port time and sea time; reduction in port time increases the number of voyages and, of course, the total tonnage.

The ultimate in ideal cargo transportation is zero terminal time. To decrease the terminal time to zero is an impossibility, but there is room for improvement, particularly towards mechanization and elimination of rehandling of the cargo. In most cases, port time saved is more important than a reduction in cargo handling methods on ship, which will reduce port time fractionally.

It is sound engineering to completely analyze the advantages of new methods and equipment before spending a great deal of new capital on modern improvements. The preliminary design of a new ship's cargo rigging requires an exhaustive analysis of every detail, if port time and handling costs are to be kept at a minimum.

We have three general classes of cargo to be transported in competition with foreign ships: Liquid, cubic, and deadweight. The ships must be designed to suit the type of cargo to be carried, particularly as to structural arrangements and deck heights. Ships may require extensive alterations to change from one type cargo to another.

The liquid cargoes may be gasoline, crude oil, molasses, wine, or even water, which require large, easily cleaned tanks and special pumping equipment. Ships carrying deadweight cargoes, such as ore, grain, or coal, should have unobstructed holds, but are often fitted with a second deck to facilitate the carriage of one-way miscellaneous cargoes. Deadweight cargo ships are designed to the full freeboard draft. The cubic cargo ship, carrying bulky lightweight cargoes, should have a number of decks so that cargo is not piled too high, and are usually of the shelter deck type with a scantling draft considerably less than the freeboard draft.

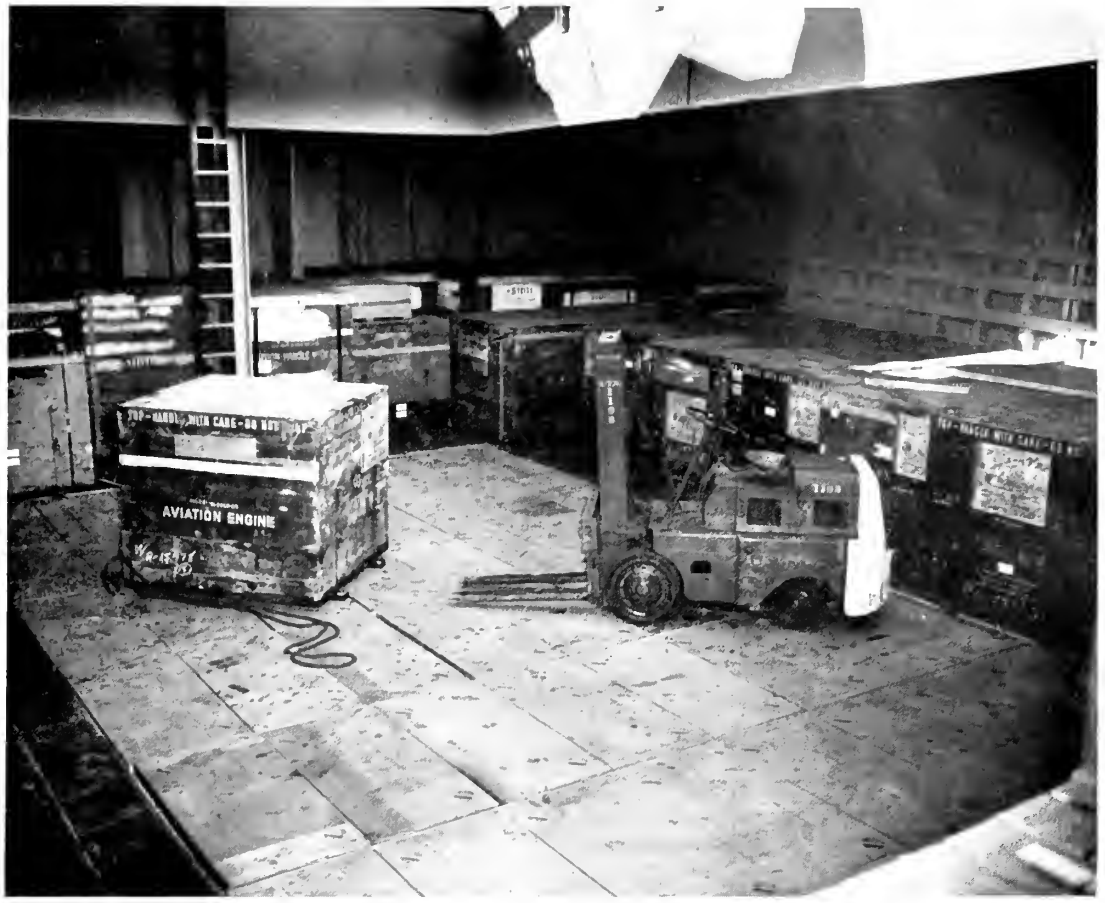
Hatch locations and openings have often been obstacles to the economical operation of a ship. Where deck cargoes are concerned, long and narrow hatches would be desirable. Large 'tween decks and shelter deck areas on each side of the hatch are important in securing the proper division of cargo for various ports. In the case where long steel, or similar cargo is to be stowed, speedy, economical handling can be obtained if the hatches on the 'tween decks are cut back. Width of hatch should be such as to avoid pockets with subsequent stowage difficulties. To have efficient cargo operation, size of hatch should be large enough, particularly in length, for either single or double ganging the holds. The length of the hold is limited by the compartmentation and deck space for winches.

The design and type of hatch cover deserve much consideration. The advantages and disadvantages of the old type wooden hatch covers with steel strong-backs should be surveyed.

The advantages of the wooden hatch covers are: Less initial cost, maintenance by ship's crew, and ease in opening and closing small sections for ventilating purposes.

The advantages of steel hatch covers, such as pontoon, single or multiple hinged covers, less maintenance, time saved in opening and closing, fireproof, safer working, greater security of cargo, and less liable to damage.

The steel "pontoon" cover has been very popular, par-



Palletizing heavy boxes below deck by using mechanical fork lifts.

ticularly because the hatch boards and strong-backs are eliminated, but it has disadvantages of weight and stowage difficulties.

Various types of sliding and folding steel covers, such as the Mackanking and Campbell, have been developed; the folding type, in particular, offers excellent advantages.

In drawing up the specifications for cargo handling gear, the ship owner or ship builder has to decide on either steam or electric power. Considering the initial cost, flexibility of control, and the necessity for a governed-speed, constant-running engine, steam and electric winches have proven their respective ability.

Electric winches cost roughly two and a half times as much as steam winches, without taking into consideration the costs of boilers, steam pipes, and generation plants and wiring. Operational costs of electric winches are much less than the steam units. Stand-by losses of electric winches are zero, while in a steam outfit, radiation and leakage losses are continuing whether the winches are working or not. It is not practical to shut the steam off the cargo deck winches for stand by periods of short duration.

Because of lower capital costs, steam winches have a great advantages over the electric. It is not economy, however, to allow initial costs to be the sole guide towards the most economical installations.

After the choice of winch has been decided upon, the winch layout on the ship's deck is an important item toward efficient cargo handling. The requirements for effective operations are as follows:

(a) Adequate winches should be installed to permit the working of one, two or three gangs per hatch.

(b) Winches should be located to give maximum 3 degrees fleet angle to winch drum for proper spooling of the wire.

(c) Winches should be placed close enough together to permit one man to drive two winches.

(d) Sufficient power should also be available to work all hatches at one time; also, the winch hook-up should be flexible enough so that intermediate repairs can be made without stopping cargo handling operations at other hatches.

The choice of masts or kingposts depends on the type of cargo to be carried. Mast design is preferable on lumber-carrying ships, particularly when clear deck space is desired. In ships carrying general cargo, kingposts or "Sampson Posts" are preferred. In either design, the modern ships should have raised platforms to act as part enclosures for resistor houses, and to accommodate the deck winches. This construction, outside of adding additional top side weight, keeps the deck clear for deck loading. Much thought should be given by the owners and designers before making their

choice of masts or kingposts. Often a combination of both is desirable.

Following are some of the key considerations to watch for in the initial arrangements:

(a) Type of cargo and the load of cargo to be handled on a single lift.

(b) Number and size of hatches.

(c) The height of all fixed parts of masts and kingposts to allow for clearance under low bridges.

(d) Possible elimination of preventers and stays.

Boom requirements depend upon the size and heights of masts and kingposts, and beam of ship. A boom should be able to cover all quarters of the hatch and still give a maximum outreach over the side of the ship of about 18 ft. The vertical height of the boom head over the open deck should not be less than 35 ft. when boom is in maximum outboard position.

Of all the rigging gear, booms have the most frequent failures, the majority of failures resulting from faulty design or overloading.

An essential requirement for the design of rigging gear is to have a scale model of the ship with all its rigging gear, including deck pads and fairleaders and winches located. With this model working in conjunction with the graphical analysis, many improvements can be made and errors detected.

The running gear, which consists of the wire and manila rope, and all blocks, should be mechanically efficient and properly chosen to give the most effective service. The choice of the wire rope sheaves and blocks has a definite relation to the efficiency and operation of the rigging gear.

Small sheaves rapidly deteriorate wire rope because of the excessive bending.

Table shown gives the variation in marine practice to the size of sheaves recommended by wire rope manufacturers.

	6 x 19 H.G.P.S.				6 x 37 H.G.P.S.				8 x 19 H.G.P.S.			
O.D. Sheave	5/8"	3/4"	7/8"	1"	5/8"	3/4"	7/8"	1"	5/8"	3/4"	7/8"	1"
Recommended Dia. by W.R. Manuf.	30"	36"	42"	48"	18"	22"	26"	30"	22"	26"	30"	34"
ABS. Min. Dia. by W.R. Manuf.	22"	26"	30"	34"	14"	16"	18"	22"	16"	18"	22"	24"
ABS. Crit. Min. by U. S. Navy	14"	17"	20"	23"	11"	13"	15"	17"				
Avg. Dia. Sheave	12"	14"	16"	18"								
Maritime Practice	14"	16"	18"	20"								
Avg. Dia. Sheave, U. S. Navy Practice					14"	16"	18"	22"				

In a properly designed block, the use of bronze bushings, with individual center pin pressure lubrication to all sheaves, is recommended. Hoisting blocks should be either roller bearing or ball bearing, preferably roller, with individual pressure lubrication.

Vang purchase blocks should be either bronze or roller bushed with pressure lubrication. Generally speaking, all rigging blocks should be heavy duty galvanized, and have no linkage connection. Drilled holes should be pin connected, center pins should be over-sized to compensate for grease grooving. Inside and outside plate straps of blocks should be wider at drilled hole to compensate for area removed. In reference to steel plate blocks, side straps should be continuously welded.

The major problem of designers and ship riggers is the inconsistency in the fitting sizes as supplied by the manufacturers. When specifying a fitting to be used for a 3/4" dia. rope, the pin size as listed for 3/4" open socket is 1 3/8"; for solid thimble, 1 1/16"; for shackle, 7/8"; and for turnbuckle 1 1/4".

The following tabulation compares the variations between commercial and Navy practice in reference to pin diameters.

TABLE OF VARIATION IN W.R. FITTINGS

Commercial Standard

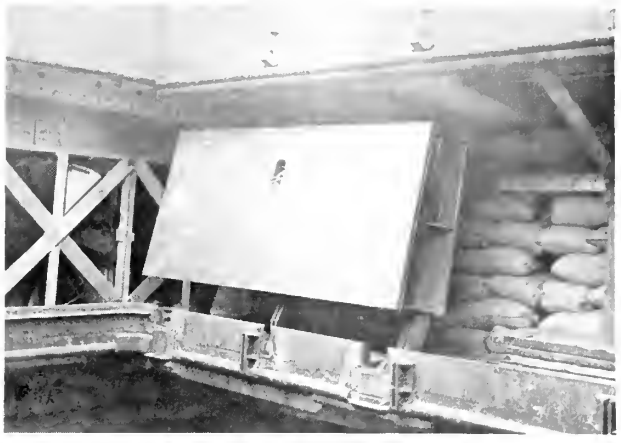
(Taken from Catalogue of One Manufacturer)

OPEN SOCKET			SOLID THIMBLE		SHACKLE			TURNBUCKLE		
Rope Dia.	Pin Dia.	Jaw Opening	Pin Dia.	Jaw Opening	Size*	Pin Dia.	Jaw Opening	Size*	Pin Dia.	Jaw Opening
3/4"	1 3/8"	1 1/2"	1 1/16"	1 1/4"	7/8"	1 "	1 7/8"	1 1/4"	1 1/8"	1 3/4"
7/8"	1 5/8"	1 3/4"	1 5/16"	1 1/2"	1 "	1 1/8"	1 11/16"	1 1/2"	1 3/8"	2 1/16"
1 "	2 "	2 "	1 5/16"	1 1/2"	1 1/8"	1 1/4"	1 7/8"	1 3/4"	1 5/8"	2 3/8"
1 1/2"	3 "	3 "	2 1/8"	2 1/8"	1 3/4"	2 "	2 7/8"	2 1/2"	2 1/4"	2 7/8"

Navy Standard

OPEN SOCKET			SOLID THIMBLE		SHACKLE			TURNBUCKLE		
Rope Dia.	Pin Dia.	Jaw Opening	Pin Dia.	Jaw Opening	Size*	Pin Dia.	Jaw Opening	Size*	Pin Dia.	Jaw Opening
3/4"	1 3/8"	1 1/2"	1 5/16"	1 1/2"	1 1/8"	1 7/16"	1 5/8"	3/4"	1 7/16"	1 5/8"
7/8"	1 5/8"	1 3/4"	1 3/8"	1 5/8"	1 1/2"	1 11/16"	1 15/16"	7/8"	1 11/16"	1 15/16"
1 "	1 7/8"	2 "	1 9/16"	1 13/16"	1 1/2"	1 15/16"	2 1/8"	1 1/2"	1 15/16"	2 1/8"
1 1/2"	2 1/16"	3 "	2 5/16"	2 1/2"	2 1/8"	2 3/4"	2 13/16"	2 1/4"	2 3/4"	3 13/16"

*Size ... and turnbuckle determined by ultimate strength of 6 x 19 plow steel wire rope.



LEFT: Single hinged starboard side cover stowed vertically showing locking device. No strong backs or hatch boards necessary. All tested to open one hatch in less than one minute. Proven after six years of operation. AT RIGHT: Double hinged port side cover stowed vertically.

Forged type swivel connections on blocks should be eliminated unless the bitter end is over-sized and built up by weld or peening. Many of these forged swivels have pulled out because of poor design.

Conclusion

It is the opinion of the marine designers and ship operators that there is much room for improvement in the design and operation of our present cargo handling methods. To improve the economy, important consideration should be made in the ship and port facilities. The purpose of shipping is to "Make Money," efficiency will only result in the best way necessary to handle cargo. The best way may be the old, conventional scheme of stevedoring and the use of ship's booms for burtoning rigs, or by more modern mechanical equipment, such as heavy cranes, monorails, terminal elevators, etc.

The trend is towards mechanization, but the transition is a slow process. To invest heavily into the installation of mechanical loading rigs when terminal facilities are inadequate, and vice versa, to mechanize a terminal dock when ship's gear is equally inadequate, is poor engineering.

The modernization of cargo handling is inevitable, and can only be done by gradual time and cost analysis. The mere improvement in detail of rigging gear, as already discussed, may be a temporary solution, at least until business warrants radical improvements. It is good economy to clean up what tools we have by really giving them a chance. Better winches, stayless masts and kingposts, better gear, is the essence towards improvements. The following is suggestive reading towards future possibilities:

(a) The Harnischfeger Corp., collaborating with the United States Maritime Commission, are developing plans for the application of Cargo Cranes, Retractable Boom Cranes, and Boom Gantry Cranes.
Ref.: P. & H. Cargo Cranes by Harnischfeger Corp., Milwaukee, Wisconsin.

(b) Monorail Construction in Ship's Hold.
Ref.: Article, "Modern Marine Cargo Handling." Spencer & Morris, Los Angeles, Calif.

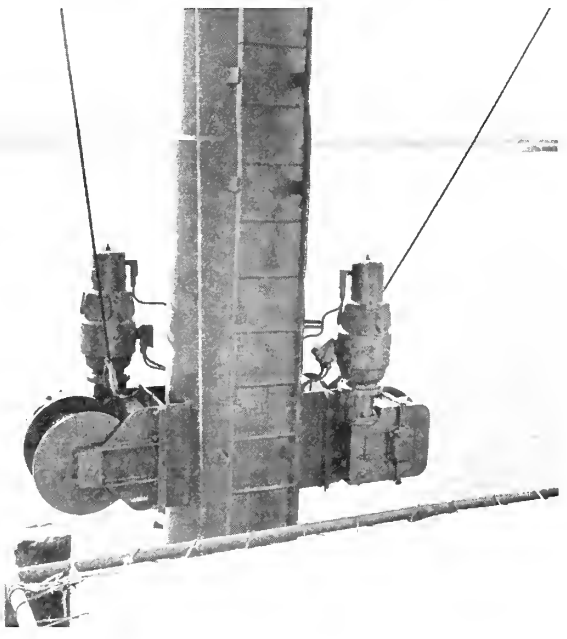
Efficiency rises in cargo handling as the size of loads increases and as the dimensions are standardized. This standardization in the size of loads is known as "Palletization."

There is no doubt that without the expenditure of a great deal of money, the standardizing of cargo by the use of pallets or containers of unitized lifts, sizes and weights and shapes may be adapted in the handling of general cargo at the terminal and on the ship. These uniform pallets, or containers, could be economically handled by mechanical equipment off ship, as fork-lifts and small movable cranes. Overhead equipment, as under-slung monorail trolley hoists, could be installed in pier sheds and on dock aprons. By an interlocking system of monorail switches and trackways, these palletized sections could be handled quickly to supply ships handling gear.

The process of palletizing the loads could be done at manufacturer's plant or shipping warehouses before being

(Please turn to page 126)

Topping lift winch on C-4 type ship. Eliminates topping lift deck loads, crossing of wires and frees use of one winch drum. Remote controlled at hatch edge.



Admiralty Decisions

by **HAROLD S. DOBBS** of the San Francisco Bar

HAROLD S. DOBBS

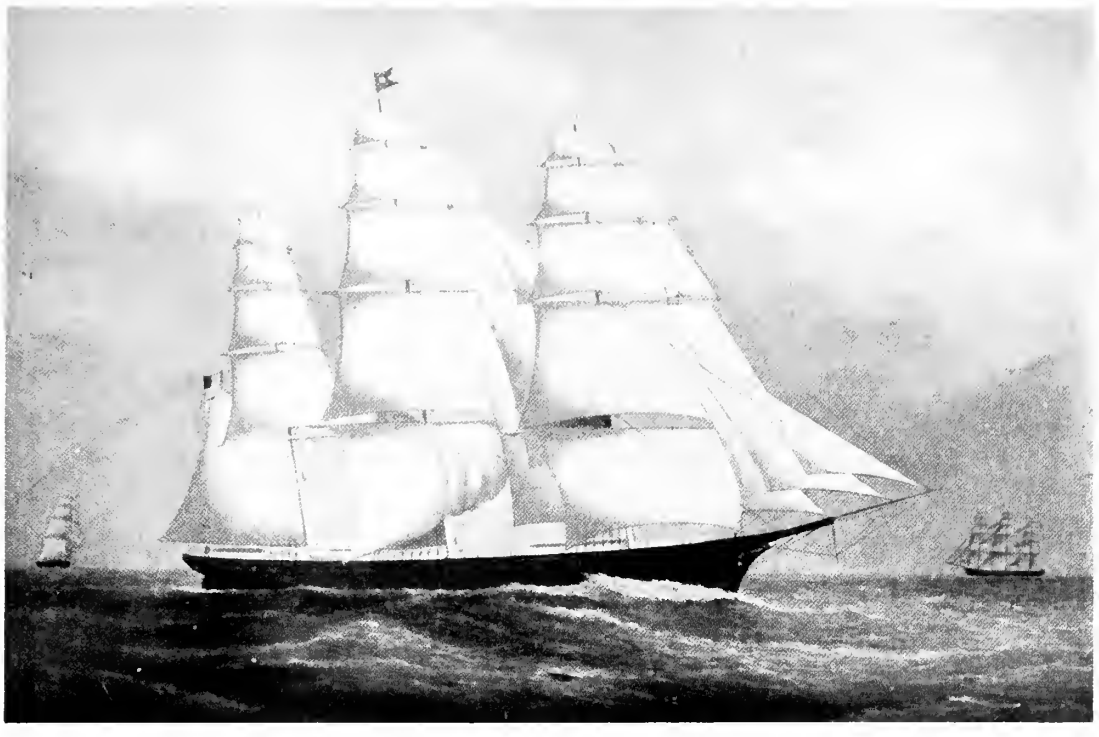
Two Vessels at Fault, But One is Absolved

Ordinarily where courts find that two vessels involved in a collision have each violated the Rules of the Road immediately prior to a collision, mutual fault is decreed and the parties add the damages of each and divide it by the number of vessels involved in the collision, each standing that share of the total damage. Of course, there are exceptions to this rule and one of the exceptions is sometimes referred to as th rule of Major and Minor fault where the fault of the less guilty of two or more vessels is jealously scrutinized. In the light of this general discussion it is interesting to review the recent case of *Lind et al.* vs. *United States of America,* 1946 A.M.C. 971, U. S. Cir. Ct. of Appeals, Second Cir.

In the *Lind* case the court found one of the vessels guilty of violations of the Rules of the Road and still reached a decision whereby one of the two vessels involved in the collision, each of which had been guilty of fault for the collision, was held solely at fault and the other vessel exonerated. The District Court in this case reached a decision of mutual fault. The libelants appealed from the lower court's decree in which they were granted only one-half of the damages for the loss of the fishing vessel MARY with the crew's personal effects, in a collision with the respondent's ship ABNER DOUBLEDAY on the night of April 18, 1944. The jurisdiction was under the Suits in Admiralty Act, 46 U. S. Code, Sec. 741 et seq., and the Public Vessels Act, 46 U. S. Code, Sec. 781 et seq. The MARY, seventy feet long and driven by a diesel engine, was in command of one Olsen, one of the libelants; she had a crew of five besides him; and for half an hour before the collision she had been on a steady course southwest by south, about 100 miles southeast of Ambrose Light, dragging her fishing gear and nets from her starboard side at a speed over the ground of between two and one half and three miles an hour. She carried a white masthead light thirty-five feet above the water, the customary red and green running lights in the forward rigging about fifteen feet above the water, and working lights at the same height, at the forward end of her pilot house, with reflectors which cast their light down upon the deck. In addition to these she carried two more white working lights on the under side of her "beam," a starboard white light "at the gallows" to which the fishing nets were attached and a white light at her stern, a few feet above which was still another white light. She did not, however, carry the lights required by Sec. 79(d) (First) of 33 U. S. Code, of a vessel engaged in trawling; that is to say, in place of a masthead light "a tri-colored lantern so constructed and fixed as to show a white light from right ahead to two points on each bow, and a green light and a red light over an arc of the horizon from two points on each bow to two points abaft the beam on the starboard and port sides, respectively; and not less than six, nor more than twelve, feet below the tri-colored lantern, a white light in a lantern so constructed as to show a clear, uniform and unbroken light all around the horizon." It was a clear but dark night, and the MARY had been bound in a general easterly direction until about 9 p. m., when she went about on a right rudder and at about 9:15 was on the course I have mentioned, southwest by south, from which she did not change until the collision at about 10 o'clock. Some twenty minutes before then Olsen, who had been in the pilot house, left it to go aft and look at the wires of his trawl. Before leaving, in accordance with practice common to wheelsmen on such vessels, he put a rope on the wheel to hold the rudder in such position that it would offset the drag of the trawl on the starboard side and keep the ship on her course. All five of the crew were engaged either in cleaning or icing the fish, or in some other duty not connected with navigation; there was no look-out and no man on the wheel; the MARY was running blind.

The DOUBLEDAY was a single-screw Liberty ship about 441 feet long, in a convoy, which was bound on an easterly course at a speed of between nine and nine and one-half knots. She carried no lights, was completely blacked out, and was painted gray, still better to escape detection; she was in the fifth row of the tenth column of the convoy, counting from the port. The officer on the bridge was the third mate, who had received his papers in the preceding

(Please turn to page 148)



Clipper Ship
Flying Cloud

Names of the C-2's

Clipper Ship Flying Cloud

WE HAVE HAD SEVERAL requests in recent months for short histories of the American Clipper Ships whose names have been chosen by the Maritime Commission as fitting monikers for their C-2 type standard cargo liners. A series, to which this article is an introduction, is the answer to those requests. Facts and figures will be taken from that great book, "American Clipper Ships," by Howe and Matthews, which is now the recognized authority on the subject. This series will be filled with the factual records and the actual characteristics of these vessels which were the finest expression of American creative genius in the late forties and early fifties of the nineteenth century.

Perhaps the most remarkable feature of the clipper ship building era in America is the suddenness of its appearance and the shortness of its life.

The lines of the extreme clipper design as applied to sailing ships first appeared in the French Navy prior to 1800. These lines were copied for American privateers largely built in Baltimore during the War of 1812. These privateers were small, ranging from 100 to 350 tons and after the war were put into trading, mostly slave trading, and proved very successful.

The first so-called large clipper was the Ann McKim, 450 tons, built in Baltimore, 1833. The second was the Rainbow built in New York 1845. Others were built for the China trade between 1845 and 1850. The demands of the California trade and gold rush brought a feverish activity in the production of extreme clippers, the gold rush to Australia helping, but no keels for extreme clippers were laid in American shipyards after 1854. The type of medium clipper had been brought out and, being commercially more profitable, continued to be built down to the late 70s.

Many records for fast construction were made in those days. For instance: "The keel of the John Bertram was laid October 8, 1850 and ninety-one days thereafter she was at Boston fully laden and ready to sail for San Francisco. She saw hard service for 32 years thereafter before meeting her fate."

In the short clipper ship era the American citizen followed the fortunes of his favorite clipper with great avidity,

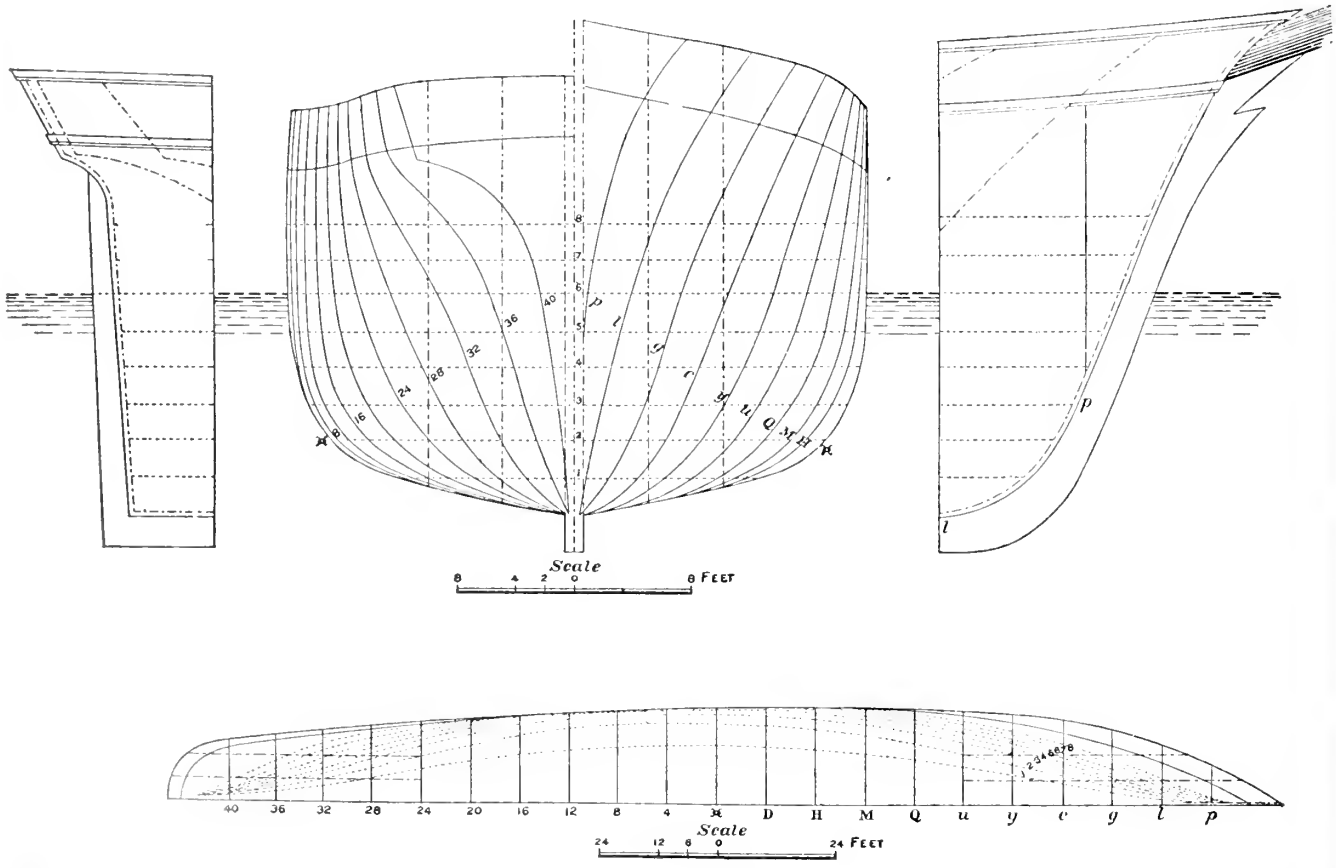
betting on arrival times, on fastest day's runs, on one clipper against another, and one one shipyard against another.

Many clippers netted their owners more than the cost of the vessels on the first round voyage. This not only because of high freights and passenger fares but also because of low shipbuilding costs. Shipbuilding timber and skilled labor were obtainable in greater quantities and at less cost than anywhere else in the world. Flying Cloud, fastest of the clippers and the finest ship built up to that time, was sold while building to a New York mercantile firm for $90,000, the price representing a fair profit over her contract cost. These low costs were the principal reason for that great era in American shipping, just as high costs in these latter days are the principal reason for its periods of depression.

To our way of thinking there is very little to be learned from the American Clipper Ship Era that will help solve our problems today. American traders and merchants of 100 years ago took to the sea because the special conditions existing at that time made it possible for them to make large profits in sea ventures. They were ready and eager to take advantage of their opportunities and there were no independent bureaus at Washington and in the state capitals, and no labor union bargaining agencies, to put any dampers on their enthusiasms. So the clipper ship era dawned with a burst of glory and as soon as the special conditions which brought it into being began to disappear the glory also faded and the clipper ships were in very large part sold for operation under foreign flags.

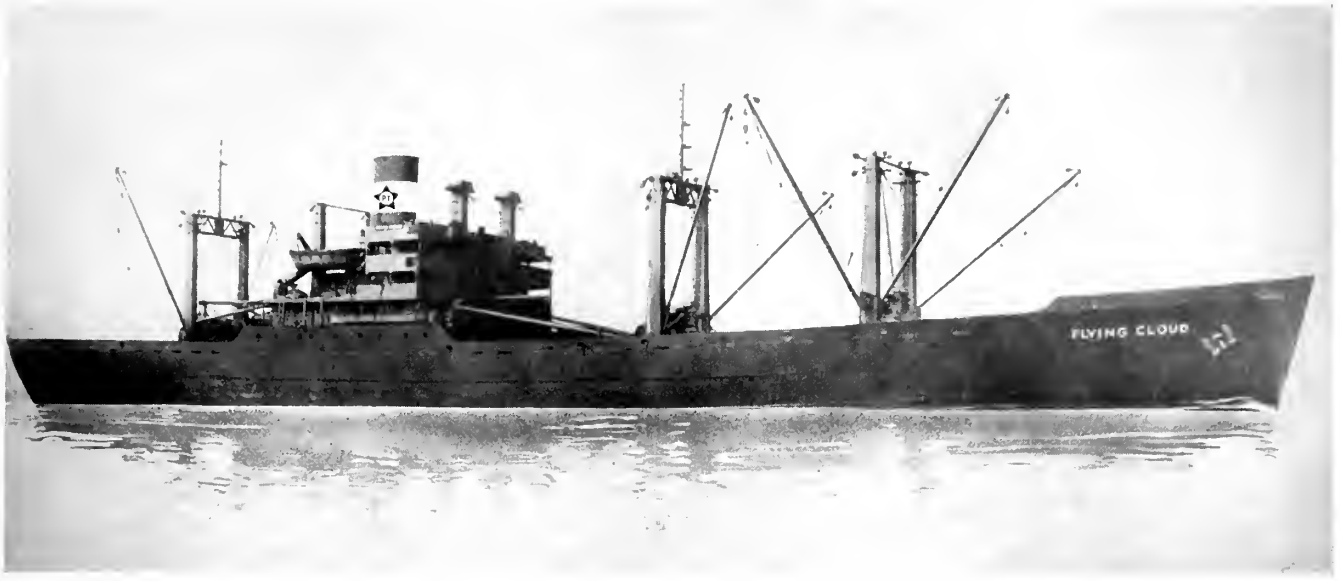
It is a fact, as we shall see in this series of articles, that not a few of the clipper ships chosen to give names for C-2 cargo carriers were American only in the fact that they were built in an American yard. In some cases they never sailed under the American flag except on the delivery voyage to a Canadian or a British port.

Flying Cloud, 1782 tons, built at East Boston in 1851.
Lines from Hall's Shipbuilding Industry of the United States, 1884.



THIS SHIP, PERHAPS THE BEST KNOWN of the California gold rush clippers, was built in the East Boston Yard of Donald McKay for account of Enoch Train of Boston, who sold her before she was finished to Grinnell Minturn & Co. of New York. She was launched April 15, 1851 and sailed from New York June 2, 1851 bound round the Horn for the Golden Gate, arriving at San Francisco August 31, 89 days and 21 hours from anchor to anchor. This was the fastest passage made up to that time on that run and was never excelled except on the fourth voyage of the same ship when Flying Cloud made the run in 89 days and 8 hours, anchor to anchor. The only claim ever advanced against these records was made by friends of the Clipper Andrew Jackson. Jackson's fastest run was 89 days and 20 hours, pilot to pilot, 90 days and 12 hours, anchor to anchor.

The total distance logged on the record run was 15,091



Named after the Flying Cloud, a modern C2 operated by Pope & Talbot.

Principal Characteristics

Length keel	208 ft.
Length deck	225 ft.
Length knight heads to taff rail	235 ft.
Beam	40 ft. 8 inches
Depth	21 ft. 6 inches
American old measurement	1782 48/95 tons
British measurement	1139 tons
Dead rise	30 inches
Side swell	6 inches
Sheer	3 feet
Rake of masts	1¼ inch to the foot

nautical miles, best day's run 360 miles, poorest day's run 26 miles, average speed 7.04 knots, best speed 24 hours 15 knots, poorest speed 24 hours 1.08 knots. At that time no cargo steamer afloat could have made this voyage without recoaling and the two stops necessary for recoaling, if the steamer carried the same cargo as the sailing ship, would have allowed the clipper to win over the steamer notwithstanding the irregularities of wind propulsion.

It is interesting to note the variations in time between the six voyages Flying Cloud made on the round the Horn run. First 89 days 21 hours, second 115 days, third 105 days, fourth 89 days 8 hours, fifth 108 days, sixth 185 days elapsed time, 113 days sailing time. The first five round trips were made under the command of Captain Josiah Perkins Cressy. On this last voyage, which was under command of Captain Reynard, she was badly damaged in storms in the South Atlantic and returned to Rio for repairs. The 113 days sailing time is made up of 31 days from New York to a point opposite Rio, and 82 days from Rio to San Francisco. It is noteworthy that on this, her slowest voyage, she made the fastest day's run of her career; 402 nautical miles, an average speed for the day of 16.75 knots.

She was laid up in San Francisco from September 14, 1856 to January 4, 1857 when Captain Cressy came out to resume command and took her home to New York in 91 days.

In New York she was sold and laid up there until December 8, 1859 when she left for Deal under Captain Winsor, making a fast passage of 17 days. Leaving Deal February 14, 1860 she made Hong Kong in 97 days. After two round trips and a third run out to Hong Kong she was chartered to carry troops home to London, arriving in April 1862. She was then sold to a British concern and operated without change of name and until after 1870 was used in the Australia run. Then she was changed to the timber trade between St. John's and London. In 1874 she went ashore on Beacon Island Bar off St. John's, broke her back and became a total loss. The hull was condemned, sold, and finally burned to get the copper sheathing and metal fastenings.

The Lightning

This was the case, for instance, with the Lightning, always referred to as the fastest American clipper. Her remarkable twenty-four hour record of 436 miles or an average of 18.16 knots was made on the delivery voyage from Boston to Liverpool. This vessel was the first of four ordered from Donald McKay of Boston in 1853 by James Baines & Co. of Liverpool for their Black Ball Line of Australia passenger packets. At that time Baines & Co. could get those vessels built better and at lower cost on the Mystic

Institute of Navigation

A Healthy Yearling

A FEW THINKING MEN WHO ARE largely responsible for much of the work in navigation during the war years, met in June 1945 at the University of California at Los Angeles under the direction of Dr. Samuel Herrick, Professor of Astronomy, and formed the Institute of Navigation with the avowed purpose of continuing research in navigation and its related arts and sciences. At the end of one year, the formal stage of growth has been completed and the Institute of Navigation began to attack the problems of the future.

The annual meeting was held at the University of California in Los Angeles. Some of the more important papers and panel discussions affecting surface navigation are here abstracted.

Polar Navigation

Captain Fred A. Gross, Jr., of the Army Air Forces Department of Research and Development, Mather Field, California, spoke on the *AAF Approach to Polar Navigation*. In stressing the two main points, preparedness and mobility, that reflect the purpose of polar navigation training in the Air Forces, Captain Gross quoted General Spaatz who stated the mission of the AAF ".... to meet, at points well beyond the continental limit of the United States, any attack aimed at the national security.... The Air arm is unique in that it possesses to a very high degree the military characteristics of mobility, speed, range, flexibility of employment, surprise, and fire-power.... The high operational mobility of the Air Forces must be matched always by a corresponding logistical mobility."

The AAF teaches polar navigation for its practical military applications, and because it gives the student a more complete knowledge of navigational theory. The problems of polar navigation are not intrinsically different than those encountered in the lower latitudes; however, each navigational problem confronts the navigator at the pole in its extreme and most difficult application.

Captain Gross stated, "In the preparation of the Polar Navigation course syllabi the most difficult problem was the definition of the Polar Regions. Variously the region had been defined as the areas above the 60th, 66th, 70th, 75th, or 80th parallels. Present day AAF equipment negates the necessity of considering the climatic, geographic, or astronomic considerations, leaving only the cartographic condition for consideration; however, there existed also departures in techniques which appeared later in the research work.

"The definitions finally laid down were as follows: Standard Latitudes, up to the 70th parallel N or S; High Latitudes, from the 70th to the 85th parallels N or S; and finally, Polar Latitudes, from the 85th parallels to the poles."

The latter part of his talk dwelt upon the problems of polar navigation that confront the navigator in either high latitudes or polar latitudes, which evoked much discussion from the floor. The Navy strongly urged the use of an inverse Mercator in which the equator is superimposed on the geographic pole and becomes the 180th meridian. The Army Air Forces and some technicians who were present advocated the use of a Polar Stereographic chart with a grid overlay. The advantages and disadvantages of each chart were discussed thoroughly, and because of the intense interest of navigators and technicians in this basic problem, "Navigation" plans to publish a critical essay on the subject in a fall issue.

It is essential that a basic chart become standard so that all navigation aids and improvement of techniques in that region be made to conform to the most advantageous chart and direction finding conditions.

Decca

Mr. H. F. Schwarz, Director of the Decca Navigator Company, Limited, of London, England, gave the Institute the first detailed knowledge on Decca equipment made available to the practicing navigators of this country.

Decca, still in an experimental stage, may have some distinct and far-reaching advantages over Loran. It may replace Loran because of its simplicity of operation, its high degree of accuracy, and the fact that it instantaneously and continously displays the position of the aircraft or surface vessel.

This system employs a continuous wave radiation whose phase difference produces a fixed hyperbolic space pattern. A Master station transmits a continuous radio wave and a "RED" slave radiates on a different frequency a continous

The annual meeting of the Institute of Navigation at the University of California at Los Angeles, June 27, 1946.

wave which is automatically locked to the Master. The receiver, after converting the Master and Red slave to a common frequency, compares their phase on the Red indicating meter. The indicator reading is a precise determination of the position of the ship on a hyperbola passing through the ship and the base line joining the Master to the Red slave.

At the same time the Green slave is radiating a continuous wave on a third frequency again automatically locked to the Master radiation. In the same manner as with the "RED" signal, the "GREEN" signal is compared with the Master and the resultant phase difference indicated on the Green indicating meter. These two readings, if taken simultaneously, fix the position of the ship. Charts prepared with lattice lines corresponding to the red and green hyperbolae are numbered with the same notation as the "RED" and "GREEN" meters and enable the operator to translate the meter reading to a pin point on a chart.

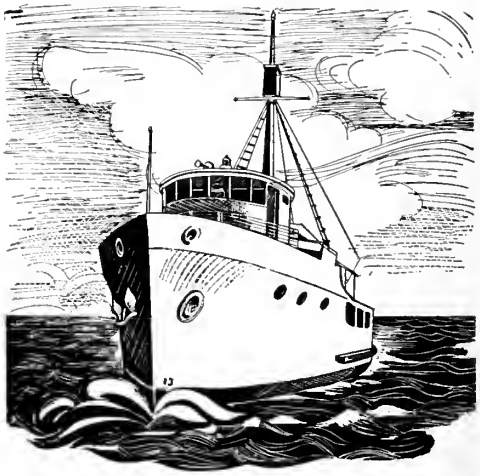
Decometers, integrate their phase readings and accordingly keep constant record of the ship's positions at all times. They must be manually set, however, at whatever point voyage within the cover of a Decca Chain commences. The marine equipment weighs only 75 lbs. and is accommodated in a box $21\frac{1}{4}$"x$16\frac{1}{4}$"x$18\frac{1}{4}$". All controls are on the receiver and it can be located in any convenient position.

Before starting on a journey, the navigator sets each meter to the zone and lane of destination by means of a simple knob. He obtains these values from his chart. He then switches the equipment on and his position within the lane is automatically displayed on the inner scale of each meter. During the trip each meter follows the passage of the ship automatically and a fix of its position is obtained by reading off the zone and lane values from the meter and plotting them on the chart.

As the Decca system operates on frequencies between 85-130 kilocycles, it is capable of giving signals of workable strength from transmitters of low power up to ranges of 1500 miles. Owing to the divergence of the lanes, the accuracy decreases with range. Furthermore the accuracy

(Please turn to page 134)

Coast COMMERCIAL CRAFT



A Towboat and a Tug

MOST LANDLUBBERS USE THE WORD "TOWBOAT" and the word "tug" indiscriminately, often applying either term to the same vessel. There is a big difference. A towboat is a shallow draft craft used for hauling or pushing barges in rivers or canals. A tug is a shipshape craft used in harbors or the open sea.

This article describes two new vessels. The Mississippi River towboat Elisha Woods, and the Chesapeake Bay-Atlantic Ocean tug Coral Sea. Principal characteristics of each of these craft are shown in the table herewith.

Elisha Woods was delivered at Nashville, Tenn. on June

PRINCIPAL CHARACTERISTICS

	Towboat *Elisha Woods*	Tug *Coral Sea*
Length	110 ft.	102 ft.
Beam	26 ft.	24 ft.
Depth amidship	9 ft. 4 in.	10 ft. 8 in.
Draft loaded	7 ft	
Propulsion Power	1400 shp	1200 bhp
	Twin Screw	Single Srew
	Geared Diesel	Diesel Electric

Three-quarter Port view of the ELISHA WOODS.

Left: Main engine room, showing twin Model 8-278A GM diesel engines on the Elisha Woods. Center: Galley from the entrance door on the Elisha Woods.

Right: Engineer's quarters on the Elisha Woods.

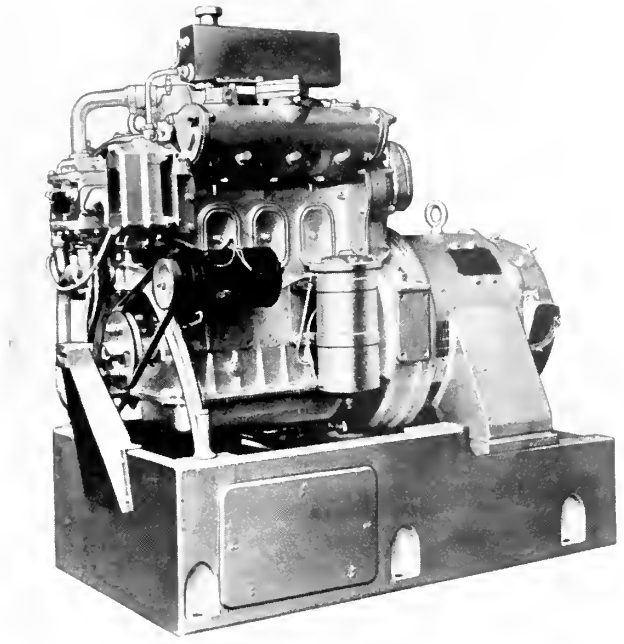
8 last. She is the motive power for a "unit fleet" consisting of two especially designed oil barges and the towboat. Both towboat and barges were designed and built by the Nashville Bridge Company. Total length of towboat and two barges is 592 feet. Each barge carries 19,000 barrels of oil. These barges have ends designed for easy towing and close coupling and these "unit fleets" are proving very economical in operation.

The propelling plant of the Elisha Woods consists of two 8-cylinder, Model 8-278A General Motors Marine Diesel Engines of the two-cycle type, rated to deliver a total of 1400 hp. Each engine is connected through an Airflex clutch and reversing mechanism and reduction gear to 74″-diameter by 54″-pitch, three blade, cast steel propeller of special blade section design.

Full pilot house control is installed giving the pilot finger tip control of each engine. Controls for the main engines, steering system, searchlights, navigation lights and all necessary instruments and gauges are incorporated in a specially designed compact console stand, easily accessible to the pilot.

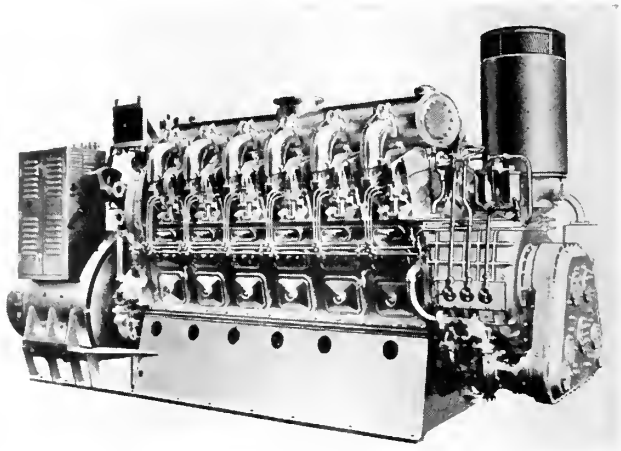
The main engines, as well as the auxiliary engines, are cooled by a special skin-type, closed fresh water system. For auxiliary power, there are two 3-cylinder Model 3-71 General Motors Diesels, directly coupled to 30-KW generators. These furnish electric power for the fire and bilge pump, power capstan, two air compressors, oil transfer pumps, fresh and sanitary water pumps, refrigerators, deep freeze box, galley range burner, heating, boiler burner, searchlights, general lighting system and other electrical auxiliaries.

The air compressors supply the motive power for main engine starting, the Airflex clutches, the air horn and the steering systems. Two steering systems provide independent operation for the two backing and two steering rudders



Auxiliary power for the CORAL SEA is provided by a General Motors Model 3-71 three-cylinder Diesel Generator Set shown in the above picture.

This General Motors Model 12-278A twelve-cylinder, two-cycle Diesel Engine, direct-connected to an 814-kw generator, supplies propulsion power for the CORAL SEA.



which, along with the twin screws, provide the highest degree of maneuverability.

Our illustrations show: the spaciousness and neatness of the engine room; the comfort and convenience of the crew accommodations; and the ample provision of galley equipment. The engine room is insulated for heat and acoustically treated for sound absorption.

Each of the two oil barges carries a large fuel tank on deck with facilities for fueling the towboat underway, thus greatly increasing the cruising range without increasing the towboat's draft. Also on the deck of each barge is a cargo pumping unit consisting of a vertical, multi-stage, deep-well pump connected through an angle drive to a gasoline engine. In addition to the pumps and necessary suction and discharge headers, the barges also are provided with hose derricks, capstans, special pin leveling devices, leaded and armored cable for electric running lights, equipment storage boxes and everything possible to increase the operating efficiency. With this special equipment, the entire cargo of 38,000 barrels can be unloaded in approximately 10 hours without even shifting the barges at the dock.

Coral Sea

Over 100 tugs for the U. S. Navy were built on a basic design developed by the late George Drake, New York naval architect. The Coral Sea is on this design.

Her main engine is a Model 12-278A G. M. 12-cylinder, V-type, two-cycle diesel, rated 1200 bhp at 750 rpm. It is coupled to an 814 kw, 700 volt, 1160 amp. generator, which supplies current to an electric propel . g motor turning at 875 rpm and driving the propeller shaft through reduction gears. The engine has port scavenging-air inlets and valve-in-the-head exhaust outlets, scavenging being effected by means of a blower mounted at the forward end of the engine and delivering the air under low pressure to the combustion chambers.

On the bulkhead forward of the main engine are the engine-water and engine-oil coolers. On the port side are: the sea-chest strainer, equipped with high and low suction; motor-driven fuel oil transfer pumps of the rotary type; a motor-driven air compressor for the ship's siren; a dead-front type switchboard; an oil-fired boiler for the ship's heating and hot water supply; large installation of electric storage batteries; and a large motor-driven ventilating blower for the engine room.

On the starboard side of the engine room, there are: a motor-driven fresh water pump and tank; a bilge pump and lube oil pump; a lubricating oil clarifier; the auxiliary diesel generating set; and a small work shop. The auxiliary generator is a G. M. 30-kw, 45 bhp, two cycle three cylinder diesel unit.

Our illustrations show the graceful lines of Coral Sea and the compactness of her power plant.

This tug was built by the Gulfport Boiler and Welding Works of Houston, Texas, together with two 18,000 barrel oil barges that will form her regular tow, for the Interstate Oil Transport Company of Philadelphia. On her maiden voyage she towed one large barge the 2300 sea miles to Philadelphia and then returned to fetch the two new barges. She thus had a tryout of 6900 miles of open sea in all kinds of weather and she behaved like a veteran with her engines

The new 102-foot tug CORAL SEA, built for Interstate Oil Transport Company of Philadelphia by Gulfport Boiler and Welding Works of Port Arthur, Texas, is completely powered by engines built by Cleveland Diesel.

functioning perfectly, averaging with her tow approximately 8 knots. Her first leg of 2300 miles was made on a total consumption of 16,000 gallons of Navy No. 4 diesel oil. This covered everything including heating, cooking, and all auxiliary power.

Complete pilothouse control of propulsion power gives the pilot perfect maneuvering facilities, so that the navigation of these tugs or towboats is practically as simple as driving an automobile.

Ferry Boat Lowell D Like A Baby Flat-Top

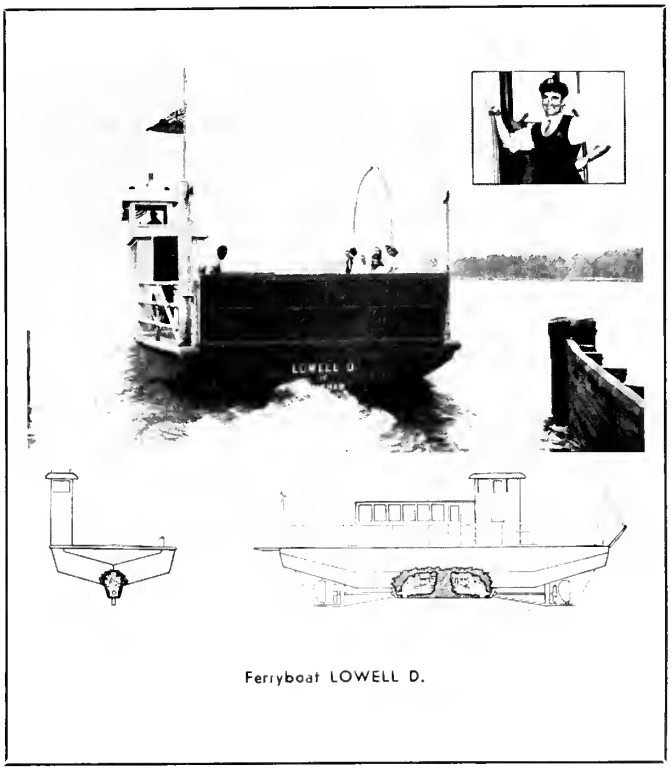
Constructed along the general lines of an aircraft carrier, the new ferryboat Lowell D which makes about thirty trips daily between Algonac, Michigan and Walpole Island, Ontario has many features of interest to vacationists, commuters and boat owners alike.

Owned and operated by Captain M. S. Dalgety, the Lowell D has a capacity of six automobiles and cabin space for some thirty foot-passangers. She makes the crossing of over a mile in about five minutes.

Of all steel construction, the boat has 5/16" plating on hull and deck, with additional ¼" plating reinforcing chines and bows for ice-breaking. She is a double-ender with "Vee" bottom and squared bows; over-all dimensions 52 ft. by 20 ft.; 5 ft. draft. For safety against collision ten watertight compartments completely surround the central or engine-room section of the hull.

Built by Erieau Shipbuilding and Dry Dock Company at Erieau, Ontario, the ferry was fitted with General Motors Diesel Marine engines by Goodison, Ltd., of Blenheim and placed in commission on May 29th when she made the 175 mile trip up-river and through Lake St. Clair to her present location.

The Lowell D is powered by two General Motors Series 71 4-cylinder diesels with 3:1 ratio reverse and reduction gears, swinging 36 by 28-inch 3-bladed propellers.



Ferryboat LOWELL D.

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Shipping Agencies Absolved of Fraud Charges

Clearing up the confused significance that has been attached to audit reports of the Comptroller General of the United States covering financial transactions of the Maritime Commission and the War Shipping Administration during the fiscal years 1943 and 1944, officials of the General Accounting Office in testimony before the House Merchant Marine Committee regarding the transactions of the two agencies asserted that their investigations revealed no instances of fraud or misapropriation of Government funds.

Bill Covering Funds for M.C. and W.S.A. Signed by Truman

President Truman signed the Third Deficiency Bill (H.R. 6885), providing for availability to the Maritime Commission of funds from War Shipping Administration receipts in connection with the transfer of the functions of the WSA to the Maritime Commission.

Financial Requirements for Citizens Under Ship Sales Act

Specific minimum financial requirements for prospective citizen applicants under the Merchant Ship Sales Act of 1946, covering both sale and charter financial requirements, have been prescribed by the Maritime Commission in Supplement 2 to General Order No. 60.

The supplement provides new language to cover working capital of applicants to charter by proposing that such applicants be required to have sufficient working capital to cover the preoperating and operating expenses of the vessel for a period of 60 days and prepaid insurance for one year.

After defining the terms "working capital," "net worth," and "preoperating and operating expenses," Supplement 2 to General Order 60 provides that preoperating and operating expenses for a 60-day period (including prepaid insurance for one year) shall be deemed to aggregate:

Dry Cargo Vessels:	
N3-S-A1 and N3-S-A2	$ 60,000.00
C1-MT-BU1	80,000.00
C1-M-AV1	85,000.00
C1-A and C1-B turbine and Diesel	90,000.00
C2-S-B1	115,000.00
C2-S-AJ1	120,000.00
C3	135,000.00
C4 and VC2-S-AP3	145,000.00
EC2-S-C1 and EC2-S-AW1	110,000.00
VC2-S-AP2	135,000.00
Tank Vessels:	
T1-M-BT	95,000.00
T2-SE-A1 and T3-S-A1	145,000.00

Recommends Denial of Petition for Increased Rates in Alaskan Trade

Denial of the petition of the War Shipping Administration for permission to make a general increase in rates, fares, and charges for and in connection with the transportation of passengers and property between United States Pacific Coast ports and the Territory of Alaska and between places in that Territory was recommended to the Maritime Commission by Examiner F. J. Horan, of the Commission's Division of Regulation. The recommendation was made in Docket No. 641—Increased Rates from, to, and within Alaska, the proceeding having been instituted on the Commission's own motion as a result of the WSA petition.

Appended to the Examiner's proposed report in the proceeding was a recommendation by the Office of Price Administration that a subsidy or other governmental aids in lieu of rate increases should be provided if the Commission decides that additional revenues should be raised to support the operations. Other recommendations by carriers in the trade were that "grandfather" rights be recognized in the trade, and that the Commission be authorized to construct suitable passenger vessels for the Alaska trade to be made available to carriers in the trade under terms similar to those

(Please turn to Page 138)

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

Loading one of seven mountain (4-8-2) type locomotives, for the Chilean State Railways, on board the M. V. Belnor at Baldwin's Eddystone Dock, before the war.

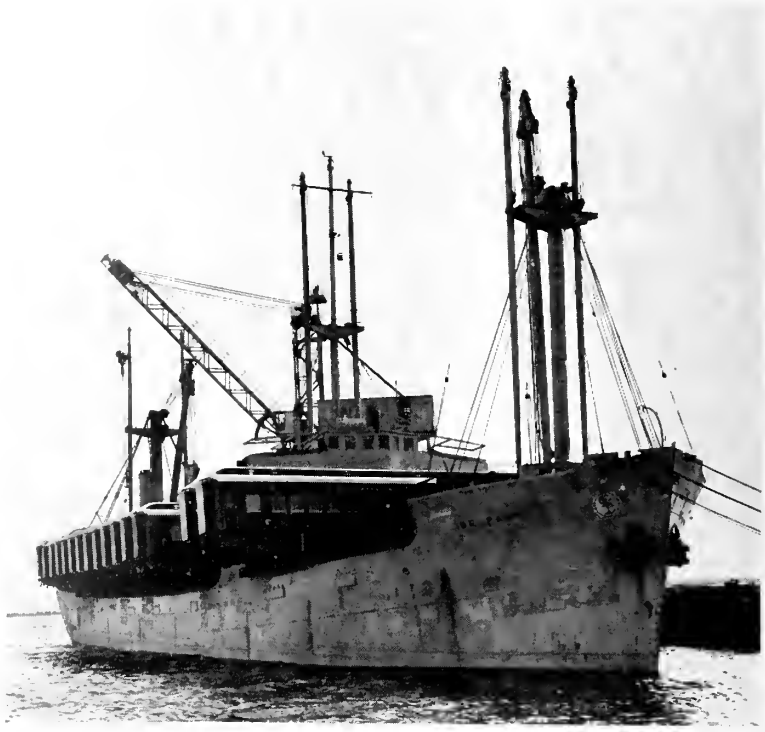
Baldwin—Exporter For More Than A Century

IN 1838, A SCANT SEVEN YEARS after Matthias W. Baldwin had established his locomotive business in Philadelphia, he entered the export field by dispatching two locomotives to Cuba. They were ordered by one Alfred Cruger and bore the builders construction numbers 104 and 105. In 1840, August Belmont of New York ordered one locomotive which was shipped to Austria. These early experiments in foreign trade were followed by locomotives destined for Germany, Mexico, Trinidad, Brazil, Argentina and many other parts of the world. Today, after 108 years, there is scarcely a country which, at one time or another, has not echoed the roar of Baldwin steam locomotives at work.

It is a rather odd fact that a number of locomotive types, which later became popular on the railroads of the United States, had their origin in Baldwin locomotives built for export. The first Decapod (2-10-0) type was built in 1885 for the Dom Pedro Segundo Railway of Brazil; the first Mikado (2-8-2) type was exported to Japan in 1897; and the Pacific (4-6-2) type had its origin in thirteen lo-

Pacific WORLD TRADE

Ralph Kelly, president of The Baldwin Locomotive Works.



A notable shipment to Chile in 1934, consisting of ten Baldwin 2-8-2 type locomotives, and fifteen passenger coaches built by the Bethlehem Steel Export Association. The locomotives were placed in the hold of the M. V. Belpamela and the coaches mounted crosswise on the deck.

comotives built by Baldwin in 1901 for the New Zealand Government Railways. The Dom Pedro locomotive was built when steel was starting to enter locomotive construction and it carried the first steel tires to be applied by Baldwin.

The years 1906 and 1907 were marked by two notable export orders: the first comprising 20 large locomotives of two different types for the Italian Government Railways; the second consisting of 20 balanced compound locomotives for the Paris-Orleans Railway of France.

Baldwin locomotives very early established a reputation abroad, not only for advanced engineering design but also for superior quality of materials and workmanship. Many stories from the field indicate that this fine reputation was well deserved. One notable instance was the case of the "Colonel Church." This locomotive was sold to a railway in Brazil in the year 1878 but, due to the failure of the original project for which it was purchased, the locomotive was abandoned to the mercy of the elements. In 1912, after [illegible] in the tropical jungle for more than 30 years, the loco[illegible] was resurrected and repaired. For the most part the [illegible] was found to be in good condition and the addition[illegible] missing parts restored it to many years of useful serv[illegible]

With the en[illegible] States into World War I in April, 1917, [illegible] omotives received a great impetus. The [illegible] American Army in France required the imm[illegible] construction of great numbers of locomotives. To meet this demand, Baldwin was entrusted with what was, up to that time, the largest and most urgent orders in locomotive building history. The first of these orders covered 150 Consolidation (2-8-0) type locomotives, later to be known throughout Europe as "Pershing" locomotives. The first locomotive was completed on August 10, 1917, less than a month after receipt of the order, and the last of the 150 left the Baldwin plant on October first of the same year. These "Pershing" locomotives were subsequently ordered in large numbers, and when hostilities ceased they were being shipped at the rate of 300 per month. Large orders for shells and other war materials were also completed during this period.

In order to get the locomotives into service as quickly as possible they were loaded into the holds of the vessels fully erected except for headlight, smokestack and cab. To prevent damage and shifting of the cargo, bales of hay were packed securely around and over each locomotive. This served a double purpose as the hay was used by the army upon arrival at destination.

During 1919 and 1920, immediately following World War I, export trade with South America assumed added importance. Europe was not in position to produce the goods demanded nor to offer credit. The United States, on the other hand, was investing large sums in South America and our industries could offer quick deliveries of locomotives and all sorts of machinery. The same conditions prevailed in certain European countries and these facts resulted in the

A number of locomotive components on flat cars ready to leave the Baldwin plant for shipment to Russia.

shipment of large numbers of locomotives to all parts of the world.

Comparative locomotive sales figures will serve to illustrate the boom in export.

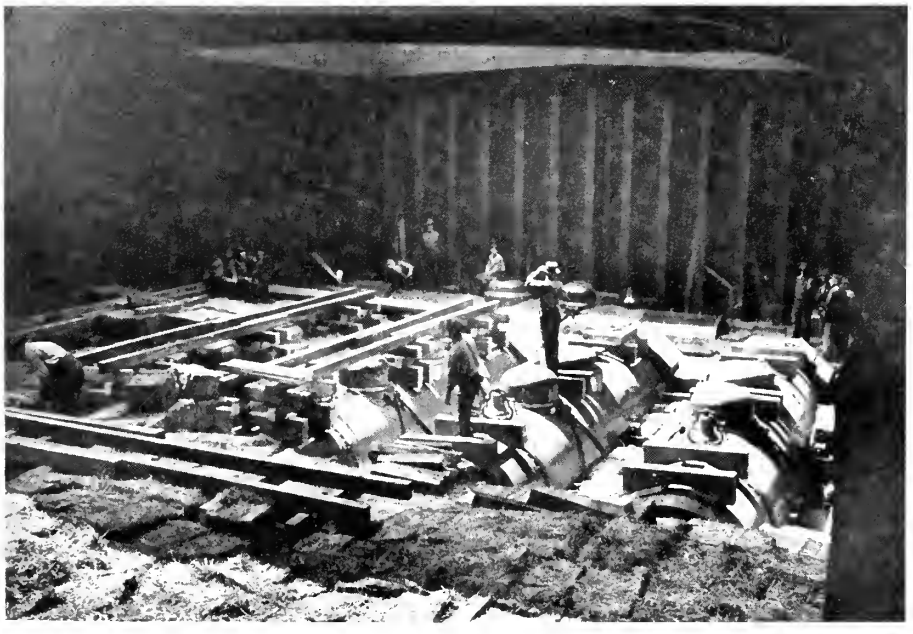
Previous to the war, during the years 1906 to 1914 inclusive, Baldwin exports of locomotives averaged 2½ million dollars per year. In the year 1919, alone, this figure was more than 24 million. In 1920 it was over 16 million and the average for the years 1921 to 1926 inclusive was 4½ million dollars.

Among the large export orders received were those covering 150 locomotives for the Polish Government; 30 for the South African Railways; and 75 for the Belgian State Railways. In 1920, twenty-five locomotives were supplied to the Rumanian Government. Credit was granted with Rumanian oil as security for the loan. In fact, partial payments actually were made in oil which Baldwin sold for cash.

Orders from Norway, Denmark, China, and practically every South and Central American country swelled the totals in this first post-war period.

During World War II, although Baldwin was engaged in a large military tank building program, large numbers of locomotives were built for the U. S. Army for shipment overseas. They operated in Africa, Europe and the Middle East. Other Baldwins went to the Russian Government to help with the task of moving men and supplies to the armies fighting their way into Germany from the East.

Since the Russian track gauge is approximately five feet, these locomotives could not be hauled to ports of embarkation over the 4 ft. 8½ in. tracks of the American railroads. Therefore, the locomotives were dismantled to



Baldwin-built "Pershing" locomotives, famous in World War I, packed in hay in the hold of a vessel bound for France.

Pacific World Trade

A long line of French locomotives in the Baldwin plant ready to be hauled to port of embarkation.

form two units; the first consisting of wheels, frames, cylinders and associated parts, and the second comprising the boiler with its fittings and the cab. These two units, as well as the complete tenders, were mounted on flat cars for shipment from the Eddystone plant.

With the cessation of hostilities in Europe, large numbers of locomotives were ordered for use in the rehabilitation of France. These orders, delivery of which has been proceeding all through the first half of 1946, include a total of 460 powerful 2-8-2 type steam locomotives of special design, 100 diesel-electric locomotives of 660-hp. capacity for Continental France, and 28 diesel-electrics of 1500-hp. capacity for French North Africa.

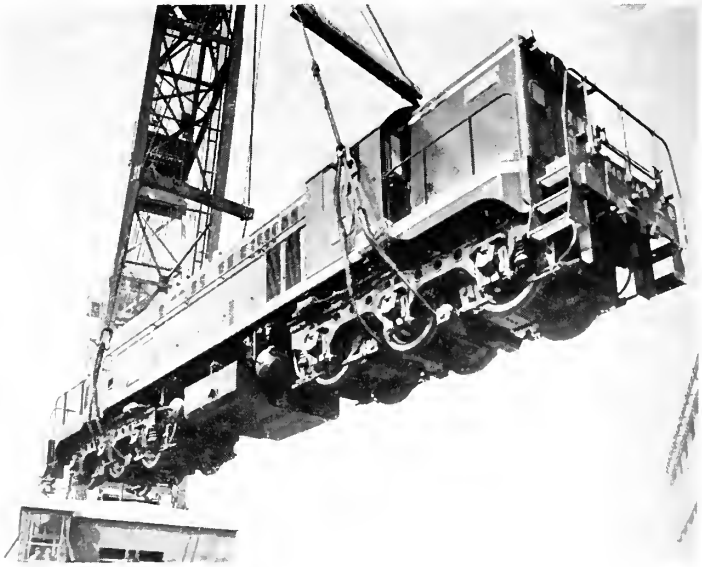
During the past year, Baldwin's export business has developed rapidly, and substantial locomotive orders have been received from Finland, China, Brazil, Chile, Mexico, Colombia, Argentina and other countries.

Many people, familiar with Baldwin's long locomotive history, do not realize that Baldwin also manufactures hydraulic turbines and presses, a variety of testing equipment, ships' propellers, stationary diesel engines and other products used by heavy industry.

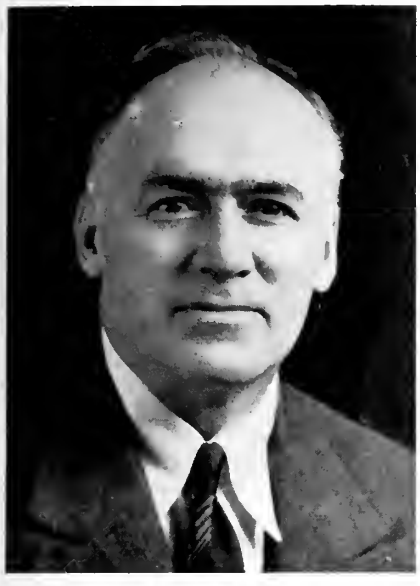
Second only to locomotives, the hydraulic turbine business has occupied a prominent place in Baldwin exports during recent years. Huge Francis type and Pelton type turbines of 30,000-hp. capacity or larger, have been purchased by hydro-electric developments in Mexico, Chile and Peru. Other powerful turbines of various types have been sold for export to Brazil, Colombia, Costa Rica and Finland. With the active interest now being manifested in hydro-electric power, in this country and abroad, there should be a good demand for these turbines for many years to come.

Hoisting a Baldwin 2-8-2 type steam locomotive on board the Harold O. Wilson at Girard Point, Philadelphia, for shipment to France, October, 1945.

A Baldwin 660-hp. diesel-electric locomotive swinging on board for the trip to Continental France. Recent orders also include 1500-hp. diesel-electrics for French North Africa.



Richard S. Turner, co-organizer of The Junior Foreign Trade Association, and partner in the Adams-Turner Company.



John L. Stewart, newly elected president of The Junior Foreign Trade Association, is export manager of Baxter Trading Company.

E. J. Macfarlan, co-organizer of The Junior Foreign Trade Association, is assistant to the manager, Foreign Trade Department, Standard Oil Company of California.

THE JUNIOR FOREIGN TRADE ASSOCIATION of the SAN FRANCISCO CHAMBER of COMMERCE

World trade and international relations in the Port of San Francisco have been stimulated by an experiment conducted at the birthplace of the United Nations. This experiment was the formation of the Junior Foreign Trade Association of the San Francisco Chamber of Commerce, the only junior foreign trade organization now operating in the United States.

The Junior Foreign Trade Association was organized in 1938 due to the foresight and efforts of E. J. Macfarlan, Assistant to the Manager, Foreign Trade Department, Standard Oil Company of California; and Richard S. Turner. then Export Manager, Tide Water Associated Oil Company, and now a partner in the export firm of Adams-Turner Company. The Foreign Trade Association of the San Francisco Chamber of Commerce has sponsored the organization since its origin.

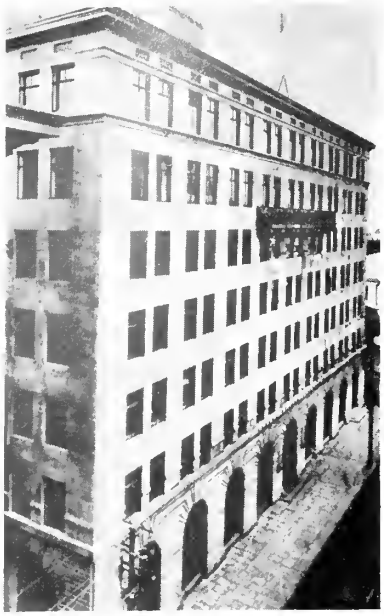
The recent war period provided a test of all organizations. The J.F.T.A. came through successfully and operated during the entire period. Since the termination of the war, the Association has pursued an outstanding program that is attracting new men now entering the field of world trade. The active membership is now over one hundred.

The success of the J.F.T.A. can be attributed to the following worth-while aims and objectives: to establish a better understanding between the younger groups interested in all phases of world trade, *i.e.,* communications, exporting, importing, transportation, shipping, banking, insurance, and other related fields; to promote a closer relationship with the Foreign Trade Association; and to develop a general interest in the world trade field through publicity, personal acquaintance and friendly discussion.

A realization of these aims and objectives is achieved through the monthly dinner meetings of the entire membership and the various social activities. The monthly dinner meetings feature outstanding leaders in the various phases of world trade and are attended by both Junior and Senior Foreign Trade Association members, offering good fellowship and educational information. Foreign Traders are noted also for their ability to relax and enjoy social functions, and the J.F.T.A. is no exception. Annual family picnics and Christmas parties are an established custom. THE SHIP'S BELL, the official house organ, has achieved a high standard of reporting.

Many of the members of the Association were in uniform during the war and now have a new understanding of world trade and its importance to the future peace and pros-

(Please turn to page 146)



Captain Robert Dollar, the founder of Globe Wireless Ltd., and his son, R. Stanley Dollar, president of the communications company. (Center) The Shanghai office of Globe Wireless in the Robert Dollar Building, 51 Canton Road.

Globe Wireless Reopens Shanghai Circuit

The reopening of the San Francisco - Shanghai circuit of Globe Wireless, Ltd., brings back the Dollar name into the communications field in China, the place where Captain Robert Dollar, the "Grand Old Man of the Pacific," first visualized a vast communications system linking all of his offices and his fleet of Dollar Line ships as they continually sailed around the globe.

Captain Dollar made his first trip to China in 1902, and during the ensuing 30 years until his death in 1932, he made more than 40 trips to the Orient and became one of the most influential counselors of the Chinese government and almost an idol in the eyes of the Chinese people.

In 1911 when Dr. Sun Yat-sen was chosen the first President of China, Captain Robert Dollar was the first prominent American citizen to send messages to President William Howard Taft and Congress recommending that the American Government recognize the Chinese Republic.

The friendship of Dr. Sun Yat-sen and Captain Dollar continued over the years and on each trip to China, the Captain would visit his friend and he came to know and admire one of the young men in Dr. Sun's regime, Chiang Kai-shek. When the Nationalist Government came into power in 1927, Captain Dollar and his son, R. Stanley Dollar decided the time was opportune for them to begin operating their long-contemplated Dollaradio communications system.

On May 28, 1928, an agreement was signed between the Robert Dollar Co. and the Chinese Government for the opening of the Shanghai Coast Radio Station XSG. This contract was the first American communications contract signed with the Chinese Government.

Station XSG began operation in 1930 and gave continuous 24-hour marine service to ships at sea from its opening date until Pearl Harbor day. During those 11 years it was never off the air for longer than one hour, despite the fact that the location of the station was changed twice; once while under shell fire in 1932, and the other time while under heavy Japanese bombing in 1937. Each time, at the risk of their lives, the employees of the station stuck to their posts.

When war broke out in China in July, 1937, there were many ships en route to Shanghai. Because of the excellent service rendered by Marine Station XSG in sending diversion orders to the captains, no ship was damaged even so much as a splinter.

The Dollars continue to have the same unbounded faith in the brilliant future of China that their father and grandfather, Captain Robert Dollar, held for so many years.

"As we reopen our San Francisco-Shanghai circuit," says Mr. Dollar, "Globe Wireless will continue its close cooperation with the Chinese Government and we intend to help the Ministry of Communications in its tremendous job of rebuilding China's communications on a modern basis with the very latest equipment obtainable.

"In addition to our communications system in China, we are setting up a sales and service organization and plan to lease our Radiotype machines to business firms all over the Orient.

"Using our Radiotype machines, a business firm with offices in San Francisco, Shanghai and Manila can have the operator write on the Radiotype in the San Francisco office and the message will appear simultaneously on the machines

(Please turn to page 146)

Captain Leslie Frank Bosshardt of Carmel, California, skipper of the seiner Pacific Star, and master of the convoy, standing by the marked stack of this little vessel.

New Diesel Fishing Fleet for China

Under the operating management of the American-Hawaiian Steamship Company 14 Pacific Coast purse seiners and draggers are en route to China under the UNRRA program. There are several features of outstanding interest in this operation.

The vessels themselves are well known in Pacific Coast fishing circles. Their names and engine equipment are:

Pacific Star	250 hp Enterprise diesel
St. Anthony	175 hp Fairbanks-Morse diesel
Joseph Balestrieri	250 hp Enterprise diesel
El Rey	220 hp Atlas diesel
Jackie Boy	220 hp Atlas diesel
Rosanne	200 hp Atlas diesel
Flying Fortress	250 hp Enterprise diesel
California Star	200 hp Enterprise diesel
Fisher Lassie	400 hp Enterprise diesel
A. C. Martinolich	250 hp Enterprise diesel
New Madrid	160 hp Atlas diesel
Oceana	200 hp Washington diesel
Pride of America	250 hp Atlas diesel
North Star	135 hp Atlas diesel

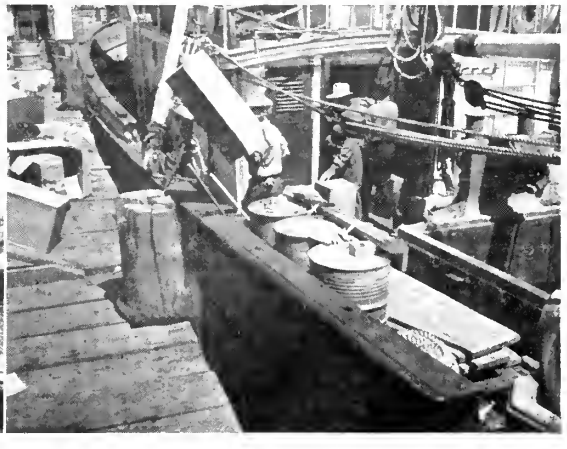
The first six of the above list left the Port of Oakland July 23 and reached Honolulu ten days later, with an average speed of about eight knots. There was no trouble encountered on the voyage. The second convoy of eight vessels left on August 16.

Each of the boats carries a crew of seven—the master, mate, chief engineer and assistant, two deck hands and one cook. All of these will remain in China for about six months to teach the Chinese the operation of the vessels in dragging and seining operations. The vessels are to be delivered under the UNRRA program to the Chinese National Government.

The boats were assembled from various Pacific Coast fishing areas and were completely overhauled and converted to their new uses under American-Hawaiian's direction. They are equipped with radio, ship-to-shore telephone, direction finder and Fathometer. They are bunkered to capacity and in place of cargo carry a reserve fuel supply in drums. The route carries them from Honolulu to Wake, Guam, Philippines and Shanghai.

In command of the first convoy, from Oakland, was Captain Leslie F. Bosshardt, who commanded a Liberty vessel during the war, and knows the Pacific well. He expected no trouble whatever during the voyage, stating that the seiners are completely seaworthy, having been out on the Pacific in fishing operations for long periods in all kinds of weather.

A similar assortment of 23 vessels recently sailed from Seattle.



Two of seven purse seiners purchased by UNRRA for China. At right: Captain Bosshardt and his crew on the deck of the Pacific Star. The crews will remain in China six months teaching the use of the vessels to the Chinese to aid China's food supply. (Another view of a purse seiner on page 142.)

To the Orient

IN OCTOBER, 1936, during the second of the major maritime disturbances of the thirties, the Olympic Steamship Company was incorporated in the State of Washington by a group of young Western men having extensive business and shipping experience. Even though the American Merchant Marine at that time was at a low tide in its existence, these men felt that through the tools furnished by the Merchant Marine Act of 1936 the American flag ships would be restored to their proper place on the seven seas, carrying their portion of the immense import and export needs of the United Stats, in addition to carrying a substantial portion of the cargo tonnage available for vessel movement in the coastwise and intercoastal trades of the United States. These men further looked for a steady growth in the section of the United States facing the Pacific and were of firm conviction that production of this rapidly expanding region should move on vessels controlled and operated by residents of this area.

The original charter members of the company were E. C. Bentzen, president and general manager; George Van Waters, vice president; E. L. Skeel, secretary; and Nat S. Rogers, treasurer. The late Frank E. Schorn was also an initial stockholder.

Pacific Coastwise Service

At the end of the maritime strike in February, 1937, the company had effected a joint operation agreement with the Consolidated Steamship Companies, which had been formed in San Francisco the previous year. This provided for combined joint service in the Pacific Coastwise trade under the name of Consolidated-Olympic Line. Through this joint service all of the major ports in Washington, Oregon, and California were served on definite schedules. Most of the vessels utilized for this service were handled on a charter basis and as many as fourteen vessels became engaged in these activities as the service developed.

Primary cargoes moved were lumber and allied products, paper products, wheat, ore, and general merchandise from the vast Pacific Northwest region of the United States to the large coastal cities of California. Northbound cargoes consisted of the large and varied production of the fertile fields of California and the large manufacturing activities in that area.

Terminal Operation

In 1939, while the activities of the Consolidated-Olympic Line steadily progressed, the Olympic Steamship Company in Seattle was appointed to manage and operate one of the most modern of the tidewater terminals in Seattle, known as Pacific Terminals, Inc. This large, modern splendidly equipped steamship terminal was successfully managed to the complete satisfaction of all concerned until the time this property was purchased in 1941 by the United States Army, who used this facility to form the nucleus of Seattle's large Port of Embarkation.

United States to Alaska Service

In the spring of the same year, the company, seeing many opportunities for trade to Alaska, decided to institute an exploratory service to the Bering Sea as far north as Kotzebue Sound. This was a seasonal trade—for the reason that sailings could only be scheduled during the ice-free period between the middle of June and early September. The coastwise steamer El Capitan was used in this trade. She completed two round-trip voyages during the above-mentioned period, servicing en route the ports of Bristol Bay, Norton Sound, and Kotzebue Sound, the latter lying north of the Arctic Circle. This Alaskan venture was to have been continued during the 1940 season; however, as the late second world war commenced in the fall of 1939, causing a world-wide disruption of commercial shipping, it was found inadvisable to resume this service to that area in 1940.

Although this activity was short-lived due to the war, it provided additional and varied operating experience in a

For Olympic

most difficult section of the world for the navigation of vessels.

Wartime Service

All shipping in 1940 was necessarily disrupted by the European War. Vessels were being taken from their usual trades and diverted to essential services more helpful to the war effort. During this period considerable chartering business was done both by Consolidated-Olympic Line and for others. The company acted as agent during this period for five voyages in the intercoastal trade. These ships proceeded eastbound with full loads of lumber for the Atlantic seaboard, and were placed on a general cargo berth westbound with full cargoes resulting from homeward voyages. This was accomplished under highly competitive conditions existing on the Atlantic Seaboard.

Also, during this time an agency was instituted and showed steady growth. The company handled British, Canadian, and Norwegian vessels, loading cargo in the Pacific area destined to the United Kingdom for the account of the British Ministry of Shipping. Cargoes consisted for the most part of grain and lumber products.

December 7, 1941, saw the finish of the last vestige of commercial operation by American operators. As America rapidly expanded her shipping industry for an all-out effort against the Axis, through the Government programs of the Maritime Commission and the War Shipping Administration, the Olympic Steamship Company was, as were many American operators, designated as General Agents for the War Shipping Administration. At this time Consolidated Steamship Companies was brought into the Olympic Steamship Company financial structure. The company also operated as a berth and time-charter agent for the War Shipping Administration.

During World War II Olympic took delivery of and operated a total of twenty-six vessels for the War Shipping Administration plus one vessel under time-charter agreement. These vessels were naturally engaged in war use and made voyages throughout the Atlantic, Indian, and Pacific oceans. The company was also owners' agents for three shipping companies whose vessels had been acquired by the Government and was sub-agent for other shipping concerns operating for the account of the War Shipping Administration, but who did not maintain offices in the ports of Seattle or San Francisco.

As the offensive against the Axis moved steadily forward, the ships of America's Merchant Marine played a heroic part in carrying out the delivery of men and materials to vital points under the most difficult of wartime conditions.

Several vessels operated by Olympic took part in these assault movements and were credited by the military with downing Japanese planes. The company is proud of the courage, resolution, and stamina of the officers and crew members who manned these ships during these difficult times.

Since the ending of the war in August, 1945, cargoes of vessels handled by this company are rapidly changing from those of a war nature to a commercial or relief type.

Resumption of Prewar Pacific Coastwise Service

Under a program laid down in late 1945 by the War Shipping Administration, Pacific Coastwise service was resumed in the early months of 1946. This was done in an effort to afford shipping companies an opportunity to resume regular peacetime services which had been entirely disrupted since 1942 and the requisitioning of all vessels for war service. The company is now operating in this trade for the W.S.A., however, with the greatly increasing operating cost, both ashore and afloat, over pre-war cost, and with the water-rate structure in this trade, it does not appear feasible to resume complete commercial operation. Steps have been taken by the Government through the War Shiping Administration and the Interstate Commerce Commission to try to effect an equitable rate structure of all carriers, water, rail and truck in this trade, and it is hoped that results from this action will make it possible for the water carriers to resume their pre-war place in the field.

Plans for the Future

In the 10-year period since its original incorporation, the company has steadily grown in size and scope of operation. The number of stockholders has increased and the majority of these are from areas adjacent to the Pacific. One of the recent entries into the corporation is Eric A. Johnston, who has today won for himself an international reputation and was three times elected President of the United States National Chamber of Commerce.

Extension of Olympic Steamship operations to the Far East might be said to have been an integral part of the company's pre-war plan. Many of its stockholders are intimately

(Please turn to page 140)

Pacific WORLD TRADE

OLD TIME PICTURES of present day foreign traders

Extreme left: C. A. (Cy) Anderson, special representative, Encinal Terminals; John J. Judge (center), regional manager, Field Service, U. S. Department of Commerce; and G. H. Mahoney (below, right), assistant manager of W. R. Grace & Co.

Banker Finds Demand For Pacific Coast Goods In Europe

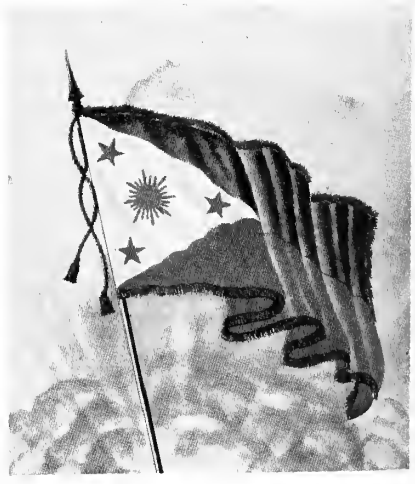
Increasing understanding of the commercial and financial importance of our Pacific Coast states, particularly California, by the bankers, business men, important industrialists and shipping interests of northwestern Europe, has been reported by Eric Hallbeck, assistant vice president in the international banking department of the Bank of America.

On behalf of the bank, Hallbeck just completed four and a half months of intensive on-the-ground study of Denmark, Norway, Sweden, Finland, Holland and Belgium. He also spent some time in England.

His mission was to create closer relationships between the commercial and industrial interests of those countries and our Pacific Coast through direct connections, and thus to foster direct trade in greatly expanded volume.

Hallbeck found many California products on the shelves of stores in Sweden and a keen desire in the other countries visited to once again have these items freely available. He also found a lively demand for information on other products available here, and the fact that California had achieved such strong economic, industrial and population gains had greatly increased the prestige of this state abroad.

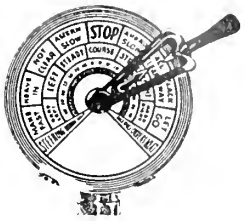
Officials of Bank of America believe that the establishment of these direct relationships between the Pacific Coast and the business interests of foreign countries, eliminating the custom of dealing through Eastern financial centers, will prove to be an important factor in the development of our entire Far West.



New flag of the Philippines Republic. On July 1 this flag was displayed at the meeting of the Foreign Trade Association of San Francisco.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

THE SEXTANT CHAPTER VII

THE ART OF TAKING SIGHTS

THE ART OF TAKING SIGHTS cannot be learned from books; only actual practice at sea in fair weather and foul, in daylight and dark, will give the experience necessary to make an efficient navigator. Consideration of the following points, however, should enable the young navigator to understand thoroughly how to use his most treasured possession at sea—his sextant—to the best advantage.

Preparation for the Sight

The sextant should always be kept in its case with, if possible (when the lid is closed) the erect telescope in the collar and the drawpiece focused so that the instrument is ready for immediate use. An efficient navigator would then be able to get a sight in a few seconds. It is extremely important not to lose valuable sights through unpreparedness. While waiting for the sun to appear from behind a cloud bank, the sextant should be kept handy in a position where it will not slide about. In a small ship, probably in a bunk is about the best place, and in a large ship it can be kept on the chart room settee. At any rate it must be kept where it will not slide off onto the deck and ruin a valuable piece of property.

It is necessary to know the height of the observer's eye at each observation. This height should be determined periodically, remembering that in a cargo ship the difference in height will vary with the ship's draft, whether she is "light" or "loaded." If the sight is being taken from some other part of the ship than from the observer's customary position, remember to use a different height of eye (if it is different). When estimating the observer's height of eye (abbreviated H. E.), which is calculated for smooth water, if the observer takes the sight when the ship is on the crest of a wave he should add half of the estimated height of the wave to his height of eye for calm water.

The sextant telescope should be used as follows. In daylight, under all usual conditions when observing the sun, use the erect telescope. It the weather is calm and the ship steady, the low power inverting telescope should be used to obtain greater magnification. At dawn and twilight, for morning and evening star observations, use the erect star telescope under all usual conditions. With experience, however, and calm conditions, use the higher power draw of the inverting telescope when there is still considerable light, i. e., very early evening and late morning sights. This gives the maximum brightness to the stars. For late evening and earliest morning sights, i. e., when there is considerable darkness, use the low power inverting telescope. This will give the maximum brightness to the horizon.

Taking Sights Generally

The sextant measures the angle between the sea horizon (called the visible horizon) and the heavenly body. You must remember that the altitude of a heavenly body will continue to get larger while the object is to the east of the observer's meridian, but will get smaller when to the west of it. Care should be taken to be sure that the horizon is

defined clearly, and to ignore sights taken when this is not the case, as unless there is a "true" horizon the results will be considerably in error. In gloomy weather it is better to take sights from as low a position as possible, as then the horizon should be more clearly defined. When observing with the sextant always try to get the observed object in the center of the telescope field.

With a clamping screw sextant always keep the slow motion tangent screw about the center of its run, so as to have plenty of play and avoid spoiling a sight by reason of the screw jamming in the middle of the observation. Always test for index error every time a sight is taken. Observers should accustom themselves automatically to apply any index error *before* calling out the altitude to be entered in the notebook. This will avoid error, and any question as to the amount of index error allowed for. Don't forget that both the index error (if any) and the error for the particular altitude shown on the certificate of inspection (if any), must be applied to every altitude taken with a sextant. Always be careful to see that the clamp screw cannot slip.

It is preferable for a beginner to learn to use a sextant by taking sights when at anchor in a known position as a check. If the calculated position is within two or three miles from the actual position, results of such sights can be considered as excellent. It is still better to take actual sights with an experienced observer and compare altitudes. In this way it can be determined whether sights are being taken properly or not. Later on sights should be practiced under way in fine weather near the coast, and the position of the ship fixed at the same time by bearings of objects on shore. The two positions may then be compared. In good weather with modern instruments and by working accurately the position obtained by a sight with a sextant should be obtained within one or two miles.

Of course, in actual practice, especially when nearing land, the opportunity of taking a sight should never be lost. Everything must be in readiness, and then when the sun shows signs of breaking trough the clouds, "shoot" it quickly. The average navigator will have the sun on the horizon and obtain a "sight"—possibly an invaluable sight—while an inefficient and inexperienced man will be fumbling with the telescope or shades.

It is distinctly preferable to allow contact to be made by the motion of the heavenly objects themselves, if this is possible. In other words, say the sun is rising; if so, the index arm should be set to show the sun a little below the horizon and a careful watch kept until it rises, when the time of its actual contact is taken.

A more reliable fix can always be had from sights taken on either side of the meridian than when both sights are taken on one side of the meridian.

When taking the meridian altitude of a heavenly body, the body must bear either true north or south from, or be directly overhead of the observer.

When a heavenly body has a low meridian altitude, such as is found when a ship is in Alaskan waters in midwinter—that is, when the heavenly body is a long distance from the observer—it will appear to remain stationary on the observer's meridian for several minutes. On the other hand, when the body is high in the heavens, the apparent stand of the body will be of short duration.

When heavenly body is nearly 90°, i. e., when it is nearly overhead, the sun will "swoop" across the meridian and appear to touch the horizon all around so rapidly at times that it is difficult to determine an accurate meridian altitude. In case the meridian altitude is extremely high, i. e., nearly overhead, observe the north or south (true) point of the horizon, direct the sextant towards this, and the altitude should be taken at noon at this point. However, in this case, be sure to take an observation of Polaris (if possible) as a check.

An ex-meridian may be taken of any heavenly body within the limits set forth in the tables (ordinarily 28 minutes either before or after the body transits your meridian). The actual observation is taken as already described in an earlier chapter, and at the same time the exact chronometer time must be noted to the nearest second, so that the hour angle of the body from the meridian may be determined.

Any altitude over about 65° may be observed from the opposite horizon if the direct horizon is obscured by land or for any other reason. In any case both of these altitudes may be taken at any time when half the difference of the two readings is the zenith distance of the center. This, therefore, eliminates both dip (H. E.) and index error. If the body is not on the meridian, then the times must be taken of the two observations and the mean taken to correspond with the zenith distance.

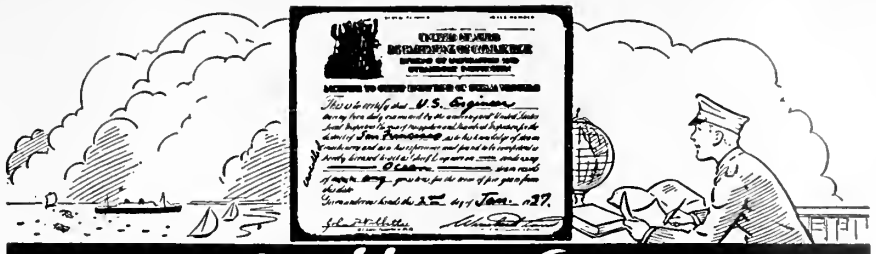
Minimum and Maximum Altitudes

This problem has assumed great importance of late years, owing to gradually increasing speed of modern ships. On any course other than east or west, but especially on northerly and southerly courses, if approaching the sun, the altitude due to the observer's motion increases, and if receding from the sun the altitude decreases. The sun comes to rest when the change of the observer's altitude (due to this motion) is equal and opposite to the rate and change of latitude due to the rotation of the earth. If the ship is approaching the sun it appears to rest after its meridian passage, but if receding from the sun it appears to rest before its meridian passage. *Therefore, on any northerly or southerly courses the maximum altitude is not the meridian altitude.* To obtain this, the clock must show apparent time at the ship as accurately as possible for the meridian passage at noon, and the altitude be taken at this time, *regardless of the fact that the sun may be still rising or falling.*

The minimum altitude is the altitude below the Pole, when the reverse to the above takes place.

(To be continued)

"A total of 455,000 motor vehicles—trucks, armored scout cars, Jeeps and motorcycles—and 14,500 military planes were shipped to Russia under Lend-Lease during the war."—Steel in the War.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

Magnetism

(Continued from August)

The electric field (dielectric field) and the magnetic field were discussed in the August issue. The great importance of these two fields in modern engineering was indicated by referring to their use in the electro-magnetic radiation of heat, light, radio, radar and communication. These are all the same form of space transmission, varying only in the wave length or frequency of oscillation.

Fig. 1 shows the several frequencies of the electromagnetic field and indicates the usefulness of the groups. These frequencies run into very high numbers wherein the lowest is the fourth power of ten, or 10,000 cycles or complete oscillations per second. Note what a small portion of the whole spectrum the range of visible light occupies.

These two fields occupy all space so that a disturbance in them may oscillate and travel for endless distances at the speed of light, or 186,000 miles per second. This gives rise to the specific relationship between frequency of the oscillation and the wave length, or distance along the path of motion between crests of the waves. Therefore, 186,000 cycles per second would mean one mile from crest to crest of the wave, or twice their frequency would give one half the wave length. Wave lengths of a fraction of an inch are in regular use in radio work, which indicates frequencies of several thousand million cycles per second.

These two fields may be influenced or disturbed (stressed) in two ways. The presence of the electron stresses the electric field. Likewise, its absence, or the proton, stresses this field in the opposite sense. All atoms of matter contain electrons and protons. (Also neutrons, or particles with neither positive nor negative charge.)

But motion of the electron or proton (either positive or negative charge) disturbs the magnetic field.

Note carefully now, that in addition to these fields being disturbed or stressed by the electron or proton, motion of the stress of either field will disturb the other. This stress in the electric field, if moved, stresses the magnetic field. And stress in the magnetic field, if moved, stresses the electric field. This is altogether without the presence of matter in any form, yet these stressed fields could not be noticed or observed without the presence of matter to either originate the stress, or to receive or signal the stress in some form, such as heat, light, electric currents, and so on.

Since a change in value or magnitude is in effect a motion, an increasing stress in the electric field causes a stress in the magnetic field. While the electric field is changing from negative to positive, it passes through zero in value. But while passing through zero, it is also changing at the highest rate of change, as contrasted with no rate of change when it reaches its maximum value, positive or negative. Thus we have a maximum value of the stress in the magnetic field while the electric field is rapidly passing through zero value, and conversely, we have a zero value of

Footnote: 1 A. = 0.395 × 10 — ^{8} inch = 0.000,000,003,95 in.

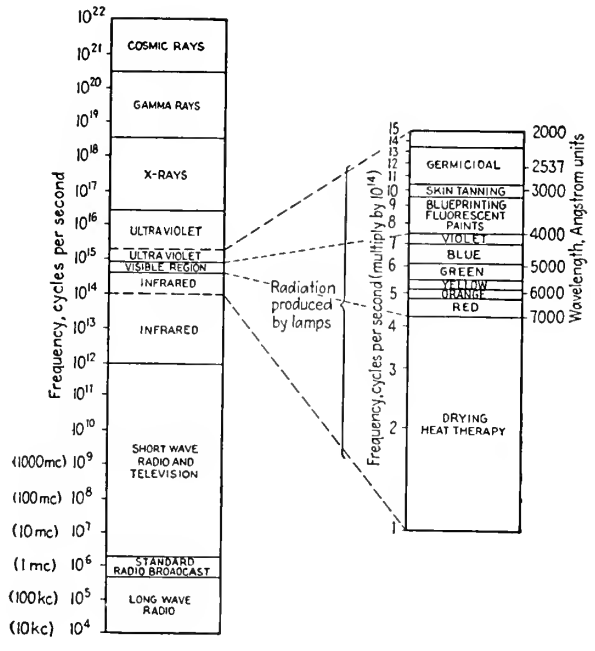


Fig. 1. The radiation represented by light is only a very small portion of the useful range of frequency available.

magnetic field while the electric field reaches maximum value and is momentarily not changing.

This is similar to the energy transfer from potential to kinetic, as the pendulum swings back and forth.

The rapid cyclic changing of the stress in these two fields, first on reaching maximum, the other zero, then reversing positions, constitutes the wave nature of propagation of energy by waves through space.

Since the presence of electrons stress the electric field, moving electrons constitute a moving, or change stress in this field, hence cause a stress in the magnetic field. The earth's magnetic field is thought to be caused by swarms of electrons drifting in the rarefied space above the stratosphere, around the equatorial belt in general. Swarms of electrons moving in an electrical conductor likewise stress the magnetic field around it. (Magnetic lines of force around a conductor carrying electric current.) And as we might suspect from the foregoing, changing value of, or moving stress in this magnetic field establishes (induces) a stress (difference in electric voltage) in the field along the conductor, which, if complete in a circuit, results in current flow (stream flow of swarms of electrons).

Or stating it again in the conventional manner, electric current flowing in a wire causes magnetic lines of force around it. And a conductor moving in a magnetic field induces a voltage along its length. Or once more, moving electrons cause magnetism, and moving magnetism causes electrons to move.

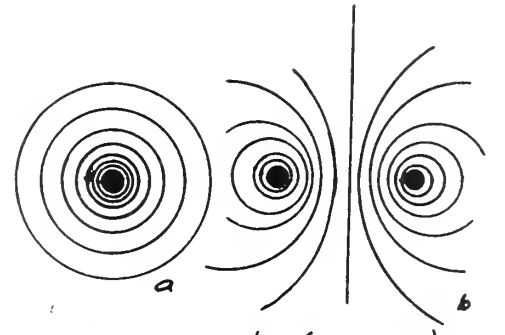


Fig 2.

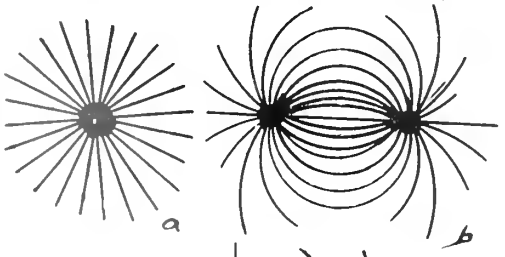


Fig 3.

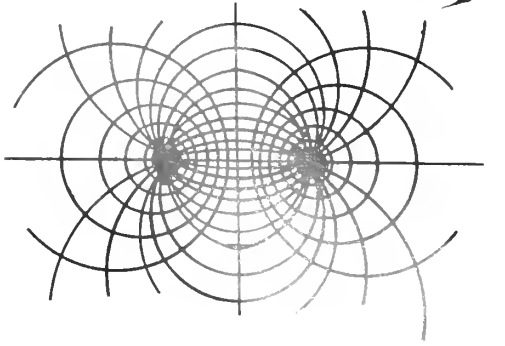


Fig 4.

The moving electrons in the winding of the field coils of a generator create its magnetic field, and the moving armature conductors in this magnetic field have a voltage induced in them.

Furthermore, when we start the flow of electrons in a conductor, and accelerate the rate of flow (amount of current), the magnetic field around the conductor is moving, because it is changing in value from zero to some final amount. This, then, induces a voltage in this same conductor which opposes the current flow. This is the inductance voltage. It acts in the opposite direction when current flow is decreasing, and thus tends to prevent the decrease of current.

Inductance voltage (voltage of self-inductance) tends to oppose any change in current. It tries to keep it flowing at the same rate. Compare this to the momentum of moving bodies. Momentum keeps a moving body up in speed and resists efforts to start it moving, or to accelerate it.

Fig. 2 (a) shows the cross sections of an electrical conductor carrying current. The circles are an attempt to represent the paths of magnetism around the conductor. Or perhaps they represent the stress in the magnetic field around the conductor.

The direction of the magnetism around the circles is imagined to be like the threads of a right-handed screw. If current is flowing away from us in this figure, into the page, magnetism flows clockwise around it. These lines should be imagined as being at great distances from the conductor, but being farther apart as the distance increases. Thus these lines may represent the density of magnetism by the density of lines.

In early text books, these lines were called "tubes of magnetic force." Now we customarily call them "lines of force," and, in general refer to them as "magnetic flux," or "flux."

Fig. 2 (b) shows the magnetic field around the two conductors of a complete electric circuit, the current flowing in opposite directions in the two conductors. Thus all of the lines around each conductor must crowd into the space between them.

If these two conductors, opposite sides of a single electric circuit, were very close together, they would neutralize each other, or nearly so, and there would be little or no magnetic field around the pair. When this neutralization of the magnetic field must be very complete, as in the high frequency radar or television circuits, it is customary to use the co-axial pair where one conductor is solid, and supported inside the other one, which is tubular. Both must share the same center.

Alternating current conductors are customarily made up in pairs or sets of three, within one enclosure or armor.

Fig. 3 (a) is an attempt to show the stress in the electric field around a conductor which is charged, has an excess or deficiency of electrons. The radial lines show the paths of the stress, and the closeness of the lines shows the density, or intensity, of the field stress.

These lines are imagined to go on into space until they meet the conductor of opposite electric potential. The

(Please turn to page 131)

Circulating Water Channel For Model Testing

Fig. 1. Float rides swift-moving current of circulating water channel.

A miniature ocean in which ship's gear remains stationary while water is forced past it, is helping the U. S. Navy uncover new secrets of design to improve performance of its fighting ships. Called a circulating water channel, the latest test unit of the David W. Taylor Model Basin, Washington, D. C., sends 750,000 gallons of water coursing through an upright circular aqueduct and drives it against ships' gear or scaled ship models in a reverse simulation of real equipment plowing its way through the ocean.

Two huge motors, especially designed by Westinghouse Electric Corporation engineers, furnish the power to circulate 2,800 tons of water in the channel at speeds as high as 12 miles per hour. Surface water is kept flat to permit visibility of under-currents, and naval engineers can watch turbulence from beneath or from either side through plate glass. Through the glass, the water's push against objects can be photographed, either with still camera or a movie camera.

How Channel Operates

The circulating water channel resembles a rectangular shaped letter "O" in the upright position. The upper horizontal element is open at the top to provide the test channel while the two vertical elements and the lower horizontal member are completely enclosed to make possible circulation of water. In operation water is forced down one vertical element of the "O", across the bottom horizontal member, up the other vertical element and then through the test channel.

To turn the water smoothly at corners, vanes have been inserted to guide it in an arc rather than letting it make a right angle turn which would disturb and slacken its rate of flow. As the water arrives at the test channel its surface is smoothed out. Flowing swiftly, but smoothly, the water then passes the ship gear tied in the channel while engineers, observing through the windows, can study the action of the water as it flows past the object being tested and photographers can record the action for future study.

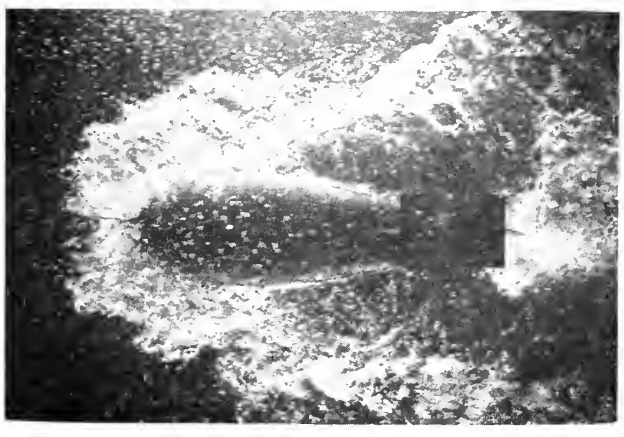


Fig. 2. Photographic study of turbulence taken through nine feet of water.

Power Required To Move Water

Moving the 2,800 tons of water in the circuitous route at the 12-mile-per-hour speed requires two 1,000 horsepower motors, the shafts of which are directly connected with huge impeller pumps. For short periods each motor can develop as much as 1750 hp. The giant blades of the pumps, situated in one of the vertical shafts of the water tunnel, force water in a continuous, steady flow around the 385 feet of the oval.

To get different rates of speed of the water in the test channel, the huge impeller pumps were fitted with variable-pitch blades. Hollow shafts were built into the motors and inside these shafts, hydraulic equipment to operate the variable-pitch impellers was placed. In this manner the inertia of the great mass of water could first be attacked with the impeller blades cutting through it like knives, the pitch of the

(Please turn to page 130)

Radiomarine's New Shipboard Radar

Indicator Unit of Radiomarine. Model CR-101.

The Radiomarine Corporation of America, New York, has designed new rugged and powerful shipboard radar equipment which incorporates the most modern advances in the radar field. Shown publicly for the first time at the National Marine Exposition, the new model is soon to be installed aboard American merchant vessels.

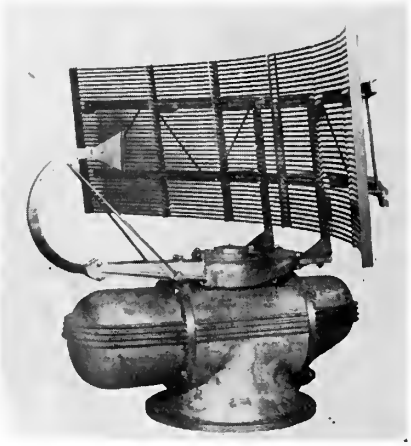
Known as Model CR-191, the new Radiomarine radar features North stabilized true or relative bearings, simplified controls, four range scales from 100 yards to 50 miles and a large easily interpreted picture on the cathode ray scope. The true-North bearings are accomplished by hooking-up a built-in gyrocompass repeater with the radar equipment.

Designed to meet the rigid all-weather requirements and working conditions of commercial shipping, the Radiomarine radar consists of three compact major units—indicator unit, antenna assembly and the transmitter-receiver unit.

The waist-high binnacle-type indicator unit, or viewing console, for installation in the wheelhouse or chart room, occupies an area 18 inches wide by 24 inches deep, and is equipped with a 12-inch cathode ray scope which provides an unusually large, easily viewed picture, for accuracy in navigation and minimum eye strain. A compact and lightweight rotating antenna assembly made of aluminum and stainless steel and measuring the surprisingly short width of 62 inches is designed for mounting on top of the ship's wheelhouse on a standard Navy flange 16½ inches in diameter. The third major unit is the transmitter-receiver mounted in a compact cabinet measuring 47 inches high, 18 inches deep and 16 inches wide. It may be installed in any convenient shipboard location which permits a reasonably short waveguide run to the antenna assembly.

Radiomarine radar is designed to operate from a power supply of 115 volts, 60 cycles, single phase. For vessels where the primary power supply is direct current, a suitable motor generator set and automatic motor starter are provided. The motor generator set has a built-in voltage regular to maintain the a.c. output voltage at a uniform value with variations in the shipboard 115 or 230 volt d.c. supply.

Antenna assembly of the Radiomarine radar unit.



Radiomarine Corp.'s new shipboard radar dial showing the 12" PPI scope picture.

The equipment will be installed and serviced at Radiomarine's 22 company-owned and long established service stations at principal ports throughout the United States. Service will also be available in foreign ports through its worldwide affiliates.

New Elongation Testers

Two new low-stress elongation testers for measuring the stiffness, or springiness, of large and fine copper wire have been announced by the General Electric Company. The large-wire tester measures elongation of wire from 17.9 to 80.8 mils in diameter, and the portable fine-wire instrument tests wire from 3.1 to 17.9 mils in diameter.

The new testers are useful for determining whether a wire possesses the proper degree of flexibility for use in such winding processes as the manufacture of coils, and make possible a comparison between wires of the same or different sizes on the basis of elongation.

Keep Posted

New Equipment and Machinery for Yard, Ship and Dock

Westinghouse Resonance Tube

Resonance Tube

One tip-off that something is wrong inside a turbine comes with a hum, a wheeze or some other unusual noise. The errant part which causes the noise—it may range from a worn bearing to a "stretched" blade—can be determined by use of a simple formula, the resonance tube and the engineer's experience. The resonance tube, manufactured by Westinghouse Electric Corp., simply a hollow plunger fitted into a "sleeve" and varying in size from six to sixty inches, locates discordant sounds by "running in" to the sound's frequency, much as a radio is tuned to the frequency of a broadcasting station.

By measuring the length of the tube at the position at which the noise can be heard the frequency is determined, and by dividing the known velocity of of sound (about 66,990 feet per minute) by the frequency, the wavelength of the noise is determined. Wavelengths of "trouble sounds" have been pre-computed and charted, and the particular fault of the machine tested is revealed by comparing the determined wavelength with the chart. Since minor repairs may be made without tearing down the whole machine, the resonance tube saves time and money and assures quiter, more efficient overall performance.

New Model Portable Extinguisher Introduced

A portable fire extinguisher containing 2½ pounds of fire-killing carbon dioxide in a new light-weight cylinder is announced by Walter Kidde & Company, Inc.

This new extinguisher is designed for small fires in flammable liquids and electrical equipment. It combines the time-tested trigger control valve with reduced cylinder weight to provide easier handling and more simple operation than ever before.

The new steel cylinder developed by Kidde engineers maintains the same high strength and durability of the old cylinder with a sizable reduction in weight. The old cylinder weighed 8¼ pounds whereas the new model weighs but 4½ pounds.

Other hand portables are available in 4, 10, 15, and 20 pound sizes; and wheeled portables in 50, 75, and 100 pound sizes.

New Kennametal Composition For Precision Boring

Kennametal, Inc., of Latrobe, Pa., has developed a very Kennametal composition, Grade K5H, specifically for small tools used in precision boring of steel parts. It has a Rockwell A hardness of 93.2, great resistance to cartering (high content of tungsten-titanium carbide, $WTiC_2$), and is unusually strong for such a hard material. Solid tools 3/32" to 5/16" diameter, and 5/32" to 5/16" square, are available, as well as blanks 3/32" to 3/8" diameter and 3/16" to 3/8" square, suitable for grinding to any desired tool point shape.

United States Rubber Collapsible Boat

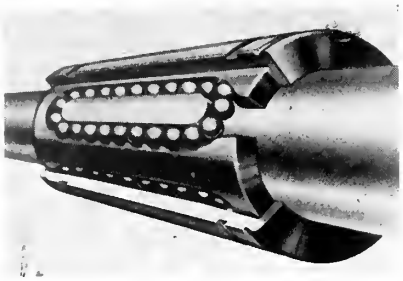
As a natural out-growth of the wartime life raft but with important variations, a boat, designed by United States Rubber Company Engineers, is now being introduced for peacetime uses. Made of heavy duck, coated on both sides with synthetic rubber impervious to gasoline, and oil, this craft is highly resistant to sunlight, aging, and abrasion.

Large valves are placed so that the air can be pumped in quickly or rolled out easily after use. One man can set up and inflate the boat in less than ten minutes and take it down in the same length of time.

Eight feet long and four feet two inches wide when inflated it comfortably seats four people. It is divided into two air-tight chambers, arranged so that if one should be punctured, occupants can row to shore without getting their feet wet. The 32 inch by 14 inch carrying case, containing the deflated boat, weighs only 37 pounds.

A special feature is a bracket to which an outboard motor, up to 3 horsepower, can be attached. Other equipment includes two rigid, easily removable seats, collapsible aluminum oars, a large hand pump, handling lines, and the carrying case. As a dinghy on yachts and as a life boat on commercial craft, it will save valuable space.

U. S. Rubber Co.'s collapsible boat



New standard ball bushing for linear motion.

Ball Bushing For Linear Motion

Thomson Industries, Inc., announces the standardization and production of their round shaft type ball bushing. Production of this new antifriction bearing now brings to the designer a bearing for his linear motions that possesses all the advantages and economies that ball bearings impart to rotary motions. Numerous post-war products now in the design stage will receive a substantial sales impetus from this important development.

Standard Ball Bushing sizes vary from ¼" shaft size to 4". Sizes from ¼" to 1" vary in ⅛" steps; from 1" to 3" in ¼" steps and from 3" to 4" in ½" steps. Production of some of the smaller sizes is now under way. Volume production of the remaining sizes will be started as rapidly as the tooling for each can be completed. A booklet containing complete engineering information is now available without obligation.

Standardization of ball bushings for square shafts is not yet complete but this type can be furnished on an experimental basis for prototype equipment. Actual production is scheduled for later this year.

New "X-P" Expendable Pallet

Greater economics in shipping are forecast for manufacturers using the new low-cost "X-P" Expendable pallet (adapted to fork-lift trucks) now being offered by Techtmann Industries.

The cost is so low that they can be discarded after a single trip. A sixty per cent reduction in weight is achieved in this 4-way pallet by the use of a double corrugated board top supported on square or round wood blocks. Entire top and block ends are dipped in a water-resistant adhesive which seals off moisture from the load.

Four thousand lb. loads have been carried on the pallet without failure. Tests show that it will survive a number of trips without appreciable damage under normal conditions of shipment. Maximum load stowage is attained in the standard 42x48 inch size, since multiples of these dimensions nearly equal the widths of truck and box car bodies.

New Regulation Valves Announced by Leslie Co.

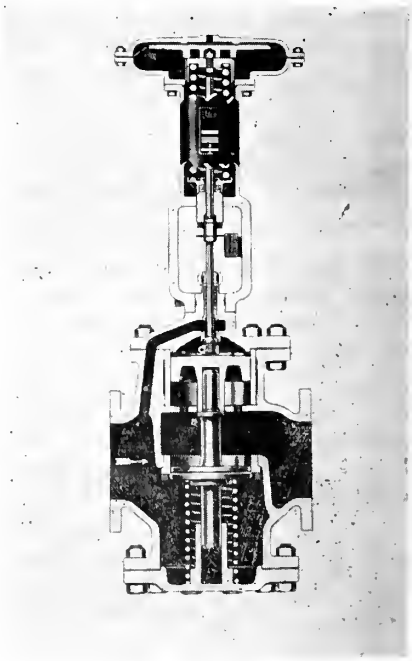
A complete new line of single-seated, fully balanced diaphragm regulating valves for process industries and power plants has been announced by Leslie Co., Lyndhurst, N. J.

These diaphragm valves are made with cast iron, bronze, and steel bodies for steam, air or gas pressures up to 1000 psi, and are designed to be actuated by standard pressure or temperature instruments or controllers using 20 psi air or clean water.

Supplied as standard equipment with 800 brinell hardened stainless steel main valves and stellited seat rings, these single-seated valves provide equal or greater capacities than most double-seated regulating valves of the name size, and have the additional advantage of being absolutely tight in dead-end service, thereby eliminating leakage of fluid commonly experienced in most double-seated diaphragm regulating valves when in closed position.

For temperatures over 450° F., steel diaphragm valves are equipped with a newly designed "Conden-Seal" cooling bonnet that offers a large radiating surface, and the unusual feature of a reservoir of condensate to aid in keeping the stuffing box temperature down.

Leslie Class D-I diaphragm regulating valve.



On the Ways — SHIPS IN THE MAKING

Matson Charters Reefers

The Matson Navigation Company late in July chartered two motorships, the Whale Knot and the Flemish Hitch, for operation in Pacific Coast-Hawaiian trade. These vessels are 323.9 feet long B.P., 50.1 feet molded beam, and 26.5 feet deep. They were built at the Beaumont, Texas, shipyard of the Pennsylvania Shipyards Inc., for the U. S. Maritime Commission and fitted with Nordberg six cylinder 21½" cylinder diameter and 29" stroke, developing 2150 normal shp at 225 rpm. Each ship has a gross measurement of 3803 tons and a net measurement of 2126 tons. The holds are fitted for refrigerated chambers to take a total of 10,000 cubic feet refrigerated cargo and 1200 tons of dry cargo.

Bethlehem Busy

At the end of June Bethlehem Sparrows Point yard launched the first of eight refrigerated cargo vessels for the United Fruit Company and christened the hull Yaque. These vessels are 365 feet long B. P., 56 feet beam, and 35 feet deep. They measure 4750 gross tons and carry 5100 deadweight tons. Built under the account of the U.S. Maritime Commission they are known as the R1-S-DH1 type. Each vessel is equipped with comfortable accommodations for 12 passengers.

On the first of August Bethlehem Sparrows Point yard laid the keels for two more of their 24,400 deadweight ton bulk carriers for the Chilean ore trade. These vessels are 560 feet long, 78 feet beam, 43'-9" deep. They are driven by geared steam turbines operating at 1450 psi and 750° F. the highest steam pressure employed on any American Flag vessel.

Mariposa Reconversion

United Engineering Company was awarded the contract for reconversion to a luxury liner of the troopship Mariposa. The bid was $6,881,500, eight hundred thousand over the estimate but nearly a million and a half lower than the other bids. Newport News bid $8,250,000, Bethlehem $8,990,000. This later bid illustrates the tremendous rise in shipyard costs since Bethlehem built the Mariposa for just a little over $8,000,000 in 1931.

New Hydraulic Remote Control

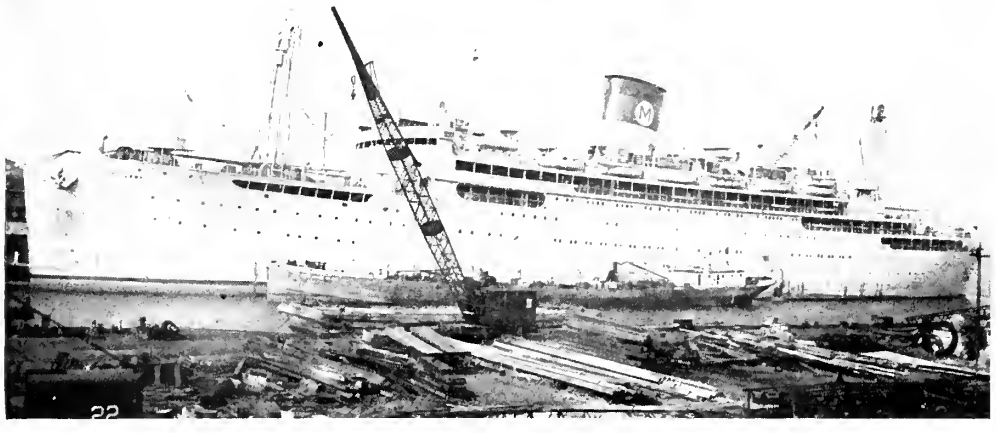
A self-contained hydraulic remote control designed to handle loads up to 1200 inch pounds torque has been released for sales to the marine industry by the Marine Equipment Division, Ellinwood Industries, Los Angeles.

The new control, known as the Model "A", will handle the remote clutch shifting lever on marine clutches on most high speed gasoline engines up to 200 horsepower and medium speed gasoline and diesel engines up to about 100 horsepower.

Located on the flying bridge or in the wheel house, the overall model "A" design precludes the necessity for an enclosing hood or special pedestal, thereby reducing the initial investment in equipment and resulting in a saving of space.

Multiple controls are possible through the provision of additional Master control stations which permit control from two or more stations.

The operating unit always precisely follows the remote control unit. The simple, dependable designed compensator unit automatically takes care of expansion and contraction of the hy-



Troopship Uruguay at Federal yard Kearny, N. J. to be reconverted to a luxury passenger liner for the New York-South America run of the Moore-McCormack Lines. As a troopship she accommodated 4493 troops with a crew of 308. As a passenger liner she will take care of 333 passengers with a crew of 407.

draulic fluid without affecting the synchronism between the Master and the Slave.

The use of a lever type Slave unit assures simplicity of installation on any type of marine transmission. The Slave unit can be mounted conveniently on the engine bearers and easily connected to the clutch arm by a clevis connection.

First Loran-Guided Pacific Crossing by Merchant Ship

Successful completion of the first crossing of the Pacific by a merchant ship using loran—the modern electronic method of long-range navigation—was announced recently by Charles J. Pannill, President of the Radiomarine Corporation of America.

Mr. Pannill reported that the trip was made by the Waterman liner, John B. Waterman, employing a compact RCA loran receiver with which the navigator was able to ascertain the position of the vessel with high precision—day or night and regardless of weather conditions.

Arriving in New York after completing a 20,000-mile journey in 127 days, Second Mate William Fleck, who operated the loran equipment aboard the ship, reported to Radiomarine that the apparatus performed with uncanny accuracy. Comparative fixes, he said, were made by celestial navigation on the voyage from San Pedro, Calif., to Shanghai. They revealed the modern system to be functioning perfectly.

One of the chief advantages of the system is that it makes it possible for navigators to take their ship on the most direct course, spending less time at sea and thereby saving fuel. In distress, a vessel could include the most accurate position in its call for assistance.

The equipment aboard the John B. Waterman was reported to have worked best in the evening and during the early morning hours, when the range increased from 750 to 1,400 miles. It was explained that this is customary since atmospheric conditions for radio transmission are better during those periods.

Captain E. R. Callaway, of the Waterman liner John B. Waterman, examines RCA loran receiver which his vessel used to complete first loran-guided crossing of the Pacific. (Inset) The John B. Waterman at the end of a 20,000-mile voyage, completed in 127 days.

Ingalls Launches Towboat

An 800-horsepower towboat, built at the Decatur, Ala., yard of the Ingalls Shipbuilding Corporation for the N. C. & St. L. railroad, recently was launched

Launching the towboat Guntersville from Ingalls' Tennessee River yard at Decatur, Alabama.

at the Tennessee River yard and christened Guntersville. This towboat is 96 feet long, has a molded beam of 25 feet and a depth at side of 9½ feet. It has a single screw powered by an 800-horsepower Superior Diesel engine. The after section of the deckhouse has two locker rooms with showers, and the captain's office over the forward part of the engine room has a shower room. Atop this is the pilot house, providing excellent visibility in all directions from an eye height of 32 feet. The steering is done by one main rudder and two flanking rudders controlled with electro-hydraulic steering mechanism. The usual complement of deck fittings is installed.

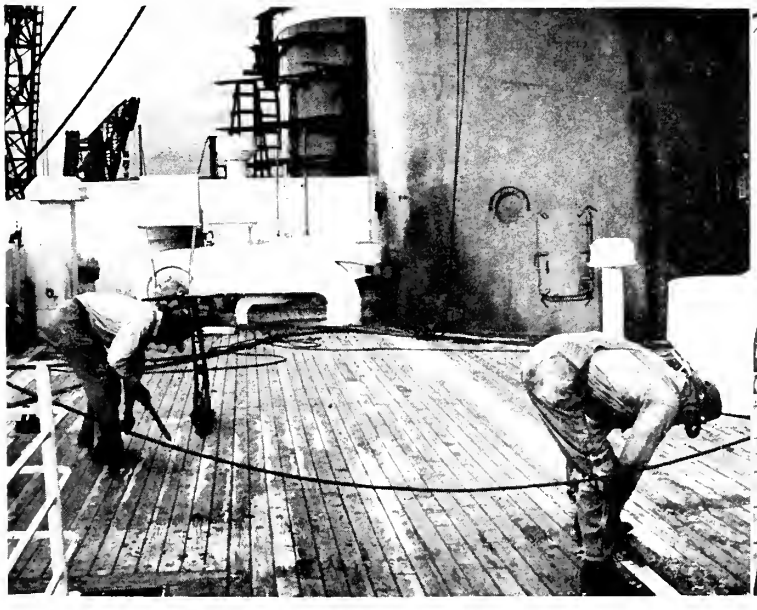
Reconversion of Grace Liners

The liners Santa Rosa and Santa Paula are in the yard of the Newport News Shipbuilding and Drydock Company, to undergo reconversion to peacetime operations. Work is underway on both vessels.

Grace Line officials in New York stated that the two vessels will not be ready to return to the Caribbean route, Curacao, Venezuela and Colombia, before early 1947.

These liners, built by the Federal Shipbuilding and Dry Dock Company, with their sister-ships, the Santa Elena and Santa Lucia were first operated in the Latin America intercoastal service between New York and California.

SS America takes a short shift in drydock at Newport News as she is completely reconditioned for peacetime passenger traffic. Her war service record as the Army transport West Point will never be forgotten. On decks that were trod by over 460,000 troops, skilled workmen replace worn planking and prepare seams for new caulking. The man aloft in bosn's chair adds his bit painting stays on foremast as ship's reconversion nears completion. The queen of our merchant fleet will be back on the seas in October.



Members of the launching party included, left to right: Gerald E. Donovan, Moore-McCormack vice president; Mrs. Donovan, Monro B. Lanier, Ingalls president; Mrs. Walker E. Miller, Edward Johnson, Mrs. Arthur Turner, mother of the sponsor; Patricia McMahon, sponsor's daughter; Captain Atkinson, of Moore-McCormack; Mrs. McMahon and Mrs. Edward Johnson.

Ingalls Launches Fourth Mormacpenn

The Ingalls Shipbuilding Corporation at Pascagoula, Mississippi, recently launched the fourth vessel to bear the name Mormacpenn for the Moore-McCormack Lines, with Mrs. Brien McMahon, wife of Senator McMahon, of Connecticut, as sponsor. The first vessel named in honor of the Pennsylvania Railroad was sold to Brazil, and the second and third, built as cargo-passenger ships by Ingalls, were converted during the war to aircraft carriers, one being sent to Great Britain under lend-lease and the other being operated by the United States Navy.

Consolidated Steel Delivers S. S. Golden Light

Delivery (July 26) of the S.S. Golden Light, 460-foot C-2 vessel, marks the completion of Consolidated Steel Corporation's outstanding shipbuilding program, bringing to 200 the number of ships built and delivered to the U. S. Navy, and to the U. S. Maritime Commission by the company from the Los Angeles - Long Beach Harbor area; and to 1298 the number of vessels launched and delivered from all its operations; 761 mechanized landing craft and 403 gun mounts were built at the Maywood plant. Consolidated Steel won every award which the Government can bestow for production.

The Golden Light, with her three sister ships built by Consolidated, have been delivered to the Agwilines and are expected to be in passenger service, operating from New York to Puerto Rico and Mexico, by early winter.

The vessels, actually built as C-2 cargo vessels, will be converted into luxurious passenger liners with accommodations for 140 passengers on each ship, and recreational features such as swimming pools and lounges.

Each ship will have cargo space for 300,000 cubic feet of dry cargo, including 160,000 cubic feet of refrigerated cargo space.

Dutch Launch Big Motor Ship

High above the roofs of the town of Flushing there rose throughout the war years the stately hull of No. "214," the 22,000-ton motorship being built by the "Schelde" shipyards for the Rotterdam Lloyd and intended for the luxury passenger service between Rotterdam and Java. The keel for the new ocean liner was laid on January 25, 1939; the launching was planned for the spring of 1940 and it was expected that it would be put into service by the summer of 1941.

In May, 1940, the Germans came The Nazis rejoiced that so large a ship had fallen undamaged into their hands. But it soon appeared that "214" was not ready for launching. The hull remained on the ways, thanks to a silent understanding between the management of the shipyards and the workers. For four years the work continued, but the ship was never completed. During these years of occupation, the hull served as hiding place for large numbers of art objects which otherwise would have been carried off to the Reich.

A huge crane was demolished under the eyes of the Germans; the parts were hidden so that at least one crane would on hand in case of destruction of the others. After the liberation, it was reassembled and put into use. A few days before the German capitulation, the explosives that had been placed inside the ship were removed. When in November, 1944, after three days of furious fighting, Flushing was freed, No. "214" — although severely battered by thousands of grenades, still rose high above the ruins of the town.

A few weeks ago, No. "214" was christened and launched, a symbol of Dutch resistance to tyranny. She is now Willem Ruys, named after a director of the Rotterdam Lloyd who, on August 15, 1942, was executed by the Germans as a hostage.

Willem Ruys has an over-all length of 631 feet; she is 82 feet wide and has a depth of 55 feet. Her motors have a combined output of 27,000 hp. Her speed is expected to reach 21 knots. The ship offers accommodation for 780 passengers and a crew of 400.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

At the head table, left to right: James Black of Pacific Gas & Electric Company, Admiral Mahlon S. Tisdale, Dean Witter, Vice Admiral W. H. P. Blandy and C. E. Moore, at the atomic preparedness meeting held in San Francisco recently.

Shipbuilders Seek Atomic Preparedness

As San Francisco Industrialists Hear Admiral Blandy

A group of over 400 industrialists—among them many ship designers and builders—met in San Francisco on August 19 to greet Vice Admiral W. H. P. Blandy on his return from Bikini, and to learn, if possible, what effect the A-bomb would have on the design of their ships.

Admiral Blandy's talk served to officially confirm the suspicions of shipbuilders that the atom bomb would bring about a re-designing of all ships to be used as naval or auxiliary vessels. The Bikini chief said, however, that as long as there was ocean traffic there was need for a Navy, and further, in his later report to Washington, "Unless and until the Atom Bomb is outlawed by international agreement, the U. S. Navy is our first line of defense, and its development must be a major consideration."

The gathering was under the auspices of the Navy Industrial Association, an important organization of major U. S. corporations dedicated to permanent cooperation with the Navy. This newly-formed group means to keep available an up-to-the-minute crossfile of the manufacturing facilities of the nation, to which the Navy could turn in event of a war emergency.

Left to right: Rear Admiral M. S. Tisdale, Dean Witter, Vice Admiral W. H. P. Blandy, C. E. Moore, president of Moore Machinery Company, Vice Admiral Richard S. Edwards, chief of Western Sea Frontier, and E. J. McClanahan of Standard Oil of California.

"Major industries are banding together," explains the Association's Vice President Charles E. Moore, "to help see that Americans are not caught again the way we were on December 7, 1941, when the Japanese could have captured Hawaii. Always before, a sudden crisis has found us unprepared. Industries will coordinate themselves in every part of the country so that the Navy could turn to them overnight in a crisis and know accurately, specifically, what each factory could do." Mr. Moore is president of Moore Machinery Company and was wartime president of Joshua Hendy Iron Works of Sunnyvale, California.

Save Shipyards

"The Pacific Coast has been so industrialized that it has the potentialities for manufacturing almost everything that would be required in another war," continued Mr. Moore. "We wouldn't go into another war with 10-knot Liberty ships (but) we have a concentration of shipbuilding that can be invaluable in safeguarding our future. These facilities should not be junked, for, if necessary, they could do a tremendous service."

Member Firms Listed

More than 400 corporations across the country have joined the association, first suggested by Navy Secretary James Forrestal. Of these, 36 are from the San Francisco Bay region, listed by Mr. Moore as follows:

General Engineering & Drydock Co., Barrett & Hilp, Marinship Corp., W. A. Bechtel Co., Shell Oil Co., General Metals Corp., Standard Oil Co. of California;

Enterprise Engine & Foundry Co., United Engineering Co., Ltd., Food Machinery Corp., Grove Regulator Co., Hurley Marine Works, Tidewater Associated Oil Co., Schlage Lock Co., International Totalizer Co., General Petroleum Corp., Goldfield Consolidated Mines Co., Western Pipe & Steel Co. of California;

Pacific Electric & Mfg. Co., Hall Scott Motor Car Co., Pope & Talbot, Crown Zellerbach Corp., Western Gear Works, Pacific Bridge Co., Amship Corp., General Electric Co., Air Reduction Sales Co.;

Bethlehem Steel Co., Columbia Steel Co., Westinghouse Electric Corporation, American Can Co., Caterpillar Tractor Co., Revere Copper & Brass, Pelton Water Wheel Co., subsidiary of Baldwin Locomotive Co., Joshua Hendy Iron Works, and Permanente Metals Corp.

The meeting was also the occasion for the announcement of E. J. McClanahan of Standard Oil of California of the election of Charles E. Moore to the Presidency of the Navy League of the United States for Northern California. Frazer Bailey was named regional vice president of the Navy League.

Simmons "Ceiling Berth" Features Marine Display

Results of applying the most revolutionary techniques in furniture designing to one of the world's oldest and most honored trades—engineering marine-type equipment for ships—were shown July 19, at the Simmons Company show room preview at New York. Simmons long has pioneered in developing marine sleep equipment.

The special exhibit was shown in replicas of two staterooms, such as are found on the most modern of luxury liners, complete with panelled walls and portholes to match berth trimmings. One stateroom featured a Simmons exclusive, the Ceiling Berth. The berth is neatly concealed in a cabinet built into the stateroom ceiling, and may be let down at will. This space-saving device will be used on the S.S. America (U. S. Lines), now being readied for its first post-war run. The functionally styled furniture in this room, prepared to give a maximum of utility with real beauty, is an adaptation of the Arc-front Suite soon to be available.

In the other stateroom, a combination sofa-and-upper berth is featured. An interesting facet is the spring supporting the Beauty-rest mattress, which rises automatically as the berth is opened and provides a hitherto undreamed of comfort. The lee-rail also rises automatically as the berth is opened. The lower berth, concealed in a cabinet flush with the bulk-head when closed, is faced with a comfortable sofa. Thus the stateroom is truly a choice living room by day, a bedroom by night—a primary "want" in the Marine field.

Top row, left to right: Robert E. Lawrence, San Diego; Paul D. Kollasch, San Diego; Curtis Dreyer, Oakland; Maurice T. Wahlgren, Glendale; William H. Ezell, Pasadena; Joseph C. Karasky, Oakland; William H. Cree, Long Beach; Wallace V. Baitinger, San Mateo; George D. Wilson, Clarksburg; Rushton O. Backer, Los Angeles; William F. Schill, Alameda; Anton R. Mirkovich, San Pedro. Middle row, left to right: Willis C. Graves, Los Angeles; Richard A. Valentine, San Francisco; Curtis B. Harrison, Orinda; Denny A. McLeod, Lake County; Benjamin C. Corlett, Napa; Donovan S. Love, San Francisco; Donald Everson, Oakland; Donald B. Cohen, Los Angeles; Merritt R. Nickerson, Sacramento; John W. Wieland, San Francisco; Harold E. Nay, Pasadena; Charles W. Bradley, Los Angeles. Bottom row, left to right: Lucian B. Vandergrift, Hollywood; Samuel F. Fogleman, Newport Beach; Ralph B. Hoyt, Berkeley; George Dickinson, Los Angeles; James E. Schrader, San Fernando; Ralph C. Levin, Los Angeles; Craig J. Swenson, Tulare; Jarle A. Bergrum, Los Angeles; Richard A. Miller, Los Angeles; Carlton A. Clendenny, Santa Barbara; James R. Chambers, Beverly Hills.

Soon to Become Ship's Officers

A "Well Done" from Capain Claude B. Mayo, USN (Ret.), Superintendent of the California Maritime Academy, Vallejo, California, brings forth the smile of achievement to each member of the class who is to be graduated from the Academy on September 7, 1946. Following graduation ceremonies each of the graduates is qualified for a license as either Deck or Engineer Officer in the U. S. Merchant Marine and may then wear the uniform of an officer in either the U. S. Maritime Service or the U. S. Naval Reserve. They will be prepared to immediately accept positions as ship's officers.

California youths who plan to enter the next class of cadet-midshipment at the California Maritime Academy must have their applications in by August 16.

Applicants, 17 to 23 years of age, with a high school education or its equivalent, should write to: Lieutenant Commander R. D. Heron, USNR, Commandant of Midshipmen, California Maritime Academy, Vallejo, California.

Included in the group are: Ed Harris, Pope & Talbot; Bill Rudy of Xzit; Bill Todd, Pacific Tankers; W. Miller, Pacific Tankers; W. Thorpe, J. T. Thorpe & Son, L. A. Harbor; H. W. Salbados, Brickseal, L. A. Harbor; J. T. Govan, president of Brickseal Refractory Co.; Bud Edmiston, Brickseal; Jim Hines and Paul Faulkner of Pacific Marine Review; W. L. Meadows, Bob Brown and Carl Rex.

S. F. Port Engineers Attend Brickseal Demonstration

Below: Demonstration of a brick coated with Brickseal, taken from a furnace heated to over 2000 F. and immersed in water with no harmful effect to the brick or coating.

An interested group of San Francisco port engineers, accompanied by Ralph Scott, visited the plant of Brickseal Refractory & Xzit Sales Company in Los Angeles recently where demonstrations of Brickseal refractory coating, Petroflo sludge remover, Serviron tank coating and other Xzit products were made.

Following the demonstrations the group enjoyed luncheon at Carl's, and later were taken on a sight-seeing tour of Hollywood and Beverly Hills, returning to the Los Angeles home of Jack Govan, president of the firm, where they were served cocktails. From

the Govan home the group went to the Paris Inn for the floor show and dinner before boarding the Lark for the return trip to San Francisco.

Among those present were: Perry Roach, Williams Dimond Co.; Jim Reamers, DeLaRama S.S. Co.; Ray Baker, Oliver J. Olsen Co.; Chester McKay, Pacific Tankers; Bill Donelly, J. H. Winchester Co.; Bill Gough, Parry Nav. Co.; George Curran, American Pacific S.S. Co.; George Reitz, Lt. Comm., Merchant Marine Cadet School; W. Finnegan, D. Padilla, C. Angell, W. E. Sizemore, W. J. Schuerbrock, Bill Center, Andy Disher, Jack Long, H. C. Lauer, E. G. Cunningham, M. T. J. Garlinger, Joe Verducci, all U. S. Army Transporation Corps.; Leonard Dunham, Al Braun, T. I. Navy Supply; T. Hill, G. Bancroft, E. Stewart, Asbestos Co. of California; Bill Barrett, Raleigh Masters, A. T. Thorpe & Son; Jack Butler, Roy Burquist, Walter Harris, Russ Matson, Ralph Scott, all of Brickseal Refractory Company.

Bill Rudy explaining the advantage of SERVIRON tank coating. It is being applied to a drum.

Salbados Joins XZIT's Sales Staff

H. W. Salbados, Xzit Sales Co.

XZIT Sales Company of Los Angeles recently announced the appointment of H. W. Salbados to their Los Angeles Harbor staff as Service Engineer. Mr. Salbados is well known on the Coast, having served a large oil company for 13 years as lubrication and service engineer for ships calling at Los Angeles Harbor. During World War II, Mr. Salbados trained engineers on lubrication methods for Navy troopships then being constructed at local yards and also designed lubrication charts for standard lubrication of EC 2-Liberty ships, the first charts of this kind to be used on these ships. Mr. Salbados gained early recognition as Chief Engineer and later Guarantee Engineer on ships of the American-Hawaiian Steamship Company. During World War I, he rendered lubrication and service engineering to the United States Navy yards and ships on the East Coast.

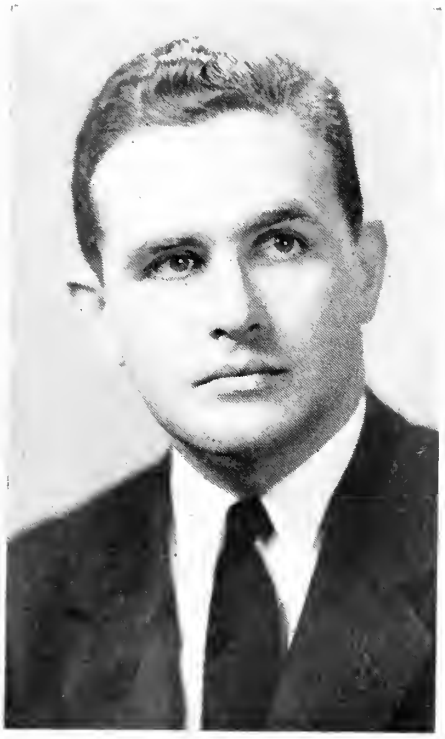
Mr. Salbados will contact all vessels calling at Los Angeles Harbor to offer engineering service for the application and use of XZIT Sales Company's protective products which include XZIT Soot and Firescale Eradicator and Brickseal Refractory Coatings.

Mackay's Service to Rome Inaugurated

Warren Lee Pierson, president of the American Cable & Radio Corporation, announced the inauguration of direct, high-speed radiotelegraph service between New York and Rome, Italy, by the Mackay Radio and Telegraph Company, ACR's radiotelegraph operating subsidiary. Opening of the New York-Rome link augments existing circuits to Italy now in operation by the ACR System and adds another to the list of important countries with which direct, high-speed service has been restored by Mackay Radio since the termination of hostilities.

All classifications of traffic—Government, press, commercial and personal—will be handled over the new circuit.

Left to right: R. L. Berquist of Xzit Sales and E. P. Butler of Xzit.



Harbor Day Committee Chairman James B. Black, Jr., of Matson Navigation Company.

John V. O'Brien, secretary-manager, S. F. Junior Chamber of Commerce.

Marine Committee Chairman Gene Hay, of General Steamship Company.

SAN FRANCISCO HARBOR DAY OBSERVANCE

A colorful celebration marked the 17th annual observance of Harbor Day in the Bay Area, August 24th and 25th. The affair was sponsored by the Marine Committee of the San Francisco Junior Chamber of Commerce, with James B. Black, Jr., of the Matson Navigation Company acting as general chairman.

Honored guests during the two-day observance were mayors and presidents of Chambers of Commerce and their families from Northern California cities and towns. The visiting dignitaries were officially greeted by host Mayor Roger D. Lapham, Saturday morning, August 24th, prior to an inspection trip by boat of the harbor when they were shown the facilities for shipping products from their communities out of San Francisco harbor. A visit to the U. S. Naval Air Station at Alameda was included in the tour.

A gala Water Carnival at Aquatic Park highlighted the program on Sunday, August 25th. Wounded veterans from Army, Navy and Marine hospitals were honored guests.

The aquatic events were preceded by a brief ceremony honoring seamen lost in the war.

Sports events included swimming races for men and women, exhibitions of comedy and fancy diving, swimming through fire, aerial demonstrations and rhythmic duet water ballets. Competitive boating events included a whale boat race, comedy tub race, canoe race, canoe tilting race, paddle board race and shell race.

Attracting thousands of visitors to the Ferry Building was the Harbor Industry Exhibit, August 19-25, held in conjunction with the observance. The Harbor Day theme, "Boost Your Harbor," was carried out in exhibits stressing the facilities of San Francisco harbor and its potentialities for peacetime world trade.

Displays of Radar and Loran, marine propulsion equipment, sounding apparatus, cargo gear and tackle, chemicals and radio transmitting equipment were shown by industrial firms of the Bay Area. Major steamship companies exhibited models of post-war deluxe ocean liners.

Of particular interest was a color replica of the proposed San Francisco World Trade Center. The $1000 model, exhibit of World Trade Center, Inc., depicts the building project planned to house export and import concerns and all organizations engaged in world commerce in a move designed to encourage foreign trade.

Glaspray Process Purchased

Earl R. Evans and Geo. T. Murton, Jr., announce the purchase of the sand blasting and metal spraying business heretofore managed by them under the firm name of Glaspray Process Co., 520 Bay Street, San Francisco.

The business will be continued at the same address, but under the new name of Evans & Murton with their former staff including Ed. T. Evans, Duncan C. Pell, and Theodore B. Brown.

At left: Lifeboat Radio and Direction Finder on display at John David Store in New York, one of the major exhibits during the National Marine Exposition. At the right is a model all-in-one shipboard radio unit as displayed in Abercrombie & Fitch window, in New York.

Radiomarine Display During National Marine Exposition

Radiomarine Exhibit at the National Marine Exposition in New York.

Above: Tubbs Cordage Exhibit at the Fisherman's Fiesta in San Francisco in July.

Fisherman's Fiesta In San Francisco July 27-28

Two-day celebration prior to the fishing fleet departing for the season.

At Right: Another exhibit at the Fisherman's Fiesta which drew a big crowd was the Puppet Show of C. J. Hendry Co.

ARTHUR ROHN VISITS COAST

Paul Joslyn, Arthur C. Rohn and Michael Ryan in the San Francisco office of Naval Architects Joslyn & Ryan. Mr. Rohn is chief engineer and assistant director, Technical Division, U. S. Maritime Commission.

Shoreside Personalities

NEW PRESIDENT AT NEWPORT NEWS

Homer L. Ferguson, president of the Newport News Shipbuilding and Dry Dock Company for over thirty-one years, resigned the presidency at the July meeting of the Board of Directors in New York, but continued as chairman of the Board of Directors. Roger Williams, executive vice president, was elected chairman of the Executive Committee, and J. B. Woodward, Jr., vice president and general manager since 1936, was elected president and general manager.

Mr. Woodward started with the Newport News Shipbuilding and Dry Dock Company in 1914 as a draftsman and estimator, after a brief professorship of mathematics at the University of Richmond, Virginia. He was educated at the Universities of Richmond and Virginia and the Massachusetts Institute of Technology. He is a member of the American Society of Naval Engineers and a council member of the Society of Naval Architects and Marine Engineers.

Mr. Ferguson became president of the company in July, 1915. He first came to the Newport News Shipyard in 1905, some years after graduating from the U. S. Naval Academy and further study in Glasgow, Scotland, being assigned to the yard as an engineer and constructor for the Navy. In the same year he left the Navy and accepted a position with the yard as superintendent of hull construction, from which he advanced to the position of general manager.

COMMITTEEMAN CHARLES S. BOOTH, general freight agent of the Matson Navigation Company, has just been elected Commander of the 17th District of the American Legion in Los Angeles. This District comprises 70 Posts, with a total membership of 13,000 Legionnaires.

PROMOTIONS

COMMODORE TELFAIR KNIGHT, USMS. Commandant of the United States Maritime Service, was recently promoted to the rank of Rear Admiral (Upper Half) in the United States Maritime Service, with date of rank from July 1, 1946. His status as Assistant Deputy Administrator for Training of the War Shipping Administration will remain unchanged and he will continue to perform the duties of that office as well as the duties of the Commandant of the United States Maritime Service.

CAPTAIN RICHARD McNULTY, USMS, Superintendent of the United States Maritime Service, was made Rear Admiral (Lower Half) in the United States Maritime Service with date of rank from July 5th. His status as Supervisor of the United States Merchant Marine Cadet Corps and Superintendent of the United States Marine Academy will remain unchanged.

Captain Norman L. Queen, USMS, Supervisor of the State Maritime Academies was promoted to the rank of Commodore.

A. P. L. PROMOTION

M. J. Buckley, vice president, announced promotion of Stanley G. Holmes to the position of assistant freight traffic manager, American President Lines. He succeeded to the vacancy made by the promotion of W. K. Varvoe as traffic manager, who succeeded Thomas Cuffe, resigned, to organize a new transpacific service.

SANFORD RETIRES FROM U. S. M. C.

L. R. Sanford, veteran official of the United States Maritime Commission, retired on July 19. He has served with the old Shipping Board and the Commission and is a veteran in the service.

When he retired, Mr. Sanford was director of the Construction Division. During the war he was in charge of the offices in New Orleans. When Carl W. Flesher resigned from the Oakland Regional Office, Sanford also assumed his duties. Later he was named director of all the regions.

BERTOLANI SUCCEEDS HUNTER AT GENERAL S. S. CORP.

Resignation of Captain A. T. Hunter as operating manager of General Steamship was announced by H. S. Scott, president of the Company. Captain Hunter is a member of the State Board of Pilot Commissioners.

J. R. Bertolani, who will assume Captain Hunter's regular duties with the General Steamship Corporation, has acted as his assistant for the past several years.

ETS-HOKIN & GALVAN NAMED DISTRIBUTORS

Ets-Hokin & Galvan of San Francisco was recently appointed distributor in California for the Marine Division Kirsten Pipe Company of Seattle.

NEIL S. LAIDLAW, former manager at the Port of San Francisco for the State Board of Harbor Commissioners, will leave San Francisco soon for Australia, where he will assume charge of the Matson Lines office upon retirement of Charles E. Brown.

Mr. Brown, managing agent in Australia for many years, will retire early next year.

NEW VICE PRESIDENT FOR REPUBLIC

The Republic Supply Company of California recently announced the election of Roy W. Johnson as vice president and Director of the Company. Since his return from the service in December of last year, he has been in charge of the Company's Oakland Division and will continue in that capacity.

Roy W. Johnson, Republic Supply Co. of Emeryville, California.

Starting as a warehouse hand in 1934, Roy has worked as counter-man, store manager, and field salesman in most of the Company's stores, gaining thereby a well-rounded knowledge of the Company's business. With an officer and director permanently located in the Bay Area, Republic is now better qualified to serve the trade.

SPERRY MOVING IN WILMINGTON

A new building is now being completed at 128 North Marine Avenue, just south of "B" Street, Wilmington, which will be the business home, some time in September, for the Sperry Marine Sales and Service groups. W. H. "Casey" Emerson, Marine Supervisor, will be in charge of the Wilmington office and provide sales and service in the center of the Harbor District, carrying on the policy of complete Sperry service that was started in May, 1923, and which has continued without interruption since that time.

BETHLEHEM STEEL APPOINTS McCLUNG GENERAL MANAGER

Announcement has been made by T. S. Clingan, vice president, Bethlehem Pacific Coast Steel Corporation of the appointment of William J. McClung as general manager of the company's steel plants and mill depots. Mr. McClung will be in charge of operations of Bethlehem Pacific's steel plants in Seattle, South San Francisco and Los Angeles, and mill depots at Seattle, Portland, San Francisco and Los Angeles. His headquarters will be at the South San Francisco Plant.

Mr. McClung comes to the Bethlehem Pacific organization after more than fifteen years of service at the Lackawanna, New York plant of Bethlehem Steel Company, where he has been assistant to the general manager since March, 1945.

A native of the West, Mr. McClung was born in Phoenix, Arizona, and graduated from the University of Southern California in 1930. He started in the employ of Bethlehem Steel Company in that same year, after working for a short time on the Hetch Hetchy aqueduct project for the city of San Francisco.

NEWEST MARITIME COMMISSIONER SWORN IN

J. Grenville Mellen, right, of Gulfport, Miss., takes oath of office as Commissioner of the U. S. Maritime Commission, to fill the unexpired six-year term of Edward Macauley, which ends September 26, 1950. Administering oath is Secretary of the Commission A. J. Williams.

Sherrill Moves General Office to Chicago

Sherrill Instrument Corporation has moved its general office from Peru, Indiana, to 185 North Wabash Avenue, Chicago 1, according to an announcement by E. D. Wilk, manager.

The Sherrill line of precision-magnetic compasses, so important in military uses during the war, is again available for automobiles, airplanes, pleasure and commercial boats and sportsmen.

Mr. Wilk also annnounced the appointment of D. B. Sayre as sales manager of the compass division. The compasses are being marketed through leading wholesalers and retailers.

Left: George Barr, General Electric Co., and Robert Brown, General Electric Co.

George Barr Advanced by G. E.

George Barr, well-known marine superintendent of the General Electric Company, has been promoted to a new position in the Federal and Marine Section of the Industrial Division, Apparatus Department, effective August 1.

Mr. Barr will work directly under George L. Crow, manager, Federal and Marine Section, and will have offices in the Russ Building. In his new capacity, Mr. Barr will contact the marine fraternity in the Bay Area as a further service of G.E.'s "Keep 'Em Sailing Service."

Robert Brown has taken over Mr. Barr's former position and will carry on the tradition of the Marine Section and continue to give the all-out service for which the company is famous. Brown is a long-experienced turbine engineer and for several years has been in charge of turbine work in every phase.

Paint Plant Near Completion

The American Marine Paint Company's large factory and warehouse addition to its plant at Bryant and Rincon Streets, San Francisco, is rapidly nearing completion. The rapid expansion in the demand for the company's marine paints in recent years has made necessary the increased manufacturing and warehouse facilities. The new addition is a three-story structure costing well over $100,000. When completed it will give the company a completely modernized plant equipped with new high-speed mills and other new machinery.

The paint company has been specializing since 1903 in the manufacture of marine coatings. Their line includes Germicide Anti-Corrosive and Anti-Fouling paints, the latter being made in three grades: standard, tropical, and super tropical. For wooden craft the company makes the well-known line of Cape Cod Copper paints, including Triple C, which is so widely used in Pacific waters.

The company maintains factory branches in Wilmington, California, and Seattle, Washington, under the management of Kenneth Barthmess and Ralph Jenkins, respectively. Steckmest & Company have recently been appointed distributors in the Portland territory.

John Parker is president and F. W. Blanch vice president and sales manager of the company.

Lidgerwood Reorganizing Manufacturing Facilities

Lidgerwood Manufacturing Company, a leading producer of hoistings, conveying and marine auxiliary machinery, is reorganizing its manufacturing facilities, concentrating its heavy manufacturing and its medium and light lines in its other plants at Superior, Wisconsin, and Beacon, New York.

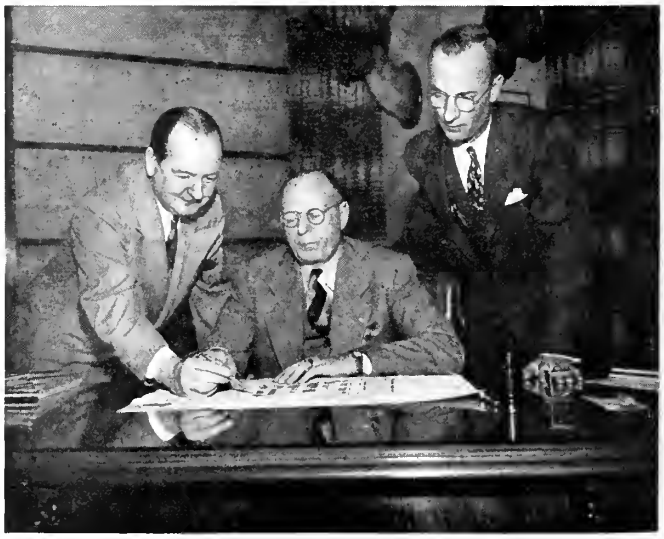
To effect the new policy, the company has sold its real estate at Elizabeth, New Jersey. Machinery, equipment and necessary executive, administrative and engineering personnel will be transferred to the appropriate units.

Under the name of Superior-Lidgerwood-Mundy Corporation, 206 years of accumulated experience in the technique of designing and manufacturing hoists, conveying devices and marine equipment will be consolidated into a large, economical and more efficient unit.

The products of the company, in addition to hoisting and conveying machinery, include mine equipment, heavy construction machinery, electro hydraulic steering gears, windlasses and marine deck auxiliaries, etc. The world's largest battleships (the Missouri-New Jersey class) are exclusively equipped with Lidgerwood electro hydraulic steering machinery. The world's largest cableway was installed by Lidgerwood at Boulder Dam and is rated at 160 tons capacity.

S. F. MARINE SHOW

Roger E. Montgomery, president and general manager of the National Marine Expositions, Inc., pointing out the floor plan of booths in the forthcoming Exposition in San Francisco in 1947, to J. L. Stuart, president of J. L. Stuart Mfg. Co. and J. Sauter, vice president of the same concern.



Bryan O'Connor Back Around the Bay Area

Bryan O'Connor is back around the bay area contacting the marine trade, representing Toumey Electric & Engineering Company, after a long absence during the war years.

New Pacific Far East Line

Organization of a new company known as the Pacific Far East Line, Inc., for the purpose of operating several C-2 type steamers in trans-Pacific trades was announced recently by Thomas E. Cuffe, vice president of American President Lines, who is resigning to join in organizaing the new firm. The Pacific Far East Line, Inc., has applied to the Maritime Commission for the purchase of a number of C-2 type vessels.

"Further details with respect to the proposed operation will be made available at a later date. It is anticipated that operations will get under way within the next sixty to ninety days," Mr. Cuffe said.

Associated with him in the enterprise are William T. Sexton and Kenneth D. Dawson, identified with the Coastwise Line and the Pacific Coast direction of the United States Lines, together with other outstanding figures in West Coast shipping, commercial and industrial activities.

Mr. Cuffe's resignation from the American President Lines is effective August 1. He has been identified with the company and its predecessor since 1921. Mr. Cuffe said two former executives of the American President Lines will be among the key personnel of the new corporation: J. R. Wagner, former assistant freight traffic manager; and E. V. Nevin, former assistant to the executive vice president.

Commenting on this new move, Mr. Cuffe said: "My association with the American President Lines and with Henry Grady, its president, and its other officials, has at all times been extremely pleasant and satisfactory. It is with great reluctance that I am now leaving that company. However, I have always looked forward to participating prominently in a shipping venture in which I had an equity interest, and this opportunity was one that I did not feel that I could reasonably decline."

Admiral Moran Resigns from U.S.M.C.

The War Shipping Administration announced that effective August 9, Rear Admiral Edmond J. Moran, USNR, had resigned as assistant deputy administrator for charters and valuations to re-enter private business.

Admiral Moran joined the Maritime Commission in April, 1941, as a consultant and as special assistant to the Commission. Since that time he has served as director of the Small Vessel Procurement Division, manager of Barge and Towboat Services, assistant deputy administrator for Small Vessels, all with WSA, and as director of the Maritime Commission's Large Vessel Disposal Division. He was enrolled as a Lieutenant Commander in the Naval Reserve and called to active duty in April, 1942.

In the spring of 1944 he went to England to assist in plans for the Normandy invasion and because of this outstanding work was awarded the title of Commander British Empire, a letter of commendation from the U. S. Navy and the Croix de Guerre from the French Government.

Admiral Moran was born in Darien, Conn., October 13, 1896, and served with the Atlantic Squadron as a Lieutenant (jg) during World War I. He was president of the Moran Towing and Transportation Co., Inc., New York City, when he entered Government service.

Bayerlein of Nordberg Retires

E. C. Bayerlein, formerly chairman of the board of Nordberg Mfg. Co., recently retired from active service after an association of more than 52 years.

Marine Parks

To encourage development of the bay area's small boat industry, the Exchange has fostered formation of the California State Marine Parks Association. Officers of the Association are: Charles A. Winslow, staff commodore, Oakland Yacht Club, president; M. A. Cremer, manager, Marine Exchange, secretary-treasurer.

Swedish Ships Adopting Raytheon

The first commercial radar in the world to be manufactured on a production-line basis has recently been installed by the Raytheon Manufacturing Co. aboard the SS Drotningholm of the Swedish-American Line. Simplified design allowed completion of installation and testing in three days. With this radar production line now in full operation, it is expected that units will be produced at a constantly

At the Fisherman's Fiesta held in San Francisco late in July, this booth of Submarine Signal Co., marine division of Raytheon, was one of the attractions. Left to right: O. L. Dewey and E. L. Moore of Submarine Signal. The model tuna clipper in the background is the largest clipper in the world, so claim the builders of Pan-American, Martinolich Shipbuilding Co.

accelerating rate to meet the urgent needs of the merchant marine for radar protection.

The Mariners Pathfinder is a completely new unit designed to meet the actual needs of the Merchant Marine and based on a thorough survey of their requirements from the standpoint of operating practice, practical navigational methods, installation problems, cost, and maintenance.

The major concepts that arose from this survey were: (a) the need for a minimum range for spotting buoys combined with an effective maximum range as an aid to navigation and to assure safety from collision; (b) The need of equipment which did not require specially trained personnel for operation and maintenance; (c) Simplification of equipment to minimize failure, to permit operation by navigational personnel and to reduce installation costs.

Raytheon has produced an equipment whose design has all the best features, battle tested in Navy units, modified by those requirements considered necessary for merchant marine operation. Modifications were tested under operating conditions culminating in the highly successful test trip of the M S Tunaholm in which approximately two full days were saved on a round-trip voyage between the United States and Sweden.

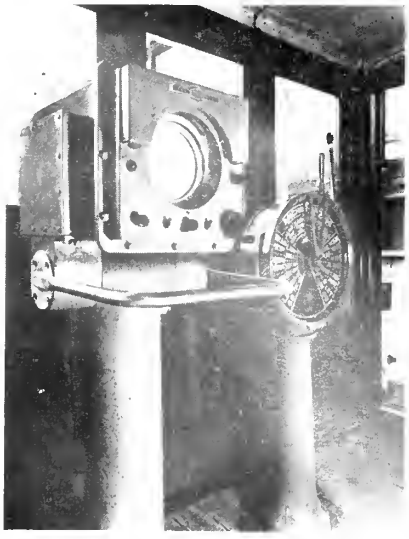
Raytheon's Mariners Pathfinder has been simplified to a degree where any qualified deck officer can operate, read and accurately interpret the radar scope results. Engineering simplification includes such improvements as automatic frequency control incorporated in the micro-wave receiver of the radar system so that tuning of the receiver by the operator is not required. Only three units comprise the entire system, the indicator unit, transmitter-receiver, and antenna. Installation costs have been reduced to a minimum in this manner.

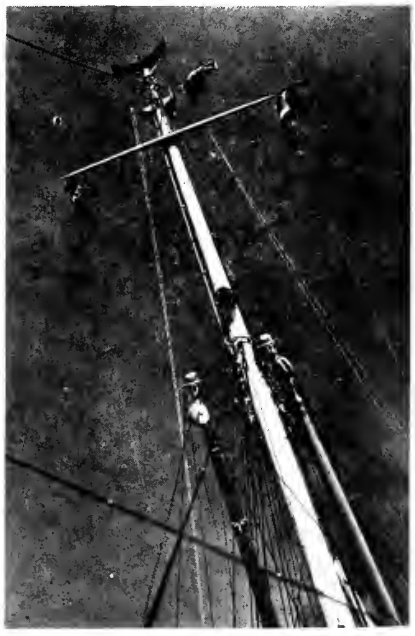
By maintaining a careful balance between adequate power output and minimum power drain from the ship's mains, operating requirements of the Mariners Pathfinder are exceptionally low. Included in these production models are necessary connections to incorporate other navigational aids such as the Ramark beacon system being developed by the Coast Guard.

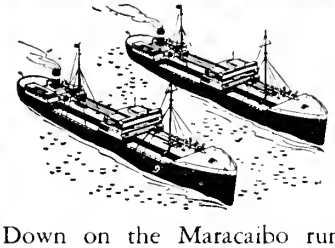
Continually scanning the surrounding waters with its pencil-sharp radar beam, this antenna is perched on top of the foremast 103 feet above the deck.

Below, left: Raytheon's Mariners Pathfinder Plan Position Indicator unit aboard the SS DROTTNINGHOLM.

Below, center: Ship's officer checking Raytheon's Mariners Pathfinder radar aboard the SS DROTTNINGHOLM.







TWIN SISTERS
WITH A FIGHTING PAST

Down on the Maracaibo run ply the sister-tankers S.S. *Bachaquero* and S.S. *Misoa*. Conventional and prim, they steam along placidly with never a hint of their fighting past.

Yet not so long ago, clad in grim gray war paint and stripped to little more than basic hull, these two ships stormed the beaches of Africa and Europe, spouting fire and steel. You would never guess that the plates on their bows cover doorways for landing ramps over which streamed assault troops, tanks and tons of materiel.

These shallow-draft 371-foot twin-screw tankers were the original ships selected for conversion into beach-storming tank-landing craft. They were so successful that they provided the basic design for the subsequently developed LST.

When their wartime job was done the sisters were brought to Bethlehem for reconversion. Now fully restored, efficient and trim as ever, they are back at their normal tasks—two of the many vessels with a past which Bethlehem repair yards have rehabilitated and modernized for profitable peacetime service.

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COPPER ALLOY BULLETIN

MARINE AND POWER EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared by Bridgeport Brass Company "Bridgeport" BRASS CO. *Headquarters for BRASS, BRONZE, and COPPER*

Corrosion-Resistant Tubing Vital for Refrigeration Equipment

Because the operation of refrigeration equipment generally comes under the direction of the power plant and marine engineer, a brief discussion of the corrosion problems involved with various types of refrigerants and available corrosion-resisting alloys, may prove helpful.

Refrigeration on board ship, in use for many years, has been growing by leaps and bounds. Increasing quantities of perishables are being transported across wide oceans, and indications are that there will be more widespread use of air conditioning for the health and comfort of passengers and crews. It is anticipated that fishing vessels will be equipped with facilities for "quick freezing" of their catch at sea.

On land, refrigeration has long been widely used in the meat packing industry; for ice making and beverage cooling; for "quick freezing" of fruits and vegetables; and for food locker systems.

Industrial Refrigeration

The power plant engineer is coming more and more into the industrial refrigeration picture. Many power plants are designed to supply refrigeration in connection with manufacturing processes and with the handling and storage of gas products and special materials. In some cases, refrigerating equipment is being driven directly by the turbines.

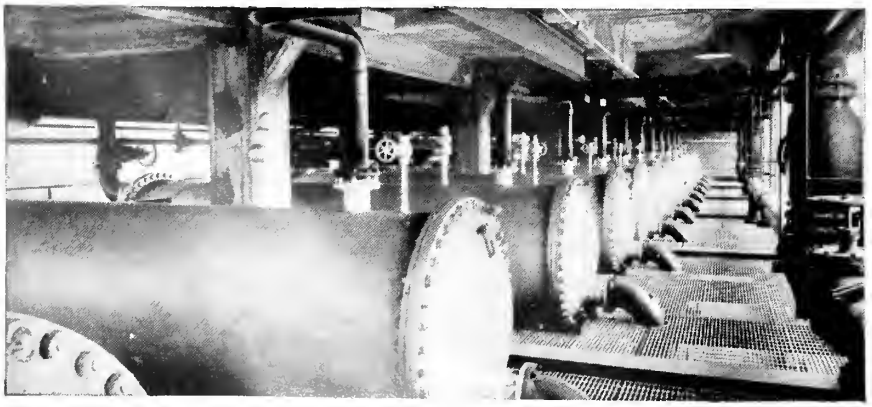
Certain substances such as rubber, as well as material used in the manufacture of synthetic rubber, plastics and fibers, must be stored at sub-atmospheric temperatures. Various liquors used in the manufacture of synthetic fibers must be cooled during the process. Refrigeration also plays an important part in the manufacture of penicillin and many other pharmaceuticals. An understanding of the corrosion problems involved in the operation of refrigeration equipment will help engineers reduce maintenance to a minimum.

Types of Corrosion Encountered

Since refrigeration systems may involve many miles of tubing which must handle corrosive liquids or gases, selection of alloys capable of standing up under service conditions is one of the most fundamental problems confronting the power plant engineer.

The most common types of corrosion which involve tubing in refrigeration systems are:

1. Corrosion by the refrigerant (ammonia, methyl chloride, Freon, etc.).
2. Corrosion by brine (sodium chloride or calcium chloride solutions).
3. Corrosion by air (atmospheric corrosion—either where air is cooled, or where air is cooling the refrigerant).
4. Corrosion by cooling water (fresh or sea water).
5. Corrosion by the product being cooled (beverages, chemicals, liquors or gases).



Ammonia condenser, horizontal shell and tube, multi-pass, closed type.—*Courtesy York Corp., York, Pa.*

Refrigerant Affects Alloy Selection

Where refrigerants such as Freon or methyl chloride are used, copper and copper-base alloys have proved to be most satisfactory from the standpoint of corrosion resistance and long life. For low velocity sea water, arsenical Admiralty stands up well in contact with water and the refrigerant. For fresh water or where air is the cooling medium, copper is very widely used. If there is a possibility of air impingement corrosion because of high sea water velocities Cuzinal (aluminum brass) is superior to Admiralty. For extremely high sea water velocities cupro nickel is recommended. In cases where air is cooled or where air is cooling the refrigerant, fins are attached to the copper or copper alloy tubing for greater heat transfer efficiency.

Ammonia refrigeration is widely used for meat packing, artificial ice making and "quick freezing", as well as in processes involving petroleum refining, manufacture of synthetic rubber and fibers, pharmaceuticals, chemicals and many others. It presents a special problem since severe double corrosion is involved. Steel pipe rusts away from contact with water, and copper-base alloys do not stand up when in contact with moist ammonia. Bridgeport's Duplex Tubing, consisting of two tubes of different metals drawn together, with steel to the ammonia side and copper or a copper-base alloy to the water side, is gaining wide acceptance because it stands up better than steel tubing.

Preventing Taste And Color Contamination

In addition to overcoming severe double corrosion problems, Duplex Tubing can be used to prevent product contamination from the standpoint of taste or color. For example, in a methyl chloride refrigeration system it is desirable to use a copper-base alloy in contact with the refrigerant and aluminum in contact with such products as fruit juices, food products, certain chemicals and drugs.

Bridgeport's Duplex Tubing is available in many combinations—Admiralty, aluminum brass, aluminum bronze, copper, cupro nickel, Muntz Metal, red brass or yellow brass combined either inside or outside with aluminum, Monel, nickel, low carbon steel or stainless.

Technical Service Department

Bridgeport's Technical Service Department, composed of an experienced group of practical men, is available to help solve your corrosion problems by aiding in the selection of the proper tubing alloy. Inquire through your nearest Bridgeport office. In the meantime write for your copy of Bridgeport's 112-page Condenser Tube Manual.

Foreign Sales Under Ship Sales Act

FIRST FOREIGN SALES of war-built merchant vessels under the Merchant Ship Sales Act of 1946 to a member of the United Nations not listed as a preferred nation in Section 6 of the Act was announced August 2 by the United States Maritime Commission.

France

The Commission approved the application of the Republic of France for the purchase of 75 Liberty ships. The sum of $17,500,000 agreed as payment for French claims for the Normandie and other shipping claims is expected to be applied to the purchase of the 75 vessels. The French will deposit 25 per cent of the purchase price with the Commission at the time of delivery. Mortgage aid up to 75 per cent of the adjusted statutory sales price of each vessel will be extended, in equal annual payments with interest at 3½ per cent over a period of 20 years from the date of delivery reduced to reflect extra war-service depreciation.

Netherlands

Sale of 45 vessels to the Kingdom of The Netherlands was also approved under Section 6 of the Merchant Ship Sales Act, as a preferred nation. Conditions of the sale are generally similar to those offered the French.

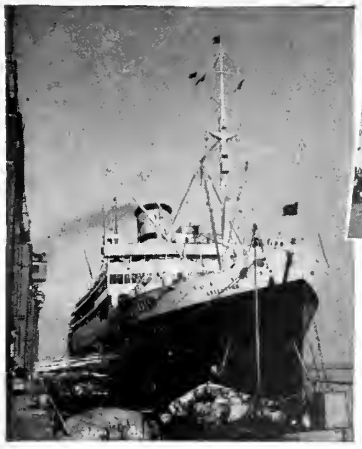
Norway

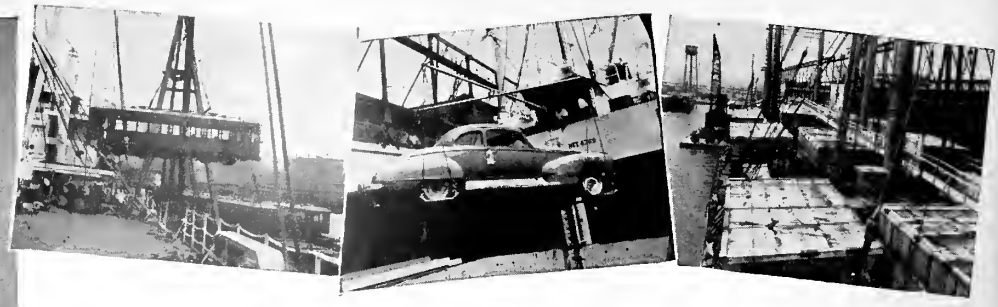
The application of the Kingdom of Norway was approved for the purchase of 14 vessels under Section 6 of the Act. Conditions of sale similar to those offered to France and the Netherlands will be extended to Norway.

All sales have met conditions stated in the Merchant Ship Sales Act of 1946 and General Order 60 of the Commission. The statutory sale price is subject to adjustment for desirable or undesirable features installed on individual vessels. List of vessels follows:

Name of Vessel	*Type*	*Purchaser*	*Statutory Sales Price*	*Floor Price*
			EACH	EACH
75 (Not Named)	EC2-S-C1 (Liberty)	France	$639,000	$544,506
2 " "	C-1A	Netherlands	970,000	912,859
3 " "	N3-S-A2	"	380,000*	468,817
6 " "	VC2-S-AP3	"	1,065,000	1,005,431
4 " "	VC2-S-AP2	"	979,000	879,157
1 " "	C1-B	"	970,000	912,859
28 " "	EC2-S-C1 (Liberty)	"	639,000	544,506
1 " "	T2-SE-A1	"	2,026,500	1,505,352
General Fleischer	C-1A	Norway	970,000	912,859
General Ruge	"	"	"	"
Alf Lindeberg	"	"	"	"
Narvik	"	"	"	"
Fridjif Hansen	EC2-S-C1	"	639,000	544,506
Leiv Eiriksson	"	"	"	"
Ole Bull	"	"	"	"
Carl Oftedal	"	"	"	"
Lektor Garbo	"	"	"	"
Viggo Hansteen	"	"	"	"
Edvard Grieg	"	"	"	"
Roald Amundsen	"	"	"	"
Vads	"	"	"	"
Harald Torsvik	"	"	"	"

* Prices marked with an asterisk are inapplicable since under the terms of the Ship Sales Act of 1946 no dry cargo vessel, except a Liberty type vessel, may be sold at less than 35% of the domestic war cost and no tanker may be sold at less than 50% of the domestic war cost.





The American Merchant Marine and World Commerce

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THE American Merchant Marine Conference, sponsored by The Propeller Club of the United States in conjunction with its Twentieth Annual Convention, will be held in New York, October 16, 17 and 18th, 1946.

The Conference theme will be "The American Merchant Marine and World Commerce." Problems of vital importance to the future of the American Marine Industry growing out of the period of world reconstruction and the rehabilitation of our foreign trade will be presented and discussed by the recognized authorities. The Conference will concentrate the experience and wisdom of its outstanding leadership upon subjects of utmost importance affecting the future of the American Merchant Marine.

Panel Discussion meetings will be held on Wednesday and Thursday, October 16 and 17th; the Main Conference Session on Thursday afternoon, October 17th; Propeller Club Convention Sessions on Friday, October 18th, and on the evening of that date, the annual American Merchant Marine Conference Dinner.

The necessity for coordinated and constructive effort was never so great as at the present time . . . Your help and participation are needed in this program to foster the best interests of the American Merchant Marine as a vital factor in the national defense and our economic welfare . . . Arrange now to attend the American Merchant Marine Conference, and to take part in this important annual gathering of the American Marine Industry.

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THE WALDORF-ASTORIA — New York City

October 16, 17 and 18th, 1946

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British Research on Anti-Fouling Paint

ON APRIL 12, 1946 at the meeting of the Institution of Naval Architects, London, J. E. Harris and W. A. D. Forbes read a paper on "Underwater Paints and the Fouling of Ships" which brought out certain conclusions based on the Marine Corrosion Subcommittee of the Iron and Steel Institute and the Admiralty Corrosion Committee. From this paper as published in the Engineering Digest June issue we extract the following:

The main factors governing the settlement of a fouling organism on a test plate are the season of the year (which determines the presence or absence of the settling stage of the organism) and the toxicity of the surface (which may limit the settlement to a few highly resistant species or may eliminate it altogether).

The color and texture of the surface is of little or no importance in limiting fouling. The seaweed growths, particularly that of the green grass-like form, *Enteromorpha,* are much more susceptible to poisons at low light intensities where their growth is less rapid.

The fact that an anti-fouling composition has a limited length of life is only too well known to shipowners, and equally well known is the fact that the thicker the paint coating applied (or, within limits, the more you pay for it!) the longer it lasts. More accurately—the length of life of a successful anti-fouling composition depends on its poison content.

The leaching rate test constitutes a most convenient way of ascertaining how methods of manufacture, and variations in the ingredients of a paint, both in quality and quantity, affect the anti-fouling qualities.

The leaching rate test is independent of location, season of the year, or the existence of fouling organisms.

The system used for the leaching tests does not employ an anti-corrosive undercoat, since the composition is applied to ground glass. It has been shown that the leaching rate over an anti-corrosive undercoat is not appreciably different from that obtained with the anti-fouling coat alone, when both systems are applied to a ground glass surface. Compositions which fail to attain and maintain the critical leaching value foul rapidly when used in service.

The effect of poisons other than copper cannot yet be fully estimated by leaching tests. Mercury leaching rates, measured by the dithizone technique, do not give a true picture of the rate of loss of mercury from a composition.

The poison content of the composition applied to a vessel will fall off more rapidly than that of an identical composition on a leaching test slide, by reason of the extra loss while the vessel is under way.

In a study of 150 experimental paints carried out by the Marine Corrosion Subcomittee, using a single type of varnish composed of a binder fraction (a resin-modified phenolic; linseed stand oil with suitable driers), a resin fraction and naphtha, the effect on the leaching curve was studied on varying:—

(1) The grinding time.

(2) The total pigment/resin binder ratios (with a constant content of cuprous oxide).

(3) The cuprous oxide and mercuric oxide contents of a composition in which the total pigment/resin binder ratio was held constant.

(4) The secondary (non-toxic) pigment fraction.

(5) The varnish, by varying the thinner and by the use of a selection of different plasticizers.

The general conclusions drawn may be summarized as follows:—

(1) Above a minimum grinding time, which is very short compared with the general commercial practice, there was no appreciable effect on the leaching curve of a paint containing cuprous oxide alone, or cuprous oxide with mercuric oxide as the toxic pigment.

(2) The ratio of resin to binder was critically important in determining the ultimate steady leaching rate of copper from a cuprous oxide composition.

(3) With all other factors held constant, an increase in cuprous oxide content produced an approximately linear increase in the leaching rate of copper.

(4) Changing the type of secondary pigment (as also changing its amount — see (2) above) alter the shape of the copper leaching curve without greatly changing its final level.

(5) Changing the thinner had no very marked effect.

The anti-fouling action of a composition is intimately connected with the rate of loss of poison from the paint

(Please turn to Page 136)

Shore Radar for Ports and Harbors

by M. G. SCROGGIE, B. Sc., A. M. I. E. E.

British Consulting Radio Engineer,
Ex-Squadron Leader R.A.F.

THE QUESTION OF THE USEFULNESS of port Radar was one of those discussed at the recent International Meeting on Radio Aids to Marine Navigation, organized in London by the British Government. One answer was a paper, by A. G. Bogle, B. E., A.M.I.E.E. of the Admiralty Signal Establishment, to which paper the following survey is mainly indebted.

One of the bad weather problems of Port Authorities, which Radar can solve, is that of obtaining immediate warning if channel buoys or lightships shift from their charted positions. Information on their actual positions and movements is then needed. Besides improving safety, and ease of supervision, Radar has been estimated to save cost in certain cases, since by its use buoys could replace manned lightships now employed to make sure of obtaining reports if they shift.

Another valuable benefit conferred by Radar is moment-by-moment information on the positions and movements of all ships entering and leaving the port. If necessary, a ship could be guided through fog from entrance to berth or vice versa, entirely by instructions from a shore controller provided with Radar, in a manner analogous to G. C. A for aircraft landing. Short of this extreme case, advice assisting ship masters in special difficulties would undoubtedly often be valuable.

It is true that Radar on the ship itself shows not only the position relative to the channel and any obstructions, but also its course, which can only be deduced indirectly by a shore authority; and in any case the tradition of personal responsibility would make a ship master unlikely to accept complete control from the shore. Over against this, it will be a long time before all ships are equipped with adequate Radar. And a shore system would always have technical and economic advantages, since problems of siting, first cost, maintenance, operation, and correlation with chart and with local information, [illegible] or much less difficult than on board ship. In British waters, fog prevails during about 400 hours or [illegible] per annum; and, in parts of the N. W. Atlantic, over [illegible] about 25 per cent of the whole year. In such localities, shore equipment would be much more frequently useful than on ships which might spend only a very small proportion on their time in poor visibility; and so a comprehensive and efficient service would economically be more justifiable on shore.

Requirements of Port Radar Installations

Range and hence transmitter power depend very largely on the area to be covered; and in large or complicated harbors more than one set would be necessary. More important is range and bearing discrimination. The range discrimination obtained with present practice, using a pulse duration of 0.2 microsecond, is 30 yards, which is probably adequate. Anything closer would complicate display technique at maximum range, which may be about 12 miles. At that distance, two points (for example, two buoys marking the entrance to a channel) at equal range, and therefore separable as 200 yards apart to subtend 0.5°. Azimuth is therefore the more exacting requirement at present.

The display should provide sufficient precision at critical points, together with a general picture of the area, including all available information; and must be continuously related to the chart. In general it will have to be located some distance away from the Radar set, even where only one is used; while multiple installations inevitably demand, connecting links and remote controls.

Finally, instructions arising from the Radar facilities must without delay be conveyed to the vessels concerned.

Design Features to Meet Requirements

Frequency. To provide sufficient azimuth discrimination with a scanner of practical size, the frequency must be very high, but not so high as to be excessively affected by

rain and clouds. The best compromise is probably 5 cms; but of the 3 cm. and 10 cm. bands for which tubes and other components are now available, 10 cms would necessitate a scanner with the awkwardly large horizontal aperture of over 20 yards in order to give a 0.5° beam, 3 cm. waves are seriously affected only by very abnormal weather, especially if the beam is reduced to about 0.5° in the vertical plane too, which is a more practical possibility at 3 cm. than at 10 cm.

Pulse Duration and Recurrence Frequency. Pulse duration is a compromise between range discrimination and receiver bandwidth. As already mentioned, 0.2 microsecond gives a discrimination of 30 yards, and the bandwidth required is about 7.5 Mc/s. It is a choice already well proved by practice.

If the spot diameter on a P. P. I. 25 cms. in diameter is 0.5 mm., it subtends about 0.25° at the circumference; and to avoid echoes being broken up into separate points there should therefore be not less than 1440 time base radii per revolution. Assuming a scanning speed of 10 r. p. m., this is 240 per second, which is thus the lower limit of p. r. f. The upper limit is set by the risk of long-range echoes from mountains, etc., appearing on the following time base sweep. Taking a maximum range of 70 miles for such echoes, it is 1,400 per sec. A reasonable practical p. r. f. is 1,000.

Power. Since the narrow beam requirement implies a correspondingly high aerial gain, there seems to be no need to use the highest-power 3 cm. magnetrons available; the type giving about 30 kw peak power should be enough.

Anti-Clutter. Reflections from sea waves saturate the display and conceal echoes due to objects within a radius that increases with the roughness of water. Reducing receiver gain until clutter is of the same order as receiver noise allows desired echoes of sufficient amplitude to show. The reduction required depends mainly on range, but also on other factors, such as aspect of the waves.

"Swept gain," in which receiver amplification is made a function of range, has been used successfully in ship-borne Radar. As the clutter has been found to follow approximately an inverse exponential variation with range, the gain/range relationship is designed accordingly; and a control is provided for adjusting to the roughness prevailing at the time.

An alternative solution, in which the gain is determined by the signal level actually received, reduces the gain appropriately to the actual distribution and intensity of clutter. In order that desired echoes, which are generally of short duration, should not be reduced too, the automatic gain control averages the signal strength over several microseconds. In a harbor area, where the distribution of sea clutter is likely to depart considerably from the simple law assumed for swept gain, the second method is preferable. Its disadvantage, that land echoes are rendered less recognizable, does not apply to shore Radar, where the P. P. I. is permanently aligned with the map.

Display. The type of display visualized is one large P. P. I. showing the whole area, and one or more auxiliary displays if necessary to show particular sections on a larger scale. Practicable cathode ray tube sizes do not provide a main display large enough for direct viewing by a number of persons, nor does the map show up well thereon, so some sort of projection is needed. The Skiatron or dark-trace tube was used successfully during the war to provide a two-foot projected picture; but unfortunately it acquires persistent traces from permanent echoes, so fails to show displacement of buoys with certainty.

Keeping Pilot Informed. Another method developed for war use consists in projecting a photograph of the P. P. I. taken during one revolution of the scanner. The negative is developed, fixed, and dried in as little as six seconds after exposure.

Transmission. Remote display and control at a distance of several miles presents a number of problems, rather complicated but not acute. Either cable or microwave radio can be used as a link.

Communication with ships. At the International Meeting already mentioned, Capt. H. V. Hart, O. B. E., R. N. R., of the Mersey Docks and Harbor Board, gave particulars of the V. H. F. radio telephony system used for control of the very intense use of the Mersey Docks made by convoys during the war. The system evolved, which was a great success, and has been continued since the war, will no doubt be adapted to cooperate with shore Radar (which also is being used experimentally by the same authority).

Briefly, a number of portable R/T sets, weighing only 13 pounds apiece, are put on board each pilot boat going on station, for issue to incoming vessels. They are subsequently collected at the dock, serviced, and re-issued. The sets work in a waveband around 40 Mc/s, and are supplied with simple instructions which can be followed without technical knowledge. Seven shore stations are used to control the rather lengthy Mersey channel. They keep pilots informed of visibility, confirm arrangements for docking, and convey any special instructions that may be required. Ships which might be held up and lose a tide because of doubts about the safety of proceeding are able, by calling up shore, to ascertain the conditions ahead.

Everything But Smoke in Ship's Stack

The smokestack, long the trade-mark of a steamship, isn't what it seems to be any more. The streamlined funnel on a modern ship, in many cases, is just so much camouflage and encloses, perhaps, dog kennels, the radio shack, or ventilation shafts. Smoke on the newest American passenger ships is discharged from a thin pipe disguised to resemble a cargo mast, according to the American Merchant Marine Institute.

Once the number of stacks greatly impressed passengers but in these days of forced draft and oil-burning engines, there is little need for many funnels. But whether they belch smoke or not, tradition indicates ships will always have funnels. The public and naval architects agree ships look better with a smokestack.

Pacific MARINE REVIEW

NEWS FLASHES

WORK AHEAD FOR SHIPYARDS

John R. Steelman, Director of Reconversion, in replying to criticism of delays in the ship construction program announces that under Naval contracts the government will pay private shipbuilders $325,000,000 in the year ending June 30, 1947 and $75,000,000 in the year ending June 30, 1948. Additional expenditures on a large scale await analysis of the Bikini tests, but further substantial construction and alterations during the fiscal years 1948 and 1949 are probable.

The Maritime Commission will spend for conversions, alterations and repairs $225,000,000 during the year ending June 30, 1947, with substantial amounts for suceeding years.

All of these figures are exclusive of private funds to be used for construction, alteration and repairs.

* * * * *

DIESEL ENGINE FORUM

Harvey T. Hill, executive director Diesel Engine Manufacturers Association, announces a diesel engine forum to be held in San Francisco during the afternoon of November 7. It is expected that all those interested in marine propulsion will be in attendance.

* * * * *

COLUMBIA STEEL PROCEEDING WITH WEST COAST EXPANSION

The $25,000,000 cold-reduction steel sheet and tin plate mill for Columbia Steel Company at Pittsburg, California is well under way as is the construction of deep-water docks for ocean vessels and barges, and the laying of 40,000 feet of railroad trackage.

When this plant is complete it will be the first cold-reduced steel sheet and tin plate plant on the Pacific Coast. Some 12,000 tons of new machinery will be installed; it has already been ordered.

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DISPOSITION OF WSA CHARTERED VESSELS

Of the 899 pre-war vessels in the merchant marine, which were taken over on charter by the War Shipping Administration, 821 have been redelivered to their owners. These are distributed as follows:

413 Dry cargo
341 Tankers
34 Colliers
29 Passengers
3 Barges
1 Cable ship

This leaves 78 ships still under WSA control. Of these, 51 are dry cargo and 27 passenger.

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JOSLYN & RYAN SURVEY NEW YORK HARBOR

Joslyn & Ryan have a technical staff in New York at present engaged in making an extensive survey of the shipping which comes into the Port of New York from the Erie Canal system.

During the last ten years there has been a very considerable drop in the amount of shipping using this system, and this survey will recommend ways and means

which it is hoped will reverse this condition. (This, it is hoped, may be accomplished by several methods, such as the installation of more modern terminal facilities; an improved arrangement of points of pick-up and discharge of cargo; and the use of better designed barges and tugs.)

The survey is expected to be completed by mid-September.

* * * * *

BIDS WANTED

Shipbuilding and repair yards are invited to bid for reconditioning of the single-screw cargo vessels SS Dick Lykes and SS Kendall Fish on behalf of the Lykes Brothers Steamship Co., Inc.

Both of the C2-S-AJ1 type ships were built at North Carolina Shipbuilding Co., Wilmington, N.C., in October 1945.

Bids will be opened in the Commission's Washington offices at 12:15 P.M., E.S.T., September 11, 1946.

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SOUTHERN CALIFORNIA INDUSTRIAL DEVELOPMENT FOR JULY

Insulated Siding Co., 8349 Stellar Drive, Culver City is constructing a plant for production of a new siding formed of Hawaiian cane board and a product known as "Brixite." Plant will contain 30,000 sq. ft., and will represent an investment of $200,000.

Pioneer Division, The Flintkote Co., 5500 S. Alameda Street is adding a building of 104,000 sq. ft., for manufacture of folding paper boxes. Company also makes roofings, insulation board, building paper, corrugated and fibre containers.

Consolidated Steel Corp., 5700 S. Eastern Avenue, is adding a 22,500 ft. machine shop.

Texas Co. has been awarded a $5,000,000 lubricating oil contract by the Navy.

Menasco Mfg. Co. has been given additional gas turbine and jet engine work amounting to $2,402,700 by the Army Air Forces, resulting in Menasco's back-log reported to be $8,400,000.

Southern California Telephone Co. has begun construction of a new 10-story $2,000,000 building at 434 So. Grand Ave., to be used as one terminus of a transcontinental coaxial cable.

* * * * *

MATSON CHARTERS REEFERS

The Matson Navigation Company late in July chartered two motorships, the Whale Knot and the Flemish Hitch, for operation in Pacific Coast-Hawaiian trade. These vessels are 323.9 feet long B.P., 50.1 feet molded beam, and 26.5 feet deep. They were built at the Beaumont, Texas shipyard of the Pennsylvania Shipyards Inc. for the U. S. Maritime Commission and fitted with Nordberg engines. Each ship has a gross measurement of 3803 tons and a net measurement of 2126 tons. The holds are fitted for refrigerated chambers to take a total of 10,000 cubic feet of refrigerated cargo and 1200 tons of dry cargo.

* * * * *

CONTRACT FOR REDECORATING SS BRAZIL

Contract for furnishing supervision of interior decorating in reconversion of the 586-foot SS Brazil from troopship to passenger-cargo vessel in the South American trade, has been awarded to William F. Schorn, of New York.

Shorn's bid was $26,850. Other bids were Walter M. Ballard Corporation, $49,500; Van Doran, Nowland & Schladermundt, $110,000, and Walter Dorwin Teague, $114,250. All are of New York.

* * * * *

JOSHUA HENDY BUILDS PRINTING PRESSES

The non-maritime activities of maritime industries are of interest. Joshua Hendy Iron Works, Sunnyvale, California announced receipt of a second order for huge 4-color magazine printing presses for Time Magazine. Each press will cost well into six figures and at least one of them will be installed in the new Time plant in Los Angeles, now being engineered by Bechtel Bros., McCone Company, Hendy associates.

Another announcement from Hendy tells of a contract with Nordstrom Valve

Company in Oakland for the production of some four million dollars a year in valves.

Hendy also announces an order for twenty 90 and 100 ton punch presses for the V & O Press Company, Hudson, New York.

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ATLANTIC BASIN IRON WORKS GETS CONVERSION JOB ON BRAZIL

The Maritime Commission has awarded the reconversion contract on the SS Brazil from troopship to passenger-cargo vessel to the Atlantic Basin Iron Works, Brooklyn, New York, which quoted $3,944,000 and a completion period of 200 days.

* * * * *

UNITED ENGINEERING GETS MARIPOSA JOB

The United Engineering Company, Alameda, Calif., was awarded the contract for reconversion to a luxury liner of Matson's troopship Mariposa. The bid was $6,881,500, eight hundred thousand over the estimate but nearly a million and a half lower than other bids. Newport News bid $8,250,000, Bethlehem $8,990,000. This latter bid illustrates the tremendous rise in shipyard costs since Bethlehem built the Mariposa for just a little over $8,000,000 in 1931.

* * * * *

ORE CARRIERS TO BETHLEHEM

Bethlehem Sparrows Point Yard has just laid the keels for two more 24,000 d.w. ton bulk carriers for the Chilean ore trade. These vessels are 560' long, 78' beam, 43'9" deep and are driven by geared steam turbines.

* * * * *

BIDS FOR CONVERSION OF ATTACK TRANSPORTS OPENED

Bids were opened August 12 on the conversion to merchant vessels of four attack transports, built by the Maritime Commission for the Navy and used by it in war service.

The ships are 445-foot APA's of the Maritime Commission design C2-S-E1 and their Navy names were USS Sumter, USS Warren, USS Wayne, and USS Baxter.

* * * * *

BIG PIER JOB IN SAN FRANCISCO

The State Board of Harbor Commissioners announces approval of a $2,000,000 improvement program on the San Francisco waterfront, particularly at Fisherman's Wharf. The job includes removal of old ferry slips, construction of a new pier, extension of existing piers, and building a breakwater.

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MARINE INSPECTION BUREAU TO COAST GUARD

Under the President's reorganization plan, the Bureau of Marine Inspection was returned to the Coast Guard on July 19. The Coast Guard, itself, is back in the Treasury Department.

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GENERAL ELECTRIC EXPANDING IN BAY AREA

Vice President Ralph J. Cordiner of the General Electric Company, announces expansion of the company's factories in Oakland, and plans for the new San Jose factory. The Oakland plant, on 69th Avenue, will take on the manufacture of Formex Magnet Wire for which new facilities will cost $750,000. The Oakland factory on East 14th Street, where motors and transformers are made, and the cable plant at 69th Avenue, are adding new facilities, and with the San Jose plant and the Mazda Lamp works in Oakland, the company's manufacturing activities in the West will be largely concentrated in the Bay area. (Mazda Lamp production in Oakland has reached 130,000 per day, and will soon rise to 206,000, with an annual output of 54,000,000 lamps.)

* * * * *

RESERVE FLEET ANCHORAGES

The Maritime Commission announces a new reserve fleet anchorage south of Wilmington, North Carolina, bringing the total to five such anchorages. On August 15 there were 1593 vessels in the temporary or permanent reserve fleets. Of these, 1224 were dry cargo vessels; 339 were tankers; and 3 were passenger ships.

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THOUSANDS OF PASSENGERS

On August 6, the American Export Lines reported more than 70,200 prospective passengers booked to travel to and from the Mediterranean next month. They also have over 5000 registrations for future travel.

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MERCHANT MARINE ACADEMY TO AWARD DEGREES

On August 9, President Truman signed a bill authorizing the degree of Bachelor of Science for graduating cadets of the Merchant Marine Academy. This places such graduates on the same academic basis as graduates of West Point and Anapolis.

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SHIP SCRAPPING

Plans for the eventual scrapping of 1280 vessels, with the iron and steel going to the steel mills of the country, now in urgent need of scrap, are announced by the Civilian Production Administration. Included in the immediate program are 200 Maritime Commission vessels and 80 Naval vessels, all of which have outlived their usefulness. (It is understood that Kaiser's Richmond yard No. 3 will handle some of this work.)

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CHANGE IN MARITIME COMMISSION DEPARTMENT TITLES

The functions of vessel chartering have been transferred to the Chartering Section, Division of Operations and Traffic, and the name of the Division of Large Vessel Sales and Charters has been changed to the Division of Large Vessel Sales which will concentrate on ship sales matters, the United States Maritime Commission announced. Clifford G. Cornwell remains as Director. The new Chartering Section will be headed by Dudley Donald as Acting Chief, and Joseph Friedlander and Paul Sullivan as his principal assistants.

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U. S. LINES REPORT PLANNING LUXURY LINERS

A current report from Washington indicates that U. S. Lines has stated its plans to the Maritime Commission for construction of two, 1000-ft. luxury liners with cruising speed of 33 knots, and a passenger capacity of 2000. Each vessel would cost upwards of $50,000,000.

* * * * *

NEW FERRYBOAT FOR PUGET SOUND

A contract for the construction of a 300-ft. passenger ferryboat for Puget Sound Navigation Company has been awarded to Todd Pacific Shipyards, Seattle. Construction is to begin in October, with delivery next June. Estimated cost, $1,500,000.

* * * * *

NEGATIVE REPORT ON ALASKA RATES

A recommendation that the petition of the War Shipping Administration for a general increase in freight rates and fares to Alaska be denied, is contained in the report of F. J. Horan, Maritime Commission examiner. There will be little opportunity for resumption of regular service to Alaska until rates are adjusted or subsidies arranged.

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WEST FARES WELL IN C-3 ALLOTMENT

Of the 73 C-3's sold by the Maritime Commission to 9 steamship companies up to August 15, Matson received 15 for Honolulu and Australia routes on a request for 16. The Pacific Transport Lines received 3 on a request for 3. Pope & Talbot received 6 on a request for 6. The Isthmian Line was awarded 24 ships; Luckenbach 11; American Mail 6; Moore-McCormack 4; Seas Shipping Company 3; Lykes Brothers 1. The statutory sales price of a C-3, subject to adjustment, is $1,280,730.

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TODD GETS STELLA LYKES JOB

Todd Shipyards Corporation, New York, has been awarded the contract for reconditioning the 435-foot single screw cargo vessel Stella Lykes. The company's bid was $158,600 and it agreed to complete the job in 35 working days.

Other repair yards' bids ranged from $187,111 to $232,267 and the completion time from 35 working days to 50 calendar days.

Analysis of Cargo Handling Equipment

(Continued from page 67)

transported to the dock. In some cases, when it is necessary to combine different merchandise, the breaking down into unitized packages could be done by the stevedores or other labor.

Much thought should be given to procedure of shipping the loaded pallets with the ship and then made up for return voyage of a later vessel. It isn't always feasible to plan a loaded pallet for the return trip, and to ship back only empty containers or pallets is not good economy.

It is the opinion of the authors, and others who have contributed much literature towards the study of cargo handling, that it is more profitable to speed up port operations than further increase in hook speed on board ship. The whip should only be fast enough to keep the available access openings clear. Low speed of pick up and landing is more advantageous than extremely high maximum whip speed.

Walker, Potts & Wyatt Marine Surveyors

To improve and augment the service rendered the Marine Underwriters by the office of K. M. Walker during the past six years, the firm of Walker, Potts & Wyatt has been formed to carry on a marine surveying business in San Diego.

K. M. Walker, marine surveyor, member of the Society of Naval Architects and Marine Engineers and non-exclusive surveyor to the American Bureau of Shipping, Port of San Diego; and James C. Potts, naval architect and marine surveyor, member of the Society of Naval Architects and Marine Engineers and until recently naval architect for the Lynch Shipbuilding Company, San Diego; and Frank K. Wyatt, marine surveyor, Lt. Commander, U. S. Coast Guard, Reserve, have become associated in order to give a more complete service to the Marine Underwriters. They will handle stability calculations, inclining tests, all types of hull and machinery appraisals, wreck and salvage work and vessel damage surveys.

Gotham Displays at Instruments Exhibit

Gotham Instrument Co., Inc., will exhibit their complete line of precision instruments at the Instruments For Tomorrow Exhibit, at the William Penn Hotel, Pittsbugh, Pa., September 16-20, 1946.

Among the instruments to be featured will be their new air operated controllers and their complete pressure gauge line.

The Gotham Instrument Co. is one of the greatest independent manufacturers of industrial indicating and remote-reading recording and controlling thermometers.

H. J. W. Fay, president, Submarine Signal Co.

Marine Division of Raytheon

Following the merger of Submarine Signal Co. into Raytheon Manufacturing Co., H. J. W. Fay, president of Submarine Signal, announced that Raytheon's Marine Sales and Service Division has been transferred to Submarine Signal Co., which becomes the Marine Division of the parent company.

For 45 years, Submarine Signal has been an outstanding leader in the development and manufacture of underwater signalling equipment. From its research has come submarine signalling, submarine detection, the first complete radar system ever disclosed, and many other navigational equipments which have brought greater safety for the mariner and better protection for valuable ships and cargoes.

During the past 25 years, Raytheon has been one of the leaders in the advancement of electronics and in the development of electronic tubes. From its research has come the mass production and refinement of magnetrons—the very heart of radar. Under the direction of the Navy, Raytheon designed and became the sole producer of the famed ship search radar known as SG, which has been installed in a majority of all Navy combat ships.

Now merged, Raytheon and Submarine Signal will bring new safety to marine navigation against hazards both above and below the water. Through this combination of engineering and research talent and pooling of years of practical marine experience will come even greater advancement in microwave and supersonic navigation equipment.

Hereafter all Raytheon products with marine applications, including the new Mariners Pathfinder radar, as well as the Submarine Signal fathometer, radio direction finder and radio-telephone, will be distributed and serviced by Submarine Signal's sales and service organization. Coast offices are located in San Diego, Calif.; Eureka, Calif.; Wilmington, Calif.; San Francisco; Portland, Ore.; Seattle; Vancouver, B. C.; Kodiak, Alaska, and Ketchikan, Alaska.

The Marine Division of Mackay Radio and Telegraph Co. will also continue as an agent for the distribution and maintenance of Raytheon's Mariners Pathfinder radar in the United States.

I. C. Clement, vice president of Submarine Signal, is in direct charge of Submarine Signal Co. sales activities and he has named James Thompson to manage government contract services; Clark C. Rodimon sales manager, with James J. Tynan as assistant sales manager; Kenneth V. Curtis, application engineer, and H. W. Hollis, equipment service manager.

Shortage of Skilled Service Men on Diesel Electric Equipment

"The prevailing shortage of skilled service men on diesel-electric equipment has added to the responsibility of the operators and supervisors of such equipment," said Edgar J. Kates, Chairman of the Oil and Gas Power Division, American Society of Mechanical Engineers, and a nationally-known diesel engine consultant, at an interview during the national conference of that organization held recently in Milwaukee.

Mr. Kates pointed out that satisfactory synchronizing, load-sharing, voltage regulation and frequency control depend upon good performance of both the mechanical and the electrical elements of the diesel-generating units. The mechanical elements are the diesel engine and its governor—the electrical are the generator and its associated controls.

"Most operators," Mr. Kates said, "are skilled in either the mechanical or the electrical branch, seldom in both. If mechanically-minded they understand the diesel engine's speed regulation as controlled by its flywheel and governor. If electrically-minded they are acquainted with generator characteristics, voltage regulators, cross-current control, synchronizers and frequency controllers. Consequently, if, for example, the voltage becomes unsteady, the mechanical man is likely to attribute it to faulty action of the voltage regulator, while the electrical man tends to blame the engine governor. To diagnose the trouble correctly, a knowledge of both the electrical and mechanical factors is imperative, since the factors react on each other, and the problem is really a joint one.

A unique book, written by Mr. Kates and entirely devoted to these inter-related electrical and mechanical features of diesel-electric installations, has just appeared in an up-to-date edition.

Mr. Kates has designed and supervised numerous diesel-electric generating plants and is thoroughly familiar with their operating and servicing problems. His new book, "Diesel-Electric Plants," a second edition, published by the American Technical Society, Chicago, makes available a valuable part of that experience to men who are concerned with both the electrical and mechanical aspects of such plants.

Normandie To Be Scrapped

A move has been taken by the Maritime Commission to secure President Truman's permission to scrap the former French passenger liner Normandie. The Commission is drafting specifications for offering the Normandie for sale on a scrapping basis. Public Law 101, under which the liner was seized during the war, requires Presidential authority for disposition of the 82,423 ton ship.

Commodore H. C. Shepheard,
Chief of the Coast Guard's Merchant Marine Inspection Division.

Commodore Shepheard Chief of Safety

COMMODORE HALERT C. SHEPHEARD has been designated Chief, Office of Merchant Marine Safety. This designation was officially effective July 24, 1946, while Rear Admiral Lyndon Spencer, former Chief, Office of Merchant Marine Safety, was preparing for departure on terminal leave prior to his retirement.

He was the assistant director of the Bureau of Marine Inspection and Navigation when most of the functions of that bureau were transferred to the Coast Guard by Executive Order 9083, dated February 28, 1942. The permanent retention of those functions was effectuated on July 16, 1946, by President Truman's reorganization plan No. 3.

The Commodore entered the Steamboat Inspection Service from private shipping in 1924. He served as assistant inspector, traveling inspector, and in 1935 became assistant director of the BMIN, after the Steamboat Inspection Service was amalgamated with the Bureau of Navigation.

Commodore Shepheard was commissioned a captain in the U. S. Coast Guard in July, 1942, and officiated as Chief of the Merchant Marine Inspection Division. In June, 1944, he was detached from the Inspection Division for duty in the European War Zone, where he served with the Commander, U. S. Naval Forces in Europe, and with the Supreme Commander, Allied Expeditionary Force. He was promoted to the rank of Commodore in October, 1944. He returned to Coast Guard Headquarters in Washington, D. C., in August, 1945, where he served as Special Assistant to the Commandant. Later, he was reassigned as Chief, Merchant Marine Inspection Division.

For "exceptionally meritorious conduct" as Chief of the Merchant Marine Inspection Division during the war, Commodore Shepheard received the Legion of Merit. "Skillfully administering a greatly expanded and vitally important Merchant Marine Inspection Service, Commodore Shepheard exercised strong influence toward the early adoption of specific safety measures for war-time shipping and for personnel engaged in that activity. . . . He contributed essentially to the development of an efficient war-time U. S. Merchant Marine."

Circulating Water Channel For Model Testing

(Continued from page 93)

blades being gradually increased to force the water along the channel at greater speeds.

Thrust bearings for the installation could not be of the usual hydro-electric type that supports only downward weight. At full load and normal speed of 80 rpm, the action of the impellers on the water would have pushed up on the motor shaft, causing the rotating element of the motor to rise. At standstill and at partial loads, reaction is downward. Westinghouse engineers solved this problem by installing self-aligning roller thrust-bearings to take both upward and downward thrust, an application which Navy officials declare has been completely successful.

Power For Motors On Models

A motor generator set, housed near the big motors, has a separate armature for furnishing variable-voltage direct current to special devices being tested in the channel.

No effort has been spared to keep the water in the channel clear so that photographic records of tests may be complete. Large filters permit passing of all the channel water through sand once each 28 hours. Special air exhausters which carry off air bubbles that may form during the water's surge are a part of the equipment.

Muirson C. Wright

Wright Made Marine Installation Engineer on West Coast

W. C. Gould, marine sales manager for the Detroit Diesel Engine Division of General Motors, has announced the appointment of Muirson C. Wright as marine installation engineer for the West Coast.

Mr. Wright, who is a graduate of Stanford University, has had fifteen years experience in the sale and installation of various marine engines. He was formerly manager of the Seattle Sales Branch of the Atlas Engine Company, with a territory covering Washington, Oregon, and Alaska. His experience in this connection covered the sale of the Atlas Imperial engine, Chrysler, Buda, Mack, Scripps, and Regal Marine engines, and a variety of Marine accessory equipment. Succeeding this experience, he managed the Mattoon, Illinois, factory for Atlas.

Wright joined the Detroit Diesel Engine Division on April 1, 1946, and has spent the intervening time in preparation for his new duties.

Ships as a Hobby

The revival interest in the American Merchant Marine is well illustrated in the rapid growth of the Steamship Historical Society of America. Founded in 1935 as a hobby club, the organization now has over 300 members located in every section of the United States.

Its unofficial motto is "ships for fun and posterity," and its chief purpose is to stimulate the preservation of records and pictures of American steamships past and present. Through its publication "Steamboat Bill of Facts" and its affiliation with the Peabody Museum, Salem, Mass., the Society attempts to coordinate the interests and activities of its fast-growing membership.

Your Problems Answered

(Continued from page 92)

higher the voltage of the conductor, the greater the number of these electro-static lines of force. It is possible to increase this density until the insulator, dielectric or space, breaks down and a spark jumps.

Fig. 3 (b) shows the stress in the electric field when the voltage difference exists between two conductors of one circuit, close to each other. Note how the density increases in the area immediately between them.

Finally, Fig. 4 is intended to show the combination of the magnetic field and electric field stress due to a pair of conductors of an electric circuit.

George H. McCoy

George H. McCoy Joins Cementers

The Chemical Department of International Cementers, Inc., announce that George H. McCoy has joined their sales staff as a sales engineer. McCoy has had a wealth of experience in marine engineering, having spent eleven years, from 1931 to 1942 in the tanker fleet of the Standard Oil Company of California as a First Assistant and later as Chief Engineer.

The Chemical Department of International Cementers, Inc., a company licensed under processes practiced by Dowell Incorporated, a Subsidiary of the Dow Chemical Company, offers to all industry a chemical cleaning service.

McCoy's chief work will be in the marine field where chemical cleaning has proven its value in tank cleaning and the removal of scale from all types of boilers and other heat exchange equipment.

ENGINE-LIFE FILTER

Micro-filtration of oil by triple-trapping is the feature of a new product of C. M. Fuller Company. This device is designed to thoroughly cleanse contaminated oil, removing all damaging foreign substances without altering or reducing additives present in many modern lubricants.

Called "Engine-Life," it is made in different cartridge sizes to fit all cases. Long threaded, lint-free textiles compose the filtering media, scientifically compacted to uniform density.

The laminated construction and outside-to-inside flow, results in multi-element filtering effectiveness of maximum area for any given size case. Since the fluid velocity is the same throughout the filtering media, there is uniform deposition of abrasives, contaminants, or other foreign matter with no tendency to block or clog one area from another.

A strong, flexible circular seal is built-in as an integral part of the element. The cylindrical perforated core is made from extra-heavy, non-corroding alloy steel.

Details of construction are described in a new bulletin just released by C. M. Fuller Company.

The T. G. Persson Company, Bloomfield, N. J., has just published catalog data on the flange jack. This is a new tool that does a hard job the easy way. Flange-Jacks are high grade tools, strong and sturdy, yet simple in design. The jaws are heavy one-piece forgings capable of withstanding tremendous pressure. In repeated laboratory tests Flange-Jacks have easily opened joints against a load of 15 tons, without damage to the jacks or to the flanges.

Large manufacturing plants, public utilities (gas), water works, oil refineries, oil fields, ships and ship yards will find this tool a necessary part of their standard equipment.

Bulletin M-6 is a recent release by the Elliott Company. It is a pictorial publication showing Elliott-Buchi turbochargers in operation in all sorts of diesel fields and their use by all makers of four-cycle diesel engines.

Ward Leonard Electric Co. has available a 4-page illustrated booklet, Bulletin 104, descriptive of their Midget Metal Base Relays. The bulletin includes coil and contact data, contact arrangement diagrams, dimension sketches of front and rear mounted units and enclosing cover data for both standard and heavy duty relays.

Stow Manufacturing Co. has recently released a 20-page manual, No. 461 F, fully illustrated in color, with complete tables and cut-away views, covering their flexible shaft valve operating gear. The book is designed as a guide in the selection, installation and use of this remote control gear for valves and all types of equipment actuated by a rotating shaft. This manual should prove very helpful to the naval architect, shipbuilder, ship executive and to the industrial chemical engineer.

Presenting a historical record, Bethlehem Shipbuilding Company has published a record of the company's shipbuilding activities since it was incorporated in 1905. Illustrated in full color, the booklet shows that Bethlehem has launched a total of nearly 3000 ships of more than forty types,

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New Chafe Guard

Development of a strong, waterproof pressure tape, known as "Chafe Guard", is announced by the Kenyon Instrument Co. Inc., makers of marine precision instruments.

Designed primarily as a reinforcing agent and strengthener, the new tape has been found extremely valuable in a variety of ways due to its imperviousness to water. Yachtsmen and small craft operators can use this tape for correcting small deck and cabin leads, attaching wires to pipes, parcelling wire to rope splices and even for repairing sneakers. Its waterproof guarantee makes it invaluable in chafe guarding the mooring lines, anchor line and in insulation uses. Cream colored, the new tape comes in rolls one inch wide and 60 feet long.

Institute of Navigation

A Healthy Yearling *(Continued from Page 73)*

is a function of the relative strength of the ground and skywave and therefore at great ranges the system is less accurate at night than in the daytime.

Nautical Almanac

A panel discussion was held on the Nautical Almanac which has been basically unchanged for years, because of the widespread agreement amongst surface navigators that current usage dictated modernization. A considerable number of surface navigators continue to use the American Air Almanac because they feel that it supplies the necessary accuracy and increases simplicity of solution work. Col. Geo. W. Mixter submitted two papers entitled *"Nautical Almanacs"* and *"American Almanacs."* In his analysis of the problem, Colonel Mixter stated,

"The need for simplicity in the Nautical Almanac, comparable with that of the Air Almanac, is greater today than ever before. The speed of ships requires quick work with no blunders. The watch officer on the bridge of the average merchantman has no skilled bridge personnel to assist with navigation, and overtime must be paid if the officer works more than eight hours per day.

"The purpose of the proposed almanac is to best serve surface navigators with little regard for the occasional requirements of others.

"Over-all results from the design may be summarized as follows:

1. An annual publication of about 50 less pages than at present.

2. Accuracy maintained equal to that of the Nautical Almanac but with less chance of blunders.

3. Convenience and simplicity comparable to that of the Air Almanac.

"Two openings of the almanac suffice for working any sun or star sight or all of a round of stars. After taking out the pertinent data from the table for the day, the group of tables gives such additional data as may be required including altitude corrections. Presumably these two pages would appear as the inside cover pages of a well-bound almanac."

These suggestions have been forwarded to the Nautical Almanac Office for their consideration in planning future issues.

Holman Sextant

Wm. H. Holman, III, of New York, a former Royal Air Force pilot, displayed and explained the principle of operation of a sextant he is developing for marine use and possible aerial utilization. The basis of the system depends upon the proper counter rotation of two mirrors, and he hopes by this process to eliminate the effect of the rolling motion of a ship at sea and at the same time eliminate the effects of dip and refraction. Further experimentation was indicated from the discussion. In particular, finding the speed with which the mirrors must rotate to perform the function desired. This was the first forum on the sextant and the experts in the audience suggested further experimentation that might provide answers to immediate technical problems that have been encountered.

Traveling During 1945

Despite the restrictions on travel in 1945, American civilian travelers, including business men, are estimated to have spent more than $300,000 for travel within foreign countries in this period and approximately $65,000,000 additional in international air and steamship fares.

Concrete Ship Records

The Maritime Commission built a total of 104 concrete ships, of which 80 were barges and 24 vessels, in yards located at National City, California; Savannah, Georgia; and Tampa, Florida. All the vessels were powered. These concrete craft saw service from the Southwest Pacific to the Normandy Beachhead. The barges, towed by Navy tugs were used for storage. The Army has since taken some of these barges for that purpose in the Pacific.

British Research on Anti-Fouling Paints

(Continued from Page 117)

surface into the surrounding seawater. Evidence based on raft exposures suggests that this leaching out of poison maintains over the surface a microscopically thin layer of poisonous seawater which is the actual toxic agent. Barnacle larvae frequently settle on such a surface and become partially attached, dying within a few days and falling off when dead without having completed the cementing process.

That the seawater itself carried the poison into this toxic border is shown by the fact that in the presence of a tidal current the border is not symmetrical about the patch of anti-fouling paint but extends in direction of current flow. It seems probable that the toxic layer of seawater corresponds in dimensions to the "laminar layer" of fluid flow, a zone in which the streamline movement of the water permits the transport of material across the direction of flow mainly by molecular diffusion. Outside this laminar region turbulent motion will produce a much greater eddy diffusion and the concentration of poison must fall rapidly to very low values.

If the laminar layer is broken down, diffusion is brought about by the turbulent eddy currents and the copper concentration falls off much more rapidly. Under such circumstances the toxic effect may be inadequate to poison "large" forms like barnacle larvae, which can settle and grow freely.

A steel surface prepared in the traditional manner by wire brushing can give a surface to which paint will adhere tenaciously if the work is well done. In practice the job will rarely be done properly either by hand labor or by using mechanically operated brushes, and in consequence other methods such as wet sandblasting have been developed.

The wet sandblasting process was developed at the Mare Island Navy Yard, U. S. A., some five years ago, and its use has now become universal in all United States Navy yards. The wet sandblasting process differs from dry sandblasting in that a slurry of wet sand is used as the cutting agent. A corrosion inhibiting chemical solution is mixed with the sand to form the slurry.

American experience has shown that it is possible for one unit to clean about 1000 sq. ft. of surface in an 8-hour shift. A United States Navy 10,000 ton cruiser was completely cleaned to bare steel in 30 hours. A British cruiser of 9,000 tons cleaned by this method in the U. S. A. took two-and-a-half days and required 220 tons of sand owing to the tough adhering qualities of the British proprietary composition.

Some few years ago an apparatus was developed at the Chemical Research Laboratory (D. S. I. R. Teddington) for examining the effect on corrosion of motion in seawater, such as occurs at the surface of a ship's hull. This apparatus is essentially an ebonite holder 3 in. in diameter on the periphery of which are mounted suitably prepared specimens 1 in. square, and which is rotated rapidly about an axis inclined at an angle of 20 deg. to the vertical in an off-set position (to avoid a vortex) in a rectangular glass tank containing seawater. Rotation of the holder at 1500 rpm is equivalent to a peripheral speed of 20 knots.

By the use of this apparatus, the Chemical Research Laboratory were able to carry out accelerated tests of the corrosion resistance of metals and protective coatings on metals intended for use in severely corrosive environments. It was found possible to obtain information, sometimes in one-tenth of the time that was required using non-accelerated methods of testing.

Did You Know That?

The 324 new U. S. merchant vessels expected to serve on foreign trade routes have a capacity of 22,000,000 tons of imports a year, or 307.5 pounds for every man, woman and child in the country.

The Savannah, first steamer to cross the Atlantic, was only 320 tons, as compared to the 26,000 of the America, largest U. S. merchant ship.

"Up She Goes"

Two Gantrys swing a 55-ton hopper section aboard the Langfitt, huge all-welded dredge being built at the Ingalls Shipbuilding Corporation yards in Pascagoula, Miss., for the Corps of Engineers, U. S. Army. The sea-going dredge, one of four being constructed there at a cost of $4,250,000 each, will be 352 feet long—largest all-welded craft of this type ever built. The four dredges make up one contract among those for approximately $100,000,000 worth of construction on which Ingalls is now working.

Washington Digest

(Continued from Page 78)

of the 1946 Ship Sales Act, in addition to amendment of the 1936 Merchant Marine Act to authorize an operating-differential subsidy on a trade route between the Pacific Coast of the United States and British Columbia.

Justice Dept. Opposes Rate System, Fee Boost, and Unanimity Rule

Disapproval by the Maritime Commission of the contract rate system of the Pacific Coast European Conference (Agreements Nos. 5200 and 5200-2) has been requested by the Department of Justice in a brief filed in Maritime Commission Division of Regulation Docket No. 648, under which the Commission proposes to determine if the Agreements should be approved or disapproved. The Justice Department also asked in its brief that the Commission deny the request of the Conference to increase its membership fee from $250 to $5,000, as well as the provision requiring that decisions of the Conference be by unanimous vote.

The Secretary of Agriculture, in another brief in the same proceeding, made the same requests. The Justice Department brief was dated at San Francisco June 25 and the Agriculture Department brief at Washington July 15.

Allocation of Final Liberty-Type Colliers

Allocation of the final four war-built Liberty-type colliers for purchase under the Ship Sales Act of 1946, of an original group of 23 ships of that type, has been made by the Maritime Commission.

The four vessels, unallocated up to this time, were made available for purchase to the Marine Transport Group, New York, and the American-Hawaiian Steamship Co., San Francisco, each of which will receive two ships. Previously the Commission allocated 19 such ships, three for purchase by A. H. Bull & Company, Inc.; eight for the Mystic Steamship Company, Boston; three for Sprague Steamship Company, Boston; two for M. & J. Tracy, Inc., New York; two for American Steamship Company, Buffalo, N. Y.; and one for the Wilmore Steamship Company, New York.

In addition, the Commission made known that a twenty-fourth such vessel, now lying damaged in an Italian harbor, will be placed in service after extensive repairs. It was explained that because of the need for this desirable type of ship in the coal or bulk commodity trade, it was found economically worthwhile to the Government to repair the vessel for sale. When repairs are completed, the Commission stated, the ship will be as efficient as any of the other twenty-three.

The demand for Liberty colliers has considerably exceeded the supply, said the Commission, declaring that forty-five applications were received for purchase of the 23 ships available.

Coast Guard Continues Maritime Orders in Effect Under Transfer

Orders, rules, regulations, permits, or other privileges made, issued, or granted in respect of all functions transferred to the Commandant, United States Coast Guard, or to the Commissioner of Customs, respectively, by Sections 101 and 102 of the President's Reorganization Plan No. 3 which were in effect at the time of the transfer of such Marine Inspection and Navigation functions to the two agencies of the Treasury Department have been continued in effect by orders issued by Commissioner of Customs W. R. Johnson and Commandant J. F. Farley of the Coast Guard. Both orders were approved July 16, 1946, by E. H. Foley, Jr., Acting Secretary of the Treasury.

The Customs Bureau Order (T.D. 51491) and the Coast Guard Order (General Order 2-46) both were filed with the Federal Register at 10:45 a.m., July 16, 1946, The Customs Bureau Order is designated in the Register as F.R. Doc. 46-12177, and the Coast Guard Order as F.R. Doc. 46-12176. Both provide that existing orders, rules, regulations, etc., shall remain in effect as if the transfer had not occurred.

Bids Invited for Reconversion of Four Cargo Ships

Four C3-S-A2 cargo vessels which are located at the Reserve Fleet Anchorage in the James River adjacent to Fort Eustis, Virginia, will be reconverted to cargo ships for peacetime trade, according to the Maritime Commission.

The vessels were built by Western Pipe and Steel Company, San Francisco, California. Maritime Commission hull number, name, and date of completion follow:

#1552 (Ex *USS Goodhue*—APA 107) November 11, 1944
#280 *SS Sea Flasher,* December 24, 1943
#281 (Ex *USS Alpine*—APA 92) September 30, 1943
#282 (Ex *USS Barnstable*—APA 93) October 30, 1943

AGWI PASSENGER CARGO LINERS

(Continued from page 60)

protect the machinery space and the cargo holds. Smoke detection cabinet in the wheelhouse covers all vulnerable cargo spaces.

Four 66-person capacity lifeboats, a supply of life rafts and buoys, and life preservers or life-saving suits for every passenger and crew member, are carried in the most approved manner for facilitating safe abandonment of the ship when emergency makes that step imperative.

Navigation

The wheelhouse is equipped with all the modern devices necessary for safe and certain navigation, including: Sperry Gyro-compass with repeaters; standard steering compass; Sperry Gyro-pilot; course recorder; rudder angle indicator; revolution indicator; Fathometer; engine telegraph; searchlight control; navigating light panel; telephone; and voice tubes.

It is estimated that the changes to each ship will take at least four months, and will cost approximately four million dollars.

TO THE ORIENT FOR OLYMPIC

(Continued from page 87)

acquainted with trade conditions in the Orient and have valuable connections at strategic centers in that area.

Actual on-the-ground surveys in the Orient preparatory to commencing these operations have just been completed by company representatives who have now returned from across the Pacific. Applications for the purchase of four C-3 or C-2 type vessels under the Ship Sales Act have been filed with the Maritime Commission. These negotiations, it is hoped, will be completed in order to permit the inauguration of this service by the fall of 1946. It is proposed to have scheduled sailings every three weeks from the Pacific Coast to the Philippine Islands, China, and Japan. While freight is the main consideration, arrangements for limited first-class passenger accommodations are also contemplated.

It is the belief of the directors of this company, based on their observations of the Far Eastern situation for many years and result of our recent studies in the Far East, that this vast area, containing over one billion people, which has been largely devastated by war, will need constantly increasing cargo space for the rebuilding and rehabilitation of these areas, and as these areas are rehabilitated, raw materials and produce from the East which are urgently needed in America will be shipped in ever increasing amounts.

In charge of the company's operations and plans is Ernest C. Bentzen of Seattle, president and general manager. He is assisted by Joseph C. Strictmatter of San Francisco, executive vice president; Eric A. Johnston of Spokane and Los Angeles, vice president; George Van Waters of Seattle, vice president; Darwin Meisnest of Seattle, vice president; E. L. Skeel of Seattle, secretary; and Nat S. Rogers of Seattle, treasurer. Additional directors and stockholders are prominent men of Washington, Oregon, California and the Philippine Islands.

Other members of the staff are David M. Gregory, director of traffic; M. M. Stewart, executive assistant; Gordon S. Cleverdon, comptroller; G. R. Seefeldt, operating manager; C. E. Gannon, marine superintendent, Seattle; M. Johnston, marine superintendent, San Francisco; and F. J. Ewers, assistant freight traffic manager, Seattle.

THE NAMES OF THE C-2's

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in Boston or the Hudson in New York than they could on the Severn or the Thames or the Clyde or the Tyne in Great Britain.

There is no more reason for going back to the "romance and glory of sail" to get inspiration for America's shipping future than there would be to go back to the horse and buggy days to get inspiration for the future of the automotive industry of today. So we will try in this series to stick to a recital of facts with none of the nostalgic nonsense and poetry that always seems to hang round the name "clipper":

"From the haven of the present she has cleared and
sailed away,
Laden deep and running free for the ports of yesterday.
And the cargo that she carries Ah! it is not China tea.
She takes with her all the romance and the glamour of
the sea."

"The merchant marine is more than an adjunct to our national security. It is an integral part of it."
REAR ADMIRAL FRANCIS E. M. WHITING.

Lowell-D — Like a Baby Flat-Top

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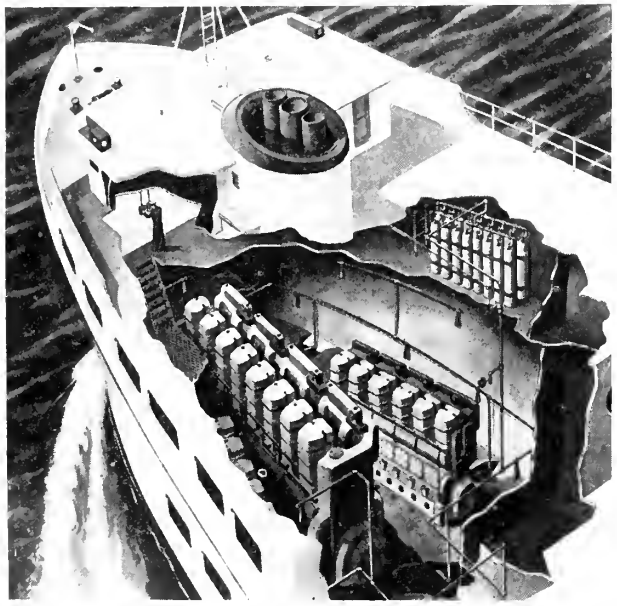
Keel cooling is utilized. Top boat speed on one engine is about 12 mph. The 2-cycle, 110 hp engines are operated alternately in the crossings, although both may be used at once by reversing one propeller. Captain Dalgety says that his fuel cost is only about one-fourth of that with his former aquipment. Due to faster crossings and a larger boat his pay-load capacity is more than doubled.

An interesting feature about the Lowell D is the fact that an engine giving right-hand propeller rotation is used on one end and an engine giving left-hand propeller rotation is used on the other. The reason for this is that the ferry must be berthed easily against up-stream wharves in a four to five-mile current. Propeller rotation was chosen which would help pull the boat sideways against the wharf when landing.

Carbon Dioxide for Tuna Clipper

The Chicken of the Sea, featured in the Dec. 1945 issue of Pacific Marine Review, and one of the largest and most modern tuna clippers afloat, has been equipped with a specially designed carbon dioxide fire extingushing system installed by Walter Kidde & Company, Inc., fire protection engineers of Belleville, N. J.

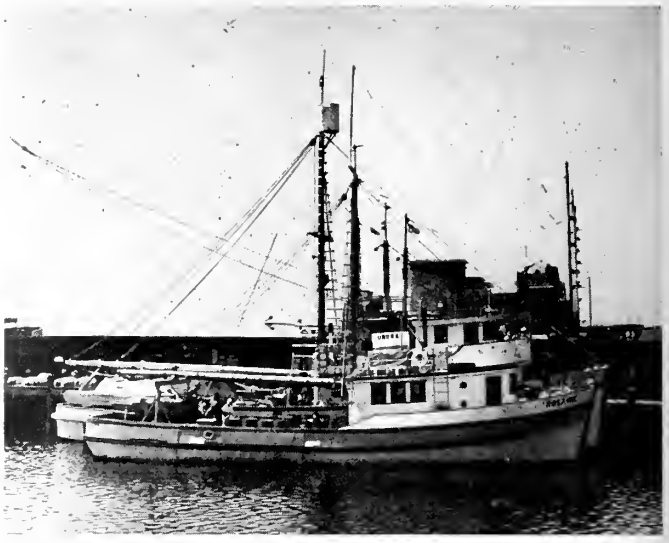


Forward section of tuna clipper Chicken of the Sea, cut away to show arrangement of CO_2 cylinders, piping system and shielded nozzles.

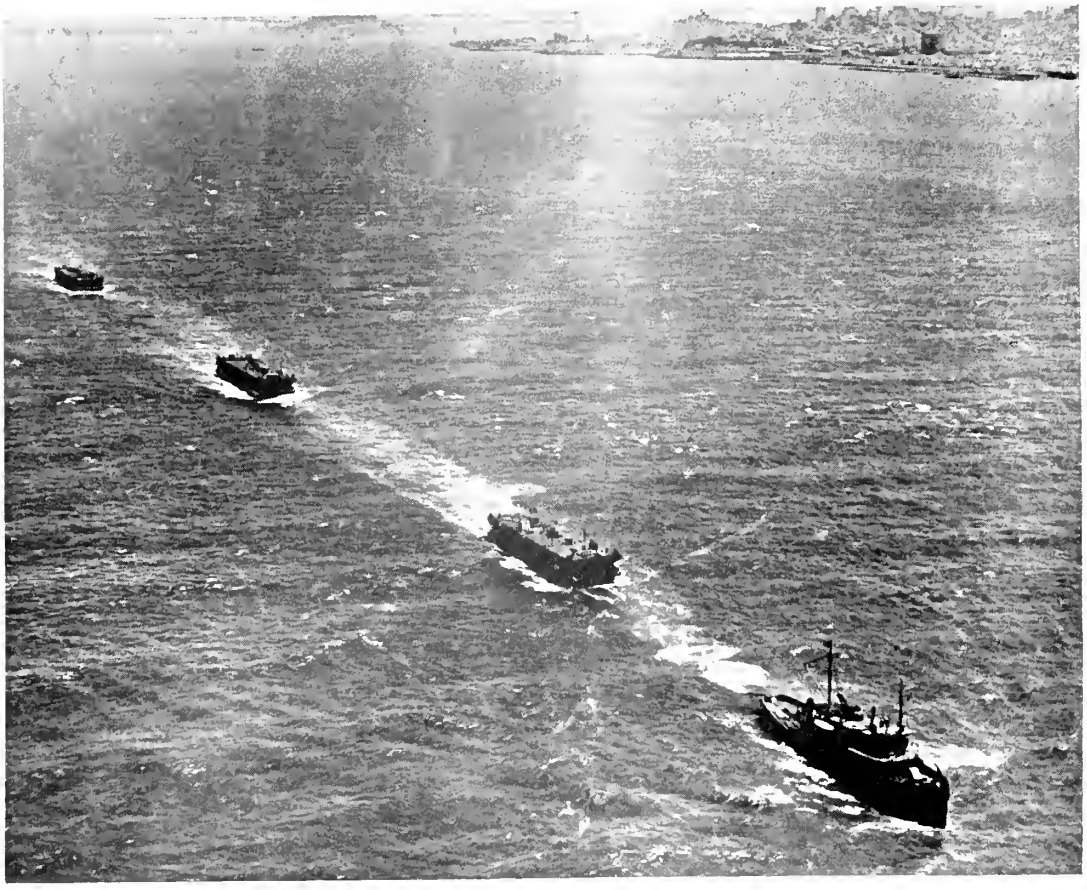
This vessel fishes for albacore (white tuna) for the Van Camp Seafood Co., Inc., of San Diego, Calif. She has a 1500-hp. supercharged main diesel engine and two 265-hp main diesel generator auxiliaries, as well as a 53-hp diesel generating set—all of which are protected by a built-in system that provides for total flooding of the engine room and bilges at the outbreak of fire.

Seventeen 50-pound cylinders of carbon dioxide are manifolded in racks located in the upper engine room. Dual controls, on the bridge and main deck, make it possible to operate the system almost instantaneously. A pull at either remote control automatically discharges the system. Carbon dioxide rushes from the seventeen cylinders, through piping and out through 27 shielded nozzles located on bulkheads around the engine room and in the bilges. Within a few seconds fire is completely killed by the smothering action of the carbon dioxide.

Carbon dioxide is recommended for inflammable liquid and electrical fires by many fire protection engineers. Not only will it kill marine fires quickly, but it does so without damaging the most delicate machinery or auxiliary equipment. It uses its own storaged pressure as the propellant, and is therefore not dependent upon water or steam pressure for operation.



GENERAL VIEW OF ONE OF THE PURSE SEINERS FOR CHINA
The purse seiner Pacific Star and the Rosanne at the Port of Oakland wharf, prior to sailing for China. Two of the seven seiners purchased by UNRRA to aid in China's good supply. (Story on page 85.)



Tug LT 215 off to Ting Chong with six barges leaving San Francisco for China.

This Tug Is Off On A 7500-Mile Tow

SEAGOING TOWBOATS HAVE A WAY about 'em that often astonishes the soul of a blue-water sailor. Nobody knows how they get away with some of their jobs —except their skippers, and they're generally a close-lipped lot. The average guess adds up to the fact that these craft can get away with almost anything because they're half guts, half nerve.

In the case of the most recent example of deep-water audacity as applied to towing, the tug in question—"LT-215"—left San Francisco on June 22nd, and now is outward-bound on a job that'll take her practically a third of the way around the world on the longest commercial towing assignment ever undertaken. In short, she's China-bound, with six 130'x30' steel barges strung out astern.

As may be surmised from her name, LT-215 is a war-time-built vessel; and after two years of Army service, she is now duly "separated" and engaged in civil life. She was designed and built under direction of the Transportation Corps of the U. S. Army, and is a product of the yards of the Puget Sound Boat Building Corporation of Tacoma, Washington. Her wooden hull, fashioned along exceedingly sturdy lines, measures 143'6" x 28'x12'.

Her main power plant consists of twin diesels—six-cylinder, 12"x15", [illegible] fresh-water cooled, Model 37-F-12, Fairb[illegible] units developing 600 hp at a normal o[illegible] of 400 rpm. These engines drive twin propel[illegible] and 34" pitch, the port engine rotating right, the starboard engine, left. Auxiliary power is furnished by two 40 hp Hercules diesels direct-connected to 25-kw., Type D, Imperial generators.

As the husky little seagoing power-plant passed under the Golden Gate bridge and headed out into the vastness of the world's greatest ocean, the question uppermost in the minds of those who watched her departure was, How long'll it take her to reach China?

The skipper—Oscar Rolstad, veteran of thousands of miles of deep-water towing in the Pacific and elsewhere—already has answered that question many times. It appeared that if, due to unforseen circumstances, he *does* have to break up passage into two or three runs, it may take sixty days or more; but if all goes well, including escape from the dreaded typhoons of the Eastern Seas, he could make it in one continuous passage of some forty-five days. And contributing largely to such feat would be the proverbial efficiency of diesel power. Also, supplementing the vessel's bunkerage capacity of 28,500 gallons of fuel oil carried in three tanks is a reserve supply of oil, plus a supply of fresh water, carried on one of the barges.

An angle of considerable interest to the towing fraternity is the tow, itself. As noted, the barges are of steel and measure 130x30x8 ft. When the question of getting them across the Pacific first arose, it was suggested that they be cut in half and shipped as a deck-load, then reassembled in

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China. But an estimated cost of $20,000 per barge was quite properly regarded as prohibitive. So the job resolved itself down to a straightaway tow; that is, almost a straightaway towing job. For instead of the usual set-up of six units, strung out end to end, the assignment was undertaken on the basis of three actual units, each made up of two barges; that is, each of three barges carried another of its 130-ton fellows piggy-back, thus making the tow easier to handle.

And there's another angle. As the tow passed through the Golden Gate, anyone could see that LT-215 was furnishing the motive-power, but few could see the towline, except for six of eight fathoms of anchor cable leading immediately overboard. To this cable is secured the main towline of 1-¾" wire rope that passes under the first two barges and is made fast to the bitts on the third. Barges 1 and 2 are each secured to the tow-line by an individual bridle, making the entire tow approximately half a mile instead of a mile long.

And what is it that makes it imperative to get this tow to the Orient? The answer is tung-oil, often miscalled China wood-oil. This commodity is vitally needed here in the manufacture of varnish; and in China, where the oil is one of that nation's foremost items of export, foreign exchange in terms of American dollars loom high on the horizon, what with the heavy demand for American goods. Into this picture, then, LT-215 and her brood of six tank barges will fit perfectly when she takes up the task of moving the barges loaded with tung-oil down the Yangtze to tidewater for discharge aboard ocean carriers, then lugging them up-river again for more loads. At present, much of China's tung-oil earmarked for export is moved in unwieldy wooden junks capable of handling only sixty tons per load.

Thus it is easy to see how important is the role soon to be taken up by the ex-Army tug and her little brood of six tank-barges.

When she and her tow left San Francisco, they called her "the tugboat that became a task force." But when she reaches Hankow and is officially turned over to her new owners, the China Vegetable Oil Corp., she'll shed her dead-pan designation and take on the more musical name of Ting Chong.

The Junior Foreign Trade Association

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perity of the world. This is reflected in this year's annual election of officers, with the majority of the new Directors and Officers being veterans of World War II. The new Officers and Directors for the 1946-1947 year are: President, John L. Stewart, Baxter Trading Company; Vice President, Allen H. Eber, Polak-Winters & Company; Secretary, John J. Mulvehill, Jr., American President Lines; Treasurer, John J. Buckley, American President Lines. The new Board of Directors members are: John J. Buckley, Allen H. Eber, Florian T. Frank, John A. Liautaud, Kenneth E. Macfarlan, Lyford M. Morris, John J. Mulvehill, Jr., John L. Stewart, and Joseph Wagstaff.

The Association has provided an opportunity for leadership among young men engaged in the foreign trade field. Many former members are now active in the Senior Foreign Trade Association. The Past Presidents of the J.F.T.A. are: 1938-1939—Raymond E. Waterlow, Standard Oil Company of California; 1939-1940—Charles Lelbach, General Steamship Corporation; 1940-1941 — John Sweet, Standard Oil Company of California; 1941-1942—George Curran, Bank of America; 1942-1943—Hy Coplon, Postal Telegraph Company; 1943-1944—Raymond E. Waterlow again; 1944-1945—Joseph Fernandez, I. F. Schnier Company; 1945-1946—Lyford M. Morris, Moore-McCormack Lines.

19 Ships on U. S. Postage Stamps

Ships have long been a popular subject for use on American postage stamps. While there have been 19 United States stamps honoring ships of all kinds, seven have depicted merchant steamers, the American Merchant Marine Institute stated.

The most recent was issued in February 1946, honoring the Merchant Marine as a whole, and showing a Liberty ship. In 1944, on the 125th anniversary of Maritime Day, celebrated each May 22, the Post Office issued a stamp featuring the famous Savannah, first steamer to cross the Atlantic.

Earliest U. S. merchant ship stamp was printed in 1869, a 12-cent stamp showing the Collins line steamer Adiatic, largest and fastest American liner in her day. Two other steamer stamps came out in 1901 as part of the series honoring the Pan-American Exposition. They were one-cent "Fast Lake Steamer" and the 10-cent St. Louis commemorative.

Two years before World War I, a German liner, Kronprinz Wilhelm, appeared on a 10-cent U. S. parcel post stamp. The big liner, was seized during the war and became an American transport. On the 1939 Panama Canal stamp, a merchant ship is shown passing through the locks.

Globe Wireless Reopens Shanghai Station

(Continued from page 84)

in the Shanghai and Manila offices. These messages can be transmitted in any form desired,—letters set up with proper spacing and the required number of carbon copies, or balance sheets with the most intricate tabulating.

"The Radiotype of Globe Wireless, Ltd., offers the most modern and efficient method of operation for basic users of communications,—all types of business firms, public utilities companies, steamship lines, brokerage houses, exporting and importing companies, etc. In other words, Globe Wireless expects to speed the world's business all over the globe."

Admiralty Decisions

(Continued from page 68)

January, and was 22 years old; besides him there was the look-out, on the gun platform at the bow, forward of the midship housing, and a quartermaster on the bridge with the mate. The master had turned in, thinking that the convoy had cleared the fishing banks. The mate said that about half an hour before the collision, at a distance of three miles he saw a cluster of white lights, two and one-half or three points off his port bow, which later "broadened slightly." The look-out told substantially the same story, except that he thought the lights became finer upon the port bow, as the vessels approached. In any event the DOUBLEDAY kept her course and speed, for both the mate and the look-out thought that the MARY would pass safely under the DOUBLEDAY'S stern. So indeed she would have done, they said, except that she suddenly swung to starboard across their bows when close aboard. Before the actual contact, the mate had called the master to the bridge but it was then too late to do anything and the ship struck the MARY almost at right angles on her starboard side and sank her shortly thereafter. The judge disbelieved the story that the MARY had made the sudden swing to starboard, but he nevertheless held her at fault for failing to carry the regulation lights, and for having no look-out. He held the DOUBLEDAY also for failing to keep out of the way, and therefore he divided the damages. The respondent did not seek to disturb the decree, and the DOUBLEDAY'S faults were indeed inexcusable. To run down a vessel brilliantly lighted, crawling along at less than three miles an hour, which does not change her course or speed, while one is oneself completely blacked out—that was so gross and strange an aberration of seamanship as to warrant no discussion. The whole case turns upon the MARY'S faults.

Concededly she was guilty of two: she did not carry the proper lights, and she had no look-out for some twenty minutes before collision. In spite of the extreme disproportion between the faults of the two vessels, the situation is not one in which the MARY can avail herself of the doctrine of the *City of New York,* 147 U. S. 72, and *The Victory and The Plymothian,* 168 U. S. 410, that the fault of the less guilty of the two vessels shall not be jealously scrutinized. That is indeed a proper canon when the facts are in doubt. The court refused to follow the aforementioned rule and concluded that the libelants stand charged for one-half of the damages under the doctrine of *The Pennsylvania,* 86 U. S. 125, unless they could show beyond reasonable doubt that the MARY'S faults had nothing to do with the collision. These must be considered from two different aspects: the failure to carry the regulation light was relevant only so far as its presence misled, or could have misled, those aboard the DOUBLEDAY as to the MARY'S future positions; the failure to maintain a look-out was relevant only in so far as a proper look-out could have changed the MARY'S actual navigation for the better.

The MARY was as brightly lighted as a Christmas tree; there were lights all over her. The DOUBLEDAY'S mate and look-out made her out at least thirty minutes before the collision when she must have been, not, as they said, three miles, but more than four miles, away. She could be, and actually was seen to be on a steady course, and to be barely moving. She drew ever nearer, and her bearing must have been constant for the collision occurred without any substantial change of course or speed by either vessel. Indeed, it is significant that the mate thought she grew finer. The court's review of all of the above caused it to make the following statement:

> "In view of all this it appears to us to press skepticism beyond all reasonable bounds to suppose that the presence of a green light on the MARY'S mast-head could possibly have changed the navigation of the DOUBLEDAY."

The green light would have added nothing until, overtaking her, they had come less than two points abaft her beam; and then it would only have told them that she was moving in the same general direction as they. This they knew and they also knew that she was on a converging course which the green light would not have told them. It was not information of where she would be when the DOUBLEDAY'S course crossed hers, that they lacked; they miscalculated her course, and sought to excuse their error by the sudden swing directly across their bows, which was, consciously or unconsciously, pure fabrication. The court found that libelants had proved beyond a reasonable doubt that the failure to carry proper lights did not contribute to the collision. The court's precise language is as set forth below:

> "The failure to keep a look-out is much more serious, for it means, as we have said, that for about twenty minutes before the collision the MARY was running blind. We must assume, in view of the burden of proof which this puts upon the libelants, that she would have made out the DOUBLEDAY some time before in fact she did; and if that called for any action, she must be charged with the failure to take it. In spite of this burden we think that she was excusable. Although the DOUBLEDAY was on the MARY'S starboard hand, the case was one of 'special circumstances,' for all navigation rules presupposes that both vessels shall be in sight of each other, and can continually check each other's positions. When they are on crossing courses, one is selected which must 'keep out of the way' of the other, and the other is held rigidly to her course and speed, in order that the first shall be able to forecast the second's future positions, by which alone the first can do her duty. This allocation of duties presupposes, however, that the vessels are equally mobile, as appears from 33 U. S. Code, Sec. 105, which provides that when a steamer and sailing vessel are on meeting courses, the second is the 'privileged' one, regardless of their respective positions, because of the greater ease with which the steamer can 'keep out of the way.' Similarly, when two sailing vessels are meeting, and one of them is close-hauled, and the other is running free, 33 U. S. Code, Sec. 102(a); or when one 'has the wind aft' and the other has not, 33 U. S. Code, Sec. 102(a).
>
> "The considerations which lie behind these rules seem

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Admiralty Decisions

(Continued from page 148)

to us to apply to the case at bar, but to reverse the respective duties. It was substantially impossible for the MARY to 'keep out of the way' of the DOUBLEDAY, for, not only could she not have made her out very far ahead; but if she had, she could not have learned the DOUBLEDAY'S course and speed. Moreover, even though Olsen had been at the wheel as he should have been, he would have known that for many minutes and over a distance of three or four miles, his vessel could have been seen by any approaching ship; and he would have been justified in supposing that such a ship would shape her course to avoid him, counting upon the fact that he could not see her or do anything whatever to avoid her until she was near at hand. Moreover, he would have known that even when he did make her out, any act of avoidance by him would at best have been blindman's buff. If he were well advised, the best he could have done for the safety of both vessels would therefore have been to hold his own course and speed, on the chance that any such approaching ship, knowing all that he did, would count upon his doing so. That was the navigation which in our judgment the situation demanded. True, we cannot be sure that, if Olsen had in fact been at the wheel, he might not have stopped, like the master of another fishing vessel near by; and we cannot be sure that if he had stopped, the DOUBLEDAY would not have crossed his bows. However, that does not make stopping the prudent course. The libelants should not be charged with a fault, however morally culpable, which in fact resulted in the safest navigation open to them under the circumstances. The fact that the prudence of their navigation was unwitting, does not make it any the less prudent navigation; we cannot hold them for the performance of their duty, however little they may be entitled to credit for performing it.

"Decree modified to hold the respondent solely liable."

Justice Chase prepared a dissenting opinion in which he laid great stress on the fact that the MARY could easily have stopped or moved out of the way of the DOUBLEDAY if she had had a look-out and, therefore, that the District Court's decision should have been affirmed.

H. F. Alexander Applies To Renew S. F.-L. A. Run

Hope of all water-minded Pacificans for the return of a famous coastwise overnight boat trip may be realized in the next 18 months if H. F. Alexander's recent application for freight and passenger service between Long Beach and San Francisco is approved.

The application, filed with the California Railroad Commission, proposes daily 5:00 p. m. sailings, and 8:00 a. m. arrivals in the two ports, with a capacity of 380 passengers and 45 automobiles. In addition, a primary purpose of the service would be to "relieve the present congested conditions of truck and trailer traffic which now exists between the centers of population" by providing space for 170 30-foot trucks and/or trailers.

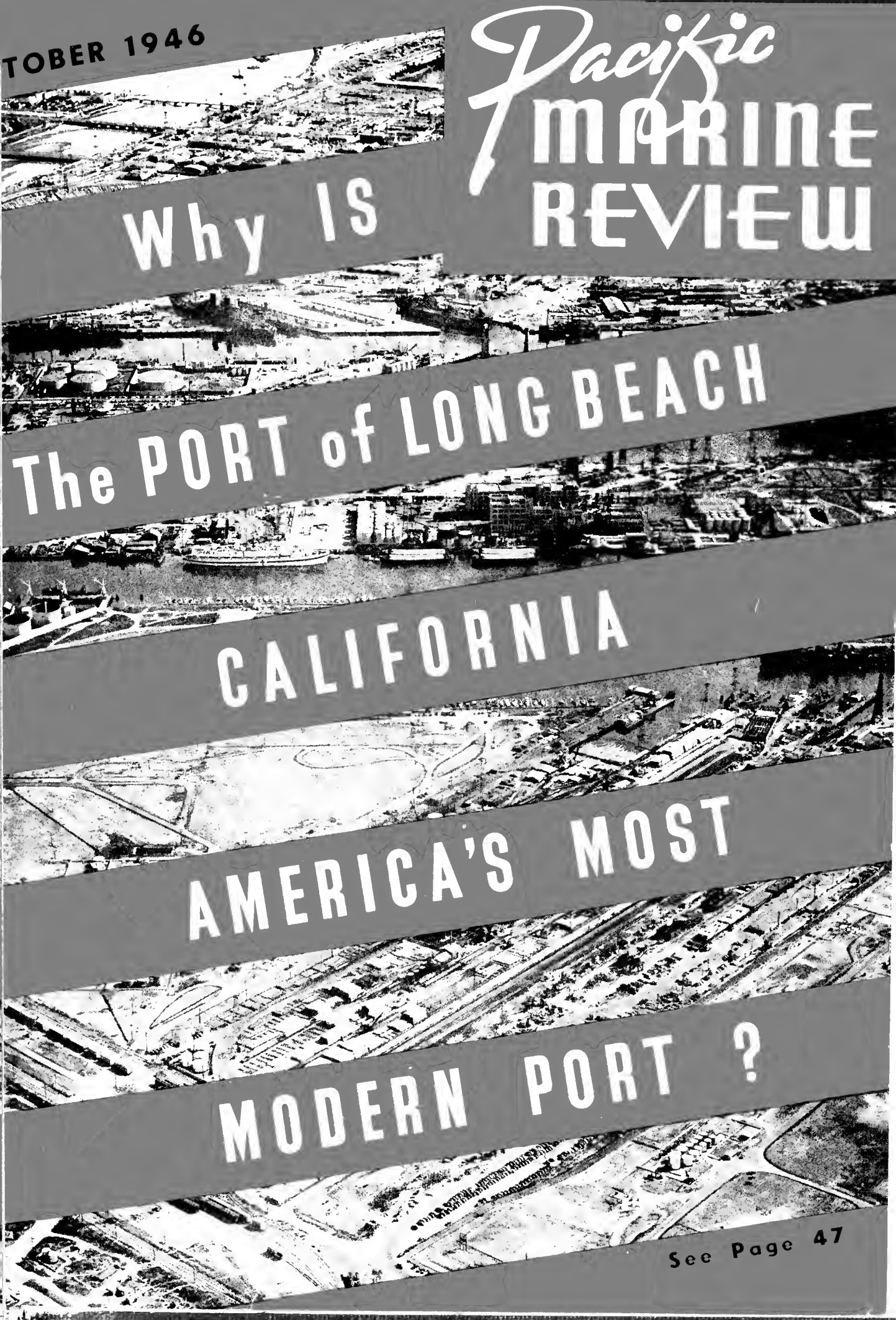
Recalling pioneer Alexander boats and the old Yale and Harvard era, permission has been asked to operate two $7,500,000 high-speed luxury liners, complete with night clubs, motion picture theaters, and dance floors. A new operating company would be formed with Alexander, one-time president of the Pacific Steamship Company, as president and chairman of the board.

Pacific MARINE REVIEW

INDEX TO Regular Advertisers

TOBER 1946

Pacific MARINE REVIEW



Why IS The PORT of LONG BEACH CALIFORNIA AMERICA'S MOST MODERN PORT ?

See Page 47

MEN and ROPE

Jim Duman, a Tubbs employee since 1925, supervises the combing and blending of sliver to insure uniformly dependable rope.

In every department of the Tubbs Cordage Company mills are men with a knowledge of fine rope making that assures a product that is always uniformly dependable.

This combination of men and rope dates back nearly a century when the Tubbs mills were founded in the West with rope makers brought in sailing ships around the Horn. Actually, some of the descendants of these original rope makers still take an active part in the production of Tubbs Rope.

It is this pride of craftsmanship — this balanced combination of fine fiber and the "know how" of skilled workers — that makes the name TUBBS your "rope buy" for extra value and service.

When the finest Manila fibers are once more available, look for this famous rope trademark.

TUBBS
EXTRA SUPERIOR MANILA
CORDAGE COMPANY

TUBBS CORDAGE COMPANY

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Pacific Marine Review

OFFICIAL ORGAN
Pacific American
Steamship Association

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Shipowners Association
of the Pacific Coast

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Pacific MARINE REVIEW

Maritime West Overlooked

An Editorial by T. Douglas MacMullen

The West supports the head offices of many major steamship companies, marine insurance companies, foreign trading banks, and volume shippers. We outpaced the country during the war years in ship production and could do the same right now. Our ports are world leaders. In shipping affairs the West is entitled to be heard.

From Congress on down, committees and controlling boards are heavily weighted with Eastern members, and it is too easy to assign as reasons the length of trip and scarcity of available candidates. We do not accept these reasons and insist that the West be represented where its interests are involved and its point of view needed, as on the Maritime Commission.

In some important groups the weakness of Western representation is striking. For instance, on six Senate committees concerned with maritime matters—Foreign Relations, Interstate Commerce, Military Affairs, Naval Affairs, Insular Affairs, and Atomic Energy—the Pacific Coast has a total of five members, only one of whom is from California. This is Senator Downey on the Military Affairs Committee. On Foreign Relations and Atomic Energy Committees *the Pacific Coast has no member.*

On nine committees of the House of Representatives —Foreign Affairs, Interstate and Foreign Commerce, Merchant Marine, and Fisheries, Rivers and Harbors, Immigration, Naval Affairs, Military Affairs, and Territories—the Pacific Coast has a total of 33 members, but 12 of the 33 are the two delegates from Hawaii and Alaska who have no vote in Congress. On the important Foreign Affairs Committee the Pacific Coast is represented by only one member, Helen Douglas. On all nine committees Washington has only one member and Oregon three.

The two Houses of Congress are mentioned because Congress is *supposed* to be representative; but commercial organizations like the National Foreign Trade Council and the U. S. Chamber of Commerce are even less representative of the West. People forget that the West is not "around the Horn" any more.

The West is important in the maritime industry. *It should have at all times at least one member on the Maritime Commission.* This should be a requirement of law.

Technology at Sea

An Editorial by A. J. Dickie

The present demands of the maritime unions and the declarations of their leaders on future policy should lead to a reappraisement of the manning scales for ocean-going vessels.

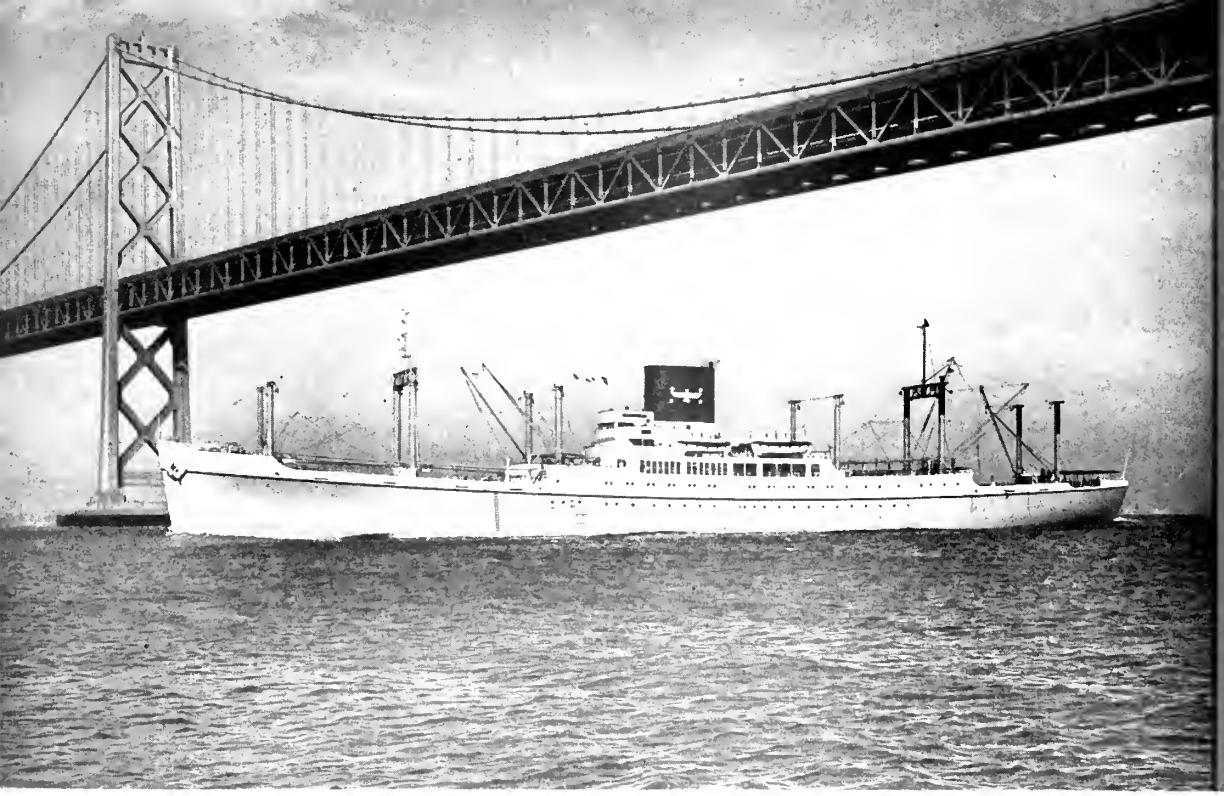
In the light of the great advancements in scientific and automatic aids to navigation, in combustion control, and in material handling control, is it necessary to maintain the traditional requirements as to firemen, able-bodied seamen, and other ratings?

With radar keeping automatic watch and transmitting all it sees to a screen on the bridge, is it necessary to have a watch on deck? With an echo depth sounder giving a continuous record of depth under the ship a leadsman would seem to be an unnecessary luxury. Reliable automatic combustion control combined with the now universal usage in American cargo vessels of including the boilers in the engine room make it very possible to eliminate firemen without in any way detrimentally affecting the operation of the machinery.

Before the war a serious proposal was made by a great British diesel engineer to arrange a diesel electric drive so as to dispense with not only the engine room crew but the engine room itself. His proposal was to have a number of small power identical diesel generating sets each enclosed in a waterproof casing and installed on deck connected in series and driving an electric motor direct or gear connected to a short propeller shaft at the stern.

Some method of reducing the personnel carried on American ships would seem to be the only way out of the present dilemma of high basic wages and high overtime demands. Designers and engineers can easily devise a ship with many features that are fully automatic and that demand a minimum of supervision. Such a vessel might cost more than the conventional type, but the extra cost would be fully justified.

As the demands of union labor multiply the possible operating savings due to technology become more important. Both employees and employers in the maritime industry should carefully consider these possibilities.



Preside
Polk
passin
San
Francis
Bay
Bridg

S. S. PRESIDENT POLK

United Engineering Completes First Big Reconversion Job on Coast

Principal Dimensions	
Length overall	492 feet
Length between perpendiculars	465 feet
Beam, molded	69 feet 6 inches
Draft, full load, molded	26 feet 6 inches
Depth, molded to shelter deck	42 feet 6 inches
Shaft horsepower	8500
Speed	16½ knots
Gross tonnage	8500 tons
Deadweight tonnage	9400 tons
Fuel capacity	1455 tons
Displacement	16,190 tons
Bale capacity	568,050 cubic feet
Passengers	97
Crew	135

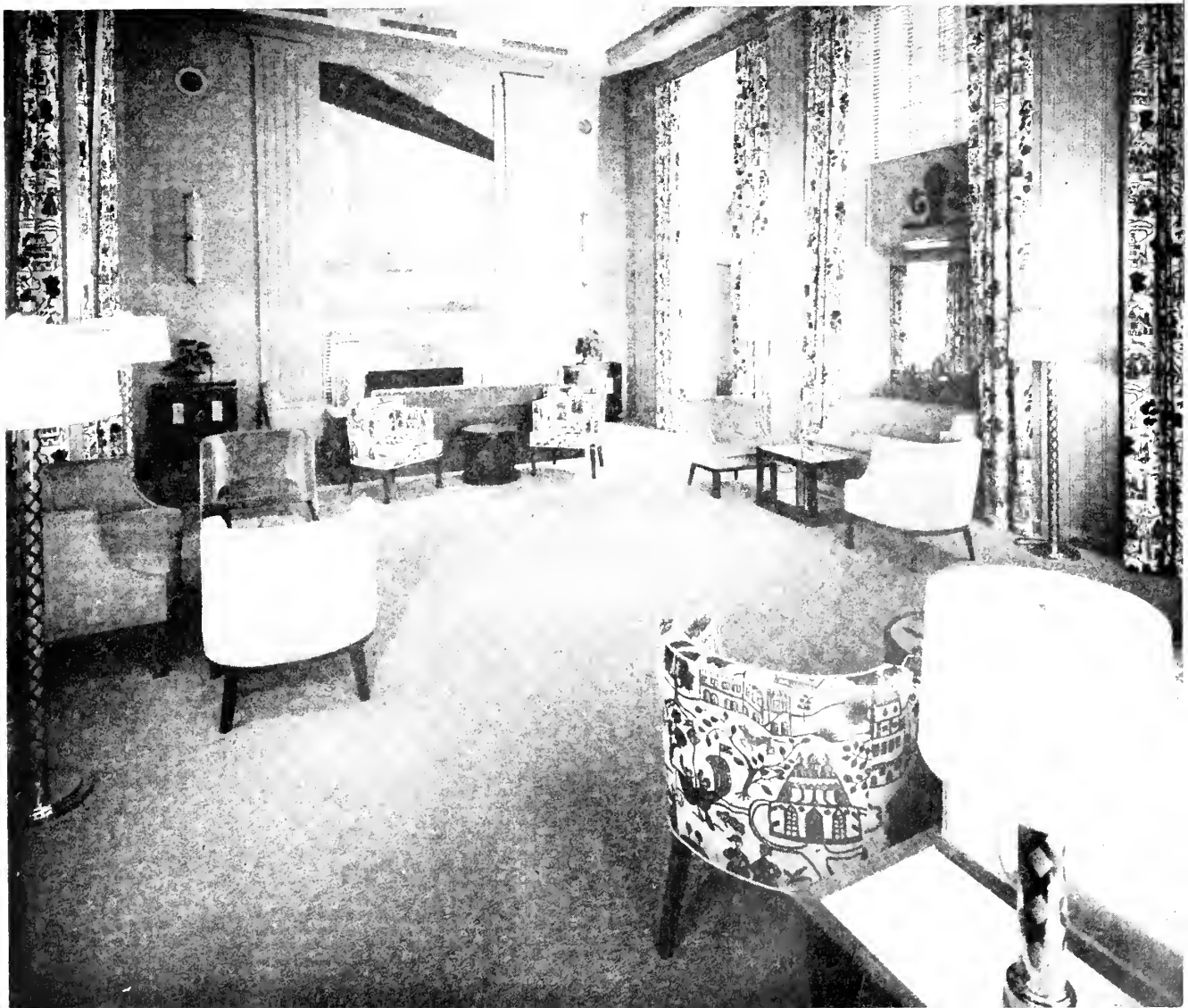
The departure, Friday afternoon, August 23, of American President Lines' President Polk for the Orient marked the resumption of transpacific luxury passenger service—the first such sailing in nearly five years.

It was also a noteworthy achievement for the employees and staff of the United Engineering; especially so, since it was their first major contract on postwar passenger ship reconversion work. The quality of the workmanship is creditable, and few difficulties were encountered other than acquiring the necessary materials on time. In spite of the latter, the contract was completed in record time.

This trim, C-3 type vessel was originally built and delivered to the American President Lines late in 1941

Card Lounge, looking forward ►

Main Lounge, looking forward from port side ▼



▲ Dining Room, looking forward.

▼ Mrs. Grady, T. J. Cokeley, operating manager of APL, with Dr. Henry F. Grady, president of American President Lines, admiring the photographic mural which decorates the side wall of the dining saloon.

from the builders' yard at the Newport News Shipbuilding and Dry Dock Company. However, the role of transpacific and around-the-world luxury liner for the President Polk was suddenly cut short during her maiden voyage on December 7, 1941, some twenty minutes after she had left the pier in San Francisco Bay en route to the Orient. On December 19, twelve days later, she sailed on her first wartime voyage as an Army transport and cargo ship in the Southwest Pacific war zone, eventually finishing this trip, evacuating war refugees from various ports around the world.

Returning to the West Coast, the President Polk was completely stripped down to become a troop transport of about 1900-troop capacity, and as such was operated for four trips by the American President Lines for the War Shipping Administration. She was then taken over by the Navy and operated as a naval transport throughout the Pacific war area until her return to the American President Lines last January.

These C-3 type vessels are noted for their very seakindly hulls, with a large cubic and deadweight capacity for cargo, and equipped with every modern fitting and device to maintain comfortable and convenient condi-

tions in the staterooms and public rooms for the passengers, and to insure an abundance of wholesome and delicious food in the dining saloon.

It will be noted from the principal characteristics of the ship, as shown in the line box herewith, that these vessels have a good turn of speed, and ample oil tankage capacity for large cruising radius. The space amidships, occupied by the propulsion machinery, is very short, leaving ample opportunity fore and aft for large cargo holds.

This class of vessel was comprehensively described in the December 1940 issue of this publication, so this article will be devoted mainly to a description of the reconditioned passenger accommodations and public rooms, whose scheme of interior decoration has been completely redesigned, and is an excellent example of the marine interior decorator's art, combined with highly skilled shipbuilding craftsmanship. However, the specifications also required the complete overhaul and reconditioning of all the ship's propulsion machinery, auxiliaries, and electric lighting system. All the crew's accommodations also had to be reconditioned according to the original design plans and specifications.

Passenger Accommodations

The President Polk's sleeping accommodations for 97 passengers are arranged in six single-bed staterooms, and two rooms for three each, all located forward on the promenade deck. The remaining accommodations are located on the shelter deck, and consist of six rooms for two each, and twenty-four rooms for three each. The three-person rooms have two single beds and a pullman berth. All staterooms have private toilet, a lavatory and a tub bath and/or shower.

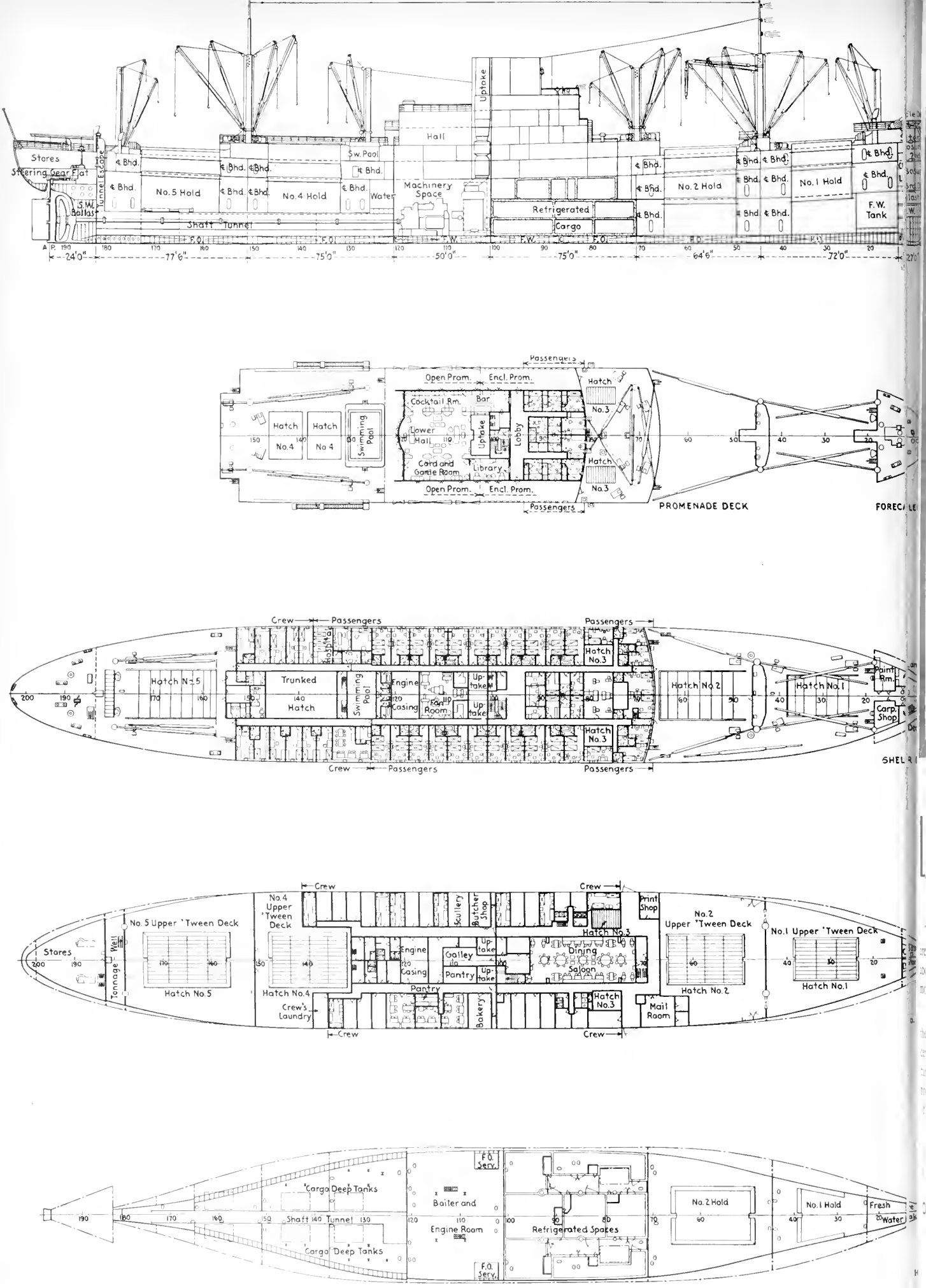
As will be noted in the general arrangement plans, and the illustrations herewith, these staterooms are quite commodious. The metal-clad Marinite walls are nicely fin-

(Please turn to Page 117)

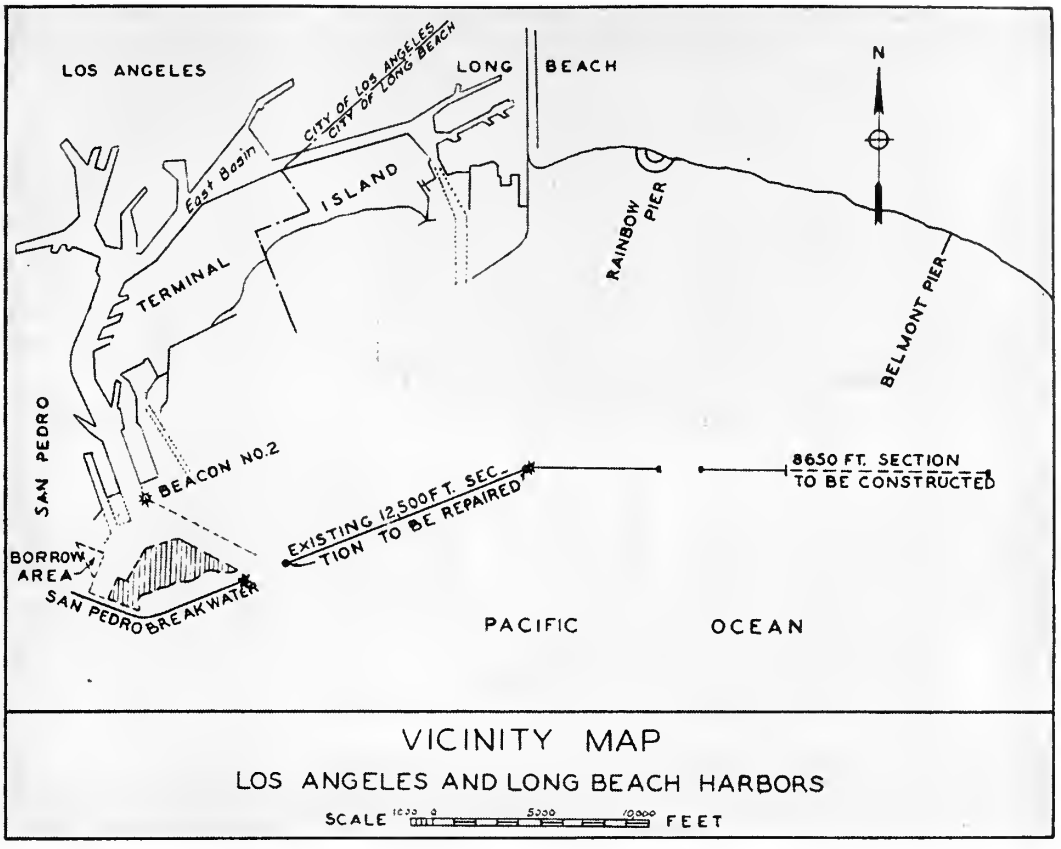
▲ At top, Cocktail room and bar, looking forward.

▲ Center, Library, looking forward.

At left, Stateroom for three on Promenade Deck. ◀



INBOARD PROFILE AND GENERAL ARRANGEMENT PLANS OF THE PRESIDENT POLK



Long Beach

Two of the most rapidly growing ports in the country are in California—Long Beach and Oakland. An article about Oakland will be found elsewhere in this issue and more will be said from time to time.

To show the progress being made at Long Beach, and the amount of planning and expenditure that go into the development of port facilities, there follow several feature articles relating to pier construction, breakwater, a proposed shipping operation, and the recent convention of port authorities held there.

Not only has Long Beach Harbor been officially declared as a principal base for the United States fleet, but it also provides unlimited possibilities for world trade

A long completed stretch of breakwater, showing level construction.

and coastwise and intercoastal shipping. It constitutes both a chief terminus of raw material supply and an important gateway to the vast markets of the world.

Oil

Revenue from great oil reservoirs underlying the entire Harbor area has permitted a rapid and continuous program of development, wholly unique in world history. The port is not only debt-free, but its present income assures still further improvement and expansion on an extensive scale.

The ultra modern facilities of this newest major Pacific port present incalculable advantages to industries located in this area.

Los Angeles-Long Beach Harbors Breakwater Result of Long Planning

By ALAN C. BERRY *Chief, Technical Information Branch, Los Angeles District, U. S. Engineer Department*

With Credit to KENNETH PEEL, *Chief, River & Harbor Section for Data*

ON JUNE 24, 1946, the Los Angeles District, U. S. Engineer Department, Colonel R. C. Hunter, C.E., District Engineer, awarded a contract for construction of 8650 linear feet of detached breakwater and complete restoration of an existing 12,500-foot detached breakwater.

The 8650 linear feet of the new breakwater is an extension of an existing portion of breakwater and will complete a 13,350-foot detached breakwater. The extension begins at a point due east and about 4700 feet distant from the westerly end of the 13,350-foot detached breakwater and extends in easterly prolongation thereof a distance of about 8650 feet.

The breakwater will be constructed with a rubblestone enrockment superimposed on a core of sand covered with clay and quarry waste. The sand inner core is complete for the entire structure. The clay and quarry waste outer core and the class B stone emplacement are nearly complete. The clay core material will be dredged from a specified area in the Los Angeles outer harbor.

This "clay" core calls for some elucidation. To the layman's mind, "clay," and especially wet clay soaked in ocean water, conjures up a slick and no-supporting mass, which, if not boxed, must inevitably flow from under any weight or pressure. But this is a different kind of clay.

An analysis of the sample gave:

Actual specific gravity (dried sample)	2.37
Moisture content (of sample in question)	44%
Sand, silt and clay	56%
Clay in dried sample	36%
Divided as — Gumbo	31%
Kaolin, $Al_2O.2S_1O_2.2H_2O$	5%

The relatively low Kaolin and high sand content account for the fact that the clay is hard and, when being dredged, fractures like stone. A chunk of this

clay, freshly dug and whittled to a 3-inch cube bore a man's weight with no apparent effect. Trimmed to a 2½-inch cube, it sustained a load of 233 pounds; the material showing cracks, as in concrete, but not crushing. Additional tests have established it as a thoroughly satisfactory core material for breakwaters of the Los Angeles-Long Beach type.

It is said that a stratum of it bore the weight of Deadman's Island. The pressure of this load, at low tide, when the stratum was clear of the water because of erosion and overhang was three times the weight which would be brought to bear on the breakwater base. Deadman's Island, of course, has been dredged from Los Angeles Harbor.

Restoration of the 12,500-foot detached breakwater consists of rubblestone enrockment work.

The principal features of the work are:

1. Dredging.
2. Placing class A stone.
3. Placing class B stone.
4. Placing class C stone.

The job calls for about 107,118 tons of clay core material and approximately 2,000,000 tons of stone.

When this breakwater project will have been completed it will be the materialization of a dream which is nearly half a century old. And it will be the *longest breakwater in the world.*

A final step remains to make it a perfect job from the ideal standpoint. If a final extension to the shore in the vicinity of Sunset Beach should be found justifiable—and Congress should authorize it—Alamitos Bay and Anaheim Bay Naval Harbor would be protected as a result.

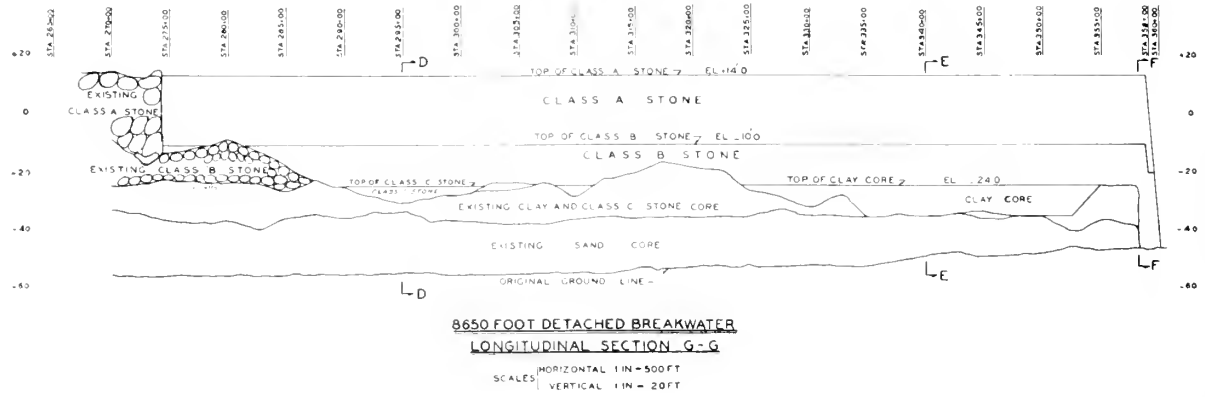
The San Pedro breakwater, constructed of cut stone superstructure on a random stone base, was begun in 1899. It is 11,152 feet in length. The job was completed in 1912. The project had not been anywhere near completed when the need for a far more extensive system was felt.

As far back as 1908, the practicability of constructing a great breakwater system which would protect the ports of Los Angeles and Long Beach and offer haven to a mighty Naval force was understood.

In that year, Captain Amos E. Fries, then District Engineer of the Los Angeles District, U. S. Engineer Department, drew up a long range program in which he urged that a time limit of twenty-five years be set for accomplishment of the task. At that time, the port was visited by the Atlantic Fleet, under Admiral Evans, and the District Engineer pictured to the local authorities a great protected anchorage of 15 square miles, with a breakwater running three or four miles.

The River & Harbor Act, approved March 2, 1919, called for a review of the local project. Agitation for it became active again. Major Frederick B. Downing, C.E., U. S. District Engineer at that time, recommended that a survey be made. On September 18 of that year he held a hearing at which he advocated it. Then, in

Derrick barge emplacing Class "A" stone on breakwater.



8650 FOOT DETACHED BREAKWATER
LONGITUDINAL SECTION G-G

SCALES: HORIZONTAL 1 IN = 500 FT
VERTICAL 1 IN = 20 FT

November of the same year, he said in his preliminary report:

"It is believed that future development of Los Angeles and Long Beach will ultimately demand the extension of the breakwater along the line near the 8-fathom contour, with its eastern extremity roughly marked by the west jetty of the silt diversion channel. Such an extension would facilitate the use of the harbor by the United States Navy."

Once more it was foreseen—even as Captain Fries had foreseen it—that the extension of the breakwater to protect development of the combined harbors of Los Angeles and Long Beach would bring the U. S. Navy to greatly increased use of these waters.

The advisability of having it balanced against the expense of its construction (estimates ran to $17,500,000) flowed back and forth with even the Board of Rivers and Harbors stating in 1920 that ". . . the extension of the breakwater would be very expensive . . . is not really needed at present. . . ." But sure conviction that it would be necessary and sentiment in its favor kept piling up. In 1921, the Chief of Engineers listed it in his letter of transmittal with his reports to the Secretary of War as one of the desired items.

Again it was put off as too expensive and premature at that time.

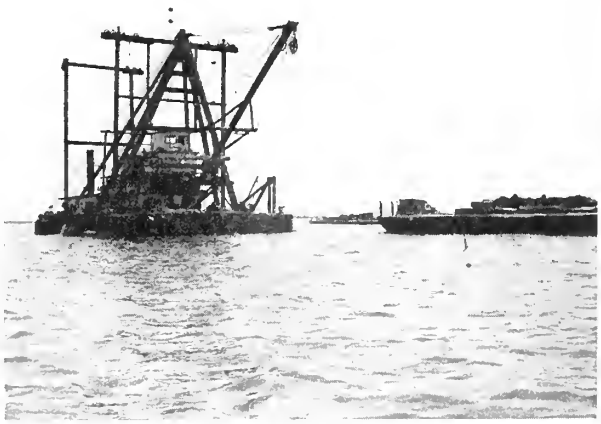
Two years later it was up for consideration again, this time by Major E. D. Aedery, C.E., District Engineer of the Los Angeles District.

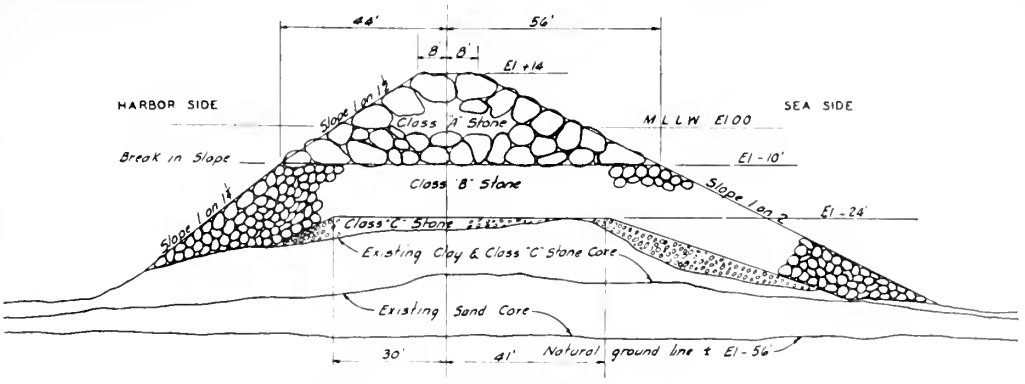
In 1924, the Board of Rivers and Harbors held a hearing in Los Angeles at which the whole subject was considered, and the opinion voiced that it was a project of vital importance to the entire southwest, rather than of purely local concern.

A civilian engineer, visiting out here, criticized the $17,500,000 estimated cost, which estimate was based on a breakwater of rubble mound construction. He began speculation as to why dredgings could not be built into a ridge and capped with stone to form a breakwater at more moderate cost. That idea set the civilian engineer of the district to figuring on what could be used as a substitute for stone in the construction of the bases and

(Please turn to page 112)

Below, left: A cargo of stone being unloaded from side-dump tilting barge. The barge is self-dumping and requires about 17 feet of water in which to operate, and bails itself at the end of each operation. Below, right: A big clamshell dredge at work dredging inner harbor.

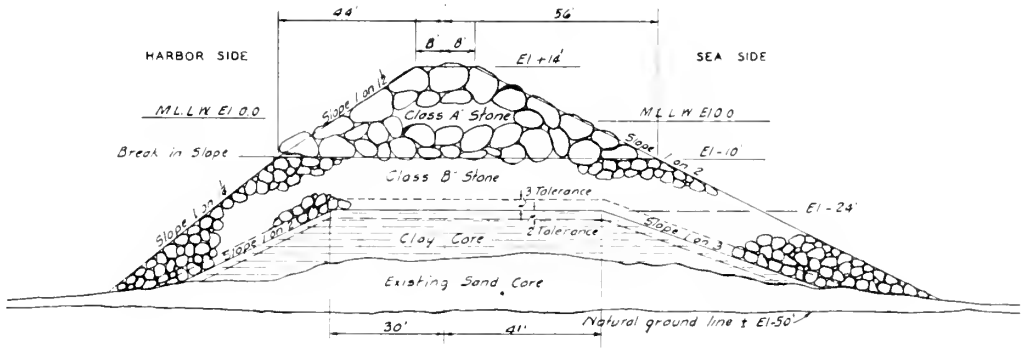




CROSS SECTION D-D

TYPICAL SECTION 8650 FOOT BREAKWATER

SCALE 1 IN = 20 FT.

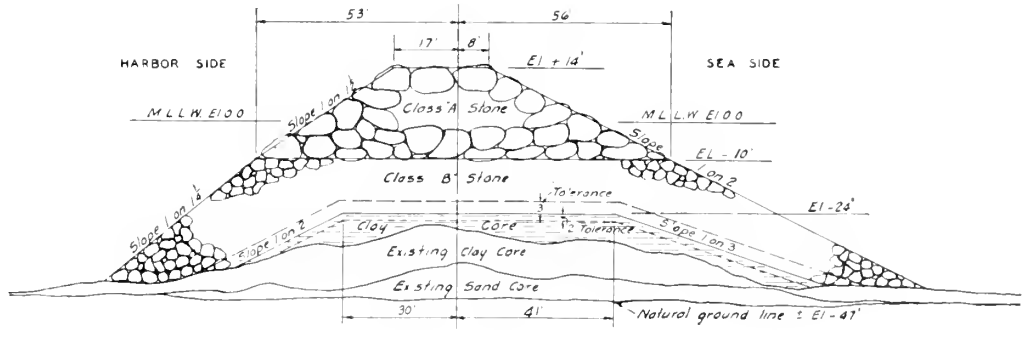


CROSS SECTION E-E

TYPICAL SECTION 8650 FOOT BREAKWATER

SCALE 1 IN = 20 FT

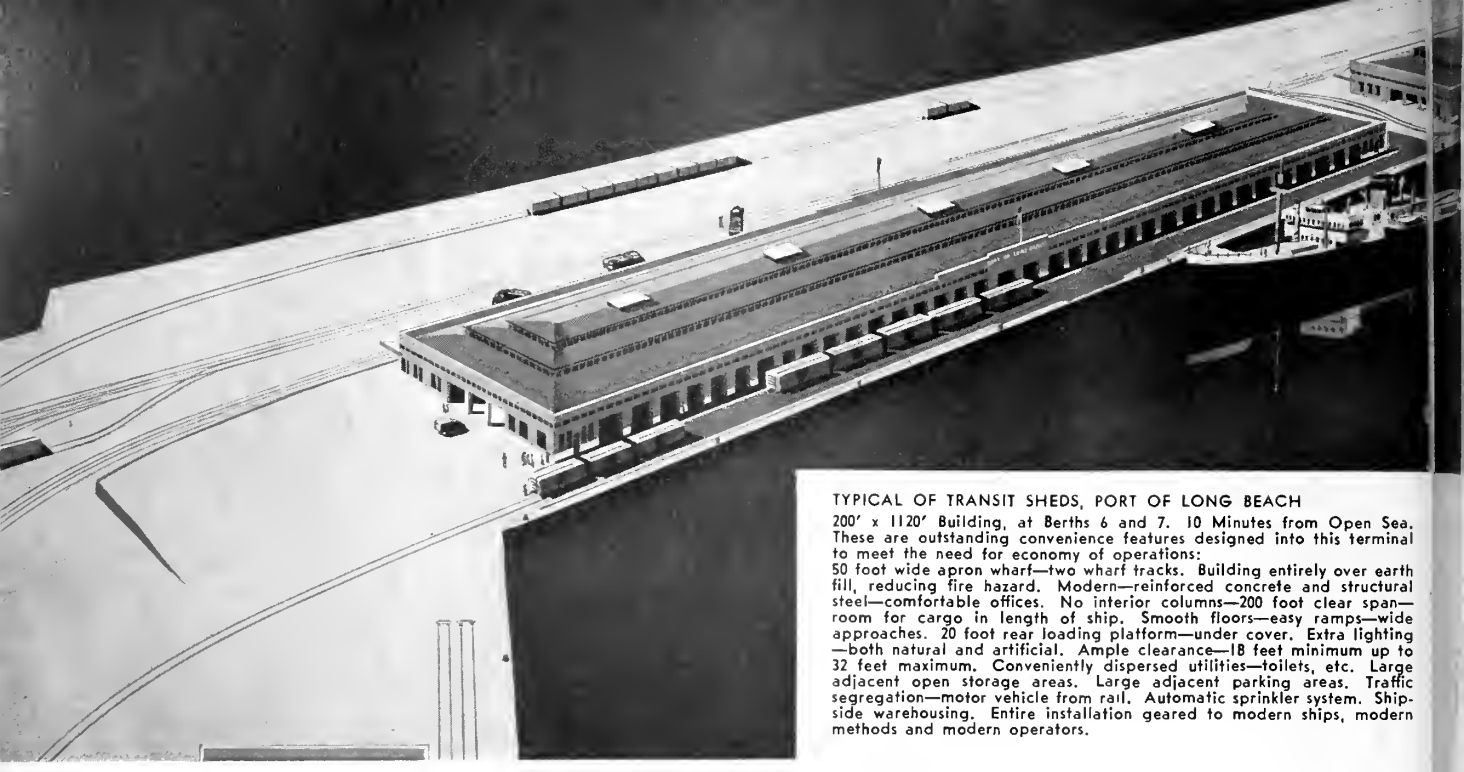
10 0 10 20 30 40 50



CROSS SECTION F - F

ENLARGED END 8650 FOOT BREAKWATER

SCALE IN = 20 FT



TYPICAL OF TRANSIT SHEDS, PORT OF LONG BEACH

200' x 1120' Building, at Berths 6 and 7. 10 Minutes from Open Sea. These are outstanding convenience features designed into this terminal to meet the need for economy of operations:
50 foot wide apron wharf—two wharf tracks. Building entirely over earth fill, reducing fire hazard. Modern—reinforced concrete and structural steel—comfortable offices. No interior columns—200 foot clear span—room for cargo in length of ship. Smooth floors—easy ramps—wide approaches. 20 foot rear loading platform—under cover. Extra lighting—both natural and artificial. Ample clearance—18 feet minimum up to 32 feet maximum. Conveniently dispersed utilities—toilets, etc. Large adjacent open storage areas. Large adjacent parking areas. Traffic segregation—motor vehicle from rail. Automatic sprinkler system. Ship-side warehousing. Entire installation geared to modern ships, modern methods and modern operators.

Modern Transit Shed Construction--Port of Long Beach

By ROBERT R. SHOEMAKER, *Chief Engineer of the Port of Long Beach*

The accompanying illustration indicates the type of transit shed structure which the Administration of the Port of Long Beach feels is essential in many instances to the future economical handling of general cargo. The structure pictured, a 200-foot by 1120-foot building, will soon be a reality. The wharf, bulkhead, complete foundation system and most of the underground utilities, including an automatic sprinkler system, has been completed at Berths 6 to 7, on Pier A, Long Beach Outer Harbor. It should be noted that the most unusual feature about the structure is the fact that there are no interior columns, even though the building is 200 feet in width. The spans consist of steel rigid frames so that relatively unlimited vertical height is available for stacking of cargo with modern cargo handling equipment. Furthermore, the rigid frames, which can be fireproofed with a light weight, fire resisting material, give probably the most fire resisting steel structure that it is possible to conceive.

The full 1120-foot length of this structure is to be divided with a fire wall into two equal parts, thus giving each unit of the shed approximately the same capacity as the largest freighter which would be berthed opposite the equivalent linear feet of frontage.

With modernized cargo handling equipment, distance is entirely unimportant, but what is important is space and freedom of movement, with ample vertical clearances, as well as liberal horizontal clearances, for easy and quick operation of motorized equipment.

Waterfront doors are located in every panel, so that the spacing of the doors is approximately 32 foot center to center. The doors are 18 feet in width and 14 feet in vertical height. They are the rolling steel shutter type so as to avoid any interference with cargo, either alongside or to the rear of the doors. On the land side, doors are spaced at variable distances in alternate panels so that the spacing averages approximately 50 feet. It has been found that no uniform spacing of doors along a loading platform is a practical answer to the spacing of box car

(Please turn to page 112)

In wartime, battle fleet units were often refueled while under way at sea. Here a Navy tanker is passing hose to a carrier. Under like conditions some Standard of California tankers fueled warships on convoy duty in the Atlantic. *(Official U. S. Navy Photo)*

Standard's Tanker Fleet

BEFORE THE 692-TON TANKER GEORGE LOOMIS was launched at San Francisco's Union Iron works in 1896, oil was carried in wooden barrels in the holds of sailing ships. Only one other steel tanker had been built before in the United States. Today the fleet of Standard of California includes 33 vessels and as long ago as 1921 the company was operating the largest privately-owned fleet of cargo ships on the Pacific Coast. In 1945, the fleet carried 31,337,000 barrels of petroleum products and navigated nearly a million miles.

Recent additions to the fleet represent a transition in tankers which was begun in the 1930's toward a larger, faster craft. From 10,000-ton ships which ran at about ten knots, the trend has been to vessels five knots faster and larger by at least six thousand tons.

Tankers are tailor-made for specialty jobs, and they are much better built than most merchant ships. Because of the nature of their cargo tankers are constructed with compartments which must have oil-tight integrity. Any small opening between tanks might well cause contamination of a ship's varied cargoes.

Kinds of cargo carried by tankers would make a long list, including anything from crude oil to highly-refined gasoline, from diesel furnace oil to jet propulsion fuel. Those who man the ships must know the characteristics of every product and how each should be handled.

As an example, ships carrying liquid asphalt must keep the cargo fluid. Special heating coils hold the asphalt above the temperature at which it would solidify. When carrying highly volatile natural gasoline, the effort is to keep the cargo cool. Sprinklers, such as you might use on your lawn in summer, are placed on deck in hot weather to splash the steel plates.

Routes of the tanker fleet, and of the inland craft which operate in harbors, rivers and bays, are determined by the cargo to be carried and the demand for products. Some make routine hauls, carrying crude from Estero Bay to refineries at El Segundo and Richmond. Others carry refined products from refinery wharfs to distributing

Oil Carrying Fle

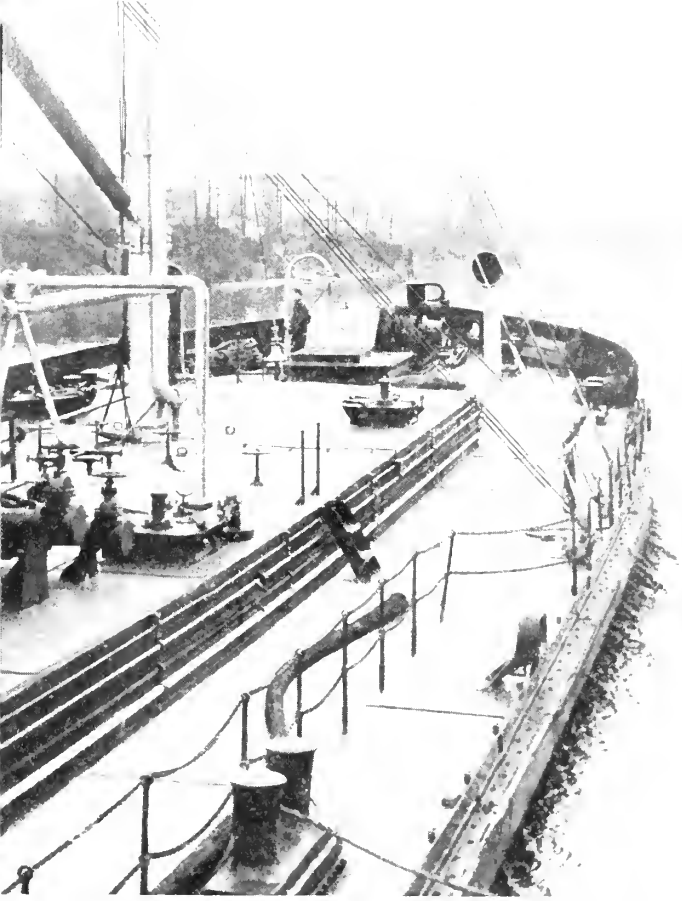
	NAME	CAPACITY BARRELS
1.	S.S. H. D. Collier	138,300
2.	S.S. R. G. Follis	101,500
5.	S.S. F. S. Bryant	101,500
9.	S.S. R. C. Stoner	153,750
10.	S.S. J. L. Hanna	138,300
11.	Towboat, Standard No. 3	——
12.	S.S. J. H. MacGaregill	138,300
14.	Barge S. O. Co. No. 12	5,000
15.	S.S. W. H. Berg	103,400
16.	S.S. M. E. Lombardi	58,600
27.	Towboat Standard No. 2	——
28.	Barge S. O. Co. No. 93	29,500

Vessels listed in blue were built on Pacific Coa

		CAPACITY BARRELS
3.	Motor barge Petroleum II (United Engineering, Alameda)	900
4.	S.S. J. H. McEachern (ex-J. K. Moffitt, Union Iron Works, San Francisco)	6,500
6.	S.S. W. S. Miller (Bethlehem, Alameda)	7,500
7.	Barge S. O. Co. No. 4 (United Engineering, Alameda)	50(
8.	Launch, Despatch No. 3 (San Diego)	——

tandard of California

AME	
Barge S. O. Co. No. 15 . (ex-Martinez, Union Construction Co., Oakland)	13,000
Barge S. O. Co. No. 11 . (Los Angeles Shipbuilding Co.)	7,100
Launch Despatch No. 7 . (F. L. Fulton Co., Antioch, Calif.)	
Motor barge Contra Costa . (Union Iron Works, San Francisco)	7,900
20. Barge S. O. Co. No. 8 . (Floating Machine Shop) (Oakland, Calif.)	
21. S.S. D. G. Scofield . . (Union Iron Works, San Francisco)	81,200
22. S.S. J. H. Tuttle	153,750
23. Launch Despatch No. 6 . (F. L. Fulton Co., Antioch Calif.)	
24. Barge S. O. Co. No. 9 . (Los Angeles S. B. Co.)	3,550
25. M.S. Alaska Standard . . (Union Iron Works)	12,500
26. Barge S. O. Co. No. 7 . . (United Engineering, Alameda)	6,900
29. Launch Despatch No. 8 . . (F. L. Fulton Co., Antioch)	
30. Barge S. O. Co. No. 14 . . (Built by Dravo) (Assembled at Stockton)	9,400



Barge moves through an inland canal from Puget Sound with petroleum products for Lake Washington points. Few barges have their own power. Most are towed by tugs from alongside or bow.

Executives who direct operations of tanker fleet. Center, J. L. Hanna, director and vice president of Standard of California. Right, J. H. McEachern, Marine Department manager. At left, A. E. Kihn, assistant manager.

Oil flotilla at Richmond Long Wharf loading berths, where as much as three million barrels of petroleum cargo is handled each month.

points up and down the Pacific Coast and to Hawaii, as well as to foreign lands.

Unique in the service of Standard's fleet is the tanker Alaska Standard, which serves consumers in the northern Pacific. This ship is engaged in a veritable peddler's trade. It fills on-the-spot orders of customers ashore who tell their needs to the salesman on board by radio telephone.

Besides its own fleet, Standard has just formed with The Texas Company a new subsidiary, Overseas Tankship Corporation, to operate a fleet of tankers throughout the world in transporting oil produced and marketed by the joint foreign interests of the two companies.

In the war years the destinations of the tanker fleet could be read in the headlines. Wherever planes flew and tanks and trucks of a mechanized army moved against the enemy, there the tankermen went. They refueled warships on stormy seas, and filled storage tanks on tiny island bases.

When the red signal flag flies from the halyard the tankerman knows that cargo is being handled. Silently, swiftly, the oil that moves by ship is being unloaded or brought aboard through thick hoses that curve over the rails.

There is none of the noise and activity usually associated with loading a ship. No creaking booms swing heavy loads over the side. No open holds reveal the vessel's inner spaces. No gangs of dock workers are seen or orders heard. On deck a ship's officer watches carefully to gauge the loading level of a tank, while seamen stand by to turn valves.

Because the tanker takes on or discharges cargo so fast—some Standard of California ships can load 20,000 barrels an hour—she spends more time at sea than almost any other vessel. Only the Great Lakes ore ships load and unload faster.

But a great deal of preparation and planning is necessary before loading begins. Much preliminary work is done at sea, where empty tanks are cleansed with whirling, hot salt water spray, and weight estimates are made to plan a properly-balanced load.

Safety determines the number of tanks to be loaded simultaneously and the speed at which the cargo may be pumped aboard. Normal technique is to start the oil or gasoline flowing slowly, check to see that it is coming

Loading hoses trailing over the tanker's side at Richmond Long Wharf load ship with refined products, or discharge oil cargoes.

aboard properly, and then speed up the pumps and "let her run."

27 Tanks May Be Loaded at Once

The mate on watch is in charge. He must carefully oversee the filling of all tanks; as many as 27 may be loading at the same time. Weights of products vary, hence the relation between quantity and safe loading limit also varies.

Temperature has effects too. Ships sailing into warm climates must leave room in each tank for expansion of cargo. Conversely, when a ship is heading north the tanks can be filled close to the top, because the cargo will contract in colder climates. Before a ship leaves port with refined oil or gasoline, laboratory tests are made of tank samples to insure against contamination or mixing of cargoes.

During unloading an officer on deck and a plant man ashore gauge ship and shore tanks, watching rates of discharge from the ship and into the tanks. So long as un-

(Please turn to page 144)

View of No. 3 tank room, showing rail supports and towing cable

The New Towing Tank at Stevens Institute

By HUGH W. MAC DONALD

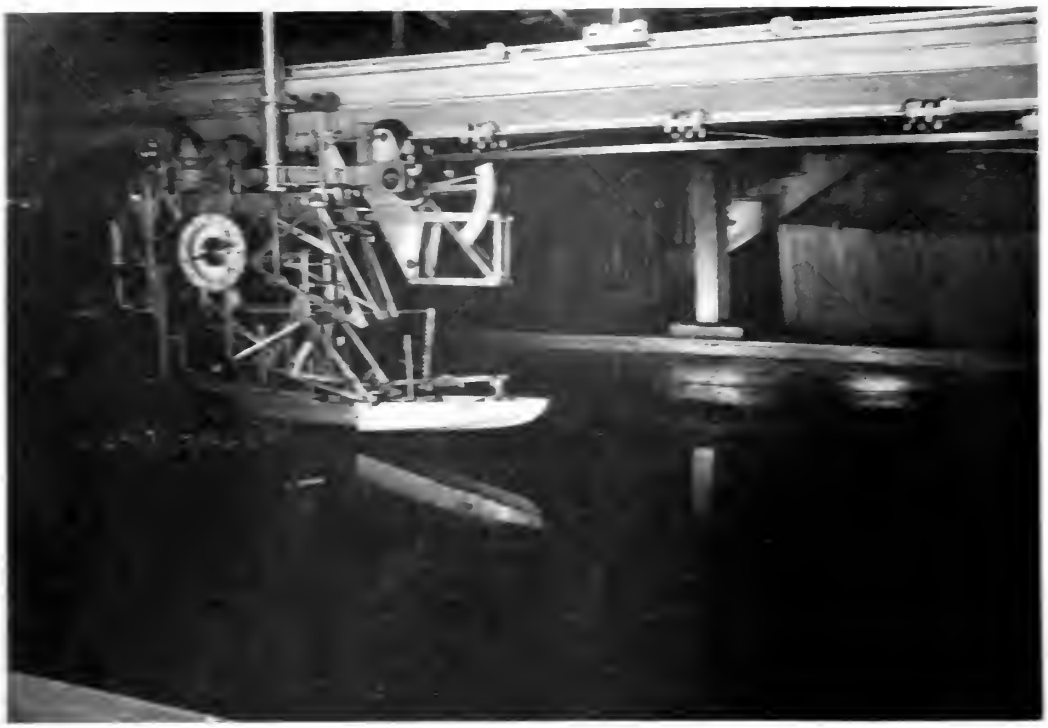
The Experimental Towing Tank at Stevens Institute of Technology, Hoboken, New Jersey, has undergone many changes since 1940, when naval and military research requirements began to absorb almost its entire capacity. New facilities and equipment, in some cases of a unique kind, have been constructed and little semblance to the plant and organization of the pre-war period now exists. With the lifting of wartime restrictions, it is now possible to describe the new facilities, although details of the character of the work conducted during the war period remain, in most part, classified.

In addition to the original tank, which has been in constant service for over ten years, two considerably larger tanks were constructed during the war years. These allowed much broader and more extensive research programs to be carried out on surface vessels, flying boats, high speed planing hulls, and submerged bodies.

The construction of the second tank of the Experimental Towing Tank resulted from an urgent need for studies of the turning characteristics of naval vessels.

The third tank was constructed to fill the need during the war for broader and more extensive hydrodynamic research on seaplane hulls. Problems of behavior and handling of seaplanes, which had never before been considered, had to be investigated. Background data to be used for reference when creating new designs had to be accumulated.

The principal requirement of a maneuvering basin is that it be of sufficient length and width to permit the execution of turns and other maneuvers with models of



Deadrise test apparatus and carriage Tank No. 3

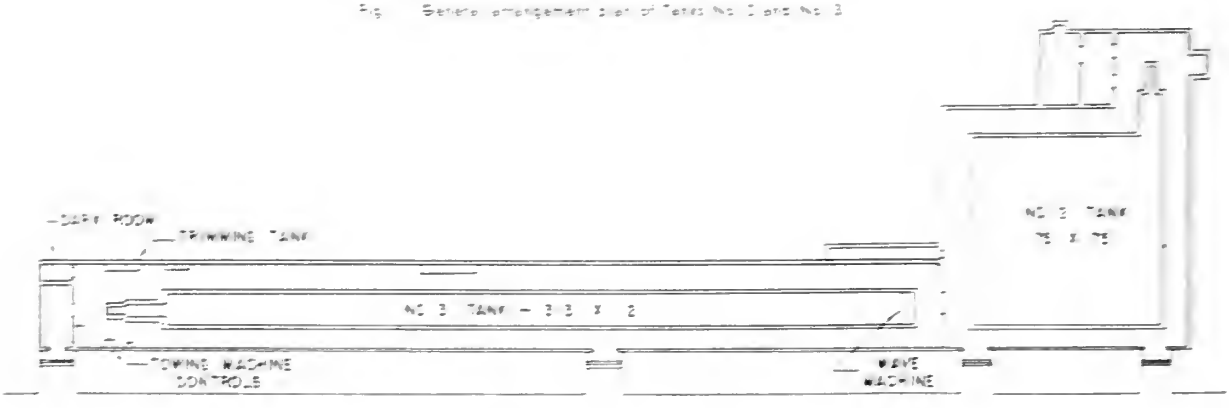
appropriate size and that it be suitably equipped with the necessary apparatus to make measurements. Until Tank No. 1 of the Experimental Towing Tank was built there was no properly housed tank especially constructed for maneuvering tests either in this country or abroad.

The successful employment of small models made it possible to provide a tank of ample size at a cost that was not prohibitive. In 1941 the new tank was in operation and was proving its worth, both in the accuracy of the results obtained and in the facility with which the testing could be done. The models used for the turning tests were generally 5 feet long although longer models could be used for partial runs or for designs which turn in very small circles.

This Tank No. 2 is a 75-foot square reinforced concrete basin with a 4½-foot depth of water. It has an extension at one corner 9 feet wide and 16 feet long, which is further extended by a 4-foot long starting dock of smaller section. These extensions make possible a straight run of 100 feet and also provide a suitable approach for large turns which require the full size of the tank. The accompanying plate, Figure 1, shows the dimensions and general layout of the tank and the building in which it is housed.

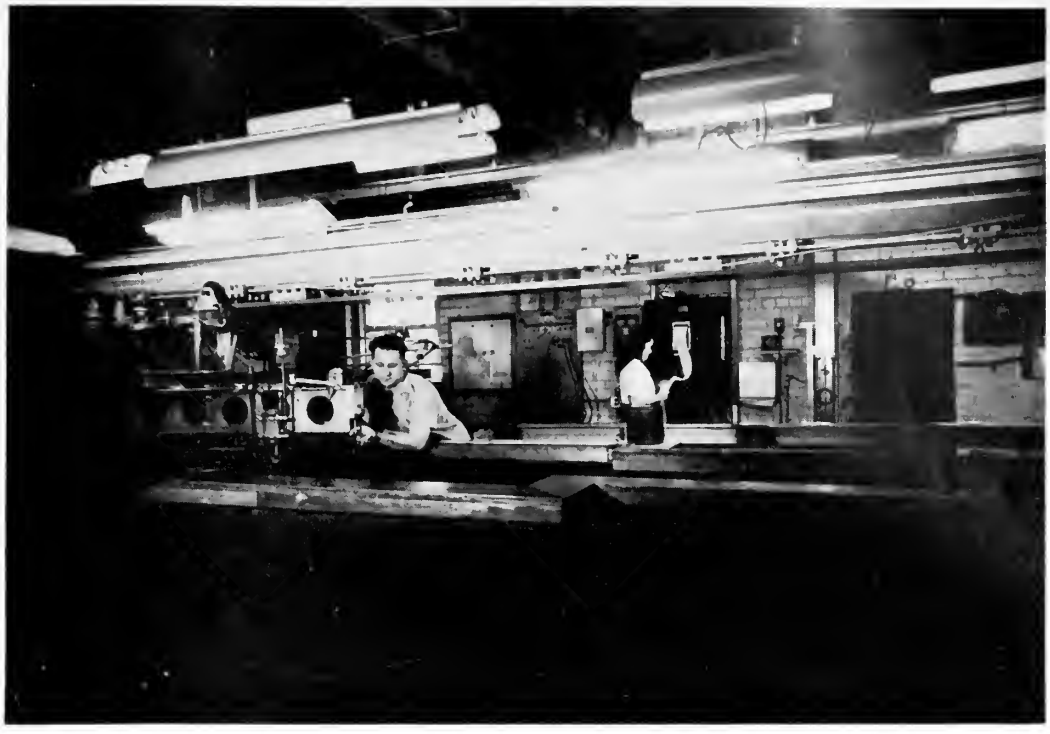
A wide board covers the top of each wall supported

Fig. — General arrangement plan of Tanks No. 2 and No. 3



HUDSON STREET

Operating apparatus, Tank No. 3



by legs resting on the outer edge of a recessed shelf. Behind the supporting legs is a series of planks, ballasted to submerge their outer edge and so provide "floating beaches," which make effective wave breakers.

The roof is supported by trusses which span the full dimensions of the building, so that the working space is entirely free of columns. The clearance between the water surface and bottom cord of the trusses is 11½ feet.

A three-story annex to the main building provides a space for the extensions to the tank and for various auxiliary services. The basement houses the tank extensions, and also includes a depressed boiler room in which are located: the furnace; various electrical controls; two filters for keeping the tank water clean; and heating equipment for maintaining it at an even temperature. The floors above include: office space, a room for the motion picture analyzing machine; and drafting and computing rooms.

Analysis of a single motion picture record of the entire maneuver determines: path of the model during approach and during turning; speed of the model; heel angle; trip angle; and drift angle or heading.

The model is self-propelled by a pair of series-wound direct current motors, drawing current from a battery of four small storage cells, with switching arrangements to allow speed variation. The motors are arranged to rotate

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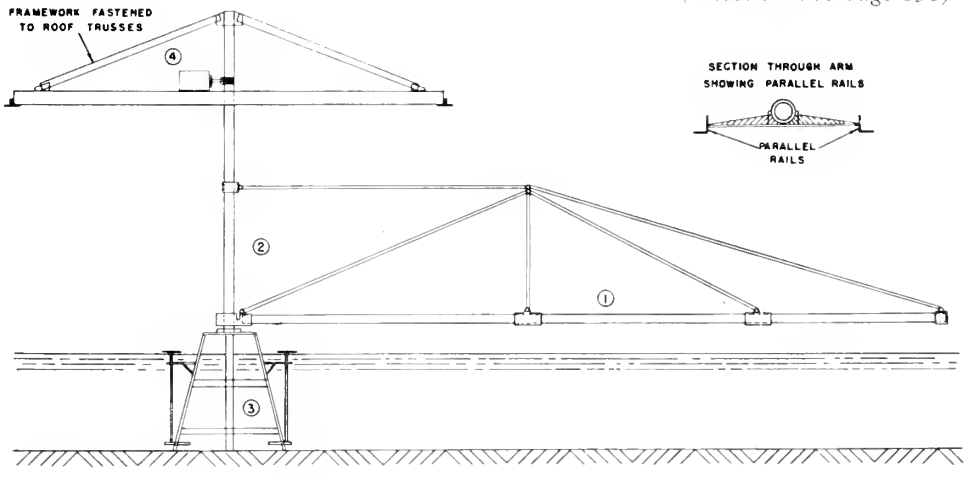


Diagrammatic sketch of the rotating arm, Tank No. 2.

George Westinghouse at work.

Centennial of a Great Engineer

A CENTURY AGO ON OCTOBER 6, 1846, in the town of Central Bridge, New York, there was born to the wife of a Vermont farmer a boy, later christened George, who was destined to shape much of the industrial life of America and to become known before he died as "the world's greatest living engineer." The Westinghouse family later moved to Schenectady where the senior Westinghouse became a successful inventor and manufacturer of farm machinery.

George Westinghouse at the age of 15 tried unsuccessfully to enlist when the Civil War was declared. However, two years later he was serving as a cavalry scout, and later still as a naval engineer. Just after the war he attended Union College, Schenectady, for a few months exhibiting a remarkable facility in mathematics and in mechanical drawing. College, however, bored him and he was soon back in the shops. Three months after his nineteenth birthday and six months after Lee's surrender George was granted patents for a rotary steam engine.

Railroads

At this time the railroads were becoming quite a network and safety in rail travel quite a problem. In 1866,

Westinghouse began to develop the air brake idea that grew into a great system of safety and accident prevention devices on American railroads. In April, 1869, the first train equipped with air brakes rolled out of Pittsburgh bound for Stubenville, Ohio. On the train were George Westinghouse and many important railroad executives. Before the train had completely left Pittsburgh, coming out of a tunnel, the engineer saw a horse and cart stuck on the tracks at a grade crossing two short blocks ahead. He reached nervously for the handle of this "new fangled" brake and the train ground to a stop within a few feet of the cart. Thus, the first application of the Westinghouse air brake had proved a dramatic success.

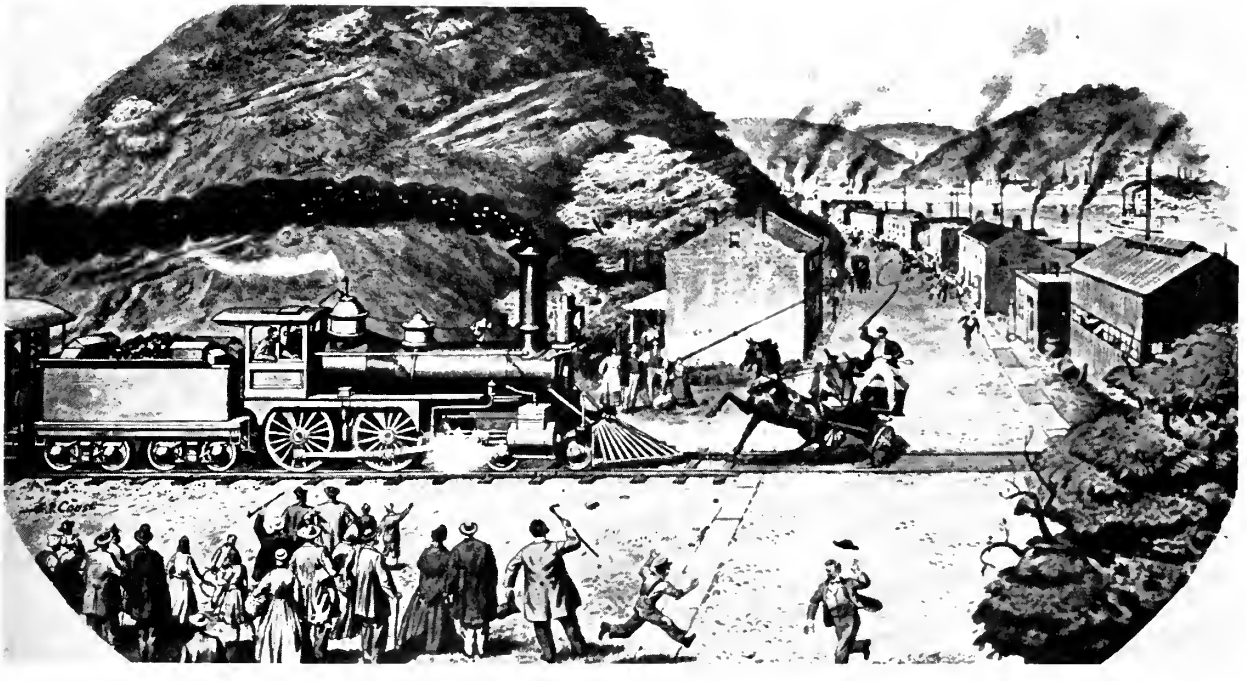
This invention revolutionized railroading. It enabled the engineer in his locomotive cab to instantly set or release all brakes on the train and so to greatly increase the safe speed, the comfort, and the economy of rail transportation all over the world. A little later, Westinghouse looked into railroad signaling and found that the equipment then in use, gotten out by several firms, was grossly inadequate and unsafe. He merged several of the leading firms into the Union Switch and Signal Company and developed interlocking electric and pneumatic power signals that laid the foundation for the control systems that serve our railroads today. In 1881, at the age of 35, Westinghouse had international fame and great wealth. He had also the respect of the nation and of his employees.

He was a pioneer in labor relations. In 1871, he introduced the Saturday half-holiday, a little later pension benefits for retiring employees, in the early 80's vacations with pay, sickness and accident benefits, and a Relief Department for sick or disabled workmen. In 1890, when the Westinghouse Air Brake Company was moved to Wilmerding, he built one of the first model industrial communities—shops with ideal working conditions, and modern workmen's homes with rentals and prices set at low levels.

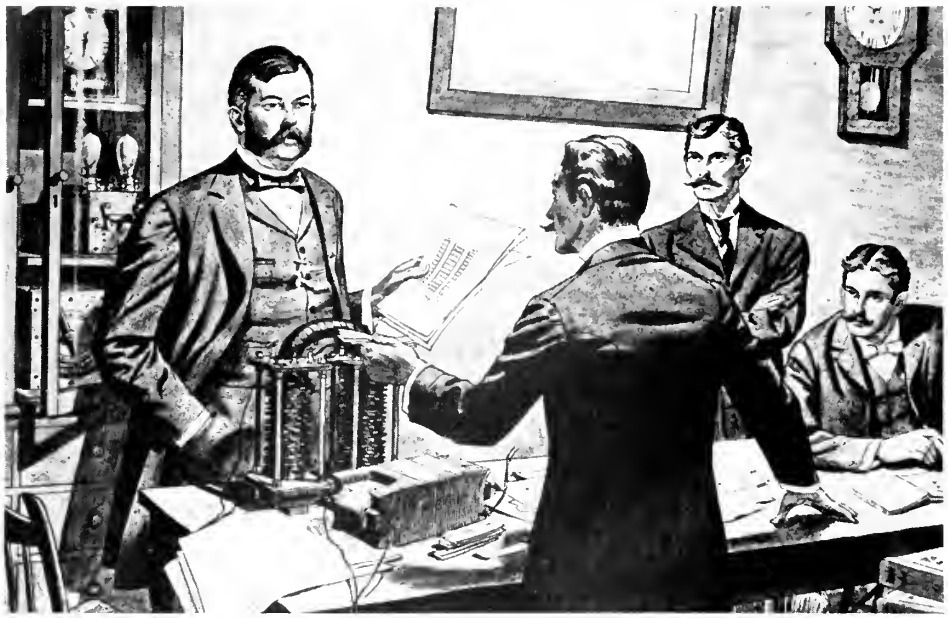
Electric Energy

With all this to his credit Westinghouse turned his attention seriously to electricity and immediately put his finger on the weak spot. At that period direct current only was used and that at voltages which limited its economical application to areas within four or five miles of the power station. Westinghouse saw that some sort of electric reducing valve was needed so that alternating current at high voltages could be transmitted long distances economically and reduced to safe usable voltage at the point of service.

In the spring of 1885, an agent was sent to London to acquire the patent rights for such a device which had been created by Gaulard and Gibbs, two European electrical engineers. This device was the crude grandfather of the modern electromagnetic transformer now familiar on all alternating current circuits. Three weeks after the drawings and a sample unit had reached Pittsburgh, Westinghouse and his technical staff had completely



The first demonstration of the air brake for trains.

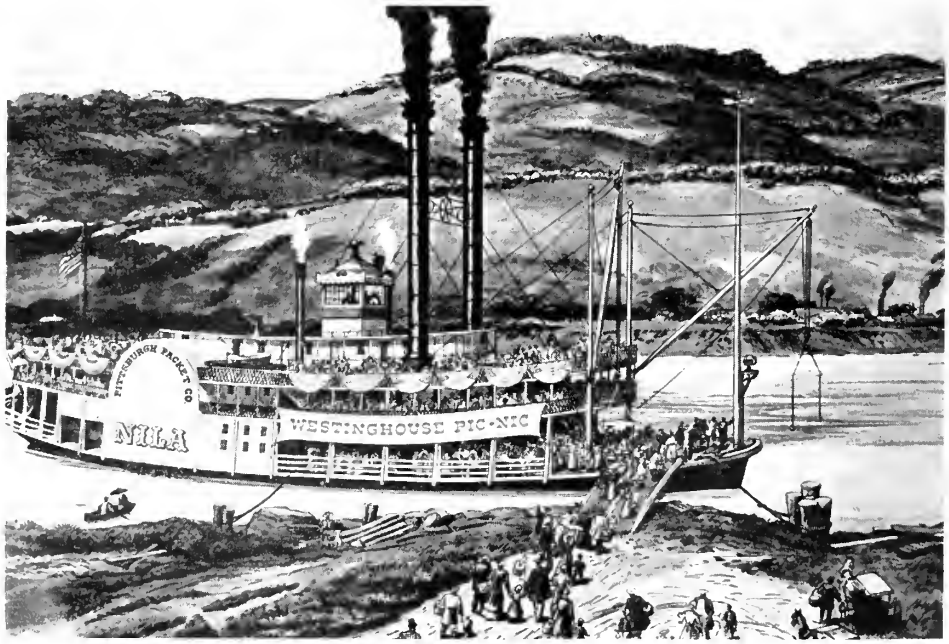


The first electric transformer, 1885

redesigned this electric voltage changer and had worked into it the basic features that are still standard. Westinghouse sensed that he had here the key to long distance transmission of electric energy and immediately made two very characteristic decisions. He decided on a large scale practical demonstration and he organized the Westinghouse Electric Corporation.

William Stanley was sent to Great Barrington, Massachusetts, where he rented an old rubber mill three-quarters of a mile from the town and installed a boiler, a 25 hp steam engine belt connected to an a.c. generator, a transformer and a switchboard. Wires were strung on trees to the business section of the town, where 13 stores, two hotels, two doctors' offices, and the telephone and post offices were equipped with transformers and incandescent lamps.

On March 20, 1886, the switch at the central station was thrown in and the town glowed with light from the first a.c. system installed in America. Within two years after this demonstration approximately 100 Westinghouse a.c. plants were operating in America. However, there was great opposition from those manufacturing d.c. systems. Stories of fearful risks due to high voltages were fed to the press and installers of a.c. systems were accused of being heartless murderers of innocent women and children. Westinghouse was impressed with the ne-



Westinghouse was a pioneer in employer-employee relations.

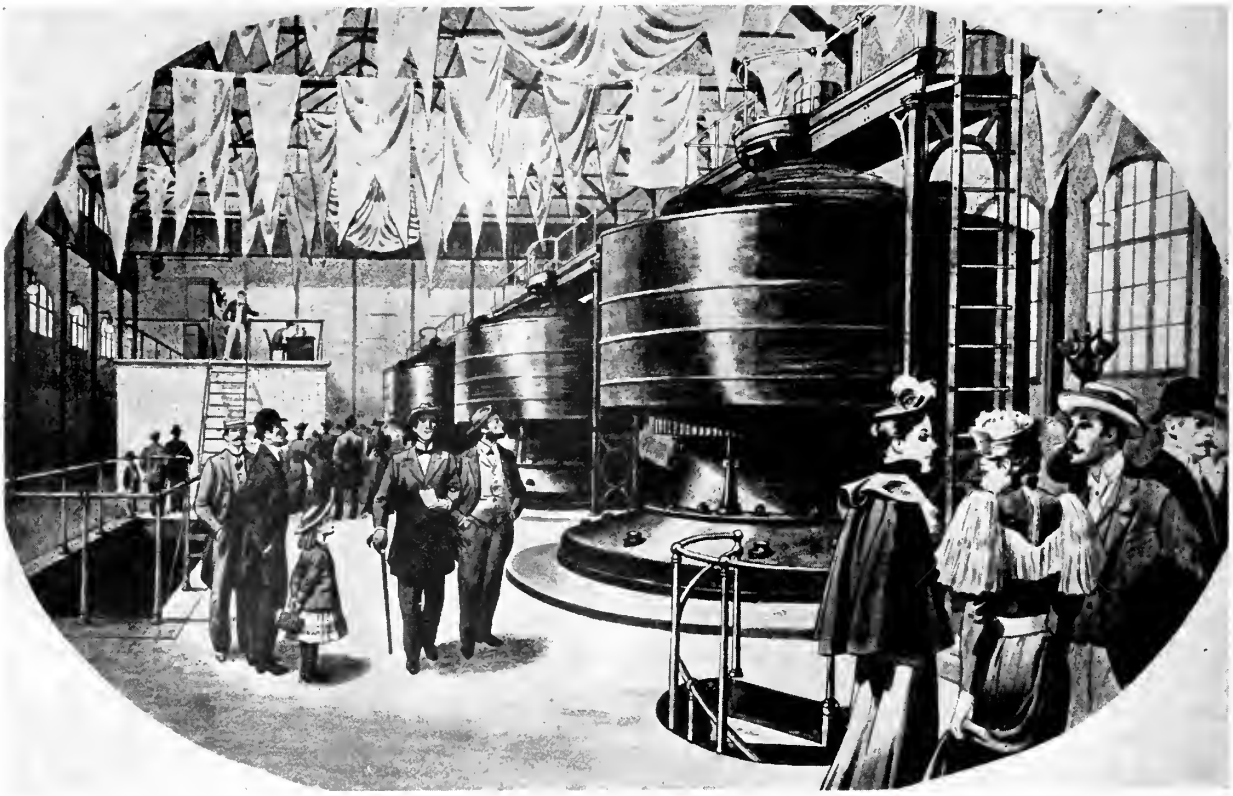
Lighting Great Barrington, Mass., by a.c. electric lights, March 20, 1886.

cessity of having a very public demonstration on a large scale, and when the Columbian International Exposition at Chicago was planned for 1893, he put in a bid for the electric lighting and power installation that was so low it meant a saving to the exposition of more than a million dollars, as compared with the bid of his nearest competitor. A quarter of a million lamps illuminated this exposition and these were all operated by alternating current.

The Steam Turbine

The opposition was still strong but Westinghouse kept right on with his development work—building hydroelectric power plants with a.c. transmission lines, some of which were for installation in California—bringing out the induction motor—designing the rotary converter. A complete layout for alternating current development of the Niagara Falls project was perfected and submitted to the International Committee which included Lord Kelvin and Thomas Edison, both strong supporters of d.c. Kelvin at last capitulated and on October 24, 1893, the Committee awarded Westinghouse a contract for three 5000 shp polyphase generators. Transmission lines were run to Buffalo, 22 miles distant, and three seconds after midnight, November 16, 1896, switches were closed and Niagara power was

Westinghouse Exhibit at Chicago Columbian Exposition, 1893.



Generator House at Niagara Falls, 1895.

operating in Buffalo. This plant soon set the pace for a.c. power developments all over the world.

About 1894, Westinghouse secured the American rights to manufacture the Parsons steam turbine and under his magic touch this machine soon developed into a very economical and dependable power unit for central stations and for ships. In 1905, he produced the first single-phase a.c. main-line electric locomotive. In 1911, he brought out, with the help of Rear Admiral Melville and John H. McAlpin, the first American reduction gear drive for marine steam turbines.

In 1913, his heart began to murmur and the doctor ordered complete rest. The great engineer retired to his estate at Lenox, Massachusetts, where he passed away March 12, 1914, at the age of 68.

This man was too busy to write an autobiography, and he seldom made any comments about his career or his times. However, in a reminiscent mood one day he said, "If some day they say of me that in my work I have contributed something to the welfare and happiness of my fellow men, I shall be satisfied."

Rest in peace, George. Millions of your fellow men have praised your work either by word or by substantial orders for your products.

Richmond No. 3 Opened For Limited Lease Bids

The United States Maritime Commission terminated on September 30 the existing arrangement with the Kaiser Company, Inc. lease for the use of the government-owned shipyard No. 3 at Richmond, California.

The Kaiser Company has occupied the yard under a temporary arrangement originally negotiated to provide for emergency repairs to war damaged ships. The lease expired December 31, 1945. The Kaiser Company has since been utilizing these valuable and large government-owned facilities for various types of undertakings unrelated to Merchant Marine activities.

The Commission will be advertising the yard for competitive bidding on a proper value base for use in ship repair, reconditioning, reconversion and scrapping.

The Commission has also taken action to expedite the transfer to the War Assets Administration of government-owned shipyards 1, 2, and 4, at Richmond for such use as the WAA sanctions.

Mechanical Handling Must Come

By WILLIAM C. CROSBY

The Author Is Vice President of Mechanical Handling Techniques, Inc., New York

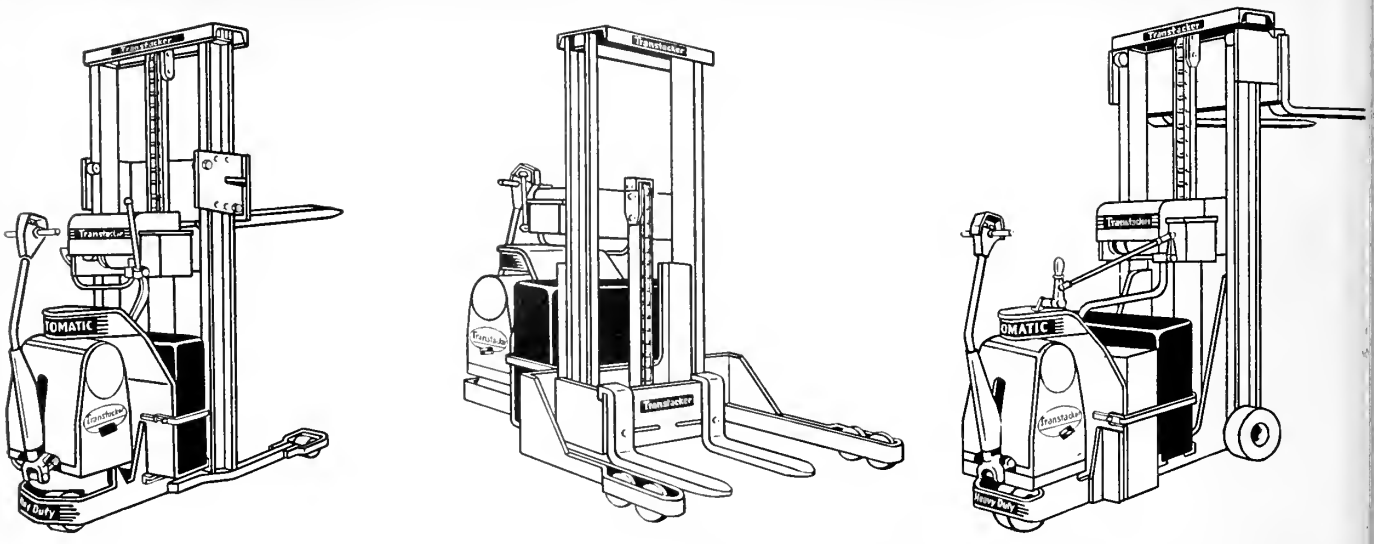
THE DAYS OF THE WAR SHIPPING Administration are numbered. Government operation of seagoing commercial vessels will soon be a thing of the past. The old established intercoastal steamship lines are stirring from four years of operational inactivity with a wartime "hangover" that can make them or break them. Undoubtedly it will make some and break others. Which will be the forunate ones?

The answer to that one is not only of interest to the investing public and the officers and employees of the lines concerned, it is of vital interest to shippers, terminal operators, truckmen, warehousemen, in fact it is of extremely vital interest to the entire economy of the West Coast. Even a cursory study of transcontinental rail rates must make clear to the most amateur economist just what the existence of the intercoastal lines has meant in hard cash to the businessman of the Far West. It is impossible for anyone to break out and say for sure what factor has contributed most to the development of an area, but there can be no question that the rail rates set by the competition of the intercoastal lines have truly been one of the major factors in the growth of business along the West Coast.

Yet today the head of many an intercoastal steamship company must seriously be wondering if his line is going to make the transformation successfully. The big question in the minds of these executives is, "Will transcontinental rail rates be sufficiently higher to permit water carriers to operate profitably?" That question is bound to lead to query number two, "How can I cut my costs

(Note: The pictures illustrating this article were furnished by the Exide IRON CLAD TOPICS. Exide batteries power the trucks shown on this and the following pages.)

Careful study of materials movement throughout any plant usually suggests many ways to cut handling costs. Battery-powered trucks enable faster set-up time of machines; they assure faster movement of materials through all plant operations which normally results in better utilization of skilled workers and high-speed machines; tiering trucks increase storage capacity by full utilization of the cubic capacity storage areas, and they make possible substantial reductions in the man-hours required to unload or load freight cars and highway trucks and trailers.



The new Transtacker made by Automatic Transportation Company, Chicago, is the motorized hand truck counterpart of electric-propelled fork-lift trucks. Left to right, the open-face pallet model, capacity 3,000 pounds; the straddle type pallet model, for single- or double-faced pallets, capacity 4,000 pounds; and the extended load or "cantilever" model, made for skid platforms, these Transtackers do the work of fork-lift and high-lift platform trucks where weight, size, speed or cost make the larger units impractical.

so that I can operate under the ceilings established by the rail rates and still not go broke?"

When that question comes up, the statistical department of many a steamship company will go into a period of feverish activity. The cost of this and the cost of that will be analyzed. There will be very solemn meetings of the "Board." But, if the preliminary figures are borne out, and there is every indication that they will be, no matter what else those figures show they will inevitably point the finger at terminal operations. They will show port costs taking an even bigger slice of the revenue dollar. In some cases, they are going to show port costs threatening to eat up almost 60 per cent of gross revenues.

And right there, luckily for the steamship operators, there is one of the greatest opportunities to profit by circumstance that has come along in years. The whole question of terminal costs, operating methods, materials handling systems has been given one of those stir-ups that only a war could give an industrial function as old and habit ridden as freight handling. From this mix-up, from this shifting and changing that was the war, have come wholly new ways of doing almost everything that is done on a pier, and the most important new way of all is a new way of thinking about the whole problem.

I know a couple of terminal superintendents, old-timers but great guys, who right at this point are going to turn the page to something else. "Oh," they'll be thinking, "I tried some of these so-called new methods the Army and the Navy used in the war. They're all right maybe for military supplies, but they don't work on my piers."

And maybe they are right. But the fact remains that the handling methods employed between the wars, that is from 1920 to 1941, without much change, simply cannot solve the problems which are here today. A complete change of viewpoint, a basic reappraisal is required. If any known methods don't do the job, somebody somewhere has got to think up a new method that will do the job.

That is where the intercoastal lines have it over almost any other run in the world. If ever a trade route was ideal for developing mechanized handling methods, new thinking and a whole new approach to the problem of terminal costs, it is the intercoastal steamship companies.

These companies have three major characteristics which put them in this enviable position. First, they are all American Flag lines operating under the same wage scales and their ships will be similar in design to start off with. Second, the ports they hit are all located in the United States where power equipment and the men to operate it are available. And thirdly, and probably most important of all, they handle certain volume commodities which lend themselves ideally to mechanical handling as we know it today or as we can foresee it in the future.

However, this favored position will not develop the savings it should unless something is done about it. Not unless the operators grasp the opportunity here and now will they be able to realize the potential profits.

True, mechanization will come eventually whether the steamship companies do anything about it or not. But when it does come, if the steamship companies are still in business, they will have to adapt their ships and their methods to the other fellows' mechanization. By acting now, and acting together, they can guide this change so that it will result in the maximum benefit to themselves.

Their record along these lines to date is not too good.

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Postwar Shipping Program In the Pacific

By A. W. GATOV *Executive Director, Pacific American Steamship Association*

THOUGH THE PACIFIC AMERICAN STEAMSHIP ASSOCIATION has a membership serving foreign as well as domestic routes, both of which are deeply involved in enormous efforts towards rehabilitation on a private basis, the domestic services seem to be facing the roughest going. Further, since the Stockton area has a greater interest at the moment in our domestic trades, I will speak largely in regard to these routes which, before the war, in sailings, cargo tonnage and ships, represented more than all the rest of our Pacific Coast shipping combined.

Still further, the domestic branch of our family is substantially a long-voyage trade; the intercoastal service, for example, covers 13,000 miles more or less for a round trip. You, in Stockton, have seen that the ships employed in these trades are of a size and type which could journey anywhere in the world. So let it be known at the outset that we are talking about shipping in its relationship to Stockton, not in terms of barges, rafts or river boats, but of ocean-going ships.

Let's look at what happened to our domestic trades. You are all thoroughly familiar with the stirring story of the conversion of American industry to the needs of war, and in this respect the Stockton area, it goes without saying, did more than its share. In domestic shipping it was not a conversion—it was a complete obliteration. A few weeks after Pearl Harbor the trade ceased to exist. Highly skilled and specialized organizations which had taken years to train and build were absorbed in other fields almost overnight.

Fortunately for the Nation, the rail and highway carriers shouldered the added burden of traditionally waterborne traffic, and we all know they did a magnificent job of handling it.

BEFORE THE TRAFFIC CLUB, STOCKTON, CALIFORNIA, AUGUST 27, 1946

With the ending of the war, in which the record of our domestic fleets was in the highest tradition of our merchant navy, many of its ships and many of its best men did not return. The ships which did come back—and many of them were frequent callers at your port—were battered and worn with four weary years of the hardest kind of usage. Their age and the beating they took did not justify more than temporary reconditioning. The trade had to be re-tooled on a wholesale basis.

Thanks to the courage and foresight of Captain Granville Conway, then Acting Administrator of the War Shipping Administration, and his associates, the United States moved vigorously and effectively to tackle the problem. Bearing out the military and other interests in the preservation of domestic shipping, the War Department, the Navy Department, as well as the Departments of Agriculture and Commerce, urged the Maritime Commission to act affirmatively and speedily. There was a taking of stock, and it was obvious in terms of simple arithmetic that the prewar rates were totally inadequate for postwar costs. And as to the question of why private operations were not resumed, it was thoroughly understood that while the Government could have made the domestic operators a present of the new ships necessary, even the most careful of operators, cutting costs to the bone, would have lost out.

Two months after V-J Day a limited number of Victory-type freighters were assigned by the War Shipping Administration to the various holders of Intercoastal Service Certificates on a basis roughly approximating the prewar service of each of the respective lines. In respect to the off-shore trades, the rate adjustment problem was met by the simple device of taking the prewar conference tariffs and adding a percentage surcharge. In the domestic trades there was no such easy answer. As you know, the intercoastal and coastwise operators have been under the jurisdiction of the Interstate Commerce Commission since 1940. The procedures of the Interstate Commerce Commission to protect the public interests are, perhaps, properly designed to avoid hasty,

emergency action on rate increases. There is also the ever-present complication of the relationship between rail and water rates and its effect on water-borne cargo volume.

It was fully realized in advance that the experiment would be at taxpayers' expense—to a greater or lesser degree—but it was felt there was ample justification for the action. It meant, first of all, the continued operation of a substantial fleet of ships which otherwise would have been—and also at taxpayers' expense—added to the laid-up fleet. It meant an immediate alleviation of the situation where, through a terrific shortage of rail equipment, the rehabilitation of our national economy was seriously hampered. It meant a continued employment of officers and crews, of longshore labor and repair yards; in fact, all the manpower and materials which such a vast operation requires. It also meant revenues for port facilities; but, principally, it demonstrated in practical terms that the domestic services were necessary and required. It was felt that in a measure this also would provide the trial period during which a determination might be made as to what adjustments would be required to preserve the domestic trades under private operation. A new rate level which, in some measure, would reflect the vital changes that have occurred in shipping during the past decade was essential.

The next move came late in March of this year, when the War Shipping Administration, joined by the Maritime Commission, petitioned the Interstate Commerce Commission to conduct a full investigation of intercoastal and coastwise rates and their relationship to the rates of competing forms of transportation. Thus far, however, the Interstate Commerce Commission, as the governing body for rate control, has not undertaken decisive action. Its process of review, prolonged at best, has not been spurred by the immediate need for action which the steamship lines face at this reconversion period. The Interstate Commerce Commission, it would seem, has been largely unimpressed by the magnitude of the issue. In respect to the many manufacturers, packers and distributors who use water transportation, it is regrettable that we and they must continue to face the uncertainties in regard to the future of our mode of transportation. It seems to be some months off before the Interstate Commerce Commission can be expected to provide the urgently required rate decisions. There has been delay after delay, and we understand further progress has now been postponed until September 30, at which time oral hearings will begin in Washington before the full Commission, not on a rate investigation, but on the Interstate Commerce Commission's legal right to make such investigation as was petitioned by the water carriers. It is only a hope, but perhaps important decisions may result.

It is doubted that any substantial number of people in this country woud favor Government operation of domestic shipping on a permanent basis. It is certain that such a move does not motivate the officials who are behind the present experiment. Though it may be considered by some as only a stop-gap operation, it is a useful and constructive one, and that it is not unpopular with the shipping public has been demonstrated by the fact that in spite of all sorts of handicaps, the showing which started from scratch has reached a heartening volume.

Before the war 143 ships, totaling approximately one and a half million tons, were engaged in intercoastal trading. Today, under the War Shipping Administration, there are about 58 ships of approximately one-half million tons. The speed of the presently employed, faster, Victory-type vessels does, however, offset to some degree the great difference.

The War Shipping Administration is operating the service at a loss, as would also be the case were the ships under private operation. At the moment there exists, for many reasons, a shortage of eastbound space. Paradoxically, additional vessels for this seemingly attractive tonnage can only be employed by increasing the loss to the WSA.

As a government agency expending taxpayer's funds, the War Shipping Administration ,it would appear, could not over-tonnage the route on prospect of trade development and is in the position where concrete demands, or, if you like, emergencies are the only considerations for expansion.

It is our understanding, however, that some relief will be afforded by use of spot vessels in Pacific Coast positions which, after the half voyage east-bound, can be further employed in the Atlantic off-shore trades or laid up in the East.

Concurrent with the War Shipping Administration's admirable efforts to cut expenses, we find yet another governmental agency, the Office of Defense Transportation, making a strong recommendation that our Government undertake an expenditure of 200 million dollars for rail car construction to relieve the serious shortage.

Strangely enough, there was no mention by the Office of Defense Transportation that additional ships, using realistic rates, could offer immediate relief. The shipping industry has brought this interesting situation to the attention of the Government.

It would be sheer folly for me to guess at the overall rate increase necessary to put the domestic trades on a paying basis. You will be interested, however, in hearing the sad story of some of the factors involved in the new rate determination.

In the pre-war days, an intercoastal turn-around meant anywhere from 80 to 100 days. On the long leg of the voyage between the coasts the transit time ran roughly

from 17 to 21 days. With the higher speed Victories now running, however, the turn-arounds, barring slowdowns, sit-downs and jurisdictional disputes, have dropped to roughly 70 days and the transit time has been reduced to 14 days. Against all this time saving, here are some interesting figures from actual experience:

In 1939 the ship wage and overtime bill for an intercoastal round trip was $14,000. Today it is in excess of $27,000. Prewar the ship's complement fed for 80c per man per day. Now the figure is over $1.37. On the cargo side, for almost identical commodity make-ups, a ton of cargo handled in and out in 1939 cost an average of $3.12. In 1946 the same operation is costing over $6.00, and the ceiling hasn't been reached yet. Excluding repairs, insurance and overhead on which present conditions do not permit a fair comparison, a normal round voyage in 1939 would run about $85,000. Today it involves an expenditure of about $150,000 plus, and there is no guessing at the moment as to the extent of the plus, but it is by no means a small one.

Before the war intercoastal lines were able to operate side by side with rails and the structure of the cost elements for both was somewhat comparable. This is no longer the case. During the period of Government control, wage costs for steamship lines were extensively increased by grants to labor which are grossly disproportionate to those granted by the same governmental body to employees in other modes of transportation and private industry generally. They are lasting concessions which cannot be absorbed without compensating adjustments. The average straight time rate for all railroad employees, excepting executives, officials and staff assistants, has risen from 75 cents per hour in 1941 to $1.09 per hour after the recently averted national rail strike. This represents a rise of 46 per cent.

In the shipping industry, the base wage for unlicensed personnel has jumped in the same period by an average of 124 per cent. The pay for an able seaman, as an example, was increased by 133 per cent. These are important factors in shipping's competitive position with other forms of transportation but are not, by far, the only ones. In shipping, some 40 per cent of the operating expense is cargo-handling cost. On this phase, Pacific Coast wages have increased by nearly 50 per cent—a figure not in itself too disturbing were it not for the fact that at the same time there was a heavy decrease in longshore efficiency.

You have labor troubles of your own, and having ourselves suffered instability and sometimes chaos for over 12 years, we know whereof we speak when we say we have full appreciation and understanding of what lies ahead for you.

About the future in our Pacific Coast offshore trades, it would appear that for some time to come, our imports and exports, excluding relief goods, will be largely governed not by the desire to trade and the demand for goods

Albert W. Gatov, executive director, Pacific American Steamship Ass'n.

but by conditions under which trade must be conducted. Conditions here and abroad preclude large-scale free trading at once and for at least a year, although an encouraging expansion is taking place.

Our production has fallen short of meeting domestic demands and, translating this into offshore shipping terms, it means a continued lag. Foreign nations still under the impact of war-born civil strife are likewise unable to produce raw materials which they normally import and which supports the necessary two-way trade and loadings.

Transportation facilities abroad are limited, and inland facilities need restoration before trade is to be resumed satisfactorily. Overseas warehousing is poor; dock installations are incapable of handling large volumes. In addition, foreign exchange difficulties are still present. There is the ever-present danger that ultimately our spiraling rise in prices may put us at a disadvantage with foreign trade competitors though our own production be plentiful. There are extensive blueprints for Pacific Coast foreign trade services by American steamship lines, contingent upon a developed and sustained volume of foreign trade and from opportunities arising out of the elimination of the Japanese and German merchant fleets. Such transpacific expansion, however, must take into consideration that in 1936, for example, three-fourths of our exports to the Far East were destined for Japan and one-fourth of our imports originated there. It is obvious that in the long pull it must first be seen to what extent that trade can be replaced by our relations with a New Japan or by markets elsewhere.

We must not overlook the fact that we have no exclusive rights in the Pacific. England is working diligently to regain her supremacy of the seas; Norway, Sweden and other traditionally maritime nations are planning

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Marine Insurance

Interest in our occasional articles on special phases of marine risk prompts the establishment of a regular section. It will include, in addition to technical discussion of insurance problems, a letter from a special correspondent in London, legal decisions on insurance points, and insurance news of interest to the marine world.—Ed.

THERE WERE MANY SHIPS IN OLDEN TIMES. The Ark that Noah built in 2500 B.C. was a three-decker, and "pitched without and within," indicating that the art of caulking vessels to make them watertight was well understood.

We are told that Jacob, about 1689 B.C., in blessing his children, indicated that "Zebulun shall dwell at the haven of the sea; and it shall be for a haven of ships" (Genesis 49:13). In Numbers 24:24, we read "ships shall come from the coast of Chittim and shall afflict Asshur and Eber." Deborah complains that "Dan remains in ships" (Judges 5:17), and in 1000 B.C. "King Solomon made a navy of ships. And Hiram sent in the Navy his servants, shipmen that had knowledge of the sea" (1 Kings). There are many references to "Phoenician" ships of Tarshish, which plied the length of the Mediterranean in trade.

But the sea in those early days was a cruel master and many were the ships that never returned to their "havens."

The losses entailed, including those sacrificial losses caused by jettison in order to lighten and save the ship, caused merchants to seek some method of sharing these losses—and insurance was born. Not insurance as we know it today, but the principle of the distribution of loss over the many, in order that the burden of loss may not oppress the few, appears in "general average," the method devised by these ancient merchants to distribute losses due to jettison.

U. S. Development

The progress of marine insurance in the United States has always been an uphill fight. Unlike other forms of insurance, it is international in its character and consequently marine companies are in active competition with the underwriters of the world. Competing with the old and strongly financed companies of Great Britain, the American companies had and still have a difficult struggle. The foreign company does a world-wide business while the American company is to a considerable degree confined in its underwriting to risks to and from the United States. In order to force American companies out of this business, foreign underwriters will often write American business at unprofitable rates in an effort to control it. Furthermore, most of the larger British companies are entered in the American insurance field and carry on locally an active competition for business.

Nevertheless, in spite of the obstacles there is a well-established marine insurance facility in the United States today, fully able to care for the needs of American merchants and shipowners, but unnecessarily handicapped in combating foreign competition by the unwise restrictions placed upon its activities by the various States and unduly burdened by taxes high in comparison with those assessed by the governments of foreign countries.

World Trade

The practice of selling goods in foreign markets on a credit basis would not be carried on, were it not for the security given by the marine insurance policy. This document is always attached to the commercial papers or is referred to in them, and is available to indemnify against loss of or damage to the goods on which the credit transaction is founded.

When consideration is given to the trenmendous volume of goods which is constantly in transit from market to market to supply the needs and the desires of mankind, some appreciation may be had of the very vital place that marine insurance has in the life of man. Were this system not available to furnish, in almost limitless amounts, indemnity against marine and transportation perils, only a small measure of the human comfort that man has attained would be enjoyed. Credit transactions make possible the international interchange of commodities, the credits being given on the security of real values as evidenced by the goods in transit. The continued existence of these goods while the credit continues is vital to the security of the lending bank, but as all goods are perishable and subject to loss or damage, the lender places his real reliance on the policy of insurance, know-

ing that by virtue of this document his security will not be destroyed merely because the collateral itself has been destroyed or damaged.

Protection all the Way

Marine insurance, originally designed to protect property at risk at sea, has been greatly broadened to cover the transportation of property not only by water but by land and, in more recent times, by air. The policy, as originally developed, described only perils encountered at sea. It has been necessary to add new clauses to policies enumerating the perils insured prior and subsequent to property being waterborne. One of these forms reads:

> **"Goods while on land conveyances are covered against loss or damage caused by fire, collision, derailment, or by any other accident to the conveyance; while on docks or elsewhere or shore, against the risks of cyclones, hurricanes and collapse and/or subsidence of docks, wharves, piers or quays and also against fire and floods (meaning rising of navigable waters) whether this insurance be F.P.A. or otherwise."**

It will be observed that the perils enumerated are of the same general nature as those embraced in the "perils" clause of the marine policy.

London Letter

By Our British Marine Insurance Correspondent

It is safe to say that most European countries have experienced a wave of theft and pilferage in the past few years. In some instances, the extent of the losses has been unprecedented. Taking the United Kingdom as a fair example, it is correct to say that, notwithstanding the addition of extra police (where, that is to say, the manpower problem has permitted this to be done), theft from ships, railroad vans, and, indeed, from any and every kind of vehicle, has shown a remarkable increase compared with pre-war years.

Insurance people, on whom the bulk of these losses fall, as the damage has eventually to come out of the pockets of the underwriters, have on numerous occasions protested that these burdens are more than they should be called upon to bear; but the trouble goes on without any appreciable abatement.

There is no mystery about the cause of the rise in thefts. It is traceable to the shortage of goods, and it is the rationed goods which are so much sought after, because of the very high value which can be realized in the Black Market. Unfortunately, every country has its Black Market.

This brings me to a letter which has been received in London from a business associate in Denmark. The letter reads:

> "I do not know how much British underwriters complain about the losses caused by theft and pilferage, but I may say, from a Danish point of view, both the number of claims and the amount of losses are fantastic, and I may add that it seems as if the experience is specially bad as regards import goods shipped by British vessels. Of course, it is obvious that all kinds of rationed goods are subject to theft and pilferage, and this takes place in England before shipment, as well as on board the vessels and after discharge over here. The delays and lack of control in the ports of shipment and discharge give ample opportunities. Often here it takes a couple of weeks to have the goods cleared through the Customs.
>
> "Underwriters are rather powerless, but certainly something must be done in one way or another to put a brake on these enormous losses. Even the best and strongest packing is no hindrance against theft and pilferage. Often new and strong wooden cases with iron bands are used, but, on the other hand, some British steamship companies are trying to avoid responsibility as per the Carriage of Goods by Sea Act, 1924, as they put a stamp on the bills of lading to the effect that the packing is to be considered insufficient. Such a clause should, to my mind, be null and void and not admissible. It may be different if it is a special written remark against a particular packing, but a general clause cannot be allowed. It would certainly interest me to hear what British underwriters' experiences are as to theft and

"The marine insurance companies in the United States are literally the *protectors* of the financial investments of American shippers and shipowners."

FRED B. GALBREATH,
Manager, Marine Office of America.
San Francisco.

pilferage and as to the above-mentioned clause, and also what the British underwriters intend to do to minimize losses."

British underwriters show their "respect" for the evil-doers by charging a substantial rate in policies covering the risk of theft and pilferage. It is, however, the mention of a bill of lading clause (apparently in general use with some shipowners) automatically clausing the bill to the effect that "packing is insufficient" which is regarded as the most interesting feature of the letter from Denmark—which country is a highly important marine insurance center, entitling any views from that quarter to receive close consideration.

Clearly, any such clause is very undesirable, for—so it would seem to London marine insurance experts—it would appear to preclude underwriters from claiming recoveries from shipowners in circumstances in which, but for the clause, recovery could properly be made. The question arises whether such clauses would stand the test of litigation. If the bill of lading on goods packed securely in substantial containers is claused to the effect that the packing is insufficient, the clause is not in accordance with the facts, and it would seem that, if shippers and consignees registered a formal protest against any such clauses being inserted in bills of lading, such clauses would be held to be of no effect, especially since the automatic inclusion of such clauses in bills of lading is obviously against public interest.

Portuguese underwriters say that the national market is sound by reason of the control of rates by "Premio," the national underwriting association. Basic rates are firm and the English Combined Marine Surcharges schedule is used. Business is in good supply, and the customary practice is for the Portuguese Companies to write the whole of a risk and to re-insure the excess of their retention, mainly in the English market. Whether this business is as satisfactory to English underwriters as it is to those in Portugal is regarded as questionable, in view of the considerable discounts which are allowed on these re-insurances.

Feeling has been aroused in the marine insurance market in the United Kingdom at the implied suggestion, in the "Fourth Report from the Committee of Public Accounts," that underwriters have been profiteering in regard to the insurance of Government imports of commodities. The insurance was effected by placing a vast "open cover" in which practically the whole marine insurance market—Lloyd's and the Companies—participated. The report stated that for 1943 it was estimated that underwriters would earn a margin of about £700,000, "whereas the actual figure proved to be £2,100,000," and that "underwriters agreed to refund a little under £1,000,000 in respect of the profits earned in 1944 and 1945 . . ."

What the committee have overlooked is that marine insurance is a speculative business, the true results of which can only be perceived when the figures over a number of years are available. Incidentally, it is pointed out in London marine insurance circles that the Government made a profit of £90,000,000 out of their own war risk insurance on the hulls of ships, but that there has, as yet, been no suggestion that any portion of this very large profit should be refunded to shipowners.

The Ministry of Transport has arranged with the Decca Navigator Company for experimental operational trials on board merchant ships of the Decca system of radio navigation (the Decca Navigator).

A "chain" of Decca transmitting stations enables a ship, by means of the special Decca radio receiver and charts overprinted with a special pattern of lines, to establish its position in a certain area around the stations. Such a "chain" (using radio frequencies provisionally assigned) has recently been established by the Company for the experimental use of the Royal Navy during survey and mine-sweeping work in the Thames Estuary and parts of the North Sea, and the Ministry of Transport has taken advantage of the existence of this "chain" to test the usefulness of the system to the Mercantile Marine.

Continuous transmissions from the Decca stations began on July 18th and the trials are expected to last some months. The object is to enable the Ministry, in conjunction with the departments concerned with radio navigational aids for aircraft, to assess the value of the system, as at present operated, in relation to other systems of radio navigational aid which are being developed and tried.

The following happened to a London marine insurance commentator, as he wittily—and good humoredly—relates in a contemporary:

"'Shooting a Line'

"No one knows better than I that sub-editing is essential to the best written article and often results in a definite improvement of the matter sub-edited. Even Homer nods sometimes, however, and when last week I wrote, concerning the two fine new Scandinavian ships 'Saga' and 'Kronprins Frederik' that they were vessels on which any underwriter would be 'glad to have a line,' I intended to convey, in market parlance, that they were good risks in which any underwriter would be glad to be interested. I was surprised, and rather amused, to find that my technical phrase had been misunderstood by the 'Sub' who dealt with my matter, and it had been altered to 'both fine ships about which underwriters should be glad to have some information!'"

30,000 Mines Floating in Pacific

United States Naval headquarters estimated that 30,000 mines laid during the war had broken loose and were floating in the Pacific ocean trade currents.

It termed the danger heightened because of an all-out resumption of commercial shipping.

Barge filled with open bales of waste cotton.

The Phobos Ship-Fire Tests

In the August issue of Pacific Marine Review we published a lengthy article on these tests, which we regard as a most important step in the interest of safety of life and property at sea. The tests have now been completed and a formal technical report will be issued in due course at which time it will be reviewed here.—Ed.

The experimental cargo fires on the S.S. Phobos, a Liberty ship converted by the U. S. Navy as an attack transport, have been carried out in the interest of determining just how cargo fires can be controlled and extinguished.

In these cargo fires, cotton in bales was used as the flammable material for the following reasons: (1) cotton fires have always been found the most subborn to combat due to the fibrous nature of the cotton which it was believed gave off sufficient oxygen to maintain a fire condition even though submerged in water; (2) the belief that cotton bale fires started near the center of the bales due to compression causing what has been misnamed "spontaneous combustion."

Preliminary tests, wherein internal ignition of cotton bales was attempted, showed that this was impossible even though such inflammable material as thermite was used as the ignition material. Even in the test fires on the ship the extended application of electric heating units was necessary to cause ignition of the bales, although a cigarette dropped on the surface of the bale would cause a "flash fire" to occur.

In order to make these experiments as widespread as possible in cotton, both the highly compressed bales for overseas shipment and the ordinary "gin bale" as it comes from the cotton gin before high compression were used.

Observations

The first and most important step in dealing with a cargo fire is to *seal the hold* in which the fire occurs.

Steam is not a good extinguishing agent, except for its moisture content. And if there is any possibility of re-ignition, the vacuum created by evaporation will suck air into the danger area to a degree that will even dislodge a hatch cover.

There should be an absolute requirement that an officer on every ship be familiar with all hold openings and the means of closing them.

Any cargo fire can be extinguished with adequate carbon dioxide, but this may require speed to port.

Insurance underwriters should see that there are facilities and experts in every port—other than city fire departments—capable of handling ship fires and servicing the ship equipment.

Merchant Marine schools should place greater emphasis on fire extinguishment.

Rules covering some or all of the above will no doubt appear soon, and the official report on the tests will be awaited with great interest.

Kidde cylinder banks and manifolds.

Admiralty Decisions

by HAROLD S. DOBBS of the San Francisco Bar

Harold S. Dobbs

Who's Who in Ship Accident Cases

In most cases the shipowner finds himself defending personal injury actions where persons are hurt in and about the vessel even though it is difficult to point to the active negligence on which the claim is based. The common thought is that he resembles an insurer and that all one has to do is show that he was hurt aboard ship or in the immediate vicinity of the vessel, in the case of certain groups of claimants, and the shipowner will thereafter be held responsible unless he can show that he was not negligent in a particular situation, rather than the libelant proving that active negligence was a fact.

In *Byars* vs. *Moore-McCormack Lines*, 1946 A.M.C. 985, U. S. Cir. Ct. of App., Second Cir., the plaintiff appeals from a judgment dismissing the action and from a decree in admiralty dismissing the libel of plaintiff-libelant. The libelant sustained injuries by falling through a defective hatch on the steamship PELOTASLOIDE which had been chartered under a bareboat charter to the United States. The injury occurred while Byars was engaged in setting up a beam across an opening in the ship's deck in connection with the construction of an ammunition compartment.

The plaintiff sued Moore-McCormack Lines, Inc., agents for the vessel, at law and also filed a libel in admiralty against the United States and the War Shipping Administration under the bareboat charter made by Lloyd Brazilerio to the latter. Although the crew and officers remained on board, because they were Brazilian citizens and could not be discharged under our naturalization laws, no regular crew watches were kept and the ship was in possession of East Coast Shipyards, an independent contractor employed by the War Shipping Administration for the purpose of making repairs and building the ammunition chamber that has been referred to. The contract specified, among other repairs, the renewal of 50 per cent of the wooden covers to the hatches. The independent contractor had the benefit of a survey of the defective hatches made by one Binder, port engineer of the Moore-McCormack Lines, Inc., a surveyor of the War Shipping Administration, and a representative of Lloyd Brazilerio, the owner of the vessel, and contracted to repair them. There is no reason to suppose that the officers and crew knew how far the hatches were defective or could tell which one of the workmen would be assigned to construct the ammunition compartment, or that it was the business of the officers to safeguard any of the contractor's men against dangers in connection with the defective hatches that were to be repaired. Their employer had notice that 50 per cent of the wood in each was unsafe.

If different contractors had been employed to repair the hatches and to construct rhe compartment, it may be that there would have been a duty on the part of the bareboat charterer and its agents to give notice to the contractor building the compartment that the hatches to be repaired by the other contractor were defective and of that contractor to notify or otherwise guard its employees against defective hatches which they would have been likely to step on in carrying out the construction work. But there was no such duty on the part of the bareboat charterer or its agents where a single contractor had both to repair the hatches and to construct the compartment and it had been given notice of defects in the hatches. It would seem to have been the duty of the contractor to repair the hatches that were defective before its workmen engaged in constructing the compartment were likely to step on them or in the alternative to see to it that any of its workmen likely to use the hatches were warned of their condition.

The bareboat charterer and his agents were not liable for various reasons. First, because the independent contractor had been warned of the defective condition of the hatches and had been given possession of the ship in order to repair them. Second, because none of the parties sued had any reason to assume a separation by the contractor between Byars and his co-employees in their work on hatch covers and construction of the ammunition compartment and had

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Pacific WORLD TRADE
Reg. U. S. Pat. Off.

By T. Douglas MacMullen

What's Going on In China?

By JOHN EARL BAKER, LL.D.,

For many years Officer both for U. S. and for Chinese Government in China.

"WHAT'S GOING ON IN CHINA? Something similar to what went on in these United States from 1861 to 1865," said John Earl Baker, LL.D., many years Officer both for U. S., and for Chinese Government in China, before San Francisco Commonwealth Club luncheon at the Palace Hotel, August 30.

In part, he stated:

"Confronted with armed defiance, Abraham Lincoln took much the same course as Chiang Kai-shek is taking now. Like Chiang, Lincoln lacked unanimous support. In addition to the secessionists in the South, there were 'copperheads' in the North.

"Lincoln offered peace under terms expressed by the one word 'union.' When it was rejected, he was blamed for causing civil war.

"Chiang Kai-shek has insisted on only one condition—a national army; for, no people constitute a united nation if they contain two independent armies. Lincoln was once urged that Jefferson Davis was ready to come to terms. He asked if Robert E. Lee would accept the same terms, for he knew that Davis could implement no agreement to which the Confederate Army was opposed.

"As in Lincoln's day, outside nations have their own interest to serve. The United States has long favored a strong, united China and to that end has sold to China on practically gift terms the munitions already in China which we did not use in defeating the Japs. Russia, wanting satellites in Asia like those in Europe, delivered to the Communists the arms which she captured from the Japanese.

"In Lincoln's day, defenders of slavery were vocal in England, and today critics of the government are vocal in the United States. They portray at length the virtues of the Communists and cry out at greater length the vices of the Kuomintang. Very few of them know at first hand whereof they speak; they get their information from Chinese. If the Chinese got their impressions of America from only the critics of the New Deal one could scarcely blame them for turning to Russia as their guide.

"The gossip on vice and corruption in the Chinese government at least serves to refute the charge that freedom of speech and of the pen are inhibited by fear of concentration camps. If concentration camps exist, that affords another contrast to the Chinese Communists; the latter liquidate their critics.

"But as 'agrarian reformers' they fall far behind the National government. Admittedly, rural conditions in China make for discontent. Farms are too small; interest rates are too high; crops cannot get to market or goods from production points except at too great expense; drouth, flood and pestilence are too frequent and virulenr.

"But the killing off of landlords remedies none of these ills. Around Yenan that remedy was not used,

largely because three years of famine had removed 60 per cent of the population. But in other parts which the Communists have occupied, plundering has been their sole remedy.

"Towards enlarging the average four-acre farm, the government has fostered industry, which in time may move half of the rural population off the farms, and promoting irrigation and conservancy projects which would add to the cultivable area. To reduce the rate of interest, it has fostered and financed rural cooperative credit societies.

"These were the forerunners of the industrial Co-operatives, to which the government has furnished the working capital, and marketing cooperatives, which have raised the price to the farmer of his cotton and his citrus fruits. To increase production, the government has financed the development of improved seeds, which are now being distributed; wheat, cotton, millet and kaoliang—food and fibres—which yield as much as thirty per cent more than the old varieties.

"But if there is one thing beyond any other which the Chinese farmers need for their improvement, it is efficient transportation. Before and during the war, the government had built nearly 100,000 miles of motor road. During the war, out of improvised materials it built 1,000 miles of railway. It has improved the navigability of many interior streams. It has the credit to extend the railway system rapidly, if it were not for the influence of the opposition. What has been the achievement of the opposition in this field? Absolutely nothing.

"For twenty years the Chinese Government has been building up a public health service. In spite of limitation in graduate physicians, public health centers were opened in over 900 counties during the war—practically every county in 'free' China. Epidemics have been controlled—sanitation has been improved. Again, what has the opposition to show?

"Similar comparisons are in order within the field of education. Forty-six million Chinese have become literate during even the war years. Nine thousand doctors have been trained.

"The national government is a going concern, it has the credit, the men with training, skill and vision for the continuance of this performance.

"It will take Chiang Kai-shek as long to unify his country as it did Lincoln.

"When V-J day came, his armies were a thousand

45 Years With Standard Oil

In recognition of 45 years of service with Standard of California, E. J. Macfarlan, assistant foreign trade manager, was presented with a diamond studded service pin on Sept. 5 by Vice President J. H. MacGaregill (at left) while James Black, Foreign Trade Manager at Standard, and Macfarlan's son, E. J. Macfarlan Jr., look on.

miles from the Great Wall. The railways were destroyed, the ships sunk or captured.

"Within a year, the Canton-Hankow railway has been restored, although 239 bridges had to be reconstructed. As a result, south China has been consolidated.

"The second year is being devoted to the rehabilitation of the northern railways. Pacification of that area cannot advance faster than the rails which carry the National armies and their supplies.

"Remember that it took the United States 20 years to get our Constitution in shape, and even then it had to be amended at once to provide our so-called Bill of Rights."

Alden G. Roach, president
Consolidated Steel Corp.

Consolidated to Operate Shipyard in Philippines

FORMATION OF PHILIPPINE CONSOLIDATED SHIPYARDS to engage initially in ship repair operations in the Philippines and the Far East is announced by Alden G. Roach, president, who is also president of Consolidated Steel Corporation. The new enterprise will not engage in business in the United States. Associated with Consolidated Steel Corporation in the new joint venture is the Philippine Industrial Equipment Company, an affiliate of the Industrial Equipment Company, which is controlled by S. D. Bechtel, K. K. Betchtel and John A. McCone. Others associated in this venture are Morrison-Knudsen Company, Inc., K. D. Dawson, Andres Soriano, and other interests in San Francisco and Manila.

The first activity of the new enterprise under contract with the United States Navy Department will be the repair, conversion and making of several hundred smaller Navy craft.

Operations have already begun at Manicani Island, off the coast of Samar, Philippine Islands, and may be extended to other locations currently under negotiation. Existing dry docks and facilities will be utilized and will be expanded as conditions require.

Field operations will be under the sponsorship and direct supervision of Consolidated Steel Corporation personnel, supplemented by personnel who, for a period of years, have been associated with various Bechtel Brothers and McCone activities. Field operations will be under the direction of C. W. Lee, of Consolidated Steel Corporation, as general manager, and George S. Colley, vice president of the Philippine Industrial Equipment Company, and who has long been associated with the W. A. Bechtel Company.

Approximately 200 highly trained engineering and other key personnel drawn from the associated groups are being transferred by air to the Philippines. Approximately 2000 employees, including native labor, will be engaged in this first ship repair operation, with substantial additional personnel to be added to meet future requirements.

Optimistic Over European Trade Prospects

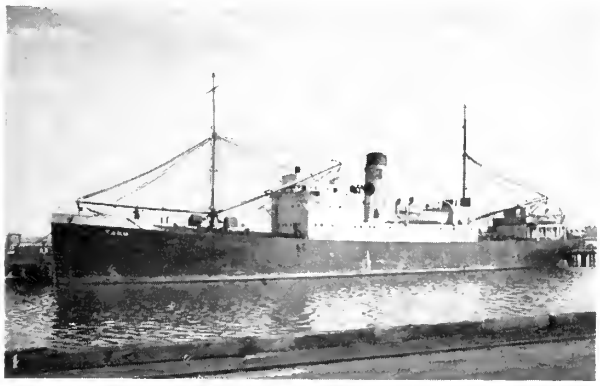
Returning on the Holland-American Steamship liner, Noordem, after spending five months of a business trip in five European countries, J. Alfred Rohner, president of Rohner, Gehrig & Co., 15 Moore Street, New York, one of the better-known customs brokers, international forwarders, and steamship representatives, expressed a feeling of extreme optimism on the future of American imports and exports.

Asked for some comment on European trade restrictions, Rohner was quick to point out that these restrictions are "gradually being lifted or eased," and that it would not surprise him if the bars were dropped altogether within a comparatively short time and free trade prevalent nearly everywhere. He conceded that the proposed revisions of the administrative provisions of the

Tariff Act of 1930 would be helpful. As to reciprocal trade, Rohner indicated that he had always been a firm supporter of it.

In predicting a brilliant future for the foreign trade of the United States, Rohner underlined the fact that all of the European countries were in dire need of American-made goods. The real upswing in business—and this will be tremendous, he asserted—will come where the financial structures of the various countries reach a final degree of settlement.

The business head stated that he was aware that the Paris Peace Conference had some effect on trade, but added that eventual settlement of European matters would work in a positive manner for the economy of all nations.



Steamer Lloyd Cuarto, the ex-Taku, now on the South American run.

Lloyd Line's New Service

Lloyd Shipping Company's first sailing in its proposed fortnightly cargo, refrigerator, and passenger service between San Francisco and Los Angeles, Mexico, Central America and Panama was to be the steamer Lloyd Cuarto, ex-Taku from San Francisco during September. She is a 14-knot vessel of 1400 gross tons with general cargo and reefer space. The second sailing will be taken by the Lloyd Quinto, ex-Tyee, a vessel of similar dimensions. Both sailings are classed 100, A-1 at Lloyd's of London, eliminating any insurance differential.

Lloyd Line already has applied for membership in the steamship conferences which control South American trades including the Canexco freight conference, Capca freight conference, Pacific Coast Panama Canal conference and the Canal, Central America northbound conference.

Ports of call will be San Francisco, Los Angeles, San Diego later, Manzanillo, Mazatlan, Acapulco, Salina Cruz, San Jose, La Union, Amapala, Corinto, Puntarenas, and Panama.

Trade Mart

Foreign traders have noted with interest the recent approval by the New York Legislature authorizing the creation of the World Trade Corporation to consider the establishment of a World Trade Center in New York State to cost at least $100 million. Governor Dewey appointed 10 directors of the corporation to be headed by Winthrop W. Aldrich, Chairman of the Board, Chase National Bank.

Others on the board are: Elliott V. Bell, superintendent, State Banking Department; Herbert Brownell, counsel, American Hotel Association; Basil Harris, president, United States Lines, Inc.; Bayard F. Pope, vice chairman, executive committee, Marine Midland Trust Company of New York; David Sarnoff, president, Radio Corporation of America; David Shotz, lawyer; George H. Sibley, vice president, E. R. Squibbs & Sons; and Charles E. Wilson, president, General Electric Company. M. P. Catherwood, State Commissioner of Commerce, is ex-officio member.

The board will make a survey and select a site for the Trade Center's location, establish an operating organization and recommend a sponsoring municipality which will take over the project of the state-created World Trade Corporation. The World Trade Corporation was authorized to operate for five years and "thereafter until all its liabilities have been discharged."

The proposed Center is expected to be organized along the lines of the prewar Leipzig Fair in Germany. It is likely that should the directors determine to build the Center it will be located in New York City.

Giant Construction Project in Chile

Preliminary findings on a Transandean tunnel project, prepared by an Argentine-Chilean technical commission have been released, according to the Office of International Trade, Department of Commerce.

A 12½-mile all-year tunnel, the longest mountain tunnel in the world, is planned, with terminals at Puente del Inca, Argentina, and at the confluence of the Quebrado de Navarro and Juncal Rivers in Chile.

The average altitude of the tunnel will be approximately 8465 feet above sea-level.

Pacific World Trade

Economy, Safety and Speed Necessary In Packaging for Export

By C. S. TRAER

EXPORT ORDERS WILL PROBABLY play a greater role in the peacetime economy of our Nationa than ever before.

There are millions of people (other than those of our own country) who require food, homes, tools and other necessities of life. Besides the pillaged-needy, there are a few nations untouched by war, but whose commerce is greatly back-logged, and who now have great demands for our goods.

All of these demands represent a challenge to North American industry. If we are unable to meet these demands, the production lines of some other nation will overshadow ours. The *future* must be kept in mind—the day when foreign customers will order *our* goods in a competitive market-to-come.

It is not enough to "just" meet the demands mentioned here. At present, demand is greater than supply and any tendencies toward letting product-quality "slip" must be overcome. The same reasoning holds true in packaging products for export and domestic shipment. Certain packaging materials are difficult to obtain and this may lead some manufacturers along the path of inadequate product-protection. When this happens, the manufacturer is forgetting that his customers want their goods delivered in perfect, usable condition.

A customer "knows" a manufacturer by his product, and it is therefore imperative for U. S. exporters to see to it that their shipments arrive at ports of destination in the best of condition. This precaution, or consideration on the part of the manufacturer is one of the strongest pieces of *sales promotion* he can effect.

Members of North American industry must not allow their high standards of quality, production, packaging or service to recede. Let it be repeated here: we must work not only in the present, but increase our scope and remember the *future.* The *safe arrival* of today's export shipments will strengthen the foundation for future years of foreign trade.

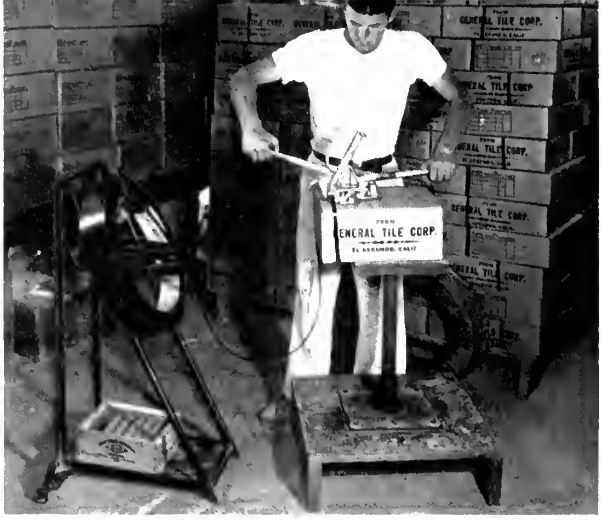
(U. S. Navy Photo)

Steel strapped pallet loads are easily and quickly loaded in a ship's hold. Note maximum use of stowage space, made possible by such compact shipments.

The steel strapping industry of the United States should, and will, continue to assume an important part in pledging safe arrival of exports to world ports. More and more companies are becoming aware of product protection and the scientifically modern methods of binding packages singly, or in units with flat steel strapping. The experience in packaging and shipping, gained by manufacturers during the war years, will stand all exporters in good stead for future shipping.

Known throughout the world for its pioneer work in this field of shipping protection, Acme Steel Company will continue to develop its facilities for counsel and assistance of shippers who desire to economically package their products for safe arrival at ports of destination.

The basic problems involved in export shipping costs and materials handling are readily solved by using steel strap for reinforcement. Steel strapping supplies the answer to many problems shipmasters have in attempting to load their holds to capacity with more *goods* and less dunnage. The amount of lumber used in crating, boxing

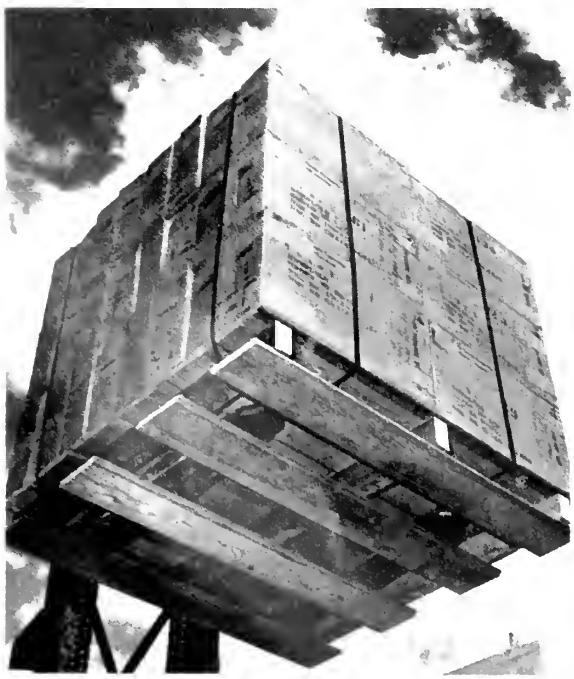


Above, left: Paper, which will be printed into Chinese money, is steel strapped into wooden cases.

Above, right: Proper packing and reinforcing protects otherwise easily-damaged tile while en route to destination.

Above: Twenty-four individual containers are handled as one unit by using a pallet and steel strapping.

Below: The pallet load is easily handled by fork truck and crane. Excellent arrival condition at foreign ports promotes customer good will toward U. S. exporters.



and bracing is reduced through steel strapping methods. This, in turn, permits better utilization of cubic foot space and effectively lowers the tare weight. Both shipper and receiver benefit.

Small items of shipping also benefit by being steel strapped, because they can be bound together, usually on a wooden skid or pallet. Each such unified load, therefore, becomes a more secure, compact, and easier handled shipment. The shipment is easier to keep track of and pilferage losses are minimized when flat steel bands strongly bind a load together.

To correctly strap packages with steel bands, handy tools of the proper size are available. One man can quickly understand the operation and handling of these tools which make swift work of seemingly difficult strapping jobs. Steel strapping is the best method known for insuring the safe, undamaged delivery of export shipments. Surprisingly enough, the steel strap method usually costs less. Whether the products are packed in cases, crates, boxes, bundles, bales, or on skids, there is a type and size of steel strap that will properly reinforce the loads.

It is important, therefore, in the interest of export progress, that American manufacturers of export commodities see to it that their goods are properly and safely packaged so they will be received in excellent condition by the anxious importer—their customer. Savings in shipping costs, time, and manpower will be of the utmost exigency to the importer and exporter, and speedier channels of supply will assist the wheels of international commerce to revolve with greater smoothness for lasting peace.

In developing export business, steel strapping, in its small, unspectacular way, will be doing much to convince importers that when they buy from the U. S. A., the products purchased are bound to get there "as ordered."

EDITOR'S NOTE: C. S. Traer is president of Acme Steel Company, Chicago. Mr. Traer's company manufactures hot and cold strip steel and a line of strip steel specialties. Among the specialties is steel strapping which is universally used in domestic and export packaging and shipping to obtain better, more economical shipping of products transported by truck, rail or boat.

ed pipe ready for shipment to Arabian-American's Ras Tanura Refinery in Saudi Arabia.

Here are 20, 22 and 24 inch oil line pipes for Arabia. The sections are 30 feet long and are nested and spot-welded to save cargo space.

Nested Pipe Saves Cargo Space on Long Trip to Arabia

Simplified handling and reduction of shipping space requirements are among the valuable advantages being realized by Arabian American Oil Company as the result of the introduction of a method of shipping steel pipe. (Arabian American Oil Company is owned jointly by Standard of California and The Texas Company.)

The idea which is leading to this economy is the nesting of various sizes of pipe one inside the other thereby telescoping two or three lengths of pipe into one.

The nesting plan was first employed on Arabian American supply loads originating on the Pacific Coast in the month of September. The initial Pacific Coast shipment consisted of more than 203 tons of 20-, 22- and 24-inch steel pipe in 30-foot lengths and was sent to Arabia via Transpacific Transportation Company's S.S. Tawali.

Since it is essential that the inner sections of pipe be made secure to eliminate the danger of injury to the crew, ship, cargo, or to the pipe itself, the plan calls for the insertion of small steel wedges between the pipes. The wedges are held fast by spot welds. Although sufficiently sturdy to hold the pipe in place, the welds are easily removed by a burner when the load reaches its destination.

To check the system under the most adverse conditions, sample loads nested and secured in this manner were given two "rough treatment" tests. First, railroad cars with full loads of nested pipe were roughly shunted into strings of other cars. Next, groups were dropped from boom slings onto wharves. These tests proved beyond any doubt that the nests would not accidentally break loose.

A second load of more than 23 tons of nested pipe will be shipped from San Francisco by Arabian American early in October.

Cabin Phone Service Brings World To Passengers' Arms' Reach

Passengers on the Cunard White Star liner, Queen Elizabeth, world's largest passenger ship now being prepared for her maiden luxury voyage from Southampton, England, to New York, will be anything but isolated from the rest of the world during their transatlantic trips. All first class staterooms have been equipped with telephones, which passengers can pick up and talk to any part of the world. Cabin passengers have specially soundproofed rooms for long-distance, radio-telephone calls. The huge ship has also been equipped with a completely up-to-date radio telegraphy service.

In addition, passengers will be able to hear their favorite radio programs through a specially-designed radio reception system.

Service to South America Will Be Faster

The Mormacgulf Completes Record Trip

The cargo liner Mormacgulf, first of seven improved C-3 type ships built for Moore-McCormack Lines' east coast South America service, has completed her maiden voyage.

The voyage was notable for several reasons, including the fact that it marked the resumption of Moore-McCormack service between the port of Boston and the east coast of South America, and that the Mormacgulf maintained a speed at sea which is believed to be a record for cargo liners in that service.

During the run from Santos, Brazil, to Trinidad where the ship stopped to load northbound cargo, she maintained an average speed of 18.9 knots. She had been advertised to make 17½ knots, but her master, Captain Jesse R. Hodges, said he believed she could make 21 knots with no difficulty.

The ship maintained average speed of 18.6 knots between Trinidad and Boston, and again 18.6 knots on the run from Boston to New York. Albert V. Moore, President of Moore-McCormack Lines, who attended formal exercises aboard the ship in Boston at which officials of the port and officials of the city and State Governments participated, and then accompanied the ship to New York, said that in all of his experience he did not recall a cargo liner's ever having attained the speed of the Mormacgulf in the east coast South America service.

The new ship carried 14,331 tons of cargo on this first voyage, including 6,836 tons southbound and 7,495 tons northbound. She also carried twelve passengers each way, this being the limit of her accommodations.

The Mormacgulf sailed June 14 from New York on her maiden voyage, after having first loaded cargo in Baltimore. She stopped to discharge and load at Bahia and Rio de Janeiro, Brazil; Montevideo, Uruguay, and Buenos Aires, Argentina. Northbound she stopped at Montevideo, Santos and Trinidad, before Boston.

At Boston the ship discharged coffee, wool, leather, and other cargoes. She will proceed to Philadalphia and Baltimore to discharge additional cargoes. She has sailed from New York on her second voyage, with stops at Rio de Janeiro, Montevideo and Buenos Aires.

The Mormacdawn, third of this group of new ships, is completed, and the Mormacisle, second of the group, is now at sea. Four more of these ships will be delivered to Moore-McCormack during the next four months.

Called "The Ship of the Future," the C-3 Mormacgulf made speed records on her maiden South American trip.

The Navy League Is Expanding

Charles E. Moore, Frazar A. Bailey at Helm

TOWARD THE END OF THIS MONTH when the nation observes Navy Day, many of those who think in terms of national safety will be seeking some active contact with organized groups interested in the maintenance of our Navy's effectiveness. The Navy League offers such an opportunity. One of its means of keeping the country Navy-minded is Navy Day.

This date — October 27 — was originally selected for the annual observance of Navy Day for two reasons. It commemorates the historic day in the year 1775 when the Continental Congress received a Bill providing for the creation and establishment of a fleet to protect the lives and property of a young and struggling nation. Also, it marks the birthday of Theodore Roosevelt, who recognized the vital need for a powerful Navy and inspired the program which resulted in a Navy respected by every nation on earth.

FRAZAR A. BAILEY

The pioneer organization for the national defense in the United States —The Navy League of the United States — is a civilian arm of the Navy. This League — founded in 1902 and incorporated in 1903 by Jarvis B. Edson—believes in a Navy second to none, as an assurance of our security in war and of our prosperity in peace. Mr. Edson was chairman of the Committee appointed by the Naval Order of the United States for the formation of a "society to insure the United States against the possibility of being invaded." On this precept the Navy League was organized.

During its existence the Navy League of the United States has had occasion to contribute much toward our naval preparedness and today as never before there is a need for this civilian support. It is a non-partisan group whose only interest is the national security which our Navy provides.

The Navy League of the United States is headed by Ralph A. Bard, Assistant Secretary and Under Secretary of the Navy during the war. He is now Chairman of the Board of Eversharp, Inc., Chicago.

Northern California is fortunate in having as leaders in this League, Charles E. Moore, president of Moore Machinery Co., as president for Northern California; and Frazar A. Bailey, president Matson Navigation Company, as regional vice president for Region 12, which includes Northern California and Nevada.

CHARLES E. MOORE

Mr. Moore is in complete charge of the Northern California activities of the League. Wherever possible he organizes Navy League Councils to carry on this program, and to appoint the Navy Day chairman for each occasion. Mr. Bailey, as regional vice president, acts as supervisor over all Navy League activities in his region. He helps the state presidents in his territory in any way possible to further the League membersip. He will be glad to hear from those who can aid in this endeavor.

In the meantime—Hail to Navy Day!

Wilmington for Crane Packing

The Los Angeles office of the Crane Packing Co. has found such an opportunity for service to the marine industry that a new office has been found necessary.

Located at 140 North Marine Avenue, Wilmington, the company is now convenient to the piers and shops of the marine industry, and is able to carry a complete line of its products under one roof.

In announcing the removal, R. G. Roshong, Southern California manager, states that plans for manufacturing locally are under way and further word along this line is expected shortly.

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Synopses of Applications For Transpacific Subsidies

Synopses of applications filed by ten American steamship lines seeking financial aid in operation of ocean services and for modification and extension of present subsidized services on various transpacific trade routes are announced by the Maritime Commission. The applications were filed by American President Lines, Ltd.; Olympic Steamship Co.; Oceanic Steamship Co.; United States Lines Co. (American Pioneer Line); Lykes Bros. Steamship Co.; States Steamship Co.; American Mail Line, Ltd.; American Export Lines, Inc.; American-Hawaiian Steamship Co.; and Grace Line, Inc. The latter company, however, stated it would not immediately seek an operating-differential subsidy.

Public hearings on all the applications for subsidy aid or modifications of or extensions of subsidized services on the recently decreed essential transpacific trade routes began in this city on August 12, with F. M. Darr and C. H. McDaniel acting as examiners.

In its application to the Maritime Commission covering operation over various transpacific essential trade routes, the American President Lines, Ltd., proposed the following six-point postwar program:

(1) To continue its established transpacific and round-the-world services under its present subsidy agreement.

(2) To continue its established Atlantic-Straits services, with its subsidy agreement appropriately amplified to cover such services.

(3) To conform its transpacific, round-the-world and Atlantic-Straits subsidized services to the itineraries, sailing frequencies, and number and type of ships recommended in the Maritime Commission's Report on Essential Foreign Trade Routes and Services, issued May 22, 1946.

(4) To supplement the transpacific Passenger-Freight Service "E," as recommended in the Commission's report, by the operation, with subsidy, of four 19-knot improved C-3 type freighters, with the same itinerary and sailing frequency as recommended for the passenger-freight ships, in order to provide adequate fast cargo service otherwise unavailable because of the limited cargo capacity of the passenger-freight ships.

(5) To purchase without delay and as soon as available for use in the subsidized services, all ships, in addition to those now owned by applicant, required fully to meet and conform to the recommendations in the Commission's Trade Route Report, plus four new 19-knot improved C-3 type freighters to supplement transpacific Passenger-Freight Service "E," except only the passenger-freight ships to be used in such service, and to so charter these passenger-freight ships; and

(6) To provide, with or without subsidy as circumstances may warrant, sufficient additional ships and sailings for transpacific, round-the-world and Atlantic-Straits services, adequate to meet all normal and extraordinary and temporary needs and demands of American-flag shipping, and to maintain, develop, promote, and expand services and the foreign commerce of the United States.

The APL also proposes, in its application, to continue its established services with subsidy, in conformity with the description of routes, itineraries and sailings recommended by the Maritime Commission. After identifying those services, APL's application said the vessels in the basic fleet in the transpacific, round-the-world and Atlantic-Straits services, when the additional vessels to be purchased and chartered by applicant are delivered, will be as follows: Four P-2 type passenger-freight vessels, to be chartered under the 1936 Merchant Marine Act; four 19-knot improved C-3 type freighters of special design, to be purchased under Title V of the 1936 Act; seven 19-knot improved C-3-P type combination freight ships of special design, to be purchased under Title V of the 1936 Act; and nine C3-S-A2 type ships, five of which have heretofore been purchased and delivered, one of which is under purchase contract and is to be delivered within 30 days, and three of which are to be purchased under the Merchant Ship Sales Act of 1946.

"The approximate aggregate cost to applicant of the above listed vessels which are now owned or are to be purchased by applicant is $52,450,000," APL said.

"In the interim period pending delivery of the additional vessels to be purchased or chartered by applicant, applicant proposes to operate other ships, including vessels now owned and vessels temporarily to be chartered, in the subsidized services."

The proposed transpacific service of Olympic Steamship Co., as revealed by its application, would serve the U. S. Pacific Coast ports of Los Angeles Harbor, San Francisco Bay and contiguous waters, Columbia River and Willamette River ports, Puget Sound and contiguous waters, and the Canadian ports of British Columbia.

In the Orient, it proposed to serve Manila, Philippine Islands and other Philippine ports, as inducements offer, with privilege of serving ports in China, Japan and Netherlands East Indies, as required and as inducements offer.

Olympic's application called for a frequency of sailings every twenty-one days from American and Canadian Pacific ports to the Orient, proposing a minimum of 12 sailings and a maximum of 18 sailings per year. The character of service would include a fast berth freight service, with limited passenger accommodations, although applicant specified it did not intend to offer any substantial passenger service, but would concentrate upon an efficient and competitive freight service. It proposed to employ C-3 type ships and, in accordance with application for purchase now pending with the Commission, proposed to employ four C-3 vessels or four C-2 type vessels, or a combination thereof if four units of each type cannot be acquired. Any supplemental service would be by charter of American vessels available and acceptable to the Maritime Commission.

The synopsis of application filed by Oceanic Steamship Co. proposed services from U. S. Pacific ports (with privilege of calling at British Columbia ports) to Australian ports of Sydney and/or Melbourne and or Brisbane, with privilege of calling at Hawaiian Islands, Samoa, Fiji, and/or other Pacific Islands lying along the same general route; and with further privilege of extension to other Australian ports as sufficient inducements offer. An alternate schedule proposed services from Pacific (with privilege of calling at British Columbia ports) to Australian ports of Sydney and/or Melbourne and/or Brisbane, with privilege of calling at New Zealand ports and/or at Hawaiian Islands, Samoa, Fiji, or other Pacific Islands in same route; and with further privilege of services to other Australian ports as inducements offer.

Oceanic proposed a frequency of sailings to include 13 sailings per year over each route with privilege of operating about one sailing per month over either of the two routes or over the two routes combined, with further privilege for increase or decrease of sailings to conform to prevailing traffic and economic conditions. As to character of service, it proposed a general freight berth service, with four vessels of the C2-S-AJ1 type, application for purchase of which has been filed with the Commission. Oceanic also requested the privilege of acquiring or chartering, as trade conditions required, four additional vessels of the same type. However, until ships are available, the line will maintain service with vessels interim-chartered from War Shipping Administration.

The synopsis of application filed by United States Lines Co. (American Pioneer Line) for extension of subsidized services to the Far East proposed:

(1) Calling at Straits Settlements and Netherlands East Indies to load and discharge cargo;

(2) Calling at California ports to load and discharge cargo;

(3) Maximum of 26 sailings per annum from United States Atlantic ports.

Over Trade Route 12 (Freight Service), the United States Lines' application proposed the following itinerary for outbound operations: United States Atlantic ports via Panama Canal, Los Angeles, San Francisco to Yokohama, Kobe, Shanghai, Hong Kong, and Manila. Its inbound operation would cover Manila, Hong Kong, Shanghai, Formosa to San Francisco, Los Angeles via Panama Canal to New York, and other United States Atlantic ports, as cargo warrants. Such services would be conditioned upon privilege of calling at other ports in Hawaii, Philippines, Japan, China, Manchuria, Russia in Asia, French Indo-China, and North Atlantic Canadian ports as cargo offers.

To cover the proposed operations, the Company proposed a sailing frequency of every four weeks with four C-2 type freighters.

Over Trade Route 17-28 (Freight Service), the United States Lines Co. proposed the following outbound itinerary: U. S. Atlantic ports via Panama Canal, Los Angeles, San Francisco to Manila, Singapore, and Penang. Inbound would include Penang, Singapore via Suez Canal or Cape of Good Hope, or via the Philippines, China, Japan and Panama Canal if cargo warrants, to New York and other U. S. Atlantic ports, with privilege of calling at North Atlantic Canadian ports and at ports in Hawaii, Philippines, French Indo-China, Straits Settlements, Netherlands East Indies and Siam as cargo offers. Such service would be covered by operation of four C-2 type freighters, sailing every four weeks.

The application of Lykes Bros. was in the nature of a request for extension of an existing trade route so as to include the Dutch East Indies and Malay States area within the Gulf-Orient service now operated by that Company. Additional ports sought to be served are the ports of The Netherlands East Indies, the Federated Malay States and the Straits Settlements. It is planned by Lykes to make about 24 sailings per year with eight C-3 type vessels on the combined service. A sailing schedule of between 18 and 36 sailings is specified. The route covered by the application is Route 22 of the essential trade routes heretofore established by the Maritime Commission.

The application filed by States Steamship Company proposed to operate a bulk and general cargo service with not less than 14 nor more than 25 sailings each year from a port or ports in the States of Washington and Oregon to ports in Japan and/or China, with privilege of calling at ports in Manchuria, Korea, Maritime Province of Siberia, and Philippines, with privilege of returning via California ports to the area of departure. It proposed that the C-2 or similar type vessel be employed.

American Mail Line Ltd., in its application, seeks to extend the Pacific route to include Borneo, Sumatra, Java, Celebes, Singapore, Ceylon and the Eastern Coast of India. It intends to purchase nine vessels of the C-3 type

and will continue to charter ten vessels now under charter until its own vessels can be substituted.

American Export Lines, Inc., by application filed with the Maritime Commission, seeks to extend its Indian trade territory to include the Straits Settlements and The Netherlands East Indies. Ports to be served include: New York, Karachi, Bombay, Colombo, Madras (optional), Singapore, Batavia, Soerabaja, with optional calls at Sabang, Belawan and Samarang, Eastbound; and Macassar, Singapore, Penang, Belawan, Sabang, Rangoon, Madras, Colombo, Karachi, Bombay and New York, Westbound. Regular service would be available every four weeks or more, consisting of cargo ships with accommodations for 12 passengers. Later, as vessels become available, a passenger-cargo service with four ships having passenger capacity of 150 each would be used. Initial service would be in Exporter-type C3-S-A3 ships of about 9900 tons and 16½-knot speed.

The American-Hawaiian Company's application was filed on behalf of a subsidiary to be organized. Ports to be served include California ports, with privilege of calling at ports in Oregon and Washington, Yokohama, Kobe, Osaka, Shanghai, other Japanese and Chinese ports, Manchurian ports, Korean ports, Russian ports as traffic offers, Hongkong, Manila and Philippine Island outports, and French Indo-China.

Sailings, to begin with, would be made as frequently as present disturbed operating, traffic and political conditions permit, employing five C4-S-A4-type ships. The Company also contemplated that when these conditions are stabilized, the vessels will operate with not less than 26 sailings per year, the service to be principally freight.

The synopsis filed by Grace Line stated that Company has made application to purchase four C-3 freight ships for operation in a fortnightly service between San Francisco and Los Angeles and Cebu, Manila, Hong Kong, Shanghai, Dairen, Kobe, Osaka, and Yokohama, with calls at other ports within the Cebu-Yokohama range as cargo offers and conditions warrant. It proposed to pay 25 per cent of the purchase price upon the execution of purchase contracts and to give its promissory notes secured by ship mortgages for the balance.

Grace claimed that the C-3-type vessels are particularly suitable for transpacific operation, pointing to the importance of the transpacific trade to the national economy and defense, making it highly desirable that this trade be served with the most efficient vessels. Assuming that the Maritime Commission has received more applications for purchase of C-3 vessels than are available for sale, Grace stated "we urge that preference be given to purchasers who will operate the vessels in the transpacific trade." Continuing, the synopsis filed by Grace stated:

"We [illegible] to operate without an operating subsidy. We believe [illegible] disappearance of the Japanese lines from the [illegible] increase in tonnage which may be expected from [illegible] growth in population, manufacturing and other activities on the Pacific Coast, together with our own efficiency, will make it possible for us to operate without Government aid. We will not request an operating subsidy unless, after a very substantial period of operation, it becomes apparent that a non-subsidized line cannot operate in the trade."

Coast Guard Amends Ship Inspection and Navigation Rules

Detailed amendments of Coast Guard regulations covering inspection of vessels, navigation and navigable waters, anchorages in ports of the United States, licenses for merchant ship officers, and certificates for merchant seamen, and other items, have been made by the Coast Guard.

Filed with the Register on September 9 and 10, the amendments are designated as F. R. Doc. 46-16281, 46-16282, 46-16283, 46-16285, 46-16286, 46-16287, and 46-16391. They relate, among other things, to "A" marine investigation board rules; boats, rafts, bulkheads, and lifesaving appliances; issuance of certificates and continuous discharge books; construction regulations; fire apparatus and fire prevention; requirements as to hulls, machinery and equipment; duties of inspectors; lifesaving appliances-specifications; lifesaving equipment; manning of inspected vessels; licensed officers and certificated men; construction or material alteration of United States passenger vessels; security of ports, and control of vessels in navigable waters of the United States; vessel inspections; cancellation of certain waivers of navigation and vessel inspection laws and regulations, and rules as to Philippine citizens and subjects.

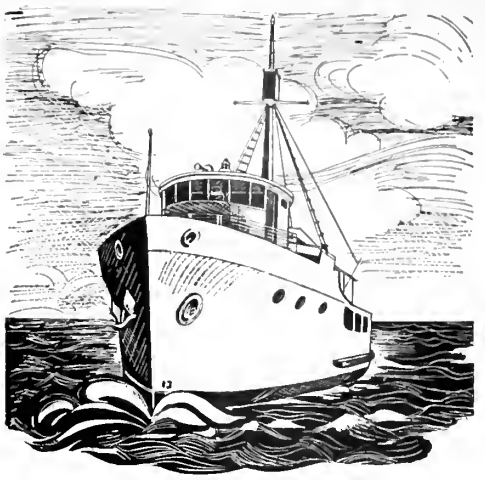
These rule changes are contained in about 20 printed pages of the Register, and copies of "Part I" of the issue of September 11 may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at a cost of 15 cents per copy.

In addition, the Coast Guard, under date of September 9, 1946, issued, and published in the Register of September 11 (F.R. Doc. 46-16284) a notice that "with the cessation of hostilities, the identification card requirements were gradually relaxed, and now the identification cards are no longer required by the Coast Guard for any purpose; accordingly, all Coast Guard (Captain of the Port) Identification Cards are hereby declared invalid, and all persons are cautioned not to accept them for identification, or for any other purpose."

S.S. Patrick Henry Retired

After nearly five years of continuous sailings to fighting fronts and to other faraway ports since the war ended, the SS Patrick Henry, the first of more than 2,700 Liberty ships built to help defeat the Axis, has found snug harbor.

Coast COMMERCIAL CRAFT



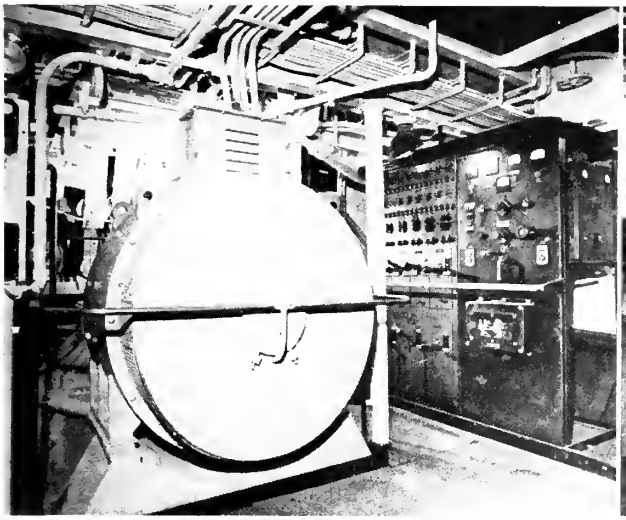
Texaco Takes a New Diesel Electric Tug

THE TEXAS COMPANY has recently taken delivery from the Gulfport Boiler and Welding Works, Port Arthur, of an all-welded steel tug christened Havoline.

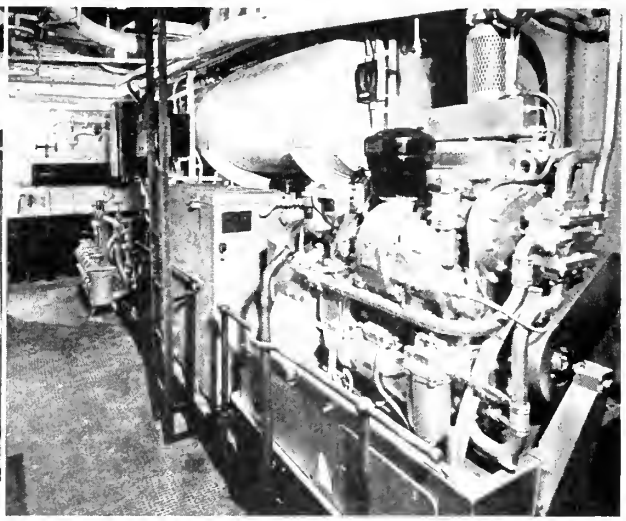
The Havoline, named after the owner's motor oil, is the most powerful of Texaco's G.M. Cleveland diesel powered fleet at Port Arthur, as well as being modern and electrically propelled. Her engine is Model 12-278A. The Gulfport Boiler and Welding Works has done a good job constructing the all-welded steel hull as well as installing the machinery. The tug's length is 102-ft. 2-in., by 24-ft. beam, with a depth of 12-ft. 4-in., and 10-ft. 6-in. draft aft in loaded condition. She is classified to American Bureau of Shipping's highest standard of workmanship.

The propulsion machinery consists of a Cleveland Diesel marine engine of 1200 bhp connected to an 814-kw, 560-volt, 1454-amp, d.c. generator, and turns at 750 rpm when operating at full load.

This diesel-generating unit furnishes current to an electric propelling motor turning at 875 rpm, and connected to the propeller shaft through reduction gearing. The manganese bronze propeller is 8-ft. 10-in. diameter by 7-ft. pitch; is three-bladed, right-handed and turns at 200 rpm free running and develops full torque and



End view of generator in foreground. Instrument panel at right, on the Havoline.



Auxiliary power for the tug is furnished by this Model 71 General Motors diesel generator set.

Master's stateroom on the Havoline.

power at 160 rpm towing. The gearing is of the single-reduction, single-pinion type and incorporates the thrust bearing. The shaft has a diameter of 9⅞ inches.

The main G.M. diesel is of the V-type with twelve 8.75-inch diameter by 10.5-inch stroke cylinders, operating on the two-cycle principle. At 750 rpm the piston speed is 1313 ft. per minute. Engine control is from the pilot house, as well as in the engine room when desired. Duplicate control is arranged alongside the after steering wheel, and during one phase of the trials, the pilot operated the tug from this after position, with none of the crew in the pilot house.

The main engine starting system consists of a starting contactor unit, push button control, special starting winding built into the generator, and a 32-cell, 64-volt electric storage battery. The latter is one of two batteries, the second being a 200-ampere hour lighting battery of 56 cells in lead-lined boxes.

For auxiliary power, a 30-kw, G.M. diesel-generator set of the d.c. type is installed. A 110-volt a.c. motor-generator can be connected with a shore transmission line when the tug is alongside a dock, enabling the various service pumps to be operated without running the auxiliary diesel engine.

Auxiliaries include: A 5-hp, 90-gpm, 50-lb pressure lubeoil pump; a condensate pump for the heating plant; a 200-gpm fire and general service pump driven by a 20-hp motor; a bilge pump driven by a 7½-hp motor; a rotary type 50-gpm fuel oil transfer pump driven by a 3-hp motor; a 395-gpm fresh water pump; a salt water 395-gpm pressure pump; a hand-operated emergency pump, and a 200-psi air compressor—electric motor-driven.

Part of the deck house structure forward and on the port side of the galley contains a G.M. Frigidaire of 20 cu. ft. capacity with wall type freezing unit. An average of 40° can be maintained when the outside temperature is 110° F. Another unusual feature is a 20 cu. ft. quick freeze unit in the galley.

The steering engine is located at the after end of the machinery compartment, and is of the combination worm and spur gear reduction type. The gypsy is driven by a 12½-hp, 125-volt marine type electric motor mounted with its drive gearing under the main deck.

Accommodation is provided for a crew of thirteen

(Please turn to page 115)

Broadside view of the new Texaco tug, Havoline.

The Gulf Clipper, new Biloxi, Mississippi to Ship Island excursion boat.

Below left: Fort Massachusetts, relic of Civil War days on historic Ship Island, 12 miles south of Biloxi in the Gulf of Mexico.

Below, right: Engine used in the Gulf Clipper, a 330 hp General Motors "Twin 6" diesel installed and serviced by Kenneday Marine Supply Co., Biloxi.

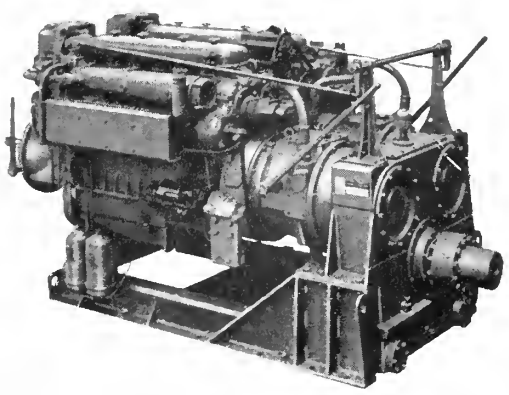
The Gulf Clipper, a New Diesel Excursion Boat

Visitors to the famous winter resort at Biloxi, Mississippi, have more reason than ever to visit historic Ship Island now that the trip is made easy and pleasurable on the sparkling new diesel observation boat, the Gulf Clipper.

On Ship Island, twelve miles out in the gulf from Biloxi, still stands the Civil War strong point "Fort Massachusetts." The fort was started by the Federal Government and completed by Yankee forces during the war between the states. Discovered by Pierre le Moyn D'Iberville in 1699, "Isle Aux Vesseaux," or Ship Island was part of the early French Louisiana Province, the capitol of which was at Biloxi before New Orleans or Mobile were settled. Ship Island later became headquarters for the British during their unsuccessful seige of New Orleans.

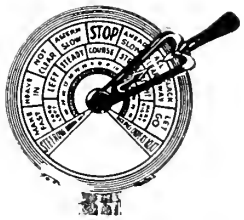
The Gulf Clipper, owned by Marko Skermatti of Biloxi, is a 65-foot "double decker" of 24-foot beam and 4½-foot draft. She can accommodate 300 passengers and plies the blue gulf waters at a twelve-mile clip, making the trip to Ship Island an easy hour's voyage each way. Music, dancing, and refreshments are provided. Besides the old fort, the island offers good fishing and real surf bathing which is not obtainable at Biloxi and Gulfport.

The secret of the Gulf Clipper's smooth propulsion lies in the General Motors "Twin 6" 330 hp 12-cylinder diesel engine. Here is power and to spare for its 46-inch diameter, 37-inch pitch propeller through a 4 to 1 speed reduction gear. At full speed under load, the engine reaches a maximum of 1900 rpm. Cooling water temperature is held to 182° by "keel cooling" which consists of passing the cooling water through 192 feet of brass piping exposed to the hull's exterior. Four trips are made to Ship Island daily, and Mr. Skermatti is confident that his new diesel-powered boat will be kept quite busy throughout the entire year.



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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Shore Opportunities

UNDOUBTEDLY, MANY OF THE MEN TRAINED to take positions as deck officers on American ships are now wondering about their future. To all such, we would suggest that the type of training they have received is a very valuable groundwork for many types of shore work.

The natural outlet for the sailorman ashore is, of course, the shoreside personnel of shipping firms. Here, in positions ranging through office and traffic departments to port captain, he can directly apply most of his special maritime training. Some of the most successful holders of shoreside jobs in the ship operation line have had their early training in sea experience. However, there are many other lines of shore endeavor in which deck officer training and experience are very valuable.

Marine insurance, for instance, presents many opportunities to the deck officer on the beach. Marine insurance uses many surveyors of hull and of cargo, and this is an occupation for which the deck officer is peculiarly adapted. Certainly the deck officer should know: stowage of cargo; safe handling of cargo; safe conditions for operation of deck machinery; seaworthiness of hull; and the other factors affecting safety of a ship at sea from the marine insurance angle. He should know also, the relative dangers of contamination and fire through close proximity of certain materials in cargo stowage, and the adequacy of ventilating and air conditioning equipment. Such factors are the routine responsibility of deck officers, and they are the routine concern of surveyors and safety engineers working for marine insurance firms.

Another outlet ashore for deck officers is with the various terminal operating firms, public port bodies, and steamship operators who own or lease the terminals they use. As dock superintendents, traffic managers, or trade solicitors, deck officers with the right personalities would be ideal. Here again, the D. O. would encounter many of the same problems of cargo handling, personnel management, and housekeeping, with which he has become familiar on shipboard.

The ship chandlery and marine supply business is also a haven ashore for many D. O.'s. Decision and exact knowledge of ship's needs are two qualities acquired only in sea experience, and these qualities are very valuable to a marine supply salesman or sales manager.

These outlets are more or less obvious as being directly dependent on ship operation. However, it is true that in practically every line of supply or service, there are examples of successful achievement by competent deck officers. From operating an egg factory at Petaluma to management of large hotel properties; running a service station to managing large orchard properties, energetic D. O.'s are now, and can in the future, undertake and succeed where many a landlubber fails.

Weather

One of the most important functions of the deck officer on ships of the merchant marine is to give assurance of safety to vessel, cargo, passengers, and crew. Among the more important marine hazards is weather.

Obviously, then, a knowledge of the weather, and an ability to foretell its probable, immediate future, is of great value to the deck officer.

Such knowledge enables him to: make runs in the shortest possible time; keep cargo in better condition; keep passengers more comfortable; and avoid tangling with destructive storms. All this will greatly enhance the personal reputation of the officer, and the public regard for his ship and the company under whose house flag she operates.

By keeping accurate check and records of weather conditions on ocean runs, the deck officer performs a very useful public service. These records, transmitted to

Twenty Second Dramas Wanted

For many months this department of Pacific Marine Review has concerned itself with illustrated description and explanation of the functions and use of the tools of navigation, such as the sextant and the gyroscopic compass. Some of our readers have been suggesting a little variation in these series.

After considerable thought, we have decided to alternate technical material (such as we have been using) with experience and human interest material.

Constructive criticism from deck officers would be appreciated. Also welcome would be questions on any subject that interests our readers. Most welcome would be contributions to this department by any deck officer.

We would like to get from deck officers on American ships short sketches of emergencies leading to "split-second decisions." These should be concise, not more than 250 words, and could very appropriately be called "20-second dramas." The subject matter may be an emergency involving such situations as: the safety of the ship, or any part of her equipment; the safety or health of any member of the crew; the loading or unloading of cargo in a foreign or a domestic port; or the personal safety or saving from embarrassment of the narrator, himself.

Such sketches, if used, will be paid for at the rate of $10.00 per sketch. They will be published with or without "by lines" as desired.

shore by radio, often save millions by enabling weather forecasts to be broadcast so that preparations may be made to meet storms, floods, and frosts.

The modern study of meteorology owes its origin very largely to a deck officer of the United States Navy, Lieutenant Matthew Fontaine Maury, who, in the 1940's, began a systematic study of ocean winds and currents from ships' logs, and produced the first wind rose charts and sailing directions for various routes and seasons. In his famous book, "The Physical Geography of the Sea," Maury wrote these words:

"Marvelous are the offices, and wonderful is the constitution of the atmosphere. Indeed, I know of no subject more fit for profitable thought on the part of the truth-loving, knowledge-seeking student, be he seaman or landsman, than that afforded by the atmosphere and its offices. Of all parts of the physical machinery, of all the contrivances in the mechanism of the universe, the atmosphere with its offices and its adaptations, appears to me to be the most wonderful, sublime, and beautiful."

Occasionally in this department, we shall take up in a suggestive way, some of the practical phases of modern meteorology. In the meantime, we recommend to all deck officers that they add to their personal libraries the latest publication on this subject, "Meteorology with Marine Applications," by William L. Donn, formerly head of Meteorology Section, U. S. Merchant Marine Academy; 465 pages copiously illustrated; published by McGraw Hill; $4.50 net.

Sea Superstitions

In the old days of sail, many superstitions were held by the sailormen as determining the fate of the voyage. In these latter days, seamen and the Maritime Commission hold these superstitions rather scornfully, and in many cases, have gone out of the way to flout them.

Friday, particularly Friday the Thirteenth, is a bad luck sailing day. Many a sailor has quit a ship, rather than sail on such a date.

Rats leaving a ship is a sure sign that great trouble, and probable sinking, is ahead.

A male name for a ship is unlucky. Everything bad that happens to such a vessel is due to her name. Some of these old salts find here the reason for the many disasters of the Liberty ships. A female name is lucky.

A pastor aboard is "bad medicine," and a Finn, particularly a cross-eyed Finn, in the crew, is worse.

Seamen at sea must never kill an albatross or a seagull. Remember the "Ancient Mariner" who, with his "cross-bow, shot the albatross," and the misfortunes that thereafter befell him?

Many superstitions have to do with the moon. Remember the "Wreck of the Hesperus?"

"Then up and spake an old sailor
Had sailed the Spanish Main.
'I pray thee put into yonder port
For I fear a hurricane.

'Last night the moon had a golden ring,
But tonight no moon we see.'
The skipper he blew a whiff from his pipe
And a scornful laugh, laughed he."

But he and his ship, and all of her crew, were lost on Norman's Woe.

(Please turn to page 128)

Wild Ranger

A Quartette of C-2 Names

A GROUP OF FOUR C-2's built by Consolidated Steel Corporation at their Wilmington, California, yard for the Aluminum Company of America were christened: Crest of the Wave, Golden Light, Twilight, and Wild Ranger. A short sketch of the careers of these four clipper ships shows some interesting features.

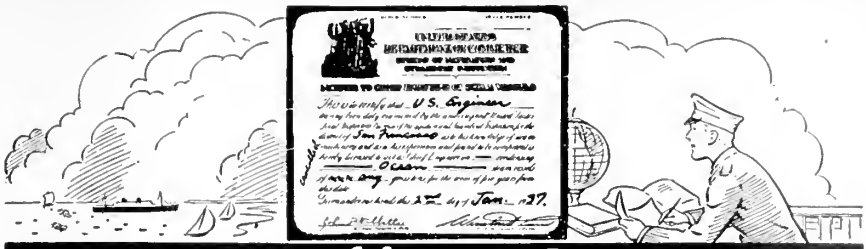
Crest of the Wave, a medium clipper ship, 175 feet long, 34 feet beam, 21 feet depth and of 942 tons, new measurement, was built at Thomaston, Maine, in 1854, and prior to 1861 was owned by M. R. Ludwig of Baltimore. In that year she was seized by U. S. Government as the property of a rebel and later sold to Jones and Co. of Baltimore. She made no record passages and in most of her sea experience was unlucky. On November 6, 1864, she arrived at Acapulco with yellow fever aboard. Thirteen of the crew, the mate, and the captain's wife had died on this voyage and on arrival only the captain was untouched by the disease. In April, 1870, during a severe gale she struck Wreck Island, 15 miles north of Cape Charles, and practically disappeared with all hands. A piece of her quarter board, her flag, and two boats with four bodies were washed ashore.

Golden Light, a medium clipper ship, was built by E. & H. O. Briggs at South Boston in 1852 for James Huckins and Sons. Her length was 167.5 feet, beam 36 feet, depth 22.5 feet, measurement tonnage 1140. Sailed from Boston February 12, 1853, for San Francisco. She was struck by lightning and set afire on February 22. Her crew and passengers, 35 in all, were forced to abandon her the next day in five boats, amply provisioned and watered. Four boats with 27 persons aboard were rescued. The fifth boat with eight persons aboard disappeared.

Twilight, a medium clipper ship, was launched from the yard of Charles Mallory at Mystic, Connecticut, October 6, 1857. Her characteristics were: length 215 feet; beam 40.4 feet; depth 22.7 feet; measurement tonnage 1482; d.w. capacity 2500 tons; 29 inches dead rise; a lively sheer, and a handsome round stern. On her maiden voyage she made San Francisco from New York in 100 days and 20 hours, a very good passage.

On her sixth voyage to San Francisco she was sold there to M. Larco (an agent for a Peruvian shipping firm), renamed Compania Maritima de Peru No. 1. On her return to San Francisco in April, 1866, she appeared as the Portuguese ship Dom Pedro I. Her next appearance at the Golden Gate was in March, 1877, when she

(Please turn to page 134)



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

Electromagnetism

(Conclusion)

The term magnetic lines or tubes of force has been used to aid the mind in visualizing the space around a conductor carrying electric current. They have no more real existence than lines of stress in the piston rod under tension or compression.

The general term *magnetic flux* has been customarily used by electricians for these imaginary lines of magnetic force. Scientists and engineers may use the term *magnetic induction* to express the idea of the magnetic flux around a conductor, or within the area enclosed by a coiled conductor carrying electric current. More particularly the term magnetic induction is reserved to mean the magnetic flux density, which is the number of units of magnetic flux per unit of area of crosssection at right angles to the path of the lines of force. The name of this unit of flux density is gauss and is one line of force per square centimeter. Or magnetic induction is the number of lines of force divided by the area in square centimeters. Good magnetic steel may be magnetized to an induction or flux density of about 13,000 gauss or 96,000 lines of force per square inch. The earth's magnetic field is about one-half gauss.

Thus the term "degaussing" a ship during the World War II referred to removing the residual magnetic lines of force.

If a current carrying conductor is wound into a coil in which the coil length along its axis is several times its diameter, and in which there is one turn of the conductor around the coil per inch of length of the coil, then the coil is said to have a magnetizing force of one ampere turn per inch when one ampere of electric current flows into the conductor.

This magnetizing force is called *field intensity*. The number of turns of a coil per inch of its length times the amperes of current flowing give the ampere-turns per inch of field intensity. The capital letter H is frequently used to designate field intensity. It may be expressed in scientific units in which one oersted equals one gilbert per centimeter equals 2.021 ampere turns per inch of coil length.

Figure 1 illustrates the relationship of these units.

Note also that the flux density may be designated by the capital letter B.

It is interesting to note that an intensity H of 2.021, roughly 2 ampere turns per inch, will produce one gauss of induction or flux density B in air. There being 6.452 square centimeters in one square inch, there will be 6.452 lines of force per sq. in. for each gauss or line per square centimeter. Therefore, by simple division it is evident that 1 ampere turns per inch of field insensity H in air or vacuum produces 3.19 lines of force per square inch of magnetic induction B.

Two thousand ampere turns per inch of coil length is an extremely high value for H seldom encountered. An ordinary value is 75 to 100 A.T. per inch. See Fig. 1. But even with this high value of H we can obtain only a small value of induction B or flux.

Good grades of iron and steel present so little retardation or *reluctance* to the build-up of magnetic lines of

Change in Chiefs

Our Chief is taking a vacation for some months. In the interim the editorial staff will pinch hit on watch. We are very eager to have criticism of this department from operating engineers.

Do you want a question and answer treatment of marine engineering subjects? What are the subjects about which you most want information?

Let us have your ideas and we will try to meet them.

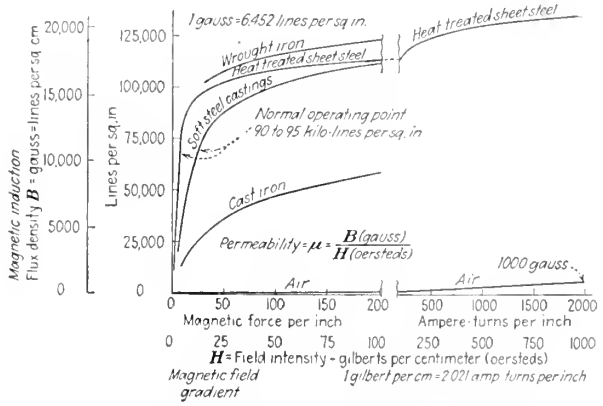


Fig. 1. A given field intensity will establish several thousand times the magnetic induction (flux) in iron that it will in air.

force that for values of 60 to 100 A.T. per in. the steel will carry 200 to 400 times as much magnetic induction as air. It is obvious therefore that in the design of a magnetic path as much of its total length will be steel and as little will be air as is possible.

But note again that whereas we may increase the A.T. per in. of field intensity H as far as we can or care to, and each increase of its value nets a similar and proportionate increase of flux density B in lines per sq. in. but in steel after we have reached a value of about 90,000 lines per sq. in. further increase of intensity H nets a smaller increase of flux density B until at perhaps 125 to 135 thousand lines per square in. we can get no more flux into the steel. Further increase of H A.T. per in. of length of magnetic path only adds more flux to the air around the steel, not in it.

This phenomena is called *magnetic saturation* and is a very important part of the design of all electromagnetic devices.

A convenient way to visualize the properties of the magnetic field is to imagine these lines of force along the magnetic path and furthermore that they are elastic like rubber bands, always trying to reduce their length. Each line is complete on its self, passing through the coiled conductor and returning outside the coil to join itself. And finally, that these lines have an affinity for iron several hundred times greater than for air. They will go out of their regular path to pass through iron and then try to pull the iron closer to the coil to shorten the total path length. Thus iron is pulled toward or into a magnetized coil if the length of the flux lines through air is thereby shortened.

If the path is shortened by iron entering it, more flux density is established because the better path of iron offers less reluctance to the flux.

This is the principle of all relays, electromagnets, contactors, lifting magnets and so on.

That part of the magnetic path not of iron or steel is called the *air gap*. Brass, copper or insulating material in the magnetic path act on it the same as air and are therefore part of the air gap. Magnetic pull tries to shorten the air gap. In most electromagnetic devices the length of the air gap is very small compared to the path length through iron.

While experienced designers can calculate the field intensity in ampere turns per inch required by a specified simple magnetic path combining both air and steel, the more complex paths are difficult to calculate because of the many factors and because magnetism will not be confined to a guiding channel but spills or leaks over everywhere, there being no insulation for it.

Therefore, designers customarily set up the magnetic path and place on it an experimental coil of wire. They then adjust the current and thus the A.T. per in. to obtain the required flux density. Knowing the required A.T. per in. they can design the coil having the required number of turns and electrical resistance to give the desired A.T. per in.

Knowing the A.T. per in. and the length of the path allotted to the coil the product gives the total ampere turns, A.T.

Most magnet coils will operate connected across a constant d.c. voltage of E volts. Then the area in circular mils of the copper wire to wind the coil will be:

$$\text{circular mil} = \frac{\text{AT } l}{\text{E}}$$

when A.T. is the ampere turns and l is the average length of the coil turns in inches. This being $3.1416 \times \frac{1}{2}$ (D-d) and where D and d are the outside and inside diameters of the coil.

This is based on the hot resistance of copper wire, about 12 ohms per foot of length and one circular mil of area, about 130° F. temperature.

At this voltage E the coil wound with this size of wire will give the specified A.T. regardless of the number of turns whether it is 1,100 or 10,000. The fewer the turns the more current in the coil. But the wire will overheat if too much current flows. Thus as many turns as possible must be used to reduce the current to the lowest possible value.

From here on the design of the coil is a matter of adjustment of size and shape. Increasing size reduces current and watt loss which is the current times the voltage; also the surface area is increased to radiate the heat from these losses. Decreasing size decreases the number of turns and increases the current and temperature at which the coil operates.

From this simple coil and iron assembly derive the many useful phenomena such as induction of voltage in a conductor moving in the air gap (generator action), or in a stationary conductor if the magnetic flux changes in value (transformer action), or the force on a conductor carrying current in the air gap (motor action).

On the Ways — SHIPS IN THE MAKING

Mrs. Ben Moreel, sponsor of ARD-33, with the Admiral and their two daughters.

Dry Dock Launching

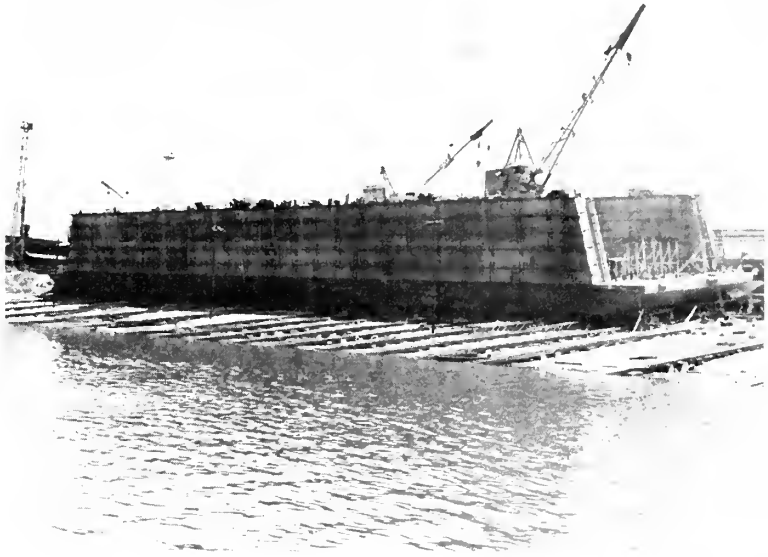
On Saturday, August 10, the largest vessel ever to be built on the inland rivers of America was launched into the Ohio River from the Dravo Corporation, Neville Island yard, Pittsburgh, Pa. This vessel is ARD-33, a floating dry dock designed by the Bureau of Yards & Docks, Navy Dept., for the use of the Bureau of Ships. This shiplifting giant, 448 feet long by 97 feet wide and 45 feet high, will be taken under special tow 2,000 miles by water through the locks of the Ohio River and down the Mississippi. ARD-33 will have a lifting capacity of 6,000 tons and is particularly designed to serve auxiliary or tender type ships as well as Liberty ships.

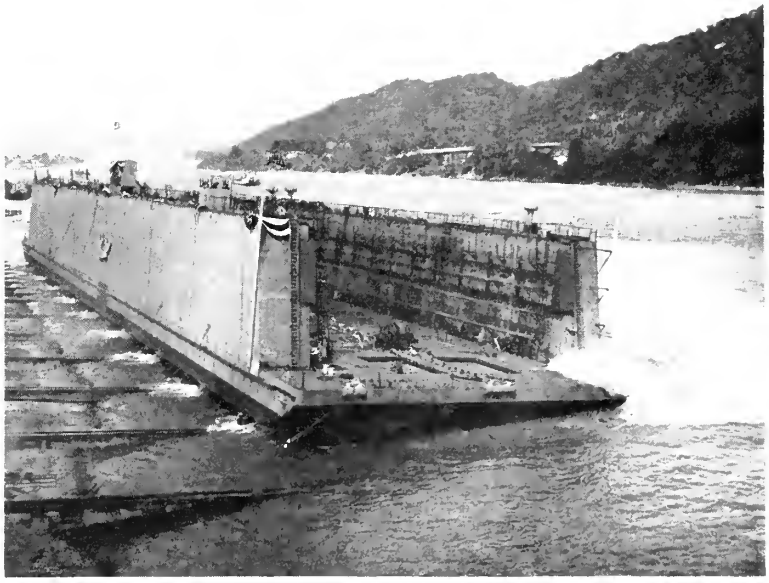
Mrs. Ben Moreell (wife of Admiral Ben Moreell, organizer of the famous "Sea Bees" and former Federal Coal Mines Administrator and Chief of the Material Division in the Office of the Assistant Secretary of the Navy) sponsored the dock.

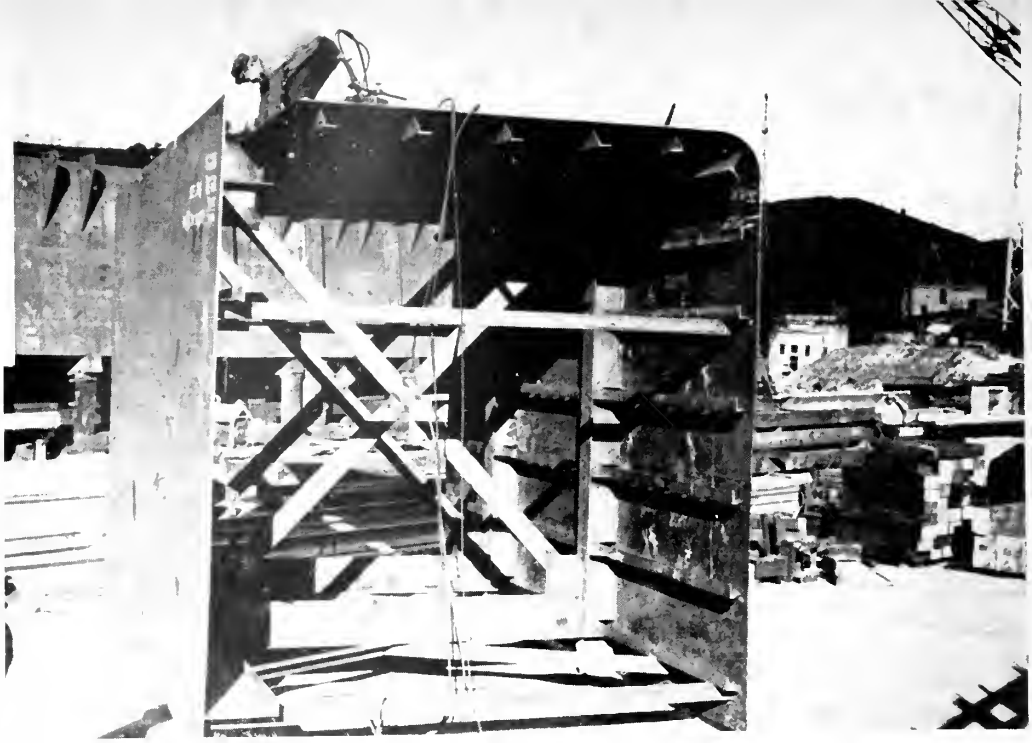
Of butt-welded construction and containing more than 73 miles of welding, she is non-self-propelled and is designed to accommodate a crew of 130 men and 7 officers.

A hole 500 feet long, 150 feet wide and 45 feet deep has been dredged in the Ohio River near Rochester, Pa., to provide a depth sufficient for submergence tests. It is estimated that the dock can be lowered to receive a vessel in less than 30 minutes and subsequently emerge by pumping out its tanks in about 2 hours.

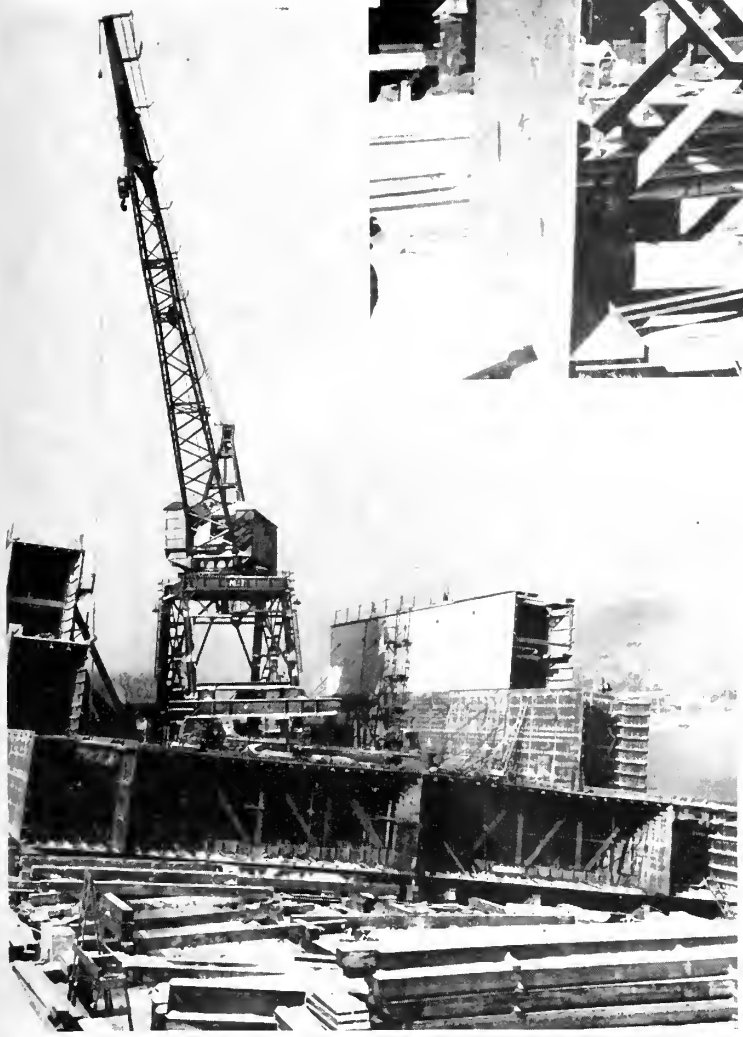
On top: ARD-33 ready for launching. Note scaffolding spot-welded to inside and outside of wing walls.
Below: ARD-33 hits the Ohio River Saturday, August 10, 1946.







Prefabricated box section for ARD-33 ready to be moved to ways.



ARD-33 under construction on ways. Note the 30-ton capacity traveling crane mounted on the deck to handle heavy weights.

ARD-33 is a self-contained unit, with its own water distillation plant, sanitary disposal facilities, diesel electric generator sets for light and power, and crew quarters comfortable in any climate. Machinery spaces, workshops and crew quarters are contained in the 12-foot wide sidewalls. Recreational facilities include a soda fountain and moving picture projector. Storage capacity (available for food, repair parts and materials) assures operation for many months at remote locations with limited tender or supply service. A watertight longitudinal bulkhead runs the entire length of the hull. Eight watertight tanks on each side provide the means for submerging and raising the dock. Each of the sixteen tanks is served by a pump and flooding valve with individual control maintained from a central station. An indicating system shows the depth of water in all compartments at all times.

Two full-revolving, 20-ton capacity, rail-mounted gantry cranes will operate from either side of the wing wall deck.

To avoid excessive stresses incident to launching, the flat bottom of the dock was erected parallel to the sloping ways—which meant building the vessel at a slope—in this instance an angle of one and a half inches in twelve inches. As soon as the well dock was assembled, a full-revolving rail - mounted traveling crane was placed in the well, to facilitate erection of wing walls and placing of machinery. The riverside rail for this crane was 7.5 feet above the deck and the landside rail snug to the deck.

Work Ahead for American Shipbuilders

In a public statement explaining his stand on the matter of advising against the building of large passenger liners at this time Mr. John R. Steelman, Director of Reconversion, has some words of comfort for the American shipbuilder. Says he:

Under Naval contracts the government will pay private shipyards in the United States $325,000,000 for Naval building, repair, and con-

version work during the fiscal year ending June 30, 1947; and

The U. S. Maritime Commission will spend $225,000,000 for conversion, reconversions, alterations and repairs during the same period.

These figures are exclusive of private construction, alterations, and repairs, and show that the shipyards have quite a respectable backlog of work ahead for the next few years.

Federal Lays Two Keels

A keel for a gypsum rock carrying steamer was laid in September and another in October at U. S. Steel's Federal shipyard, Kearny, N. J., according to Lynn H. Korndorff, president of the yard.

These ships are being built for Panama Gypsum Co., Inc., a subsidiary of the U. S. Gypsum Co., and are scheduled for delivery next spring.

Gypsum rock will be transported by the carriers from ports on the Bay of Fundy to plants of the Gypsum Company at such ports as Boston, New York, Philadelphia and Jacksonville, Florida.

Each ship will have a deadweight of 10,350 tons and a total capacity in the holds of 300,000 cubic feet. The over-all length will be 436 feet with a beam of 64 feet, a depth of 31 feet four inches, and a draft of 24 feet.

Steel single-screw steamships propelled by turbines through double reduction gears with 3,000 s.h.p., they will have a sea speed of 12 knots.

Of the single deck trunk type built on the Isherwood system of longitudinal framing with raised forecastle and poop decks, they will have rake bow and cruiser stern. Partly welded and partly riveted, they will be built under a special survey of Lloyd's Register.

Standard of California Launches New Tanker

Standard of California's SS F. S. Bryant, first large tanker to be designed and built post-war in the United States, and named for a company vice president and director, was launched Tuesday, August 27, at Chester, Pa.

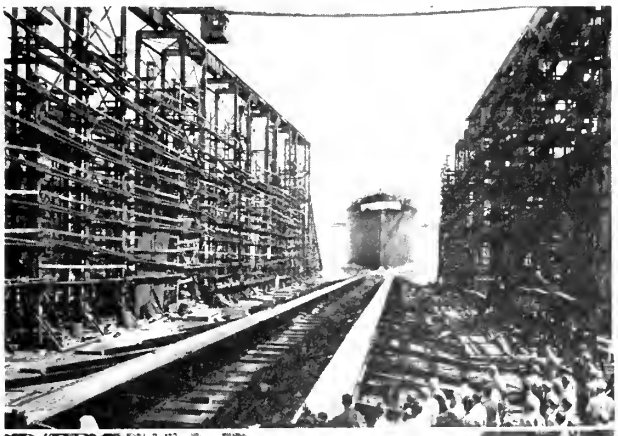
Officials of both Standard and Sun Shipbuilding & Dry Dock Company, builders, participated in the ceremonies. The vessel was christened by Mrs. Bryant.

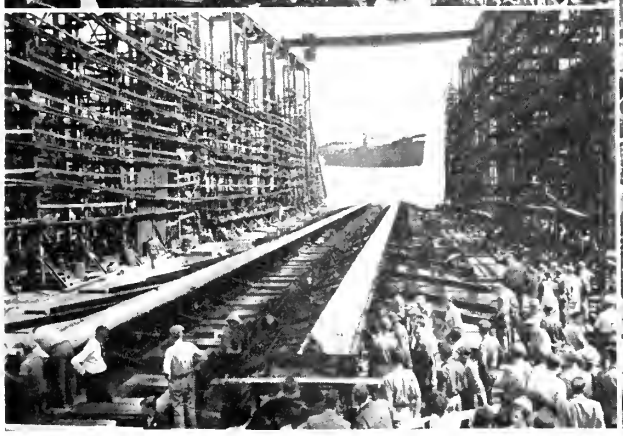
This new tanker, designed by the technical division of the Marine Department of Standard of California, and under construction since last November, features model crew quarters, which limit sleeping room occupancy to two persons. Mess, galley and recreation facilities also provide the latest improvements.

A variety of war-tested innovations in design and equipment also are embodied in the vessel. Seven pumps and seven cargo piping systems permit high-speed loading and unloading. Nearly a score of different petroleum products can be transported in bulk in the ship's 27 individual bulk cargo compartments. There are also two large package freight compartments with latest type equipment for fast handling.

High pressure steam turbines provide the power. Other statistics: cargo capacity, nearly 4,300,000 gallons; length, 442 feet; beam, 65 feet; gross tonnage, 8,300; net tonnage, 4,940; speed, 14 knots.

A sister ship, the R. G. Follis, named for Standard's president, is scheduled for launching within a few weeks.





Tanker F. S. Bryant as she takes the water at Sun Yard, Chester, Pa. Ready for tow to outfitting dock.

Below right: Launching party at Sun Yard, left to right, facing camera, Mr. and Mrs. Alva Johnston of Yonkers, New York, brother and sister-in-law of the sponsor; Mrs. F. S. Bryant, sponsor; and F. S. Bryant, vice president of Standard of California.

The S.S. Mormacyork, reconverted by Bethlehem's Brooklyn 56th Street Yard from a Navy transport to her original status as a combination cargo-passenger ship. She is shown here ready to rejoin the American Republics Line fleet.

Reconversion by Todd Yards

The 10,000-ton passenger liner Panama, of the Panama Line, which as the James Parker served as an Army troopship during the war, has resumed regular service to the Canal Zone after extensive reconversion at Todd Shipyards Corporation's Brooklyn division.

Of a normal passenger capacity of 202, all one class, the Panama was outfitted as a transport capable of carrying 2,277 troops. Sailing on her first trip on June 17, 1941, by the end of the war she had made thirty-eight voyages, including "shuttle trips" between different overseas theaters of war.

The Todd Brooklyn division was awarded the job of reconverting the ship to her former condition as a luxurious passenger carrier — with the most modern safety standards— and she entered the yard on last June 25, and left on August 26 to go to Pier 64, North River, for finishing touches before sailing.

The job involved hundreds of items of removal, repair, replacement and inspection. Removed were: all troop bunks, wartime blackout doors, and partitioning and shields. New panelling, teak doors and protex glass were installed in staterooms and public rooms. A new bar was installed on the starboard side of the club room on the promenade deck. The ship's swimming pool was restored complete with new tiling, cement, floodlighting, piping and mesh safety net.

Cabins and public rooms were extensively altered and refurbished. Electrical wiring and control panels in all sections were inspected, repaired and replaced where necessary. Ring life preservers, with which she originally was equipped, were installed. Lifeboats, davits, blocks and falls, were thoroughly overhauled. The fire alarm system was reconditioned and tested.

General repairs and replacements were made to the ship's ventilating and refrigerating systems. The engine-room telegraph apparatus was reconditioned, and repairs and renewal of parts made to pumps, main and auxiliary condensers, auxiliary controls boards, draft blower controller and air compressor controller. Boilers were cleaned and repaired, and the anti-magnetic mine "deguassing" system was removed.

Upon completion of the interior work, the Panama was dry-docked on the big Number One graving dock in the Todd Brooklyn yard. After hull inspection, the old paint was scraped and sandblasted away down to the bare metal, and the ship was given a complete bright new dress of paint for her return to the service for which she was built.

Reconverted to luxurious passenger liner. Here the Panama, of the Panama Line, leaves dry dock at Todd Brooklyn division.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

HARBOR DAY EXHIBITS
by leading marine firms.

Harbor Day, 1946
S. F. Hails a Great Port

San Francisco dramatized its potentiality as the world's greatest port when the 17th annual Harbor Day observance, a two-day celebration, August 24 and 25, was staged by the Junior Chamber of Commerce, headed by James B. Black, Jr., committee chief. He was assisted in the preparation of this extensive program by Harold Dobbs, finance chairman, and Carl Tiedeman, sport events chairman.

Some 300 mayors, civic officials and leaders of communities stretching from Fresno to Eureka joined in the Harbor Day festivities, viewing the harbor from the Army Transport Ferry Yerba Buena.

Exhibit of Globe Wireless Ltd., at the Ferry Building during Harbor Week, where Radiotype, the high-speed electronic typewriter method of handling written communications was displayed. This method was invented by Walter S. Lemmon, and recently acquired by Globe from International Business Machines Corp.

An Interesting Harbor Day Exhibit

The Radiotype machine pictured is a complete unit, consisting of transmitting typewriter, tape perforator, tape reading robot for transmitting the messages at a speed of 100 words per minute, and a receiving typewriter. With this complete unit messages may be transmitted and received at the same time.

The high light of the Globe Exhibit was the receipt on the Radiotype at the Ferry Building of the latest news furnished by the press associations and daily papers. This was transmitted over a leased wire from the headquarters of Globe Wireless Ltd. at 315 California Street. Visitors crowded around the machine and watched the news being typed at a speed in excess of 6,000 words per hour.

Ever since 1927 the Marine Committee of the S. F. Junior Chamber of Commerce has been working to focus national attention on San Francisco and its facilities; and this year's theme "Boost Your Harbor" pointed out to visitors the vast growth of the land-locked 360 square miles which became the greatest single funnel for war supplies to the Pacific. They saw, too, the expansions under way to contribute to its peacetime progress.

Million Dollar Programs

The projected expansions include the $5,000,000 Mission Rock Terminal, the $2.000,000 program for the fishing industry to provide a new pier at the foot of Hyde Street and a protective breakwater, a fleet landing facility at the Ferry Building, and 500,000-bushel grain elevator adjoining the present Islais Creek grain terminal.

These developments were described by James B. Black, Jr., general chairman, and Matthew Carberry, president of the Junior Chamber, along with the reminder that the American flag has flown over the harbor for nearly 100 years.

Events of the Days

The Women's Organization for the American Merchant Marine acted as hostesses for the two-day celebration and saw to the registration of the visiting officials. Mayor Roger D. Lapham gave a welcoming address just before all the visitors boarded the Yerba Buena for a tour of San Francisco Bay. Luncheon was served at the Alameda Naval Air Station, after which followed an interesting and extensive tour of the island by bus and a visit aboard a giant aircraft carrier, which was anchored at the Air Station. A cocktail party and reception for visiting officials at the Fairmont Hotel followed and the first post-war searchlight display in the harbor closed the Saturday observances.

Sunday's aquatic sports with whaleboat races, swimming races, tugs of war, canoe races, canoe tilting, swimming through fire, and exhibitions by noted swim stars were held at the Aquatic Park Water Carnival.

Meritorious service medals and citations for war heroism were presented to Orion A. Larson, master of the S.S. John Howard Payne, and Albert Joseph Kinast, third assistant engineer of the S.S. James Buchanan, at Aquatic Park.

Harbor Day Maritime Exhibit

Electronic, refrigeration and other new marine equipment were on display at the maritime exhibit at the Ferry Building from August 19 to Sunday, August 25, inclusive.

Staged as a part of the program for the Junior Chamber's annual Harbor Day celebration, the exhibit was arranged by Frank Janov of the Marine Exchange.

The exhibitors included: Army Recruiting (6th Army); Borden's Dairy Delivery Co.; Alvin R. Campbell Co.; General Electric Co.; Globe Wireless Co.; Grace Line; Gustin-Bacon Mfg. Co.; C. J. Hendry Co.; Hochwald Chemical Co.; Hough & Egbert; Mackay Radio & Telegraph Co.; Marelco Co.; Matson Navigation Co.; Moore Dry Dock Co.; Moore - McCormack Lines; Navy Reserve Recruiting; Pan American Airways; Harry W. Parsons, Inc.; Submarine Signal Co.; T.W.A.; Toumey Electric Co.; Tubbs Cordage Co.; United Airlines; United Seamen's Service; U. S. Maritime Service; Capt. Van Remortel; Veterans' Administration; Victor Equipment Co.; Weeks-Howe-Emerson Co.; Westinghouse Electric Corp.; Women's Organization for the American Merchant Marine; Wilbur & Son; World Trade Center, Inc.; The Young Co.

Bay Cities Equipment Co's. New Quarters

The Bay Cities Equipment Inc., distributors for General Motors Diesels in the marine and industrial fields, in all coast counties from Monterey County to the Oregon line, recently took possession of commodious new quarters in Oakland.

This new streamlined building occupies an area of 7000 square feet on a property of about one acre in size, and is located at 28th and Cypress Streets on the approach to the Bay Bridge. The building houses an impressive showroom, offices, parts and service departments.

V. E. Gray is the manager, Don McIntyre, chief installation engineer, H. M. Estes and John H. Ditz, marine sales engineers.

Modern display room at Bay Cities Equipment Inc. new quarters in Oakland.

Instrument Company Takes New Lines

FRED MURDOCH, general manager of the *Paific Coast Instrument Company* of 246 Mission Street, San Francisco, announces the appointment of his company as exclusive representative for: the *Helicoid Gage Division of American Chain and Cable Company, Inc.*, of Bridgeport, Conn., makers of *Helicoid* pressure and vacuum gages; the *Trimount Instrument Company* of Chicago, makers of manometers, flow meters, draft gages, tank level gages, electronic level controls; the *Paxton Mitchell Company* of Omaha, makers of metallic packing, pumps and cylinder liners; and the *Paxton Diesel Engineering Company* of Omaha, makers of bearing watchdogs, valve spring depressors and other diesel specialties.

Marine Exhibit Includes Display Of Wilson Tube Cleaners

One of the most interesting booths at the recent National Marine Exposition in New York was that of Thomas C. Wilson, Inc., manufacturers of Wilson Tube Cleaners, Long Island City, N. Y.

Featured in this exhibit were operating models of tube cleaners of different sizes, giving visitors an opportunity to see tube cleaners actually function. Section of tube containing various types of deposits were used to demonstrate the action of Wilson tube cleaners in removing unusually hard, heavy scales.

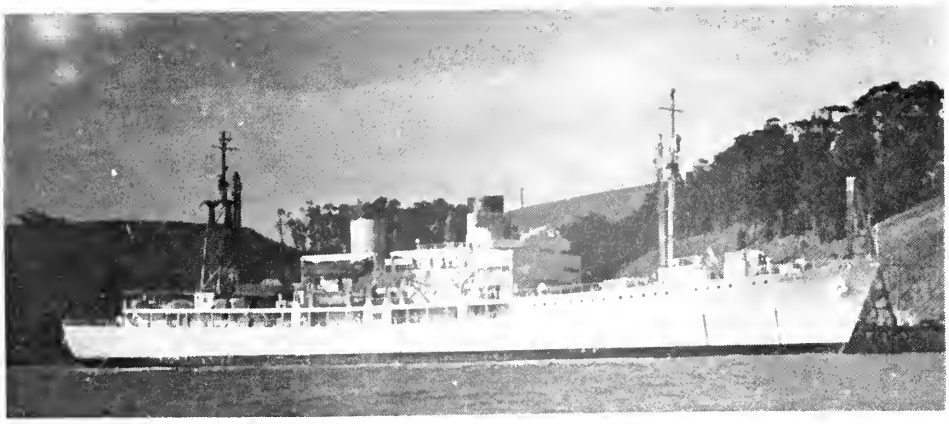
Darcoid to Represent Gates

The Darcoid Company, Inc., manufacturers of mechanical packings for marine and industrial use, announce from their California office at 249 Ninth Street, San Francisco, their appointment as industrial distributors for the Gates Rubber Company of Denver, Colorado.

The Gates Rubber Company is the manufacturer of the famous lines of Gates Vulco ropes, Gates V-Belt sheaves and pulleys, Gates Industrial rubber hose and Gates mechanical and molded rubber products.

Darcoid, San Francisco, is growing along at the anticipated rate and so expanding shoreside lines in the industrial field.

Thos. C. Wilson, Inc., display at the National Marine Exposition which was held in New York.



S.S. Golden Bear, was built 1945 at Kaiser Yards, Providence, R. I., 7000 tons. As the S.S. Mellena, she served in the war in the Pacific as a troop transport for the U. S. Navy. She was rechristened by Virginia Warren.

California Maritime Academy Triple Ceremonies

Saturday, September 7, will long be remembered as one of the greatest days in the 16 years of the Academy's history. The triple-treat observance that day included the rechristening of the Training Ship Golden Bear, followed by the dedication of the memorial gymnasium, and completed by the graduation ceremonies of the class of September, 1946.

The Honorable Earl Warren, Governor of California, addressed the assemblage at the graduation exercises; Rear Admiral D. B. Beary, USN, Commandant of the 12th Naval District, welcomed the graduates into the services as well as Commodore Norman L. Owen of the U. S. Maritime Service, head of the training organization of the War Shipping Administration.

The Rechristening of the Training Ship

The christening of the new training ship, formerly the USS Mellena, AKA 32, took place with an assembly on the forecastle of the ship. The Superintendent of the Academy, Captain Claude B. Mayo, USN, presented the official guests, including Governor Warren, Admiral Knight, Admiral Beary, Commodore Queen and the sponsor, Miss Virginia Warren. After the invocation offered by Captain W. H. Rafferty, USN, Chaplain of the Mare Island Navy Yard, the crash of champagne against the hull, rechristened the Mellena as California Training Ship, Golden Bear.

Dedication of the Memorial Gymnasium

The memorial gymnasium, which houses the newly completed swimming pool in one wing, was begun at graduation last year, when the cornerstone was laid by Captain Mayo, Admiral Tisdale, and General Hansen. At that time the names of those men who had given their lives in World War II were inscribed on metal plates and placed in a vault within the cornerstone. This graduation saw the completion of the memorial ceremony as Edward Johannessen, president of the Alumni Association, read off the honor roll of fellow alumni of his who will never again grace the Academy with their honored presence. Then the memorial plaque was unveiled and the chaplain pronounced benediction.

Graduation Exercises

The traditional processional marked the opening of the graduation ceremonies, followed by an offering of the Midshipmen Chorus under the direction of Kenneth Dick. After Invocation by Captain Rafferty, was an address of welcome by Captain J. E. Brenner, USN, member of the Board of Governors of the Academy. Governor Warren was the guest speaker and offered the graduates "Godspeed from the State of California," followed by an address by Roy E. Simpson, director of Education. Then came the welcoming to the services by Rear Admiral Beary and Commodore Queen, after which A. E. Stowe, operating manager of the American-Hawaiian Steamship Company welcomed the Class of '46 to the shipping world, followed by a response by Midshipman Captain William F. Schill and Midshipman Chief Engineer Denny McLeod. Capt. Henry Blackstone, chairman of the Board of Governors, and Commodore Queen pre-

Superintendents of Two Merchant Marine Schools

◄ Captain Malcolm E. Crossman, USMS, superintendent of U. S. Maritime Service Training Station, Alameda, California, was the speaker of the day at the opening of the Harbor Day Exhibit at the Ferry Building in San Francisco.

► Captain Claude B. Mayo, USN (Retired), superintendent of California Maritime Academy, Vallejo, California, addressing the Class of '46.

sented the licenses, commissions and diplomas to the class.

The program was brought to a close by the Superintendent, Captain Mayo, with "Salute and Farewell" to the graduates.

Graduation Ball

California Maritime Academy graduates of the class of September 7, 1946, held their formal graduation dance on the evening of September 6, at the Berkeley Tennis Club. Special decorations in keeping with the realm of Neptunus Rex adorned the dance hall.

A reception line composed of Cadet-Midshipman Captain William F. Schill and Cadet-Midshipman Chief Engineer Denny A. McLeod, with class officers and their ladies greeted the guests. Many of the young ladies who were escorted by the cadet-midshipmen came from various parts of California to attend the Academy's formal ball of the season.

Refreshments were served and music was furnished by Murry Peterson's Orchestra. Many distinguished guests and friends of the Academy were in attendance.

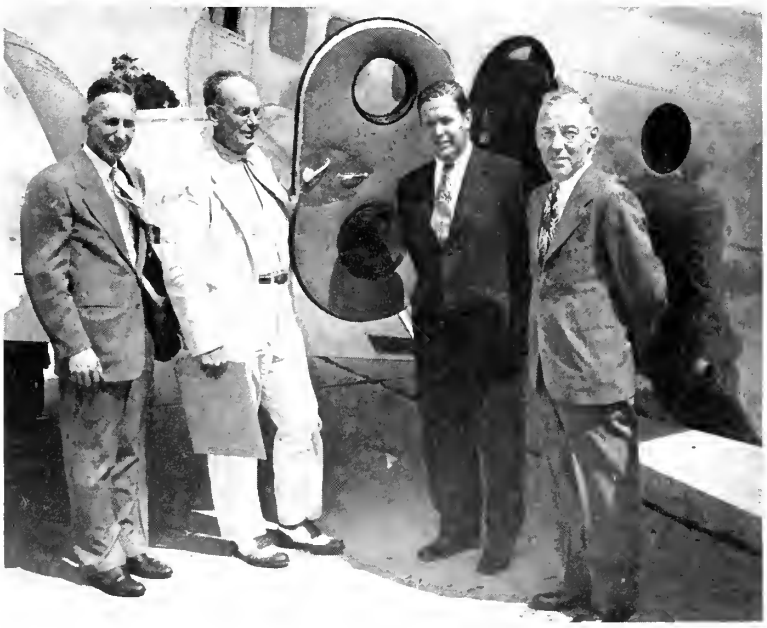
The dance committee was headed by Cadet-Midshipmen Rushton O. Backer and Richard A. Valentine.

Roebling's New Plane Makes Initial Flight

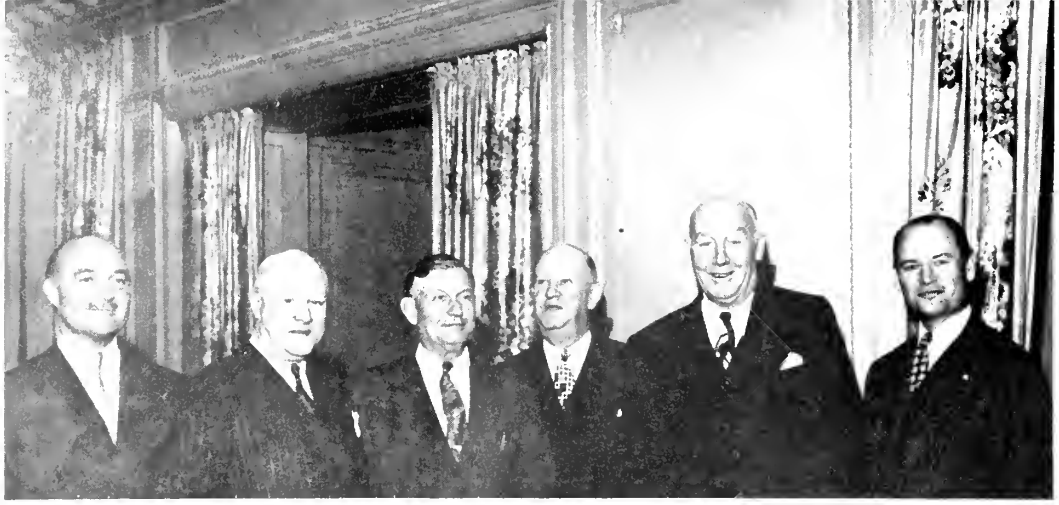
To maintain its progressive policies in sales as well as production, the John A. Roebling's Sons Company have purchased a five-passenger airplane for closer contact with its customers, distributors and branch offices.

The plane has two 450-horsepower motors, two-way radio and other safety devices and equipment. An experienced pilot and co-pilot have been hired, full time, to operate the plane.

On its maiden flight the Roebling plane stops at Toledo, Salt Lake City, Butte, San Francisco, Sacramento, Grass Valley, Fresno, Bakersfield, Los Angeles, Morenci, Globe and Miami (Arizona), Houston, New Orleans and Atlanta.



Initial 10,000 mile flight carried F. S. Burtch, manager, Wire Rope Sales Division of John A. Roebling; C. M. Jones, vice president in charge of Public and Industrial Relations; C. R. Tyson, president; E. C. Low, vice president in charge of Sales.



HUNT-MIRK PARTY HELD RECENTLY IN SAN FRANCISCO

James S. Martin, Martin & Turner; John H. Humphrey, vice president of Rainier Brewing Company; William M. Kennedy, Condenser Service & Engineering Co. Inc.; William F. Humphrey, president of Tide Water Associated Oil Co.; Lee Delhi, representative of Edge Moor Iron Works, Inc., subsidiary of Condenser Service; and Eric Pedley, Martin & Turner, representative of Condenser Service in Northern California.

Reginald V. Grady, son of Dr. and Mrs. Henry F. Grady, who sailed aboard the S.S. President Polk en route to Shanghai to take up assignment with Connell Bros.

Reception Aboard The President Polk

John N. Parker, president of American Marine Paint, talking with Mrs. Henry F. Grady aboard the S.S. President Polk. Dr. Grady and Mrs. A. Emory Wishon visit on the side.

Attending the [illegible] the S.S. President Polk are [illegible] director of Fireman's Fund In[illegible] director of American Presid[illegible] Mrs. Henry F. Grady and Mr. [illegible] Wishon, vice president and gener[illegible] Pacific Gas and Electric Co.

HOWARD OXSEN

Seattle Fairbanks-Morse Mgr.

Howard Oxsen has been promoted to manager of the Seattle branch house of Fairbanks, Morse & Co., announces R. H. Morse, Jr., vice president and general sales manager. He succeeds John F. Marquitz who will be assigned new duties elsewhere.

Howard is well known on the West Coast and is a "quarter-century" man with the company, having first joined the F-M organization in San Francisco in early 1917 in the repair parts department. He has been field service man, field engineer, and later diesel engine department manager of the San Francisco branch from 1938 to 1945.

Pope & Talbot Inc., Appoints Lunny General Manager

Charles L. Wheeler, executive vice president of Pope & Talbot, Inc., San Francisco, announces the appointment of Joseph A. Lunny, vice president of the firm, as general manager of the company's steamship division, the Pope & Talbot Lines.

Lunny's association with the company began in 1918 when he came from the Oliver J. Olson & Co., prominent at that time as the largest coastwise operators of ships on the Pacific Coast. For the past fifteen years he has been vice president and director of operations for the firm. He is widely known in Pacific Coast and local shipping circles and is a director of the Waterfront Employers' Association, Pacific American Steamship Association, Shipowners Association and member of the San Francisco Propeller Club.

JOSEPH A. LUNNY

Pope & Talbot Lumber Appointment

Hillman Lueddemann, vice president and Northwest manager of the company, has been appointed general manager of the Pope & Talbot, Inc., Lumber Division. His responsibilities will include complete supervision of the company's holding, which embrace mills, timber, real estate, offices and agencies, and important developments affecting these operations under Pope & Talbot's program of post-war expansion. Headquarters will be at Portland, Oregon, for the Lumber Division.

Lueddemann has long been identified with the development of the Pacific Northwest. He is an active member of many organizations which have been responsible for the greater utilization of her resources and waterways.

HILLMAN LUEDDEMANN

Walter Kidde Co. Opens in Los Angeles with Buckley in Charge

The Walter Kidde Co. is expanding its sales activities with the opening of an office in Southern California. District sales manager for the Pacific Coast is F. S. Buckley, who will concentrate on the industrial lines of the company. The address is 3327 West Washington Boulevard, Los Angeles.

F. S. BUCKLEY

R. H. Hunter (San Francisco), speaking on "Coastwise and Intercoastal Traffic." Seated are Mr. Martin (Long Beach), and Alvin K. Maddy (Long Beach).

Mark H.. Gates, secretary of San Francisco, talking on "The 3 per cent Federal Transportation Tax." W. R. Martin, the president, on the right.

Warren D. Lamport (Seattle) pronounces the invocation.

Captain Nicholson, USNR, consultant on port construction speaking, while R. R. Shoemaker (engineer of Long Beach) and W. R. Martin and A. K. Maddy of Long Beach lend an attentive ear.

PACIFIC COAST ASSOCIATION OF PORT AUTHORITIES 33rd ANNUAL CONFERENCE HELD AT LONG BEACH

T. [illegible] Brooke (North Fraser, B. C.), A. H. Abel (Oakland), F. W. G. Sergant (Vancouver, B. C.), E. J. Amar (Long Beach). J. A. Eurey (Seattle), new vice president, [illegible] Marvin (Tacoma), new [illegible]; F. W. G. Sergant (Vancouver, B. C.), new [illegible].

Aerial Photographs by Clyde H. Sunderland, Oakland, California

Oakland's extremely valuable Outer Harbor areas, the Southern Pacific pier and slips in the foreground, the Oakland Army Base and Port of Oakland's Outer Harbor Terminals to the left, and the $100,000,000 Oakland Naval Supply Depot in the Middle Harbor on the right.

Oakland, A World Port

HAVING EMERGED FROM ONE of the greatest wars in history with augmented facilities, and with the satisfaction of knowing that it contributed materially to the victory in the Pacific, the Port of Oakland and Oakland Harbor faces the future with the firm conviction that it will continue to grow and expand with the increased foreign trade that must follow the establishment of a durable peace.

There are many solid factors to support this belief. The first is the increased population and the concentration of industry throughout the Metropolitan Oakland area which resulted from the war, and the fact that the area has ample room in which to care for them and any further extensions that might come with the peace. Secondly, although the Oakland Board of Port Commissioners has been in existence for almost twenty years, and has achieved marvels in bringing Oakland harbor to the forefront of Pacific ports, the development of the Port is by no means complete, and there is in the Board's files a Master Plan to more than double the physical facilities, which, when completed, will make the East Bay shipping center one of the largest on the Pacific Coast, if not in the Nation.

In addition, there are the inherent natural factors

which have always contributed to the continued success of the Port: the fact that it is on the mainland side of San Francisco Bay, and the terminus of three transcontinental railroads and the major National and State highways, and has a tributary area which includes the great Sacramento, San Joaquin and Santa Clara Valleys. This tributary territory is one of the most productive in the world for agricultural products, manufactured goods, and services of all kinds.

Some portions of this tributary territory will be linked more closely with Oakland harbor in the near future when the State completes the construction of the Eastshore Freeway, a six-lane highway which passes near all the units of the harbor, and which will place them half an hour nearer for shippers in the San Joaquin and Santa Clara Valleys. Construction of the first unit of this highway has already started at the foot of Fifth Avenue in Oakland, and the remainder will be completed in rapid progression.

Oakland has always been fortunate in having an alert and progressive Board of Port Commissioners to administer the affairs of the Port. This Board was organized on February 12, 1927, to carry out recommendations under a $9,960,000 bond issue and to administer and direct the harbor facilities for the city. This Board, which has always been comprised of five public-spirited citizens, carries on its operations under the title of Port of Oakland. The present members of the Board are John F. Hassler, President; Claire V. Goodwin and Stanley J. Smith, Vice Presidents; and Clifford D. Allen and Stanley A. Burgraff, Commissioners.

The administrative staff also has been one familiar with the potentialities of the Metropolitan Oakland area and alert to every opportunity to harness these potentialities to the problems of shipping and shippers. It is headed by Arthur H. Abel, port manager and chief engineer; J. G. Bastow, assistant chief engineer and assistant port manager; Lloyd B. Hughes, assistant port manager, who is in charge of operations; W. Reginald Jones, port attorney; and M. D. McCarl, traffic manager.

Like every other port in the Nation, the Port of Oakland is now in the process of being converted from its wartime function to complete peacetime operation. At the outbreak of the war the Board of Port Commissioners decided that nothing must stand in the way of final victory and patriotically allowed its facilities to be used 100 per cent by the armed forces. Terminals, piers, warehouses and other facilities were taken over by the Army, the Navy, and other Government agencies connected with the war effort.

They became an important and vital part in the supply and manning system of the various agencies. During the intensive war year of 1944 when the war had practically reached its apogee, Oakland harbor han-

OAKLAND BOARD OF PORT COMMISSIONERS

Members of the Board seated, left to right: Stanley A. Burgraff, commissioner; John F. Hassler, president; Claire V. Goodwin and Stanley J. Smith, vice presidents; and Clifford D. Allen commissioner. With them, standing, left to right, are: Lloyd B. Hughes, assistant port manager; Arthur H. Abel, port manager and chief engineer; and J. G. Bastow, assistant port manager and assistant chief engineer.

dled almost an equal amount of tonnage with San Francisco.

Since V-J Day every effort has been made to secure the return of these important facilities. A compromise agreement was reached a few months ago concerning the Outer Harbor Terminals south of the San Francisco Bay Bridge approach and fronting on San Francisco Bay, which were leased during the war by the United States Army. The Seventh Street unit of these terminals, which was operated by the Army, is now in the process of being returned to the jurisdiction of the Port, and comprises one berth. The Army has also informed the Board that the other portions of the Outer Harbor Terminals will be returned as soon as possible.

On the other hand, the Ninth Avenue Terminals, which were operated by the Navy, are being returned to the Board on October 1, and the War Shipping Administration has already made formal announcement that it will relinquish the Livingston Street Pier on the Inner Harbor on September 14. These facilities will all be devoted to peacetime pursuits as soon as they are returned, and integrated with the peacetime operations which have centered during and since the conflict at the Grove Street Terminals.

The presence of five major military and naval bases within the general area of Oakland harbor is expected to tremendously increase the shipping which will be attracted to the mainland side of San Francisco Bay during the coming years of peace. These bases are the Oakland Army Base in the Outer Harbor, which is the major operating unit of the San Francisco Port of Embarkation, the huge Oakland Naval Supply Depot in the Middle Harbor on land donated by the Port of Oakland, the Alameda Naval Air Station, the Army's Intransit Depot on the Inner Harbor, and the Coast Guard's big Government Island Base in the Oakland Estuary.

Confident that the future will eventually require its projected units, the Board's Master Plan contemplates many important and valuable improvements. Under this plan there are many detailed projects to improve, expand, and increase the existing units of the Port, and to develop two entirely new Port areas, those in the North Harbor, which fronts on San Francisco Bay north of the San Francisco-Oakland Bay Bridge approach, and San Leandro Bay, adjacent to the huge Oakland Municipal Airport, which is also under the jurisdiction of the Board.

In the North Harbor the Port of Oakland has a total area of 1540 acres on which it is planned to develop a terminal which will care for anything the future may require by ultimately providing berthing space for ninety large vessels. The first step in this development, which will be undertaken as needs demand, will consist of dredging, construction of a unit of piers, and related facilities.

The Board has also acquired 675 acres of land at the head of San Leandro Bay, extending from Sixty-sixth Avenue to Hegenberger Road, which is the easterly end of the Port of Oakland, and has drawn plans for a large shipping terminal with berths for twenty-eight large vessels and adequate transit sheds, warehouses, and industrial areas complete with supporting trackage, highways, and related terminal facilities. This large terminal, when completed, will be integrated with a Master Plan for the Oakland Municipal Airport.

Easterly section of Oakland's Inner Harbor showing the Coast Guard's Government Island base (left center) in the middle of the waterway; the Ninth Avenue Terminal of the Port of Oakland (bottom left), Encinal Terminals in Alameda (right center), and the tidal canal leading to San Leandro Bay.

In this regard the Board is in a unique position on the Pacific Coast in that it controls both sea and air terminals, a factor which should have tremendous possibilities for the future with the growth of air freight and the possible necessity of some sort of coordination between air shipping and older branches of transportation.

The Oakland Municipal Airport will eventually be very conveniently situated in the center of the projected San Leandro Bay harbor terminal. It also has unlimited possibilities, both in area and in the expansion of service facilities. The Airport's Master Plan contemplates the enlargement of the present operations area of 1000 acres to 1700 acres, and the utilization of the entire 2400 acres available there for allied industry and aviation use.

Its strategic location, and eventual enlargement and

creation of three sets of parallel 10,000-foot runways, make it ideally suited for the main transoceanic air passenger and freight base for the entire San Francisco Bay area. The projected Eastshore Freeway will also pass near its boundaries, and will bring it closer in time to all the centers of population in the San Francisco Bay Area than any other airport of the region.

The advantages of the Airport have already been recognized and it has attracted many concerns engaged either in non-scheduled freight or passenger service to all parts of the Pacific and the United States. Among the lines already using the Airport in addition to the three scheduled air lines—United, TWA, and Western Air Lines—are Transocean Air Lines, Continental Sky Van, Inc., California Eastern Airways, NATS, Air Transportation Service, the Air Transport Division of the Matson Navigation Company, the air arm of the Waterman Steamship Corporation of Mobile, Ala., Far Eastern Air Transport, Inc., of Manila, and in the near future Australian National Airways, Philippine Air Lines, and KNILM of the Royal Netherlands East Indies.

Allied aviation industry is also represented, as the field is one of the bases of the Pacific Airmotive Corporation, the heavy aircraft maintenance plant of the Matson Navigation Company, and the location of the new school of the Aero Industries Technical Institute.

Los Angeles-Long Beach Harbor Breakwater Result of Long Planning

(Continued from page 50)

Close-up of Class "A" stone emplacement.

heartings of deep water breakwaters, those parts of them that would be well below action of the waves.

On April 15, 1924, the District Engineer submitted his survey report. At that time a detached extension of the outer San Pedro breakwater some 7800 feet long was proposed. There was to be an opening of 2500 feet. At the eastern end, there was to be another 2500-foot opening followed by a "shore" arm of 17,000 feet, which was to extend to the jetty along the west side of the silt diversion basin.

After further discussions and advancing of facts and figures and salient features, the work of actual construction on a prolongation of the outer arm of the San Pedro breakwater and a 12,500-foot extension was begun in 1932. On December 29, 1937, it was completed. Stone for the first job was brought from the Catalina Island quarries and from the Hauser Quarry in Riverside.

Congress authorized by Act of October 17, 1940, construction of some 21,000 feet of additional detached breakwater to extend due east from the end of the 12,500-foot breakwater. The breakwater system, as now authorized by Congress, will shelter the harbor and coast from Cabrillo Beach in San Pedro to Belmont Pier in Long Beach, and will be a haven for a greatly expanded Pacific Fleet, with its heart at Terminal Island.

Modern Transit Shed Construction—Port of Long Beach

(Continued from page 52)

doors, for the reason that box cars are of such variable lengths that it is quite impractical to anticipate how they will be delivered to the dock.

In order to increase the flexibility of the use of the doors, both on the water side of the shed and the land side, the adjacent space for operations has been increased. The apron wharf, for example, is 52 feet in width between the pierhead line and the center line of the first row of building columns. This is sufficient to compen-

sate for any variation of the door spacing with respect to hatch openings, points of deposit of cargo on the apron wharf by ship's tackle. On the land side, the design includes a 20-foot width of loading platform which is to be covered by a canopy to protect the cargo from the weather.

It is not anticipated that the loading platform will be used for the storage of cargo, although it is conceivable that such a use might arise at times. The real purpose of the additional width of loading platform is to make it readily possible for motorized equipment to move from transit shed doors to box car doors or trucks, irrespective of the relative location of the two, by reason of either door spacing, car spacing or truck spacing. A narrow platform does not permit this.

The rolling steel fire shutters in the fire wall at the center of the building, as well as the large truck doors at each end of the shed, are 18 feet in horizontal width and 16 feet in vertical height, to accommodate any fully loaded trucks that may of necessity drive within the interior of the shed.

The details of construction of the shed are as follows:

While the open shed is spanned with structural steel rigid frames, the design is modified at each end of the building with a structural steel column and beam arrangement to accommodate offices, caretakers' room, storage space, toilets, tarpaulin storage, and the like.

Second floor construction at ends of the building for office purposes consists of reinforced concrete beam and slab construction supported on structural steel. All exterior walls are of reinforced concrete and the framing for the roof is of steel purlins with 2-inch tongue and groove sheathing for the roof deck proper. The roofing is asbestos impregnated felt.

Particular emphasis has been placed on the location, the width and the approaches of all ramps into and out of the shed, with the expectancy of moving a large volume of cargo direct from ship side to open storage areas or from ship side to nearby water side warehouses located independently from and separate from the transit shed.

Since it has been felt that transit shed construction, generally, has not in the past been adequately lighted for the safe handling of cargo by mechanized equipment, the lighting installations will be considerably intensified and will provide approximately four candle power per square foot of floor area.

One of the annoying little factors in the operation of waterfront facilities, that of getting cargo wet, has been met in part by the use of steel gratings connecting to floor drains across the entire width of every exterior rolling steel shutter, so that driving rain has little opportunity to come within the confines of the shed and wet cargo which may be resting upon the floor.

Notable also is the fact that the construction of the bulkhead and the apron wharf in front of the building is such that the entire building structure is located on earth fill, and thus is relatively free of fire hazard originating from beneath a wharf. In addition, the wharf itself is of reinforced concrete construction on steel and concrete piling, with earth fill above the concrete deck, in order to provide flexibility in wharf carrying capacity, as well as in the distribution and change of railroad crossovers.

Vertical clearances are 18 feet at the eaves and rise to 34 feet at the center. While this total height is excessive as compared with any current cargo stacking practice, it is consistent with the width of the shed, and the tendency with various designs of lift trucks is to stack cargo higher and higher.

The floor is of such capacity as will carry any load that it is reasonbly possible to stack within the building. Therefore, the great clear vertical height and the elimination of all interior columns will, it is believed, justify the resulting extra cost of structures.

All railroad trackage is of the girder rail type with cast manganese tongue and mate switches and cast manganese frogs which provide an absolute minimum of interference with surface traffic. This is highly important in economy of operations.

Of prime importance in the operation of the terminal, is the great depth of open area immediately to the rear and measuring approximately 300 feet in width by the length of the shed from the low line platform to the rear approach highway. This provides ample space for parking of employees' cars in the near vicinity of the structure and also for the handling of great quantities of open storage cargo, deck cargo, pipe, lumber and the like.

The Port now has under contract two structures of equivalent design, except that the width of shed is 120 feet and the lengths are shorter. The 200-foot wide shed is to be contracted for in the early fall of 1946.

Bulk Commodity Terminal-Port of Long Beach

By MR. SHOEMAKER

Since one of the most important items of expense in the cost of operating shipping is the time during which a ship is tied up or delayed in port, it is essential that all cargoes and bulk cargoes in particular, be handled by methods which will reduce the ship's turnaround time to a minimum.

It is important that large volumes of bulk cargo be available before time-saving operations can be anticipated, and justification found for the construction of the expensive facility necessary to handle such cargo economically.

In Long Beach Harbor such a condition existed as

PORT OF LONG BEACH:
Bulk coal loader.

early as 1940 and the Port was quick to accommodate itself to the needs of the cargo. Through cooperation with the Great Lakes Carbon Corporation the municipality and the company built a pier designed specifically for the handling of outgoing shipments of bulk petroleum coke and any other bulk product of approximately the same weight and size. Through these cooperative arrangements the Port built all the sub-structures, designed and built the wharf to accommodate the facility and the Great Lakes Carbon Corporation constructed the hoppers to receive the bulk cargo and the elevator and conveyor system and trimmer, to move the cargo from bottom dump hopper cars to the ship's hold.

During the past five years, the contract between the City and the Great Lakes Carbon Corporation expired and the City has since taken over the loading facility, has maintained it, and has modified it to adapt it to greater variety of bulk cargoes than it would serve in the past.

For example, the initial purpose of the installation was to handle petroleum coke which was a waste product of gasoline refining at several of the large gasoline refineries in the Long Beach-Los Angeles harbor district. Some of the markets for this petroleum coke have since disappeared, some were greatly affected by the war, and, at the same time, changes in the process of manufacture of petroleum coke have resulted in a lesser supply being available. The facility, however, is so flexible as to permit its use for potash, for sulphur, and for coal, and the same would be true of cement, gravel, sand or any other bulk product, the total weight of which does not exceed approximately 150 pounds per cubic foot, and the total size of which is approximately 14 inches.

During the five months commencing February 1, 1946, the Port of Long Beach has handled upward of 250,000 tons of Utah and Wyoming coal destined to Italy and France and has loaded this coal at the rate of approximately 250 tons per hour.

The installation permits bottom dump hopper cars to be spotted on the wharf tracks directly over a series of steel-lined hoppers which are housed in a reinforced concrete housing below deck level. Fed through grating and onto shakers, the cargo is then dropped mechanically to the endless belt conveyor which elevates it to such height in the conveyor tower as permits it to be dropped upon a secondary belt conveyor and transferred horizontally to a point over the ship's hatch whence it is dropped into the hold where trimmer devices do the rest. Operation is entirely electric.

The Alexander Application

Long Beach Picked For Southern Terminal

H. F. ALEXANDER

There are several significant features to the application of H. F. Alexander, briefly mentioned in the September Pacific Marine Review, for resumption of coastwise passenger service and the freighting of loaded trucks and trailers between San Francisco and Long Beach.

The first point of interest is the bucking of the trend toward giving up to the railroads, air lines and highway carriers. Water Carriers in general are happy over this development.

The amount of business available between the San Francisco Bay area and Southern California is very great, and Alexander has come up with an idea that will bring an *increase* over the present volume and *create a volume of new traffic*. The plan to provide a means for carrying loaded trailers from port to port at rates that indicate a saving to shippers is real progress. And the plan to offer passengers entertainment on the overnight ride is so reminiscent of the pleasant rides the public has enjoyed on other routes that the idea finds immediate response.

The carrying of passenger automobiles is a long-needed feature, for a car is almost a "must" to visitors on either a pleasure or business trip to the Los Angeles area.

The heavy industrial section of Los Angeles, and the truck terminals for the extensive wholesale and manufacturing districts, are convenient to Long Beach. With the financial ability to promptly meet demands for increased facilities which Long Beach affords, the Alexander plan for a Long Beach terminal looks like a far-sighted precaution.

Texaco Takes a New Diesel Electric Tug

(Continued from page 90)

officers and men, and includes six lavatories, two showers and two toilets. The complement consists of captain, two mates, one cook, chief engineer, two assistant engineers, three oilers and three deck hands.

There are six berths, a settee and a table in the forecastle. Above the forecastle on the main deck are two cabins, one with a single berth for the use of the cook, and the second with two berths for the first and second mates. Next in line is a combination galley and mess room, equipped with oil fired range, the usual utensils, and a large dining table. Two cabins for the engineers are over the aft end of the engine room at the after end of the deck house, with a toilet and shower between the cabins. The crew's shower is in a small compartment on the main deck alongside the upper engine room, which is aft of the galley. All berths have comfortable spring mattresses.

Ship to shore telephone has been installed for communication between the owner's operating department and the tug's captain, which increases the general efficiency of the vessel. For ventilating the crew's quarters, there is a blower of 1500 cu. ft. capacity in the upper part of the engine room, with ducts leading the air to the forecastle through the galley. A blower of 9600 cpm capacity, driven by a 5-hp motor through a speed reduction of 3.7:1, ventilates the engine room. On top the pilot house is mounted one 12-in., 1000-watt, 110-volt searchlight to aid in night docking or picking up buoys. A 20-ft., by 5-ft. 8-in. metal lifeboat is carried. For fire damage prevention, there is one 35-lb. CO_2 extinguisher unit with hand hose and nozzle; four 2½-gal. hand sets and seven 1-qt. hand entinguishers.

The Havoline has been built staunchly to last several decades, and to operate with full power efficiency during her lifetime.

Postwar Shipping Program in the Pacific

(Continued from page 71)

strong come-backs in the Pacific. Russia and China will be no small contenders for a slice of the world's shipping business. This brings us back to the all-over picture, and I repeat and emphasize that in our last somewhat normal prewar year, 1939, over 60 per cent of Pacific Coast water-borne tonnage was either intercoastal or coastwise. It is this substantial portion of our traffic which is gravely at stake and which should be the cause for considerable alarm by Stockton and the Bay Areas, as well as every other Pacific Coast port.

Even the most optimistic of our off-shore Pacific interests cannot envision an expanded foreign trade on a sustained basis which would even begin to offset the tonnage loss created by a vastly reduced and possibly eliminated domestic service. The possibility of such reduction is much more real than is generally realized. In respect to your own port as well as every port on the Coast, it may not be a question of, will the ships call at your port, but will there be any ships. Coupled with the loss or serious reduction of our domestic shipping, we must consider the direct and immediate results on terminal facilities, labor and the endless number of collateral services and industries which are directly or indirectly supported by water transportation.

At present the War Shipping Administration's authority to operate in the intercoastal trade expires September 30. Even assuming that an extension is granted beyond September 30, Congress has authorized the Maritime Commission and the War Shipping Administration to engage in all-over ship operations only until March 1, 1947, at which time all vessel operations must be turned over to private enterprise.

Between now and March 1, 1947, at the latest, therefore, solutions must be found to what at this time seem to be insurmountable problems. You in the Stockton area certainly have more than a casual interest in our domestic transportation because, in addition to standing in the very center of one of the great agricultural districts in the world and which is currently expanding as an industrial center, you have developed, through no small effort, a modern, efficient, deep-water port facility second to none in the Bay Area.

You have reopened your port to commercial traffic, a port which was built through initiative and a strong spirit of community enterprise. You have embarked with extensive preparation on the project to regain and expand your port's traffic. You would not have done so had you not realized that the industry of your community, the business enterprises which move your cargo, could benefit by water transportation.

Mutually we face the problem of a couple of veterans who have been off to the wars for four years. We have come back looking for the same old job, but the job has changed and we find new and tougher problems. You in Stockton can do something about helping to put life into the avowed merchant marine policy of our Government which, as stated in the Transportation Act of 1940, is designed "to the end of developing, coordinating, and preserving, a national transportation system by water, highway and rail, as well as other means, to meet the needs of the commerce of the United States, the postal service and the national defense."

Your group, your Stockton area Chambers of Commerce, your Harbor Department, your municipal governments must tell the Interstate Commerce Commission, your Congressmen and your Senators that you are vitally interested in the creation of an economic climate conducive to a strong privately-operated, domestic, water transportation system. You must impress upon the various governmetal agencies involved that positive steps must be taken to again integrate shipping into the national transportation system.

Neither Congressmen or other Government officials can be counted upon to come to the support of the shipping industry while there is little or no evidence that the people back home are genuinely interested in a Merchant Marine or have strong feelings that one should be maintained.

Shipping will continue to press its case. Shipping knows its problems are also Stockton's problems.

Your continued and renewed interest is urgently essential.

Vic Knudsen Awarded Coveted Certificate

Vic Knudsen, in the ship rigging business at 134 Sacramento Street, San Francisco, was recently awarded the Certificate of Achievement by the Navy for outstanding accomplishment in the manufacture of cargo nets and other rigging equipment during the war.

Recognized as one of the best ship riggers on the Pacific Coast for the past twenty-six years, Knudsen is in a position to manufacture ship rigging and stevedore equipment of all kinds. During the war he operated several plants, but about a year ago consolidated all of them in his new location at Sacramento Street.

◀ Promenade Deck, starboard side looking forward.

▼ Swimming Pool off Main Lounge. Double deck height windows are seen on right.

S. S. President Polk

(Continued from Page 45)

ished, and are adequately lighted by both the indirect, or lumiere type fixtures. Three different color schemes are delicately used in the interior decorations: pale seafoam green, oyster gray, and soft rose, while the furniture in all the rooms is white oak, with table and dresser tops of light-colored Formica to match.

Ventilation is excellent. All rooms have large airports which furnish plenty of fresh air when the vessel is cruising at normal speed. Every room has an abundance of hot and cold water just by the turn of the tap. In fact, the standards and service are those of the first-class hotel, throughout.

Public Rooms

The outstanding feature of the public rooms is the Main Lounge. Situated amidships on the promenade deck, this room is two decks in height, flanked on port and starboard sides by four ventilating ducts, which form three archways, above which are installed large windows reaching to the ceiling. The center archways are closed by a group consisting of sofa, table and chairs, and behind the sofa stands a walnut fernery, abundant with greens. Open archways on the port side lead into the cocktail lounge and bar, and on the starboard side, into the card room and library.

At the forward end of the lounge is an aluminum, copper and glass decorated fireplace, over the mantle of which is a large mural depicting a city waterfront scene, with tugboat and suspension bridge in the foreground, and a hazy view of city skyscrapers beyond. The grouping of sofas, easy chairs, Chinese walnut chests and tables all tend to give an air of complete comfort and relaxation. At the after end of the lounge is a five-sectioned, full-height, curved window, discreetly screened by venetian blinds and drapes. Here one looks out at the activities

around the swimming pool and play deck, with the sea beyond. The wall color is a delicate pale green, while deep bottle green, mustard gold, and coffee brown predominate in the furniture. All windows are by Kearfott, and are well-screened by white venetian blinds.

A fine promenade deck, outside the public rooms, is glass-enclosed by Kearfott "Fulvu" windows for about one-half its length, port and starboard.

The library, which may be entered from the foyer, is decorated in a modern motif, with bleached oak-paneled walls. These panels all have incombustible Marinite cores. Along one side of the room is a large sofa with square walnut end tables with Formica finished tops. Along the opposite wall of the room is an intimate arrangement of two crimson velvet, corduroy-covered chairs, with table between. Two chairs covered with white, textured materials, are situated on each side of the foyer entrance, while behind are the built-in, grill-enclosed bookshelves. At the after end of the room, on each side of the door leading to the card room, are two modern walnut desks with chairs to match, all designed with simple charm. The carpet is a pale blue-green nubby texture, the same as in the lounge, and the drapes are a modern tapestry-rype print of soft gray, with bright flowers in reds, blues and golds, and green leaves.

Immediately aft of the library, and accessible from the main lounge through two archways, is the card and game room. Recessed into the center archway, behind the fernery, is a cream leather-covered spinet, and directly across is a grouping of a coral-covered sofa with rectangular, walnut front and side tables. Other chairs of walnut and brightly colored coverings, with tables in harmony, are interestingly arranged around the walls and in the corners. The walls are in a lighter shade of green, and in the panels between windows and archways are watercolors of landscapes on cocoa-brown mats, with light frames of walnut.

On the port side, and adjoining the lounge, is the bar and cocktail lounge. It is also easily approached from the foyer or play deck, and along the walls are arranged walnut Formica-topped tables, with walnut, coral-leather-covered chairs, in friendly groupings of three. On the walls, which are painted a light green, hang light, walnut-framed pictures of circus scenes, and the draperies have a white background, with a pattern of coral, bamboo, and green tropical leaf design, which gives the environment quite a merry touch. The bar, located at the fore end of the cocktail room, and large enough to take care of several groups, is of walnut, backed by a mirrored wall, with two Chinese scenes painted into panels at each end of the mirror.

The dining room, situated on the second deck, depends entirely on electric light, mechanical ventilation, and air conditioning. The lack of breadth in this room has almost been dispelled by the interior decorator in his clever use of mirrors and murals. On the portside wall is a long mural of the San Francisco Embarcadero, with the hills, skyline of buildings, and the Golden Gate Bridge beyond. At both ends of this mural are colorful floral-designed draperies of tropical, deep green and white. The opposite wall, with long sectional mirrors and similar draperies at ends, reflects the mural and gives the illusion that one is actually looking at the San Francisco skyline. The walls are tinted an oyster gray; the floor is black and white marbelized tile linoleum; and all dining room chairs are covered in a rose textured material. The air conditioning of this room, and the pantries and galley adjoining, is such that there is a complete absence of objectionable cooking and food odors.

K. H. Lengfeld of San Francisco designed and supervised all the interior decorating of the ship.

The galley, pantries, butcher shop, and bakery, situated in a compact arrangement just aft of the dining room, are all equipped in the most up-to-date manner. Most of this equipment was manufactured in the United Engineering shops. The three electric ranges and broiler are the latest by the Edison General Electric Appliance Co., Inc.

The following vendors supplied their equipment as shown:

Radio equipment	Radio Marine Corporation of America
Fathometer	Submarine Signal Company
Boats and Davits	Welin Davit & Boat Corp.
Public Address System	Remler Co., San Francisco
Bathroom Fixtures	Crane Company
Fire Extinguishing System	Walter Kidde & Co., Inc.
Windows and sideports	Kearfott Engineering Co.
Rubber tiling, deck covering, and stateroom carpets	Lorentzen Co., Oakland
Galley ranges	Edison General Electric Appliance Co., Inc.
Interior Decoration	K. H. Lengfeld, San Francisco
Refrigerators	The Copeland Company

Book Review

MANUAL OF DESIGN FOR ARC WELDED STEEL STRUCTURES, a 300-page copiously illustrated, attractively bound book, compiled by LeMotte Grover, M., Am. Soc. C. E., and published by the Air Reduction Sales Company, New York, $2.00 net, offers a wealth of useful, up-to-date information covering fundamentals of design, materials, inspection, estimating and engineering control of welding and related operations.

Chapters are included to encompass electrode requirements, specifications for welded connections for all sizes of rolled beams, and a series of diagrams for the rapid design of welded connections.

Mitchell-Manning's Eastern Distributors

Appointment of distributors for racing copper and shipping copper on the Atlantic and Gulf coasts was announced recently by F. J. DANNENFELSER, sales manager of Manning-Mitchell, Inc., manufacturers of these new plastic type anti-fouling bottom paints.

Wholesale distributors handling the Manning-Mitchell line on the Atlantic are *Marine Hardware and Supply Co.* in Boston, *E. J. Willis Co.* in New York, *William H. Whiting Co.* in Baltimore, *S. King Fulton* in Washington, D. C., *Paxton Co.* in Norfolk and *Frank T. Budge Co.* in Miami. On the Gulf the line is represented by *Poston Marine Supply Co.* in Tampa, *A. H. McLeod & Co.* in Mobile and *Arthur Divic's Sons* in New Orleans.

Racing copper and shipping copper are based on the scientific principles of formulation which were developed by government research during the war and proved at sea under war conditions. Introduced on the Pacific coast, they have well proved their high resistance to fouling. They carry an eighteen months' guarantee and are the only bottom paints which offer this type of surety.

Nordberg Moves L. A. Office to S. F.

Nordberg Manufacturing Company of Milwaukee, Wisconsin, announces the consolidation of the Los Angeles and San Francisco offices in a new building and warehouse at 674 Harrison Street, San Francisco. This new building is of reinforced concrete with 73-foot frontage and 100-foot depth, located within walking distance of the principal business district and waterfront of San Francisco.

These new and expanded facilities take the place of offices formerly located in the Subway Terminal Building in Los Angeles and at 55 New Montgomery Street in San Francisco. In these new accommodations there will be a showroom on the first floor, together with ample storage and shipping facilities for crusher and engine parts. This space will have a craneway for handling heavy shipments and there is a driveway for loading into trucks. On the mezzanine floor will be the offices of the heavy machinery, crusher and process machinery divisions. No change has been made in the personnel of the two offices.

What Makes a Compressor Shaft Seal Seaworthy?

A G-E shaft seal is mighty good insurance against refrigerant leakage. It keeps valuable refrigerant where it belongs... inside the G-E Refrigeration System. It keeps the G-E Compressor on the job of preserving cargoes and ships' stores . . . of cooling passengers' and crews' quarters.

Every part of the self-aligning G-E shaft seal is engineered to prevent leakage:

- The nose piece is made of G-E developed, wear-resisting bronze alloy—hand lapped and microscopically checked.
- Each brass bellows is individually tested.
- The spring pressure is uniform. Variations of more than ¾ of 1% are rejected.
- Factory run-in test on compressor assembly includes shaft seal break-in.

You'll find the same "seaworthy" engineering in the entire line of G-E marine refrigeration equipment. For reliable performance ashore or afloat, it pays to specify G.E. *General Electric Company, Air Conditioning Department, Section 65910, Bloomfield, New Jersey.*

GENERAL ELECTRIC

Marine Refrigeration

NEWS FLASHES

WESTERN METAL CONGRESS REVIVED

The industrial development of the West is given credit for the plans for resumption of the Western Metals Congress and Exposition to be held in the Oakland Civic Auditorium beginning March 22. The last event of this kind was held in Los Angeles in 1941.

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STEAMER DELTA KING OFFERED FOR SALE

Until October 18, 2:30 P.M., the Maritime Commission will receive bids for the river steamer Delta King. The vessel has been in use as a barracks ship during the war and is now located at Suisun Bay, California.

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THE AMERICA SAILS AGAIN

The S.S. America about which there has been some uncertainty, due to requirements for increased crew quarters and decreased passenger quarters, has been returned to the United States Lines for private operation.

The company has not taken title to the America, but will operate it on a charter basis for the Maritime Commission.

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BANANA FLEET RETURNS TO THE PAFICIC COAST

The United Fruit Company announces a fleet of five new refrigerated banana carrying steamers will resume the banana run from Costa Rica to Los Angeles.

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BECHTEL JOINS PACIFIC FAR EAST LINE

Added to the well known group operating the only volume Far East Line is S. D. Bechtel, head of the construction firm of Bechtel McCone. President of the company is William T. Sexton, Vice President Thomas E. Cuffe, and Chairman of the Board Kenneth D. Dawson. The line will serve the Philippines, Japan and China with modified C-2 steamers.

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KAISER CONTINUES YARD 3 UNTIL DECEMBER 31

In extending the time for receiving bids for leasing shipyard No. 3 at Richmond to November 1 the Maritime Commission agreed to allow present operators of the yard to use it for fabrication and manufacture normally undertaken by shipyards, as long as such use does not interfere with ship construction. The successful bidder will take over on January 1, 1947.

JOSHUA HENDY GETS FIBERGLAS MACHINERY ORDER

Said to be the first such orders for the West the Joshua Hendy Iron Works, Sunnyvale, California, has been awarded orders for machines for the manufacture of Fiberglas by the Owens-Corning Fiberglas Corp. These are for use in the company's new Kansas City factory and will cost several hundred thousand dollars.

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CONVERSION BIDS WANTED

Until October 9, 12:15 P.M., the Maritime Commission will receive bids for conversion of five military type vessels to C-3 cargo ships for commercial trade. The vessels are the Howell Lykes, USS Montour, USS Sitka, the Sea Sturgeon and the USS Grafton. The first was built by Federal Shipbuilding, the next two by Ingalls, and the last two by Western Pipe and Steel.

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THREE NATION MERCHANT FLEET

The joint Colombian, Ecuadorian and Venezuelan naval purchasing commission is in the United States to negotiate the purchase of merchant craft for a three-nation fleet recently created. The commission has already begun negotiations with the Maritime Commission and has several private offers. It will later go to Canada, England, Scotland, Sweden and Italy.

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GUNDERSON TO BUILD KELP SHIP

A contract for the construction of one kelp harvesting vessel has been awarded to the Gunderson Bros. Engineering Corp., Portland, Oregon, by the Kelco Co., San Diego. The vessel will have a length of 100 feet; beam 31 feet; depth 10 feet; and will be equipped with a twin screw 660 hp diesel.

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SCHELL REPORTED LEAVING THE MARITIME COMMISSION

Samuel D. Schell, executive director of the Maritime Commission since 1938 is reported to have resigned, effective September 30. The title of executive director has been abolished.

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CONSOLIDATED STEEL TO OPERATE IN PHILIPPINES

The Philippine Consolidated Shipyards has been formed to operate ship repair facilities in the Philippines and elsewhere in the Far East. The company will be associated in the enterprise with the Philippine Industrial Equipment Company, controlled by S. D. Bechtel, K. K. Bechtel, and John A. McCone. Others associated in the venture are K. D. Dawson, Andreas Soriano, and the Morris-Knudsen Company. Upwards of 200 engineering and other key personnel have been flown to Manila to get the project under way.

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CONTRACTS FOR FOUR C-3 CONVERSIONS AWARDED

The Maritime Commission announced awards on lump sum basis for the conversion of four C3-SA-2's. Todd-Johnson Dry Dock, New Orleans, gets the Sea Scamp

$466,560; J. K. Welden Corp., Brooklyn, the Sea Marlin $300,000; Todd Shipyards, Hoboken, Sea Tiger $368,198; Bethlehem Steel Company, Baltimore, the Sea Quail $379,000.

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NEW MARITIME COMMISSION SECTION

With the absorption of WSA into the Maritime Commission the Department of ship operations has been formed, embracing the functions known to the industry as ship allocations, charter and operating contracts, traffic analysis, rate determinations, marine or physical operations of ships. Head of the new department is Gerald Helmbold.

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PHILADELPHIA SETTLES RENTAL DEAL

The Maritime Commission has accepted from the City of Philadelphia the sum of $612,000 as agreed rental for the Hog Island Terminal for the four year period January 23, 1942 to January 22, 1946.

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BIDS WANTED FOR CONVERSION OF FOUR MORE C-3's

Until October 2, 12:15 P.M., the Maritime Commission will receive bids for converting the C3-SA-2 cargo vessels: Elmore, Fayette, Leon and Knox, now in the Mobile River. All are APA's built by Ingalls.

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ARGENTINA INTERIORS

Until October 2, 12:15 P.M., the Maritime Commission will receive bids for interior designs for the reconversion of the S.S. Argentina

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TWO FAST PASSENGER LINERS TO BE BUILT IN CANADA

Sir Walter Carpenter, Canadian shipping operator, announces plans to buy or build two 18-knot passenger-cargo liners similar to the C-3 type, and will institute a twice monthly service between the South Sea Islands and the Pacific Coast.

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BETHLEHEM GETS CHILEAN CONTRACT

Bethlehem Steel Company has been awarded a contract for conversion of four C2-SB1 vessels allocated under the Ship Sales Act to the Chilean Line by the Maritime Commission. Bethlehem's bid was $1,289,000. The vessels are the Oriental, Golden Gate, Flying Mist and Ocean Telegrapher.

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FIVE MORE C-3 CONVERSIONS

Until October 2, 12:15 P.M., the Maritime Commission will receive bids for converting five C3-SA-2 cargo vessels, as follows: Grundy, Hampton, Sea Corporal, Sea Partridge, Goshen. The first two were built by Ingalls, the last three by Western Pipe and Steel.

L. R. SANFORD JOINS SHIPBUILDERS COUNCIL

L. R. Sanford, former director of construction for Maritime Commission, has been appointed executive assistant to H. Gerrish Smith, president of Shipbuilders Council.

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CANTILLION RETIRES

John W. Cantillion retired on August 31 from the American Bureau of Shipping. He joined the organization in 1898.

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NATIONAL FOREIGN TRADE CONVENTION

The 33rd National Foreign Trade Convention will be held by the National Foreign Trade Council in New York on November 11-12-13.

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TERMS OF LEASE, RICHMOND YARD 3

The Maritime Commission's offer of Richmond Yard No. 3 provides for a ten year lease, which may be canceled by either party after three years or immediately in national emergency. All buildings are permanent and all machinery is in good condition.

The minimum acceptable amount is $600,000 a year. The yard may be used only for ship repair, reconditioning, reconversion and scrapping.

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GENEVA PLANT GOES TO COLUMBIA STEEL

At the U. S. Steel directors' meeting in San Francisco, President Fairless stated that the recently acquired Geneva plant in Utah is now a part of Columbia Steel with head office in San Francisco.

* * * * *

DIESEL ENGINE FORUM

The Diesel Engine Manufacturers Association's conference in San Francisco has been set for November 7 at the St. Francis Hotel. Major steamship companies, naval architects and engine manufacturers and dealers will attend.

* * * * *

RESERVE FLEET TOTALS

As of September 20, merchant vessels now in the eight reserve anchorages: James River, 725; Suisun Bay, 364; Mobile River, 214; Columbia River, 31; Puget Sound, 93; Neches River, 54; Hudson River, 166; Brunswick River, 12. Total 1659.

* * * * *

SOUTHERN PACIFIC BUYS GENERAL MOTORS DIESELS

Five new 6000 horsepower diesel-electric streamlined passenger locomotives have been ordered by Southern Pacific Company from the Electro-Motive Division of General Motors for delivery next spring. They are to serve the Golden State route from Los Angeles to Chicago and the Shasta Daylights from San Francisco to Portland. Each locomotive will carry three boilers for steam heating the trains.

Burchard and Fisken Seattle Agents for Cunard White Star Line

The Cunard White Star Line has announced recently the appointment of *Burchard and Fisken,* of Seattle, Wash., prominent in Pacific Coast shipping circles for many years, as their General Agents in that city to serve the Northwest territory. The office is located in Seattle's Exchange Building.

E. H. Gordon, appointed by Burchard and Fisken as passenger manager, is a veteran of 32 years of service in transportation. He has been affiliated with the Cunard White Star Line's services since 1922 and served as passenger agent in the Cunard White Star Line's Seattle Office from 1934 until the outbreak of the war.

The strengthening of Cunard White Star's position in the Northwest by the appointment of a general agent in Seattle at this time is concurrent with the announcement by the Cunard White Star Line that the luxury liner Queen Elizabeth will make her maiden voyage from Southampton on October 16. This ship, the largest in the world, will sail from New York on her Eastbound maiden voyage on October 25. Subsequent sailings from New York are scheduled for November 14, November 29, December 14, December 27, January 10 and regularly thereafter.

Shoreside Personalities

ALLEN RETURNS TO MARINE DEPARTMENT OF STANDARD: *Stanley E. Allen,* who was recently discharged after over three years in the service (rank of Commander), and who was stationed most of his time at a Naval base in the West Indies, has returned to the Marine Department of Standard Oil of California. "Sea" as he is affectionately known, was one of the organizers of the old Propeller Club of California, with which he served as secretary and later occupied the same position with the Mariners Club.

CARL F. FENNEMA, vice president and general manager of Wilmington Transportation Co. of Wilmington, California, announces that the company has recently re-acquired from the U. S. Navy the tugboat John H. Stewart. This Winton diesel-engined vessel will be reconditioned for the service of the company and renamed the R. D. Alexander.

Alexander, who passed on early this year, was for many years chief tugboat dispatcher for the company.

Marine Surveying Firm Opens in Seattle

Captain L. C. Perry has established his own marine surveying business in Seattle, following his resignation from the Board of Marine Underwriters of San Francisco Inc.

The captain formerly sailed from San Francisco as master of the American-Hawaiian 's Nevadan. He was with Struthers & Dixon, Swayne & Hoyt, the Argonaut Steamship Company, United American Line and Williams, Dimond & Company.

During the recent war, Captain Perry was master of the SS William Cullen Bryant. This vessel was struck by a torpedo in the Straits of Florida, but the captain succeeded in bringing his vessel to Tampa, Florida. They lost 4000 tons out of 11,000 tons of Hawaiian sugar from this hit.

Keep Posted

New Equipment and Literature for Yard, Ship and Dock

Device to Detect Pre-Welding Flaws in Steel

O. R. Carpenter, welding engineer for Babcock & Wilcox, describes a device designed to provide a non-destructive means for detecting flaws in steel plates prior to welding. The instrument, the Sperry Supersonic Reflectscope, has been used experimentally since last December. According to Mr. Carpenter, it will not only indicate a flaw in a plate but also will locate the defect. The device sends supersonic vibrations through the plate and measures the time it takes them to penetrate the material.

Sullivan AW-RJ Air Winch

The Sullivan Division of the Joy Manufacturing Company, announces a new, small, lightweight, air-powered hoist, the "Air-Winch," capable of lifting 500 lbs. yet weighing only 85 lbs. It has a rope capacity of 150 feet of ¼-inch rope, is only 18 inches long, 9½ inches high and 11 inches wide. It is powered by an extremely simple, four-cylinder, reversible, piston-type air motor and can be used in many different ways about the average mine or on the construction job.

J. M. COSTELLO SUPPLY CO., of Wilmington, California, has recently been appointed Southern California representative for the Robert G. Allen Company of New York, manufacturers of Allenite Soot Eradicator, and Allencote Refractory Coating.

Plastic Lead Seal For Pipe Joints

The Crane Packing Company, of Chicago, is now marketing a product known as Plastic Lead Seal which seals threads and gaskets on all equipment found in pipe lines, power plants in the marine and industrial fields, refrigeration, chemical industries and oil refineries.

This pipe joint compound is very easy to apply and adheres to all threads or gasket materials such as cork, fiber, asbestos, paper and copper. It makes a smooth, tight joint which can be disconnected easily at all times, although it is insoluble in oil, gasoline, steam and water.

This makes it a very popular item with the marine engineer, since he needs only one seal to handle all services commonly found aboard ship.

Admiralty Decisions

(Continued from page 76)

no reason to know which workman would be assigned any particular job—whether of repair or construction.

In *Kawalsky* vs. *Conreco Company,* 264 N. Y. 125, Conreco Company was the owner of certain premises on which the City of New York had placed a fire violation. Conreco Company employed Joseph Moreng Iron Works to do the necessary work to remove the said violation. Joseph Moreng Iron Works in turn employed one Alexander John as a subcontractor to do the iron work involved. During the course of the work, some windows in the premises became broken and John employed Victory Glass Company to install new window panes where required. The plaintiff's decedent was a glazier employed by Victory Glass Company who was killed while replacing a broken window pane as ordered, through leaning against a defective shutter which constituted part of the fire violation which John had been engaged to repair. The court said:

> "Moreng sublet this contract to Alexander John, doing business under the trade name and style of Jennings & John. Had John or his men been hurt by an unsafe or insecure shutter or barfastening, the owner of the building would not have been liable. He had employed them to make the repairs, to remove the danger, to fasten and secure the bars and shutters. No responsibility rests upon an owner of real property to one hurt through a dangerous condition which he has undertaken to fix. The duty of an owner to repair implies that the workman employed to make the repair assumes the risk. . . .
>
> "An employee cannot recover for injuries received while doing an act to eliminate the cause of the injury. As was said in *Mullin* vs. *Genesee County El. L., P. & Gas Co.* (202 N. Y. 275, at p. 279): 'The reason for this exception to the general rule is that it would be manifestly absurd to hold a master to the duty of providing a safe place when the very work in which the servant is engaged makes it unsafe. If a man is engaged in tearing down a house he is constantly exposed to dangers of his own creation; and in such a case all those who are engaged in the same common purpose are fellow-servants for whose negligence in executing the details of the work the master is not liable, even though "the work is done in successive stages, different parts thereof devolved upon different persons, and the labor performed by one set of employees being prior in time to that performed by another set." ' (See, also, *Hess* vs. *Bernheimer & Schuartz Brewing Co.,* 219 N. Y. 415.)
>
> "Therefore, if John or his employee had fallen out the window because of a defective shutter bar, no recovery could have been had against the owner. The defect John was hired to remove. Had he failed to do so, it was his own fault; or had he fallen in doing any other part of the work, it was a danger he and his employees assumed.
>
> "John undertook to repair all the shutters, bars, nuts, bolts, fastenings to the rear windows of the building and in doing so broke the glass in some of the windows. He had not finished his work as it had not been accepted by the fire department, the owner or his contractor. When notified about the broken glass, he said he would fix it at once, and undertook to do so. He sent Meyer Kowalsky who, while putting a pane of glass in a window on the seventh floor, leaned against or took hold of the cross-bar, which gave way, causing his death. This action is brought by Kowalsky's administratrix to recover damages for the negligence. The negligence if any was that of John, the subcontractor who had contracted to fix the window-bars, and who from the evidence apparently failed to do so. The owner is not liable for this unfortunate accident on the ground that he had furnished John and his employees or subcontractor an unsafe place to work, as Kowalsky, John's employee or subcontractor, was killed through defects which John was in the act of repairing. Neither is the owner liable for the negligence of John in doing or failing to do his work; Kowalsky was on the premises to help John complete it so as to remove fire department violations and get his pay."

Under the circumstances disclosed there was no liability of the defendant Moore-McCormack Lines, Inc., or the respondents United States of America, or its agency War Shipping Administration to the plaintiff-libelant William M. Byars and judgment and decree were affirmed.

Steady As You Go

(Continued from page 93)

is taken as an indication of the number of days before the storm arrives.

One of the most curious of the seaman's superstitions was the efficacy of the caul to prevent drowning. A child born with a caul over its face would never die by drowning. Nor would a sailor so die, who carried a caul in his bag. Many a landlubber contemplating a sea trip has tried to buy a caul from a sailor as insurance against drowning.

No woman should sail aboard a ship on the maiden voyage of the vessel. A vessel should be christened only by a young girl. Sailors growing beards ward off favorable winds. The vision of the Flying Dutchman off the Cape of Good Hope foretells disaster, and a vessel that drifts into the Sargasso Sea will never get through its waters.

Unfair Ship

I was sitting in the fo'c'stle
A sipping of my tea,
Sing Ho, for the hardship
Of a sailor's life at sea.
When up stepped the buckomate,
Bully boy McGurk,
Who addressed me impolitely
And requested me to work.
Now work it is a nasty word
Of ugly definition,
Of dirty hands and harsh commands
And too much supervision.
So here I'm up before the Board
Charged with mutiny.
Brother, I'm a union man—
They can't do this to me. —J.A.Q.

Keep Posted

(Continued from page 127)

Kindorf cable device.

Kindorf Cable Hangers

The Kindorf Company, 116 New Montgomery Street, San Francisco, is publicizing its electrical cable hangers and straps which were used with considerable success and economy in the Maritime Commission and Naval building programs.

The Kindorf hangers provide easy cable installation in all types of vessels, both in new construction and in repair and conversion jobs.

Fathometer Jr. Model

A new, compact Fathometer for small fishing and pleasure craft has been announced by Raytheon Manufacturing Company's Marine Division, Submarine Signal Co., Boston, Massachusetts. While this new instrument employs the same echo-sounding principle originated and perfected by this company for the U. S. Navy and commercial vessels, it achieves a new simplicity in engineering design.

The entire system, consisting only of a control unit, projectors and a vibrapack power supply unit, can be quickly and easily installed. The components of the control unit, signal generator, echo amplifier, indicator and driving mechanism, are so compact they are mounted in a single spray-proof case about one foot square and four inches deep.

With this instrument, the small boat owner can enjoy the same underwater protection formerly available only to deep sea navigators. It gives accurate depth measurements within a range of 400 feet at the rate of 360 soundings per minute. These can be checked with the charts to identify underwater landmarks, and assist in determining position regardless of fog, darkness or weather conditions.

For fishing, the Fathometer Jr. adds both pleasure and profit. It picks up the mud flat with its flounders, the ridge where codfish lurk, the runs and depths where various fish abound.

"WHAT DO G. M. DIESELS DO?" is the title of the pocket-size booklet written in verse form and illustrated by Jim Brown, product news manager of the Detroit Diesel Engine Division of General Motors. It describes the role that compact, high-speed diesels play in our every-

The new, compact Fathometer, Jr. for small fishing and pleasure craft introduced by Raytheon Manufacturing Co., Marine Division, Submarine Signal Co., Boston, Mass.

day lives, and illustrates about 40 of these applications. The booklet, written for Mr. Brown's young son, should receive considerable acceptance as collateral reading for school children as well as for adults. Copies are available free by addressing this magazine.

THE A-B-C OF ALLIS CHALMERS TURBO-BLOWERS, rotary compressors and vacuum pumps is explained fully in a 16-page booklet, cleverly illustrated, designed for student training which tells what these units are, how they operate and how to figure them.

KEEP POSTED

The details of new equipment or the new literature announced in this department will be furnished without obligation on your part. For quick service, please use this coupon.

PACIFIC MARINE REVIEW

500 Sansome Street - - - San Francisco

Send me descriptive data of the following new equipment or literature as reviewed in

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(Identify by name of manufacturer and catalog)

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BUSINESS.....

ADDRESS.....

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Mechanical Handling Must Come

(Continued from page 68)

Just consider the handling methods employed for one of their largest commodity movements, the millions of tons of canned and dried fruits and vegetables which annually flow from Central California to the large Eastern seaports. Here truly is the cream of the California crop, canned peaches, pears, apricots, spinach, tomatoes, asparagus, peas, string beans, fruit salads, dried prunes, raisin, and figs and all, mind, *packed in standard containers in uniform sizes and weights.*

Flowing the year around by truck and rail from the vast valleys of the interior, from Fresno, Modesto, Stockton, Sacramento, San Jose, Santa Clara Valley, Salinas Valley, this movement is easily one of the world's biggest transportation jobs. It supports thousands of workers, clerks and executives, in the canneries, packing houses, trucking firms, railroads, terminals and ports and maybe the crews aboard the vessels which will haul it away if they can only meet those rail rates.

So large is this movement that terminals and ports have used it as the backbone upon which their facilities were developed. The Encinal Terminal in Alameda, the Howard Terminal in Oakland, the Port of Oakland, the Port of Richmond, the Port of Stockton, and the Port of Sacramento have all invested money in facilities because they could share in this huge movement. They too are interested in seeing the trade continue and so of necessity are interested in terminal costs.

And what are the present handling methods on this great movement? Just about what they were twenty-five years ago. Beginning at the cannery or packing house, these ideally uniform cartons and boxes are loaded into trucks or railroad cars by means of the two-wheel cannery truck. If it is a motor truck there has been a change in the last twenty-five years. These trucks have grown two or three times as big, to the advantage of the trucker and shipper but to the disadvantage of the steamship operator with narrow old-fashioned piers.

However, assuming our shipment is moving by truck, after a fairly free trip through the open country it hits the congested areas of the Embarcadero or other back terminal streets and begins to lose time. Finally it reaches the pier. If lucky it enters in a few minutes. But in the heavy shipping season it waits in line for hours before it can get on the overcongested wharves. Unloading is by hand, each package individually, and stacked only shoulder high wasting all the overhead storage space. With the vessel in berth, our packages are again picked up individually by hand and stacked on a sling. So they are hoisted into the ship and again unloaded by hand and stowed.

In due course the vessel pulls out for the East Coast. There our chain of handling starts all over again in reverse. The unions may be different but the work is the same. Laboriously the packages are stacked on a sling or a pallet again and hoisted over the side to the dock. Again they are stacked by hand shoulder high. When the truck shows up, the public loaders load it by hand, except that on some piers in New York the loaders are so progressive they have bought themselves fork trucks and load with them, to their profit, not the steamship companies. In any case, there is a big chance that the truckman had to wait a couple of hours before he could get on the pier and then it took an average of two hours more to load the truck. So finally he pulls away for the consignee's warehouse where our packages are again unloaded by hand.

It is almost unbelievable when considering the large industrial tasks that have been accomplished in this nation that this monotonous chain of rehandling actually takes place. But it does. And regardless of who actually lays out the cash for each of those handlings, it is the trade as a whole that ultimately pays for them. Each and every one of them is part of the cost of shipping by steamer from one coast to the other.

It seems to me that it doesn't take much imagination to recognize that in all those handlings there exists the opportunity of a lifetime to put the steamship lines back in a position where they can laugh at the rail rates. Maybe, as of today, we don't know how to eliminate all those handlings. Maybe we haven't developed mechanized handling to the point where it will solve everything. But one thing is certain, and that is that mechanical handling today has already been developed to a point where it is a great deal cheaper than manual handling and the general trends of what is coming in the future are clearly discernible.

In my opinion, and it certainly isn't unique, the future is for more and more unit loads. The ultimate that we can foresee today is the shipping container, bigger and bigger shipping containers. As a matter of fact, even

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Mechanical Handling Must Come

(Continued from page 130)

ruling out the Seatrains, some steamship companies are already publishing rates on shipping containers.

But the intercoastal lines do not have to go in for shipping containers to get at least some of the benefit of unit loads. All they really have to do is to get together on a program and approach their shippers. In all trades, steamship companies have long suffered from their failure to get together and establish standard packaging requirements. The A.A.R. certainly is far ahead on that one with its staff of experts and inspectors while the packaging requirements of the steamship companies are still set by competition.

Now, however, if the intercoastal lines would get together, they have the chance of not only setting up workable packaging requirements but of setting up those requirements in such a way that they will eliminate many of those manual operations described above.

Let's see how such an operation might be set up. Starting at a cannery or packing house, perhaps the Flotill Products Corporation in Stockton, or the Sunmaid Raisin plant in Fresno, or the several California Packing Corporation plants, or those of Libby, McNeil & Libby Company, our cases are stacked on a pallet. Not any old pallet, but a pallet designed for ship handling by the intercoastal lines. Maybe it will be furnished from a pool maintained by the intercoastal lines. In either case the packer won't object because with his cases piled on a pallet he can stack them with machinery far higher and cheaper than he could by hand, thus saving storage space while awaiting shipment, space which probably cost about $5.00 a square foot to build. On pallets his stacks are well ventilated, portions of the stack can be easily removed for labeling or cutting out leakers. And, of course, it is a perfect setup for labeling, unloading the pallet at one end of the line and reloading at the other.

On the move to the pier the pallets are placed on the truck without manual handling, two high if necessary to get the maximum load. The time saved in loading and unloading will more than pay the truckman for the extra hauling of a few pallets. But again, if the truckman picks the size and type of pallet, it will be of a size and type that suits his present equipment and may not be at all suitable for ship loading. While on the other hand if the lines get in there first, get to their customers and work out their problems mutually, the trucklines will have to fall in line even if in time it may mean new equipment especially designed for unit loads.

So the truckman has saved on his loading time. When he gets to the pier he cuts his unloading time to a quarter or less of what it would take by hand. This one factor alone can eliminate all of the long lines of trucks that are such a familiar sight on any waterfront. And the fork truck which does the unloading without any extra cost can stack the shipment three or four pallet loads high frequently saving as much as 50 per cent of the pier space at an average construction cost of $9.00 a foot.

When the vessel is ready for loading, a fork truck breaks down the high pile and if near the hatch carries the pallet loads to ship's tackle. If some distance is involved it is carried to the tackle on flat trucks made up into trailer trains. So it is hoisted into the ship still on pallets.

With our shipment in the hold still on pallets, we reach a point where there is considerable difference of opinion. At least to some extent it will have to be taken off the pallets and hand stowed. Maybe. Even so the savings have already been tremendous. On the other hand, there is a growing number of individuals in the business and even a few lines which are beginning to favor leaving as much of the shipment as possible on the pallets.

How much is possible. Again that is still a matter of opinion. It would appear that practically all of the 'tween deck areas can be stowed on pallets as well as a large proportion of the second, third and fourth lower holds.

Again I can hear my two old-timers setting up a howl, this time joined by 90 per cent of the traffic departments in the business. "You can't do that," they shout in unison, "you lose too much of the cubic. It may cost you about 25 per cent of the cubic space in a vessel and that is what we are selling."

They are probably right on very long runs where the traffic is heavy. On the other hand, shipping on pallets will cut the turn-around time and a vessel can make extra runs which may more than make up for the cubic that is lost through the pallets.

But after all there is nothing new in the idea basically. Fifteen years ago the Fay Transportation Company, now the River Lines, operating on the San Joaquin and Sacramento Rivers of California converted their equipment and operations to handling by platform skids which were used for truck delivery at both ends of the river haul. At least ten years ago tin plate was moving from the East Coast to the West Coast in unit loads of about a ton apiece, with strip dunnage held on by metal strapping which permitted fork truck handling. The Terminal Tariffs published carloading rates of 20c per ton for

loading this commodity as against average rates of 60c per ton for similar commodities not packed in that fashion, and a larger margin of profit was realized on the lower rate.

Prior to the war, the Foster and Wood Canning Company of Lodi made deliveries to the Stockton piers on pallets of their own design. But they had to be unloaded by hand on the dock as there was no means of coordinating with the pier and vessel handlers.

And, of course, there is the Seatrain Line.

These illustrations, and many more can be found, show an interest and a trend, a trend which with the proper guidance can be bent to the tremendous advantage of the intercoastal lines.

While we have been considering these illustrations, the vessel in which our shipment is moving has been loaded, sailed and reached New York with a certain unknown portion of our shipment still on pallets and the balance hand stowed. The loaded pallets are discharged as fast as the ship's gear can swing them over the side. Not only has there been a saving in handling and time, but there have been incidental but important savings in sorting and damage. On the pier, the pallet loads are again stacked high, saving pier space, to await pickup by truck. The balance of the shipment which was hand stowed is loaded onto pallets and also stacked on the dock.

When the truck shows up it finds the pier much less congested because of the high stacking and it in turn is loaded by fork truck in a quarter of the time normally required. At the consignee's warehouse the truck is again unloaded by fork truck and if our shipment is to stay in storage can be left right on the pallet for warehousing.

Now some are going to say that this all sounds fine in theory, but there are problems that cannot be solved. I certainly don't pretend that there are no bugs in the scheme. As a matter of fact, if there were none it undoubtedly would have been put in use long since. On the other hand, I am not going to admit that American ingenuity has reached the end of its rope. And the potential savings in costs, which can be the difference between extinction and survival, certainly warrants the expenditure of time and money to work out those bugs. If the intercoastal lines can only get together and tackle a joint problem jointly, the cost and time should be small indeed.

The obvious bugs and the possible solutions will be discussed here next month.

Europa Offered to Allied Pool

The Ingalls News, organ of the Ingalls Shipbuilding Corporation of Pascagoula, Mississippi, states that standards of safety and seaworthiness for ships flying the U. S. flag are so rigid that the German liner Europa, third largest and fastest vessel in the world had to be turned over to the allied pool by the U. S. forces who seized her. She couldn't be operated under the American Flag without costly rebuilding so she could meet this nation's requirements. Our safety standards have been responsible for an annual loss rate averaging less than half of the world's annual loss for thirty-seven years.

A Quartette of C-2 Names

(Continued from page 94)

was named Hermann and was under the Costa Rican flag. She was leaking badly and had several broken beams. A survey showed her not worth a complete repair job, and in May of that year she was sold for $4575.00 to be scrapped. She was then beached at Sausalito, broken up and burned.

Wild Ranger, a clipper, was built by J. O. Curtis at Medford, Massachusetts, and launched on April 7, 1853. Her dimensions were 177 by 35.4 by 22.8 and her tonnage 1044, old measurement, and 930 new measurement. As shown in our illustration she was a beautiful, rakish ship, crossing three skysail yards. She was owned by the Sears and Thatchers of Cape Cod and her first three voyages were direct from Boston, or New York, to San Francisco, 125, 125 and 134 days. After three or four years in the India and Australia trades she made another San Francisco voyage from Boston in 144 days and then went on westward around the world—Melbourne, Calcutta, Colombo, Rangoon, London. She sailed from Gravesend December 31, 1861, but on January 3, 1862, was in collision with the British ship Coleroom and badly damaged, put in to Falmouth on January 5. Collision was on a clear day and Wild Ranger was adjudged to be in fault, libeled for 12,500 pounds and sold at auction for 4550 pounds.

Renamed Ocean Chief and sailed for 11 years more under the British flag, owned by Angel & Co., of Liverpool. In 1872 on a voyage to Rio she foundered after collision with a steamer.

Competitive Test For Merchant Marine Cadet Corps

The next competitive test for appointments in the United States Merchant Marine Cadet Corps will be held on November 6, 1946, in San Francisco and other conveniently located centers, it was announced by Commander E. G. McDonald, USMS, district supervisor, 1000 Geary Street, San Francisco, California.

The United States Merchant Marine Cadet Corps offers appointments to young Americans 16½ to 21 years of age and honorably discharged veterans of the armed forces to the age of 24 who are interested in becoming ships' officers in the U. S. Merchant Marine.

Cadet-midshipmen receive a college education (plus a B.S. degree) with pay during the four-year course, one year of which is spent in merchant ships engaged in foreign trade. Graduates of the U. S. Merchant Marine Academy, Kings Point, New York, qualify for a license as a deck or engineer officer in the United States Merchant Marine and commissions in the United States Maritime Service and the United States Naval Reserve. Deadline date by which applications must be in has been extended to October 10, 1946.

Hydro-Pneumatic Steering Gear

The Gay hydro-pneumatic steering gear power unit manufactured by the Markey Machinery Company of Seattle, is designed for use with a combination hand and power steering stand. It provides full follow-up steering and at the same time allows instant emergency steering. Operated by compressed air, it's use is restricted to diesel craft up to 150 feet in length, such as tugs, freighters, ferries, etc. The availability of compressed air on board diesel craft makes it an ideal steering apparatus for that type of vessel. It is simple in design and thoroughly dependable. Superiority over the usual pneumatic power unit is attained by the use of an auxiliary hydraulic locking chamber.

The overall length of the unit is moderate. Its crosshead is only one-half the length of line taken up on one bight and played out on the other. This is made possible by using sheaves on the crosshead and working on the bights in the lines instead of the ends. Installations of the Gay steering gear have been made on numerous diesel craft on both coasts and the gulf.

An excellent booklet is available from the company to assist owners and designers in making preliminary selection of rudder power units, and it also includes the formula for determining rudder torque.

Short Length Drills

The screw machine industry can now reduce operating costs by obtaining drills especially designed to meet its needs. Properly proportioned as to lengths, web thickness and flute contour the costly and wasteful process of cutting off, resharpening and otherwise adapting full length drills to fit machines can now be discontinued. Then, too, being shorter overall and made up in production quantities these drills are obtainable at prices less than those which apply to regular Jobbers and Taper Length Drills.

These drills are stocked in fractional sizes 1/16″ to 2″, in wire gauge sizes No. 1 to No. 60, letter sizes A to Z in both Right Hand and Left Hand cut by the manufacturer, Whitman & Barnes, Detroit, Michigan.

A FUTURE WITH A PAST: a 12-page two-color booklet (Form 9458) by Caterpillar Tractor Co., Peoria, Illinois, describes the yesterdays of scientists and inventors, who made the world of today one of mechanization and who give such promise to machinery's tomorrow.

The humble beginnings of the world's heavy work machinery and the dramatic evolution which produced today's economical equipment are portrayed as a prologue to the developments to be expected of the future.

Shoreside Personalities

F. W. RICHARDSON
Northwest Filter Company, Ltd.

Canadian Offices of Northwest Filter Company

The Northwest Filter Company, Seattle, representing Hagan Corp., Hall Laboratories and Bull & Roberts on the Coast, have established a Canadian office in Vancouver, which will cover all of British Columbia, announces William R. Gibson, manager.

Handling Hagan-Hall work for Northwest Filter Company, Ltd., is F. W. Richardson. The company will have an office, laboratory and warehouse under one roof.

Mr. Richardson, who will cover British Columbia, was born in 1899 in Vancouver. He served apprenticeship as marine engineer at Fairfields', Glasgow, and Kowloon Dock, Hong Kong. He is a certified marine and stationary engineer in British Columbia and has a wide acquaintanceship in the Province.

Williams Dimond Changes

Leon C. Munson is now vice president of Williams, Dimond & Company. He is in full charge of all the firm's activities in Southern California with his offices in Los Angeles, where he had held the title of District Manager. He joined the firm 21 years ago.

New Kelvin-White Office

Kelvin & Wilfrid O. White Company, manufacturers and distributors of all types of navigational equipment, including the world-famous spherical compass, announce the opening of a new West Coast branch, temporarily located at 419 East 6th Street, Long Beach, California.

The branch manager, James G. Weldon, carries a stock of Kelvin-White compasses and binnacles, and invites the trade to contact him for the latest information on company equipment.

Mr. Weldon, who is an expert compass adjustor, spent four years in the United States Navy working with W. Gordon White and Robert E. White of the same concern on compass development, adjustment and repair.

ETS-HOKIN AND GALVAN, electricians, announce the appointment of C. Todd Hecker as sales manager for their seven California stores. Since 1940, Hecker has served Ets-Hokin and Galvan both up-town and at the waterfront, in every branch of the company—sales, electrical, motor repair, ship and shore installation, design and building of radar and other electronic and electrical controls.

OBITUARY

John Andrew McKeown, 63, retired marine engineer with the U. S. Maritime Commission passed away at his home in Oakland, August 13. He was well known in Bay Area marine circles.

Mr. McKeown was a member of the American Society of Mechanical Engineers and Naval Architects and Marine Engineers Beneficial Assn.

His widow, Mrs. Anna G. McKeown, survives.

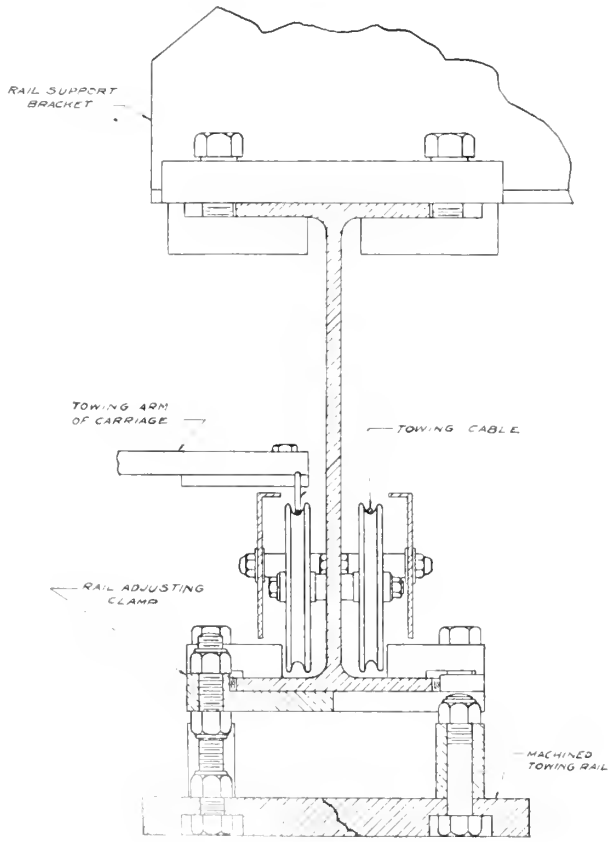
The New Towing Tank Facilities At Stevens

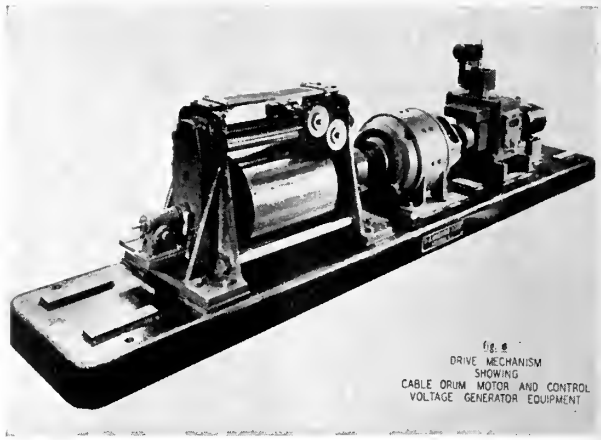
(Continued from Page 61)

in opposite directions, so that the driving torque does not cause the model to heel. The two motors are geared together and drive the propeller shaft or shafts through a gearbox, either at equal revolutions or (by means of a "differential") with equal torques. A steering engine operates the rudder after a suitable length of straight approach run. The model carries a camera "target," consisting of a mast and framework fitted with a number of appropriately situated electric lights. From the positions of the lights on the motion picture record, the location and attitude of the model may be deduced.

Data from tests in which only steady turning features are of interest, *i. e.,* diameter, turning speed, and drift angle, are more easily analyzed when vertical pictures are taken with an overhead camera, located on the roof trusses. The lights on the model are limited to a bow and a stern light, which leave concentric traces on the film. A shutter interrupts the exposures intermittently, yielding dashed traces, thus enabling determination of speed. For these tests, the model may be equipped with a rudder dynamometer to measure the lateral rudder force, in place of the steering engine to operate the rudder.

Fig. 3: Cross-section of towing rail assembly, Tank No. 3.





Drive mechanism for towing cable, Tank No. 3.

Variations of the methods described above are occasionally used. A light, overhead, hand-driven crane carries flexible cables to supply power to the driving motors from an external source without introducing appreciable restraining forces on the model. This arrangement has the great advantage of permitting the model, the capacity of which is limited, to carry additional instruments or apparatus, rather than storage cells. The measurements which can be made are thereby facilitated or increased in number. Also speed control is more positive.

When "heeling tests" are made, a motion picture camera is carried in the model and is aimed directly forward or aft, so that a continuous record of the heel angle is obtained by photographing the inclination of the rim of the tank (horizon).

In all the above test methods, however, only lateral rudder force measurements could be obtained while the model was in circular motion. It was apparent that need existed for a towing carriage capable of traveling in circular paths.

In January, 1945, the Experimental Towing Tank, under the auspices of the Bureau of Ships, Navy Department, undertook the design of a new and enlarged rotating arm apparatus. The apparatus was to be installed in Tank No. 2 and was to be built to the following requirements: Equipped to carry suitable force measuring dynamometers; maximum turning diameter; adjustable speed of rotation from one to six revolutions per minute; and acceleration to test speed within 90°.

A general assembly drawing, Figure 2, shows the principal features of the rotating arm structure. They are: A horizontal duraluminum arm with a simple system of stiffening struts; a vertical steel shaft with bearings top and bottom and with suitable keyways for transmitting the driving torque to the arm; a welded steel supporting base, mounted in the center of the tank;

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The New Towing Tank

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and a drive assembly, located at the top of the vertical shaft.

The horizontal arm is fitted on both sides with parallel rails to which a carriage carrying dynamometers and other equipment can be attached, at any attitude and any radius. The arm can be adjusted vertically.

The vertical drive shaft can be properly plumbed by shifting its lower bearing horizontally. The upper bearing is supported by a framework fastened to the roof trusses of the building. Near the top a slip-ring and brush assembly supply the means for connecting electrical instruments on the arm with a stationary point on shore. Initially, nine conductors were provided for, but additional circuits can be added.

The drive mechanism is a variable speed motor and a reduction gear, electronically controlled to within 1 per cent, the desired speed being selected by a potentiometer. The speed range calls for reduction gear ratio of 652.5:1. Externally mounted gears between the motor and gear box allow an extension of the speed range above 6 rpm. An over-riding clutch protects the high-ratio gear box from damage which might be caused by the arm's coasting. A shear pin, interposed between the arm and the clutch, serves as an over-all guard against damage to any part of the drive system caused by a shock or impact load.

The outstanding operating characteristic of the rotating arm, which has been in use since October, 1945, is its extremely smooth motion and freedom from vibration. The practical outcome of this stability of operation has been the successful use of "small motion" dynamometers especially designed for use on the arm. These instruments embody stiff springs which deflect over a maximum range of a few hundredths of an inch. Their motion is detected and transmitted by electronic means through the slip rings to a shore station. Simultaneous readings of resistance, lateral, and rudder forces acting on the hull may thus be obtained while the model (with or without self-propulsion) is being towed by the arm.

The Bureau of Aeronautics in November, 1942, asked the Experimental Towing Tank to expand its activities in seaplane testing to make studies of a systematic series of hull lines, somewhat comparable to "Taylor's Standard Series" for ship hulls. The purpose was to establish basic lines suitable either for direct application to actual designs or for comparison with other lines.

On investigation it became apparent that a new tank was needed for this research, a tank provided with apparatus having a high degree of versatility. In the early part of 1943, the broad outlines of the test program were laid out and preliminary specifications of the equipment were drawn up. Construction of Tank No. 3 was begun in December, 1943. The general layout of the building is shown in Figure 1. It is a two-story structure which includes, in addition to the tank room, a model preparation shop, a photographic shop, storage rooms, office and administrative space. In November, 1944, the first model tests were run. Apparatus from Tank No. 1 and a model which had previously been tested in that tank were used. Good correlation was found between the data collected in the two tanks. Soon thereafter model seaplane tests were pushed forward in the new tank with both day and night crews assigned to the work.

The tank, constructed of reinforced concrete, is 313 feet long, 13 feet wide inside and has a 6-foot depth of water. Its width is reduced in two steps at the north end, so as to form "docks" which facilitate access to the towing carriage, testing apparatus and model. The top edge of the tank is finished with a cypress sill 37 inches above floor level. This height, as well as the floor and water levels are the same as those of Tank No. 2 in the adjoining building. In addition, the west edges of Tanks No. 2 and 3 are aligned with each other so that, if desired, they can be connected at some future date.

Water is supplied to Tank No. 3 from the city mains through the existing metering and piping facilities of Tank No. 2. Filters and water heating equipment, also of Tank No. 2 are used to keep Tank No. 3 water clean and at the desired temperature of 70° F.

Two trap doors in the tank room provide access to the towing machinery and pipe tunnel. A third trap door, in the ceiling, provides access to the shop above. This facilitates lowering heavy models into the tank and handling machinery between the two floor levels.

The single rail principle, first developed for Tank No. 1, has been retained in Tank No. 3. Figure 3 is the cross section of the assembly. Its symmetrical design enables a model to be towed along the rail in either direction.

The clamps used to fasten the machined rail to the I beam include a system of fine threaded bolts which provide the means for accurately adjusting the lateral, vertical and angular position of each rail plate. By use of these clamps, and with the water surface and a catenary alignment wire as references, the towing rail was aligned to within $\pm$ 0.008 inch both laterally and vertically.

The carriage is towed by a 1⅛-inch stainless steel cable driven by a drum and motor assembly which is located in a pit beneath the floor at the north end of the tank room. Both ends of the cable are clamped to the drum, thus providing a positive drive of the carriage. Figure 4 shows how the cable is supported by idler pulleys and is enclosed by steel safety guards as it travels the length of the rail. A return pulley and cable tensioning device are located at the south end of the rail, while at the north end a number of pulleys, enclosed in a housing, guide the cable to and from the winding drum where its winding and unwinding is facilitated by a lead screw and traveler mechanism. Also located in this housing are cable-slack detector switches which stop

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The New Towing Tank

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the towing machinery if the cable should jump a pulley or lose its tension for any other reason. The drive mechanism is shown in Figure 5.

Speeds ranging from 1½ to 60 feet per second are obtainable and reproducible with an accuracy of about a quarter of one per cent. In addition to the preselection of speeds, various controls allow for adjustment of acceleration, deceleration and reverse speeds. Provisions are also made to drive the carriage at predetermined variable rates of speed.

The speed of the towing carriage is measured and recorded by an electronic tachometer. The accuracy of this instrument is in line with the degree of accuracy required in the drive system. The instrument receives its impulses for speed measurement from photoelectric scanning discs mounted on the cable drum shaft. By suitable selection of the number of scanning holes and the use of band-spread switches, a small increment of speed can be selected and expanded to cover the fullscale of the instrument. As an auxiliary means of determining the carriage speed, a mechanical "chronograph" device is used in which the distance traveled by the carriage during measured time intervals is plotted on a moving paper tape.

Normally the carriage is operated at the "dock," although control buttons are located at 10-foot intervals along the entire west edge of the tank. Stopping of the carriage is automatic on both forward and reverse runs, the length of these runs being adjustable on a calibrated limit switch device. A second set of switches is located on the cable drum assembly to guard against accidental mis-setting of the normal limit switches. For emergency stopping, automatic mechanical devices are provided which are independent of the electrical system. These include a band-brake, mounted on the cable-drum shaft, and a carriage-arresting shock-cord, located at the south end of the rail.

The testing apparatus of Tank No. 3, illustrated in Figures 6 and 7, was developed from apparatus used in Tank No. 1 and, like the Tank No. 3 project itself, represents an extension of existing facilities rather than an expansion into new fields of research. The apparatus is basically an instrument for investigating the resistance and stability characteristics of model seaplane hulls. With the use of accessories, however, an almost unlimited number of special studies, such as landing tests, can be made. Both resistance and porpoising characteristics can now be investigated on a single apparatus, whereas separate pieces of equipment were previously required. This is an improvement over Tank No. 1 apparatus, because it not only avoids apparatus changes, but also eliminates the need for making time-consuming changes of the pivots with which the model is mounted in the apparatus.

In resistance tests, the drag of the model, acting through the longitudinal freedom of motion, is transmitted to a dynamometer for measurement. Cam actuated trips are used during resistance tests to lock the linkages, which provide horizontal motion, as well as to lock the dynamometer during acceleration and deceleration periods of the run. These mechanisms are thereby protected from inertia shocks.

The dynamometer, mounted on the front of the carriage, has both a weight pan for relatively coarse approximation of the resistance force, and an auxiliary spring for the final close determination of the model resistance. Since the dynamometer scale covers only the small portion of the model drag not balanced out by the dead-weights, visual readings can be relied upon to give accurate resistance measurements at model speeds up to about 35 feet per second. An electronic device makes it possible to record the dynamometer data at higher speeds.

In stability tests, the model is not allowed longitudinal motion with respect to the carriage. The vertical and angular motions, which during porpoising pass through regular and self-sustained cycles, are traced in combinatin on a smoked glass slide for subsequent analysis.

It is sometimes desirable to lock or restrain the angular and vertical positions of the model. For certain observations, they may be restrained during the entire run, or as in "landing tests," they may be released from predetermined attitudes at a given instant.

The range of test explorations calls for a variety of additional apparatus accessories. The displacement of the model can be varied by adding or subtracting weight. Several types of dashpots are used, both in the dynamometer system and for damping the angular and vertical motions of the model. Spring loaded devices are provided for impact tests, when it is desired to give the model an initial downward thrust prior to its contact with the water. A turbulence strut, which is a small diameter wire, is towed through the water ahead of the model to induce turbulence in the flow around the model.

The new facilities, together with the original Tank No. 1, enable the Experimental Towing Tank to carry out many diversified projects on models of ships, aircraft and submerged bodies. This diversification is possible not only because of the individual character of the tanks themselves, but also because of the flexibility and simplicity of the towing and measuring apparatus. By keeping the dimensions, weight and design complications of the apparatus within close limits, great economy of time and cost is effected.

When Japan lost a ship she could not replace it. Our losses were many times replaced by new and better vessels. The war at sea was won in United States shipyards.

—The New York Times.

Spraying machine lowered into cargo tanks whirls hot salt water to clean compartment's walls in readiness for another load. Formerly the washing job was done by crewmen who descended into tanks.

Standard's Tanker Fleet

(Continued from page 58)

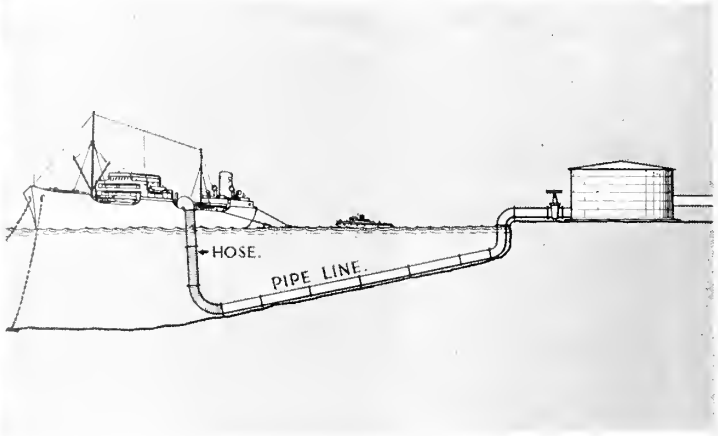
loading proceeds normally both rates should remain the same. A sudden change may indicate a break or obstruction.

To unload a cargo as completely as possible ships are often given an alternate list by pumping cargo first from one side, then the other. In this way the remaining gasoline or oil is shifted within range of pumping intakes.

When cargo is being loaded or discharged the first concern of the mate in charge is safety. He must be alert for any sources of ignition which could endanger cargo and ship. Careful watch must be kept for passing vessels because their wake, spreading shoreward, may cause a ship to surge enough to snap hawsers and possibly the cargo hoses.

Delivering Oil Under Water

Absence of port facilities presents no real barrier to loading or unloading oil tankers. Through the ingenious use of submarine pipe lines oil cargoes can be handled between tanks on land and ships anchored beyond shallow shore waters. Standard of California operates two



Delivering oil under water.

of these underwater lines, at Estero Bay and El Segundo.

The underwater lines extend along the ocean bottom to terminals marked by buoys. Ships preparing to take on or discharge cargo haul up a heavy rubber hose attached to the line's end, connect it to deck installations, and all is ready to start pumping.

Running the Ship

Wonders of science fill the wheelhouse of a modern oil tanker, yet men still remain the most important factor. The modern ship often travels without human hands on the wheel, guided only by automatic instruments. But men with a sure knowledge of the sea and its vagaries must always stand by. They are there with log, lead and watchful eyes to get the ship safely to its destination and to supplement instruments by the alert use of instinct, skill, and experience.

An automatic pilot known as "Iron Mike" stands at the helm in the wheelhouse of today's tanker. Operated by the gyro compass, it does to perfection the job of steering the ship. In the thickest fogs radio bearings from shore stations accurately tell the ship's position. Sonic waves of the fathometer check depths at rates of up to 96 readings a minute, while radar warns of possible trouble ahead and the radio man keeps short wave contact with the world.

Should any or all of these scientific wonders fail, the tanker would still be brought to its destination by the men who run the ship.

Who are these men to whom the Company entrusts a $3,000,000 vessel, a $750,000 cargo? Masters, mates, and engineers all are competent, long-time employees. Sev-enty-five per cent of the officers started their sea careers

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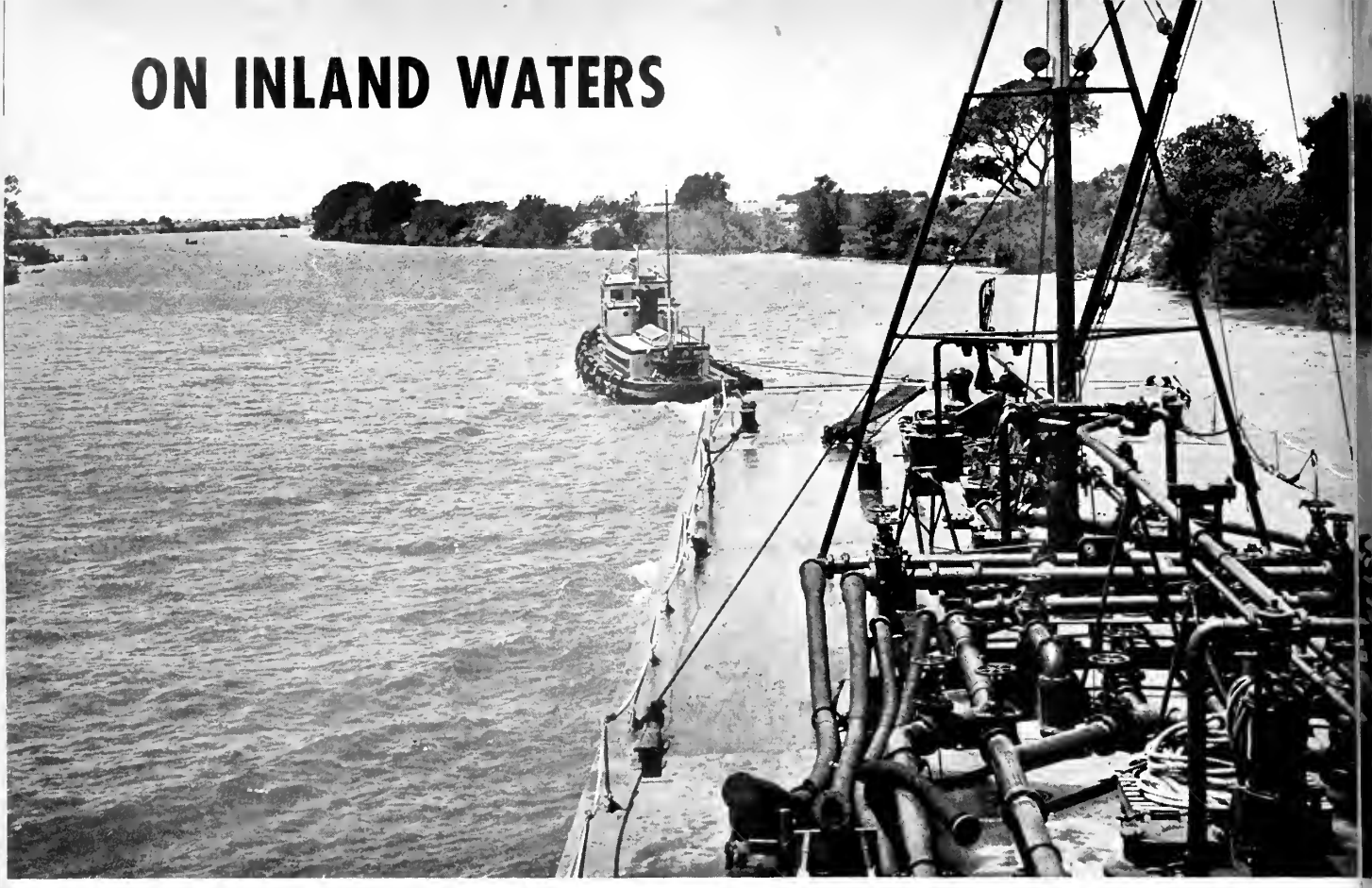
ON INLAND WATERS



Towing on the headline, a Standard of California tug brings an empty barge down the Sacramento River to Richmond for loading.

Standard's Tanker Fleet

(Continued from page 144)

with the Company as ordinary or able-bodied seamen, or as wipers in the engine room.

Length of service with the Company ranges from 16 to 27 years for masters, from 12 to 30 years for chief engineers.

Little brother of the ocean-going tankers is Standard of California's group of floating service stations, the inland fleet. Up and down hundreds of miles of bays, rivers, and canals they ply their peddler's trade, bringing gasoline and oil to bulk distributing points, riverbank farmers, freighters and luxury liners and industrial plants. Barges and towboats, they chug along inland waterways to carry in a year's time one-quarter as much oil as the deep-sea ships.

The inland fleet operates in three Pacific Coast areas. The largest of the three fleet groups carries petroleum products on San Francisco Bay and the Sacramento and San Joaquin Rivers. Another moves cargo from Point Wells to Puget Sound points, and through a canal to Lake Washington points. A third operates in the San Pedro harbor area and to Santa Catalina Island. A few of the barges are self-propelled, but most of them are towed by powerful tugs, and carry engines only for pumping products ashore.

The waters in which they operate make the work of inland seamen radically different from that of the sea-going crews. They are constantly piloting, changing course every few minutes to guide their craft around sand bars and shoreline curves. In heavy fogs they "hear" their way by means of sounding boards ashore which bounce back echoes of barge or towboat whistles.

Safety On Shipboard

You're much safer floating around on top of 150,000 barrels of gasoline in a Standard of California tanker

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Standard's Tanker Fleet

(Continued from page 146)

than you are ashore dodging street cars and tripping over Junior's scooter. This is true because safety aboard ship is not something that just happens. It is a condition that is created as deliberately and methodically as any manufactured commodity.

Safety is often said to be composed of three ingredients—education, engineering and enforcement.

Under education men on tankers are shown how to do their work efficiently and without danger to themselves—the safe way to connect a cargo hose, handle a hawser, or light a boiler fire. They are trained to recognize hazards of every kind and shown how to avoid them.

Engineering means anticipating danger points in the structural features and mechanical equipment of a ship, and so designing a vessel as to ward off risks to the crew.

Lessons in safe methods learned in fifty years of running tankers are incorporated in operating regulations which specify exactly the way many things are to be done. Enforcement is seeing that these regulations are observed.

Statistics show that organized safety efforts do reduce accidents. Expressed in terms of human values this means that much suffering and loss of life have been prevented. The Marine Department of Standard of California has a safety record which has received national recognition. In 1944 and in 1945 the National Safety Council made "Awards of Honor" to this department for its achievements in promotion of safety aboard Company ships.

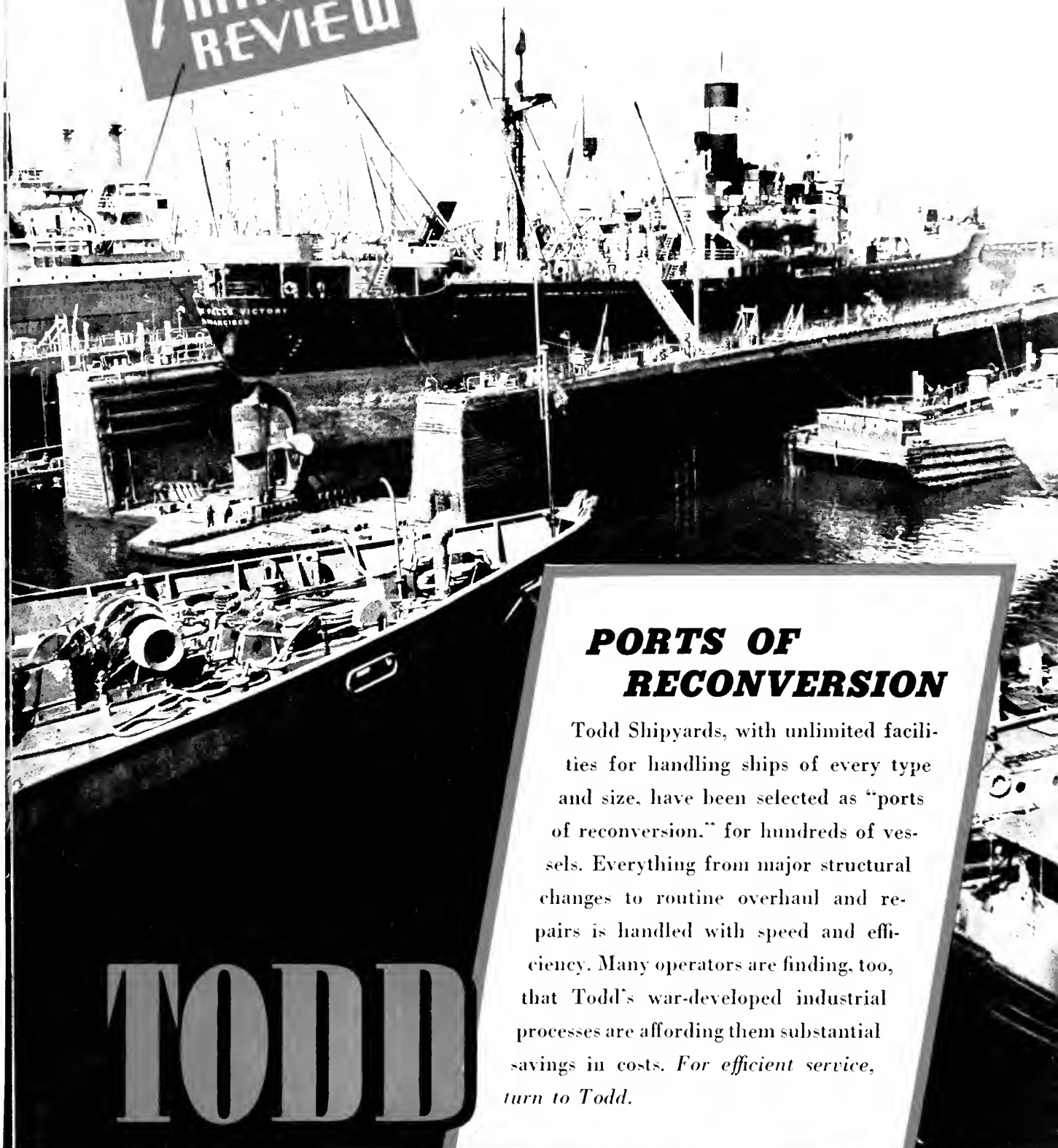
Many a landlubber wonders about the food situation on merchant ships. Here is a sample bill of fare for the Standard Oil tanker H. D. Collier: Date 8/22/46

BREAKFAST
Chilled Canteloupe
Rolled Oats Dry Cereals
Steamed Finnan Haddie in Drawn Butter
Plain or Jelly Omelet Eggs to Order
Grilled Bacon Broiled or Fried Potatoes
Hot Cakes — Maple Syrup
Dry Toast Jams Jellies
Coffee — Cocoa Hot

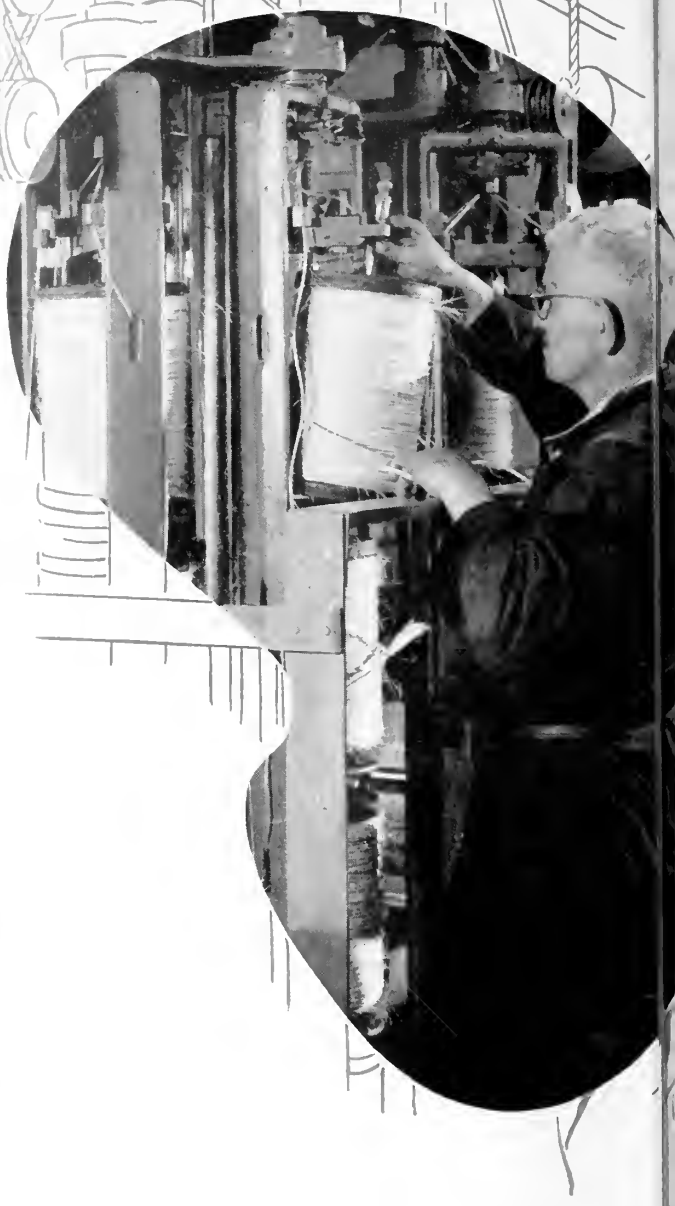
DINNER
Sliced Tomatoes — Cucumbers and Onions
Split Pea Soup
Boiled Corned Brisket of Beef and Cabbage
Macaroni Au Gratin
Baked Mexican Enchilada En Sauce
Roast Shoulder of Pork and Applesauce
Braised Parsnips String Beans
Oven Browned Potatoes
Rice Custard Cheese and Crackers
Tea — Coffee

Pacific MARINE REVIEW

NOVEMBER, 1946



MEN *and* ROPE



Putting a bobbin of yarn into upright rope machine is Jim Poulidis, a Tubbs rope maker for nearly two decades.

It requires the finest fiber to make the best rope—but the fiber alone is not enough.

It requires the "know how" of skilled rope makers to properly blend this fiber and follow it through every stage of production to the finished rope product.

For nearly a century this combination of men and rope has been a heritage of the Tubbs mills. Here old timers—many descendents of several generations of rope makers—work side by side with newer hands to make a rope product that may proudly bear the Tubbs trademark.

When you specify rope—specify **Tubbs.** It is your guarantee of greater rope dependability, greater rope value.

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EXTRA SUPERIOR MANILA
CORDAGE COMPANY

When the finest Manila fibers are once more available, look for this famous rope trademark.

TUBBS CORDAGE COMPANY

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Pacific MARINE REVIEW

Freight Rates—to Make Commerce Move

AN EDITORIAL

By T. DOUGLAS MACMULLEN

Freight rates are the result of consultation and cooperation. Regulatory bodies see that the rates are neither unfair nor discriminatory.

Discrimination was formerly very general. One commodity, geographical district, carrier, or one shipper gained at the expense of another. Now, with 75,000 freight stations and 20,000 classifications of articles, the public is pretty generally satisfied with the tariff structure on the railroads of the country.

One notable exception is the agitation in some parts of the country for rates based on mileage rather than on regions. This campaign has political implications and will undoubtedly be pressed. *Another exception is the depressed rates to seaports which are deliberately calculated to direct traffic from water carriers.*

The steamship lines were completely converted to war purposes, and while the railroads were ready to go at war's end, and the airlines were being advanced a decade or more in equipment, facilities and the air-mindedness of the public, the water carriers—than whom none were more important in carrying on the war — were being almost extinguished. Their ships were taken over by the government—and after 15 months they are still waiting for some semblance of a fleet. In the air, the Civil Aeronautics Board arranges for foreign steamship lines to conduct air services to and from the United States while refusing, under a trick interpretation of the law, to permit American steamship companies to do the same.

It is time for the government and the people to wake up to conditions in an industry which is vital to all. Undermining by left wing groups, who do not want to see it strong, is aided by competing rail rates that do not cover fully distributed costs. It is aided by the attitude of the I.C.C., the C.A.B., and the N.L.R.B., and the Labor Department. And it is aided by Chambers of Commerce and industrial traffic groups who cannot see that strong intercoastal steamer service is important—very important—to them.

The strong position taken by Admiral Smith and the other members of the Maritime Commission is heartening. They are right, and should prevail.

The Master Mariner

AN EDITORIAL

By A. J. DICKIE

The Marine Society of New York, founded in the year 1769 and so at least seven years older than the United States, is composed of Master Mariners who are deemed to be outstanding in their profession. This society, alarmed at the trend of the present labor disturbance in the Maritime industry of the United States, has recently —October 15th—petitioned President Truman to call a special session of Congress to deal with the merchant marine situation. The wording of this petition defines the status of the Master Mariner very clearly and it is here presented in abbreviated form:

WHEREAS, the office of master mariner, more commonly called the Master or Captain of the Ship, has always held a high and honorable position of trust, confidence, and responsibility in all maritime countries, and

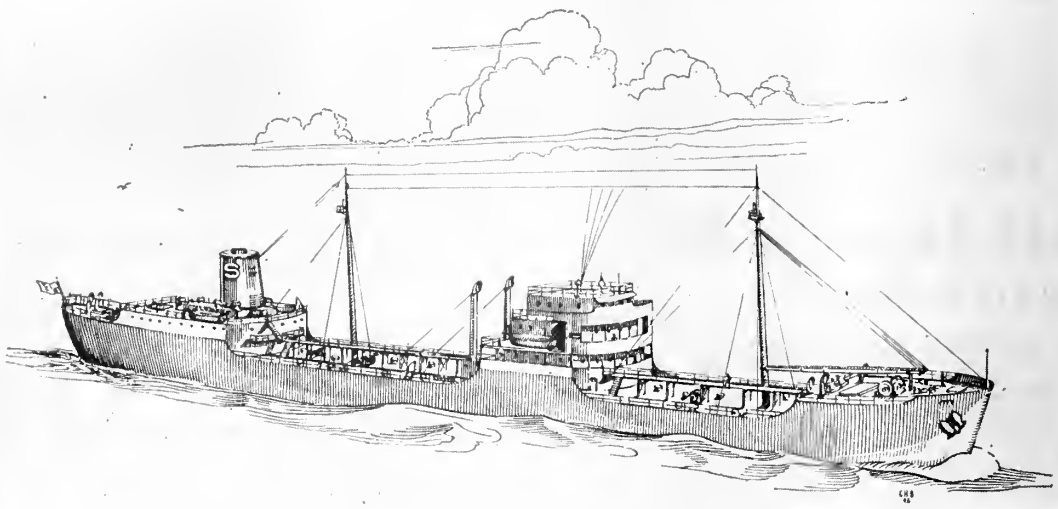
WHEREAS, the Master or Captain of a ship is charged by the Laws of the United States with the safety of the ship, crew, passengers and cargo, and

WHEREAS, the Master or Captain of a ship is also charged by the Laws of the United States with the proper exercise of law, order, and discipline aboard ship, and

WHEREAS, attempts are now being made to destroy the efficiency and discipline of the American Merchant Marine by degrading Masters or Captains to the picket lines with their former subordinates aboard ship and to require Masters or Captains to join labor unions whereby they will lose the ability to properly enforce efficiency, safety, and discipline; therefore, be it

Resolved, That the President of the United States should call a special session of Congress at once in order to prevent the destruction of our commerce, the destruction of law, order and discipline aboard our ships, and conditions jeopardizing safety of life at sea; and be it further

Resolved, That specific legislation should be written clearly defining the rights of master mariners and decreeing that the Master or Captain of a ship holds a position tantamount to that of a Chief Executive in the business in which he is engaged, and is therefore not subject to the provisions of any labor act requiring collective bargaining and control by subordinates aboard ship.



Artist conception of tanker F. S. Bryant.

Tanker F. S. Bryant

TWO IDENTICAL TANKERS BEING BUILT for the Standard Oil Company of California at the Sun Shipbuilding Company, Chester, Pennsylvania, have some novel features that make them the outstanding examples of new postwar private shipbuilding in America. One, the F. S. Bryant, was launched August 27 and is now about ready for delivery. The other, R. E. Follis, was launched October 21. These tankers were designed: to handle several varieties of petroleum and derivatives without danger of contamination; to afford a maximum of comfort and good living to the crew; and to make fair speed with maximum reliability and good fuel economy.

Of the typical three island, single screw, double reduction geared turbine drive type, with straight raked stem and cruiser stern, the hulls have one complete deck with forecastle, short bridge and poop erections. Starting at the bow the hull is divided by watertight and oiltight transverse bulkheads into compartments named: forepeak and chain locker; dry cargo hold and forward deep tank; forward cofferdam; No. 1 cargo tanks; No. 2 cargo tanks; No. 3 cargo tanks; No. 4 cargo tanks; cargo oil pump room; No. 5 cargo tanks; No. 6 cargo tanks; No. 7 cargo tanks; No. 8 cargo tanks; after coffer dam; fuel oil bunker; machinery space; and after peak. From the forward bulkhead of the forward cofferdam to the forward bulkhead of the machinery space two longitudinal oiltight bulkheads divide all of these spaces into three sections. In oil cargo tank No. 5 and in the deep tank forward, there is a further longitudinal centerline bulkhead.

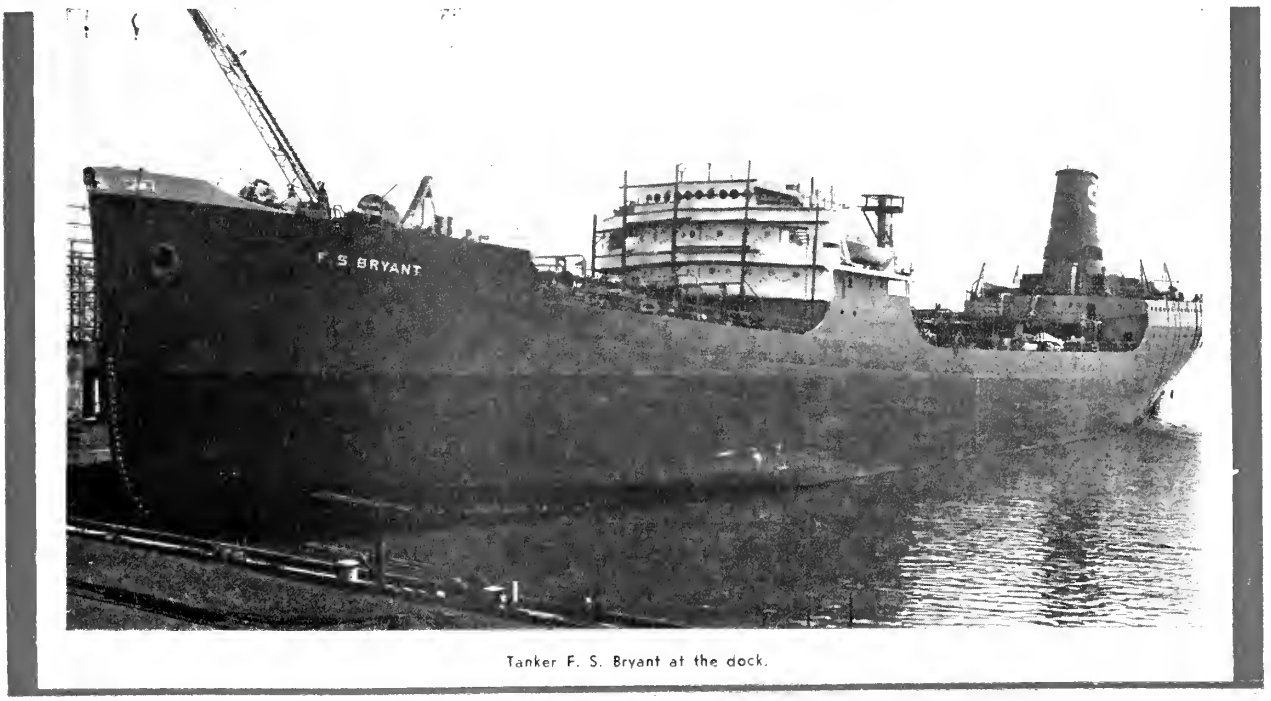
This division creates 27 oil cargo tanks, each of which has its piping connections for discharge and loading, for steam heating of the cargo, for the introduction of inert blue gases in the ullage; for the Butterworth tank cleaning system; and for gas venting. Each cargo tank has a circular 48″ diameter 30″ coaming covered hatch, except that for tanks No. 5 and pump room wing tanks these hatches are 36″ in diameter. Each hatch is connected to a 4″ venting line led through a Shand and Jurs pressure vacuum valve to a 10″ header that runs to and up the nearest mast and terminates in a Shand and Jurs flame arrester. Merco-Nordstrom lubricated plug cock valves are fitted to shut off each mast vent and also to divide vapor piping into two sections.

Strake Rivets

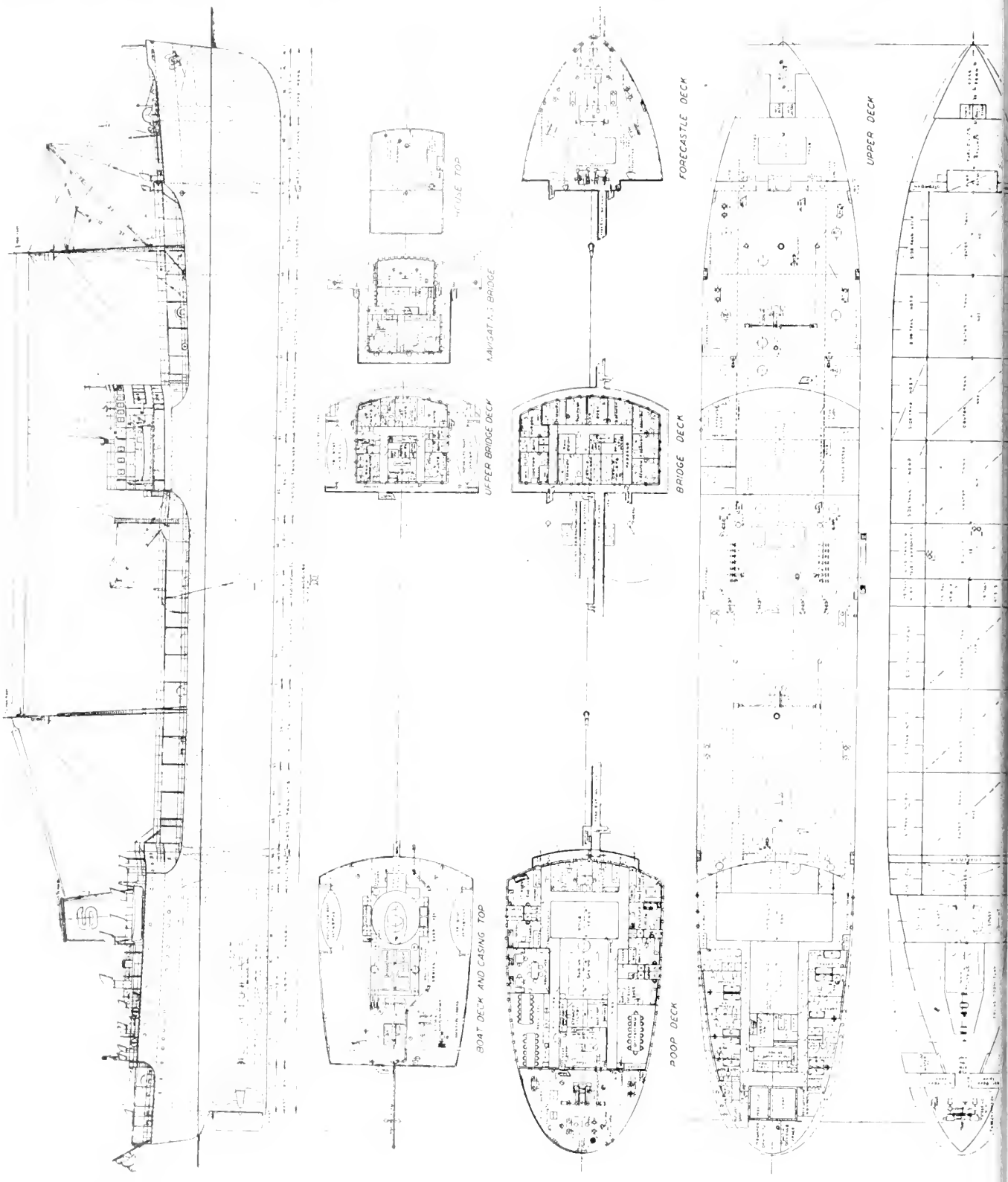
All joints in the hull are electric arc welded with the

F. S. Bryant, vice president of Standard of California, talking with John G. Pew, president of Sun Shipbuilding Company, and Mrs. Bryant, the sponsor of the Sun tanker.

exception of the longitudinal seams at each edge of the bilge strakes and the stringer that connects the deck to the upper edge of the sheer strake. The edges of the bilge strake are lapped over the side strake above and the bottom strake below and are double riveted with 7/8" steel rivets spaced 4½ diameters. The stringer angle 8" x 8" x 0.875" is chain riveted to the sheer strake and the deck plating with 1" steel rivets spaced 4½ diameters. All rivet holes were punched or drilled 1/8" small and reamed in place to fit rivets. This construction effectively eliminates the possibility of dangerous cracking due to the locked up stresses possible in a completely welded job and at the same time gives the hull girder sufficient flexibility to better withstand impact stress due



Tanker F. S. Bryant at the dock.



Outboard profile and arrangement plans of tanker F. S. Bryant.

to heavy seas. This is one of the novel features of the design of this tanker.

Design and construction was approved by American Bureau of Shipping for classification +A1 (E) oil carrier, and, with equipment, conforms to the rules of the Inspection Division of U. S. Coast Guard, the U. S. Public Health Service, and the Panama Canal.

As will be noted from the General Arrangement Plans herewith, the Captain's office and quarters are on the navigating bridge, just aft of the wheel house and chart room. Here, the skipper has a very nice penthouse apartment with a private bath and comfortably furnished rooms. Trimmed in teak, these quarters have large sliding windows and are surrounded by a gallery shaded with awnings.

On the upper bridge deck are housed: the 1st, 2nd, and 3rd Mates, the radio operator, and two pilots. These are in five cabins each with a private bath.

The bridge deck below has ten cabins. Four of these are single, two of which take the purser and the doctor, who have a bathroom in common; and the other two, the pumpman and the bosun. Twelve seamen occupy the other six rooms, two in a room. For the seamen, pumpman and bosun, four showers and four toilets are provided.

On the poop deck are accommodations for: the chief engineer's cabin and office, the 1st, 2nd and two 3rd assistant engineers, a machinist and the steward. Each of these seven cabins has a private bath and is comfortably furnished with attractive equipment. Aft of these quarters on the port side are the crew's lounge and the crew's messroom, and on the starboard side, the officers' mess. Amidships, between the two messrooms, are the galley, bakeshop, and steward's stores.

On the upper deck, below the poop, are: accommodations for a cook, three firemen, three oilers, three wipers, four mess boys, and four spares; the ship's hospital, the ship's laundry, steward's dry stores; steward's refrigerating stores; the Carrier refrigerating machinery; butcher shop; engineers' stores; and clean and soiled linen lockers. Five showers and five toilets are installed on this deck.

In all accommodations for crew and officers including messhalls, recreation rooms, and washrooms, the color scheme is pale green bulkheads, cream ceilings, tan lacquer decks, brown lacquer doors, brown stain and varnished furniture and aluminum radiators. The passageways and other enclosed areas are buff bulkheads, cream ceilings, and red lacquer decks. All companion ladders have red enamel rails and sides, and black steps. The galley has a tile deck, cream bulkheads and ceiling, black ranges, with aluminum heat resisting paint on bulkhead back of the oil range. Chart room and wheel house are finished with pale green ceilings, tan lacquer decks, and buff bulkheads. In general, the exterior of the deck erections is aluminum with red enamel trim and brown decks.

All accommodations are mechanically ventilated to provide 15 changes of air per hour in the poop and poop-

deck house, and 10 to 12 changes of air per hour in way of the quarters in the midship bridge erection.

Doran Safe "T" showers are fitted in all the baths. All plumbing and sanitary fixtures are of the best quality and include: vitreous china water-closets; china washbasins with running hot and cold water; refrigerated drinking fountains; and chromium plate toilet cabinets.

In short, the living quarters on these Standard Oil of California tankers are comparable to a modern home ashore.

Machinery

The propulsion plant is of the steam geared turbine type with semi-closed feed water system. Two Babcock and Wilcox water tube boilers (equipped with superheaters, de-super heaters, and air preheaters) supply steam at 450 psi and 750° F. to a General Electric cross-compound turbine which is connected to the propeller shafting through General Electric double reduction helical gearing, the propeller thrust being taken by a Howarth thrust bearing built into the forward side of the low-speed gear casing. The propeller is a solid four-bladed, right-hand screw of manganese bronze, 18′ 3″ diameter and 17′ 3″ pitch.

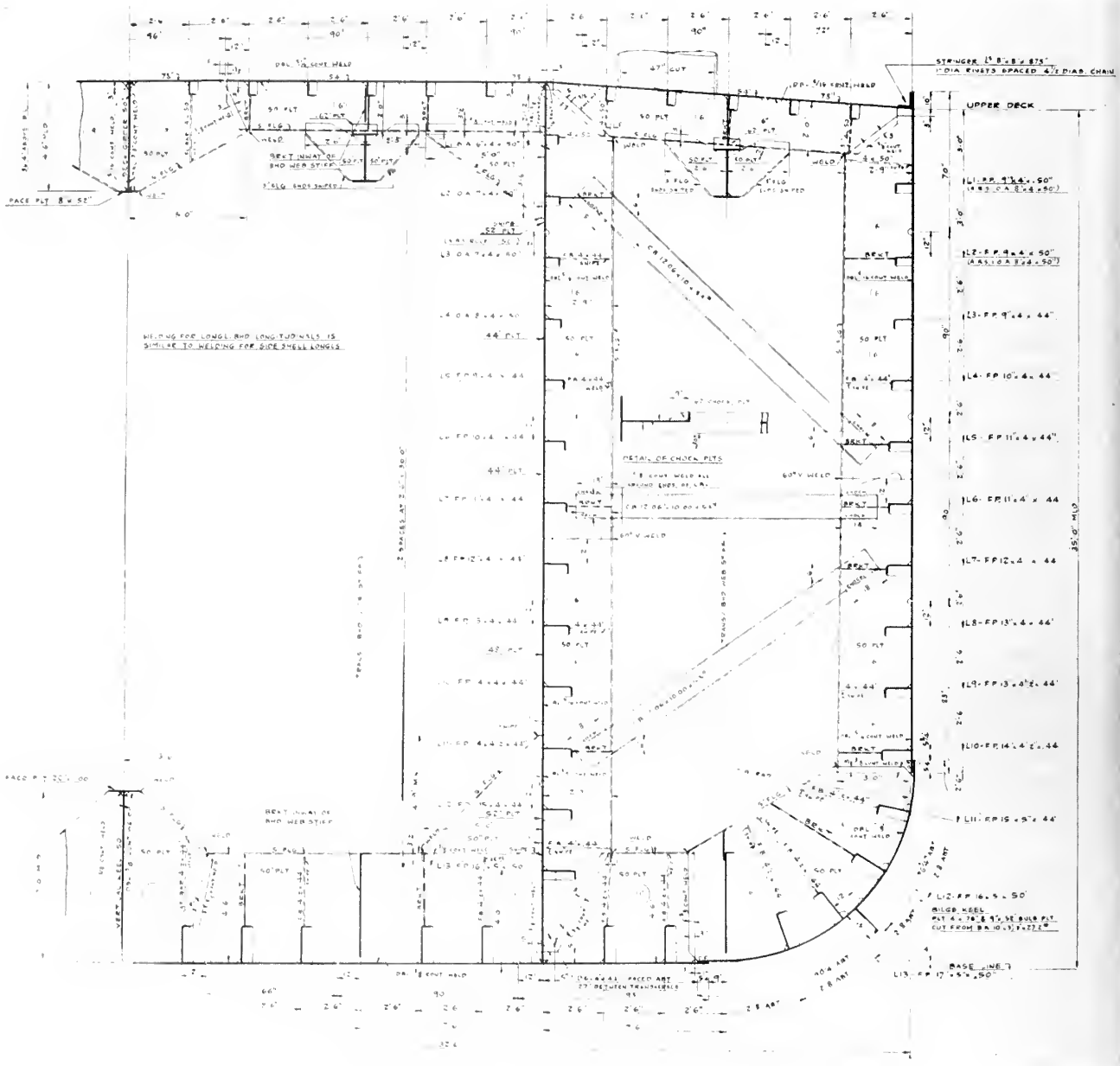
These turbines are of the standard marine type with reverse element built into the low pressure casing and developing 80% of the normal full load ahead, torque at 45 rpm astern. The plant normally develops 5000 shp at 90 rpm for a sea speed of 14 knots and is capable of sustained output of 5500 shp at 93 rpm. The above conditions are maintained with 435 psi, 735° F. at throttle

and a vacuum of 28.15 inches Hg on the condens[illegible] normal full load the pressure per inch of activ[illegible] tooth face per inch of pinion pitch diameter is less [illegible] 55 lbs. At normal power the high pressure rotor [illegible] 6072 rpm and the low pressure turns 4048 rpm.

Three extraction connections are provided at approximately 145 lbs., 45 lbs. and 8 lbs. psi absolute. The low pressure unit is mounted directly over and exhausts directly into an Ingersoll Rand two-pass condenser with 6100 square feet of cooling surface served by an Ingersoll Rand unit consisting of two multi-stage air ejectors fitted with inter and after condensers. Each multi-stage ejector can serve the condenser under full load conditions. This condenser will handle 43,000 pounds of steam per [illegible] a Worthington centrifugal circulating pump driven [illegible] a 85 hp motor discharges 9300 gpm of sea water [illegible]rough the tubes of this condenser against a head of [illegible] feet.

The condensate pumps of which there are three (one for the main condenser, one for the auxiliary condenser, and one spare) are also Worthington centrifugals, each driven by a 15 hp motor and each capable of handling 105 gpm of condensate against a head of 195 feet. The condensate pump takes suction from the hot well of the condenser and discharges through the air-ejector condensers, the twin Paracoil grease extractors, and the first stage Ross heater to the Worthington deaerating heater.

From the deaerating heater the feed pump takes its



Half of midship section of F. S. Bryant.

suction and discharges through 2nd and 3rd stage Ross heaters to the boiler drum. The main feed pumps are Worthington centrifugals driven by Worthington-Moore steam turbines.

Each boiler is served by a Buffalo forced draft blower, each capable of serving both boilers and each driven by a 50 hp motor. Maximum capacity of each blower is 21,000 cfm. The suction of these blowers is taken from the air preheaters and this air is discharged through the space between the inner and outer casings of boiler to the B. & W. Decagon fuel oil burners.

On the fuel oil side, there are two Davis-Niclausse fuel oil heaters, two fuel oil service Quimby pumps, and one Worthington fuel oil transfer pump.

. The boilers are fitted with: Diamond soot blowers; Bailey Thermo-Hydraulic Feed Water Regulators; smoke indicators; CO_2 indicators; stack pyrometers; Eye-Hye remote water-level indicators; and Bailey combustion and draft control.

An Elliot external desuperheater is fitted capable of taking 49,500 lbs. per hour of steam at 200 psi gauge 750° F., and reducing it to 200 psi gauge and 405° F. when supplied with boiler feed water at 550 psi gauge and 218° F. This steam is used mainly to serve the cargo and stripping pumps at 200 psi. The external superheater is fitted an outlet, valve, and blank for emergency connection to the L. P. main turbine with steam reduced manually to 25 psi, and is also fitted with by-pass and reducing valve so that it may supply 140 psi steam to deck machinery, pumps, heating coils, smothering system and radiator system. Drum desuperheated, 140 psi steam normally supplies all steam-driven reciprocating auxiliaries, the boiler filling and washdown ejector, steam whistle, air ejector or 1st stage feed heater, and also through a reducing valve 70 psi steam to the 3rd stage feed heater, fuel oil service heaters, lube oil heaters, bunker tanks and the sea chest connections for blowing out.

Electric Power Plant

Electric power on these tankers is provided by two identical 200 kw geared turbo direct current generating sets working on 435 psi and 735° F. steam conditions, and exhausting into the Ingersoll-Rand auxiliary condenser at 28.5 inch vacuum. There is also installed a 75 kw generator driven by a Superior diesel engine. This unit is complete with radiator and fan, self-starter hooked up to a storage battery, and with an exhaust run up between inner and outer stack. Output is connected to bars on main switchboard for distribution to motor generating sets, jacking engine, necessary pumps, refrigerating machine, steering gear, machine shop and galley. All generators are 240 volt, direct current, compound wound, capable of operating continuously at full load or for two hours at 25 per cent overload without exceeding a 40° C. temperature rise.

The main and auxiliary switchboard, the motors for auxiliary machinery on deck and in engine room, the motor controls, the pilothouse, searchlights, and the motor-generator sets were all supplied by the Westinghouse Electric Corporation.

Two motor generator sets are provided for ship's lighting. Each set consists of a 25 kw, 125 volt, direct current generator driven by a 230 volt, direct current motor. For equipment requiring 120 volt a.c. current, there are two 3.75 kva generators each driven by a direct connected 230 volt direct current motor.

Cargo Pumps

There are seven main cargo pumps in the cargo oil pump room, all National Transit Company reciprocating steam drive vertical duplex positive displacement type. Three are 16″ x 14″ x 24″ each having a capacity of 1540 gpm at 125 psi discharge pressure. Two are 16″ x 14″ x 12″ with a 700 gpm capacity. Two are 12″ x 8.5″ x 12″ with a 400 gpm capacity.

The total discharge capacity of these pumps is 10,500 barrels an hour, so that theoretically these vessels can discharge their entire full load cargo in a little less than 10 hours, providing of course, that they had full loads of one variety of petroleum or derivative, all to be discharged at one dock. The pump room is ventilated by a steam turbine drive exhaust blower by Roots-Connersville, having a capacity to completely change the air in the compartment every three minutes. This blower takes its suction from the bilge and discharges through a mushroom type vent above the upper deck. The main

(Please turn to Page 122)

GENERAL CHARACTERISTICS

Length O. A.	459′ 7″
Length B. P.	442′ 0″
Beam Mld.	65′ 0″
Depth Mld.	35′ 0″
International Summer Draft	28′ 10″
Gross Measurement	8,300 tons
Net Measurement	4,940 tons
Displacement at Draft	17,520 tons
Deadweight at Draft	12,800 tons
Propulsion Normal Power	5,000 sph
Speed Loaded (Trial)	14 knots
Cargo Capacity 98% full	101,608 bbls.
For'd. Bunker Fuel Oil	4,655 bbls.
After Bunker Fuel Oil	4,626 bbls.
Fore Deep Tank Ballast	743 tons
Fresh Water afterpeak	158 tons
Fresh Water dou. bottom	135 tons
Fresh Water Culinary Tanks	60 tons
Dry Cargo Hold	23,500 cu. ft.
Cruising Radius Normal	13,000 miles
Normal Crew	38 men

This automatic precision flame cutting machine is making a cut in the bottom of the tanker H. D. Collier, as David Saunders, burner foreman (center), and M. Kyes, burner, inspect the operation. The machine, held in position by bolts tack-welded to shell, is here operating in an inverted position.

Ship Surgery—The Automatic Flame Cutting Machine

A TYPICAL EXAMPLE of how new machines developed during the stress of war have been adapted to peacetime shipyard operations is seen at Bethlehem Steel Company's San Francisco Yard, where an all-position, automatic flame cutting machine, originally designed and used by the yard during its Navy cruiser construction program, is serving a useful purpose in reconditioning today's commercial vessels.

The machine is one of many developed during the war at the San Francisco Yard, whose employees hold many War Production Board awards for suggestions contributing to a greater war production. Only three individual W.P.B. citations, highest award given, were awarded to shipyard employees in the entire United States—and two of these went to employees of the San Francisco Yard.

Just recently this flame cutting machine was used on two Standard Oil tankers, the J. L. Hanna, and the H. D. Collier (T-2 type vessels of 10,246 tons, having a length of 503 feet and a beam of 68 feet), in what is called a "crack arrestor" process.

Since transverse or diagonal cracks may develop in a vessel's shell or deck plating because of residual stresses in the metal resulting from improper welding or construction procedure, longitudinal cuts are made approximately 3/5ths the length of the ship on both port and starboard sides of the vessel's bottom, and in the same corresponding location along each side of the

deck. Seam straps of specified lengths, one inch thick and welded together, are then riveted over the cuts and their edges caulked.

The theory behind this operation is that, should a crack originate in the deck plating, or in the shell, it will travel along the metal until it reaches the cut, or rivet holes, and then, having no place to go, will stop.

To make the cut, a transit line is laid and a chalk line snapped along the shell or deck plating where the cut is to be made. Bethlehem's automatic flame cutting machine is then fastened to bolts equipped with lock nuts and tack-welded to the shell or plating and adjusted so that as it travels it will burn a cut exactly on the chalk line.

If the cut is made along the bottom, the machine operates in an upside-down or inverted position; on deck, it operates in a normal, or flat position. Cuts have to be made continuous in the bottom from three feet forward of frame No. 47 to 18′ 2″ forward of frame No. 68 and 3′ 4″ outboard from the longitudinal bulkhead.

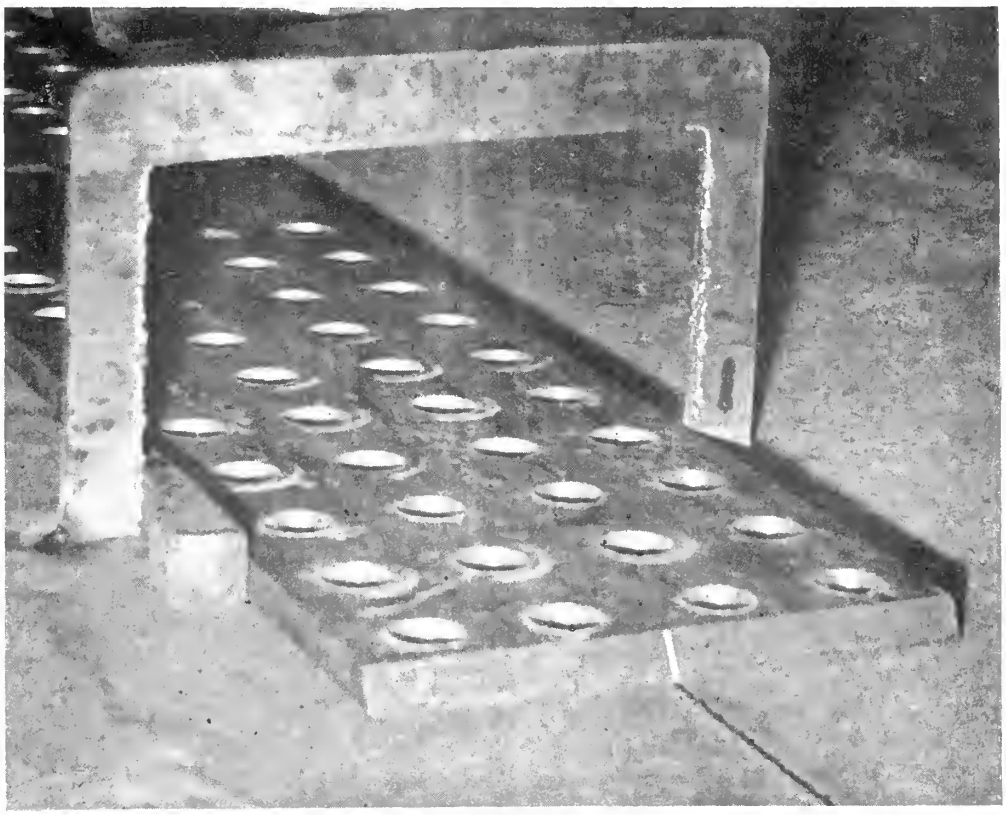
Other important features of the flame cutting machine beside those that make it adaptable to this job are that it can be operated not only in an inverted position, but also horizontally or vertically, and still make an accurate, uniformly smooth cut in each position.

It is interesting to note that, in the case of the two tankers, hand burning was not permitted, and that specifications prohibited any variation of the cut from the transit line as laid down. Furthermore, the cut edges of the plates had to be smooth and uniform throughout, without being fluted or ragged.

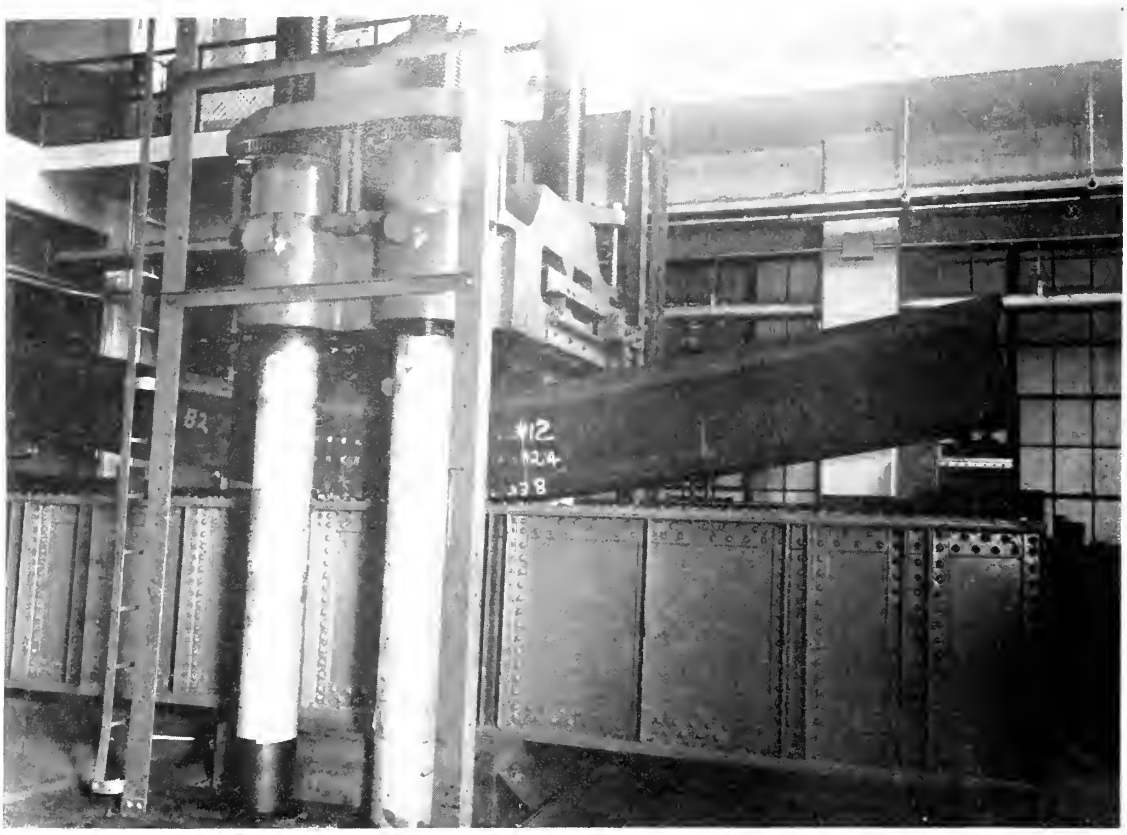
The frame of Bethlehem's flame cutting machine is of light angle steel construction. On one end is attached a #04V05—115 volt motor and governor assembly, of 8000 rpm, with a gear reduction of 504-1 through a clutch and chain drive, actuating a double pitch screw. Attached to the worm drive screw is a split nut attachment which enables the cutting torch assembly to be disengaged from the worm drive when a cut has been made and quickly brought back to the starting point for the next cut. Cutting torch holder assembly affords operational control, so that torch can be located at varying distances from frame, and can be lowered and raised. Length of travel of machine for one continuous cut is six feet, and speed can be varied from 4″ to 30″ per minute.

Editor's Note

It is obvious that this machine will be useful in many shipbuilding, ship conversion, and ship repair applications. A few that suggest themselves such as cutting rectangular holes in decks or bulkheads, cutting weld bevels, trimming plate edges in place, and many others. The device could be used profitably wherever accurate flame cutting is required on any flat surfaces that are already in place on a weldment or on an erected structure.



Butt straps are aligned and fixed in place after shell plating has been cut. Straps are then riveted in place and their edges caulked with a pneumatic chipping gun.



This 9-ton, 22-foot welded girder of fully killed structural steel, under test at the National Bureau of Standards, is shown sustaining a load of 1,685,000 pounds. The center deflection reached 18.06 inches. The permanent center deflection after removal of load was 16.45 inches. Third in a series of tests undertaken by the Structural Steel Committee of the Welding Research Council at the National Bureau of Standards, the investigation is part of a research program examining the effect of severe geometrical constraints and of residual stresses in large welded steel structures.

—Photo courtesy of National Bureau of Standards, Washington, D. C.

Testing of Steel Plates For Welded Ships

The strength of large welded steel structures, brought into prominence during the war by Liberty ship failures, is being investigated by the Structural Steel Committee of the Welding Research Council in cooperation with the Engineering Mechanics Laboratory of the National Bureau of Standards. Tests already concluded indicate that factors of design, as well as welding, have an effect on the initial formation of a crack. The continuation of a crack depends upon the notch sensitivity of the steel, a property overlooked in past specifications for ship plate.

Six 9-ton welded structural carbon steel box-girders of 22-foot span, with an over-all width of 2 feet 6 inches and depth of 2 feet 1.5 inches, have been constructed at the Ingalls shipyard, Pascagoula, Miss. Very abusive welding procedures and sequences were used, along with some unfavorable details of design, for the deliberate purpose of producing the highest possible residual stresses, especially in the vicinity of the transverse closing butt of the tension flange, which was welded last under extreme conditions of restraint. The tension flange plate is fitted between the side web plates to simulate the joints between the deck of a ship and the side plating when the

ship is subjected to "hogging" stresses (with an elastic curvature that is convex upwards).

The girders have been successfully proportioned to insure against failure by lateral deflection and buckling or twisting, the manner in which test beams and girders usually fail. The compression flange was made 2½ inches thick.

The first girder, constructed of ordinary semi-killed structural steel hull plating taken from stock in the shipyard, was tested at room temperature. It failed by rupture with a brittle or "cleavage" type of fracture and a sudden release of energy that shook the building. Failure did not occur until the measured strains and elastic deflection indicated extreme fibre stresses approximately equal to the conventionally determined ultimate tensile strength of the material, not far below the modulus of rupture of 75,600 pounds per square inch as computed for the breaking load of 1,397,000 pounds and corresponding bending moment of 71,200,000 pound-inches. Total deflection at failure was about 8 inches, about 7 being permanent set and less than 1 inch elastic deflection.

The second girder, of fully killed steel, tested at about —45° F, failed in a similar fashion, but the fracture was more of a compound, shattering type under the influence of cold temperature, and the entire girder snapped in two. The breaking load of 1,165,000 pounds was only 16.5% lower than that for the first girder although it was 30.9% lower than the maximum load imposed upon the third girder, which was tested at room temperature.

The third girder, of fully killed steel, did not fail under a load of 1,685,000 pounds, equally distributed between two load points 2½ feet on either side of the mid-span, when the center deflection reached 18.06 inches. At this point, the girder was almost touching the supporting girders of the test apparatus, and further loading was impossible. The permanent center deflection after removal of the load was 16.45 inches. The extreme fibre stresses, computed under this loading, were 91,200 pounds per square inch in the projections of the side plates and 70,200 pounds per square inch in the tension flange plate. It is probable that 70,200 pounds per square inch stress was actually realized. Data like the extensive strain gage readings still remain to be analyzed.

The purpose of the research program is to investigate, at various significant temperatures, (1) the effect of severe geometrical constraint against ductile behavior and upon the capacity of a welded structural member for resisting rupture under external load, and (2) to observe the detrimental effects of residual stresses.

The character of future tests has not been decided. The testing of girders preheated during welding, testing at various intermediate temperatures, and studies of the effects of normalizing heat treatments subsequent to construction of the girders, are all contemplated. Out of these tests, a fuller knowledge of the behavior of large welded steel structures and data that may lead to the design and construction of more satisfactory members are expected.

Diesel Conference at San Francisco

A conference between Diesel engine manufacturers and the shipping industry as a whole will be held in San Francisco November 7. The meeting will begin with a luncheon at noon in the St. Francis Hotel's Italian Room.

Upon the theme "What does the Diesel engine industry of the United States have to offer the Merchant Marine industry of the Pacific Coast," there will be answers to 48 questions that have been sent in by ship operators and naval architects, which answers have been grouped as follows:

Fishing fleets, tugs, ferries. Speaker will be G. F. Twist, vice president and general manager of Atlas Imperial Diesel Engine Company.

Coastal vessels. Robert H. Morse, vice president and sales manager, Fairbanks, Morse & Co.

Ocean-going vessels. R. W. Bayerlein, manager, Heavy Machinery Division, Nordberg Manufacturing Company.

Tankers. (To be announced.)

Fuels. H. G. Vesper, president, California Research Corporation.

General questions. E. J. Schwanhausser, president, Diesel Engine Manufacturers Association and vice president of Worthington Pump & Machinery Corporation, and Gordon Lefebvre, vice president, Diesel Engine Manufacturers Association and president of Cooper-Bessemer Corporation.

George W. Codrington, vice president of General Motors, and head of the Cleveland Diesel Engine Division, will present a film "The Modern Mariner," which pictures the application of Diesel engines in the Marine field.

Pacific Coast builders of Diesel engines will be represented at the conference by:

Atlas Imperial Diesel Engine Co. (Oakland); Enterprise Engine & Foundry Co. (San Francisco); Joshua Hendy Iron Works (Sunnyvale); Lorimer Diesel Engine Co. (Oakland); Union Diesel Engine Co. (Oakland); Washington Iron Works (Seattle).

Eastern companies included will be:

Cooper-Bessemer Corporation; Fairbanks Morse & Company; General Motors Corporation; National Supply Company; Nordberg Manufacturing Company; Sterling Engine Company; Worthington Pump & Machinery Corporation.

Transport Admiral W. S. Sims Converted

THE ARMY'S NEW FLEET OF MODERN TRANSPORTS will carry American military personnel and their families to and from occupied areas in greater comfort and safety than ever before available on troop carriers. A recent inspection of the newly converted Army transport, Admiral W. S. Sims, reveals features which confirm the Army's most enthusiastic claims.

The big ship—she is 610 feet long, with a displacement tonnage of 23,000, and compares favorably in size with the largest pre-war American passenger vessels—was approved for operation by Brigadier General Robert Wylie, assistant chief of transportation for the War Department, at the Bethlehem San Francisco yard, where she was converted from a Navy transport. The Sims is one of 18 modern vessels awarded to Bethlehem's shipbuilding division for conversion, and is one of four vessels of the P-2 type assigned to the San Francisco Port of Embarkation. The ship's name comes from Admiral W. S. Sims of World War I fame, and will be continued in Army operation.

The ship was built at the Bethlehem-Alameda shipyard, and was commissioned September 27, 1945. There followed five round trips to the Philippines, with a total of about 50,000 troops. In the Spring of 1946, she was decommissioned by the Navy and turned over to the Army Transportation Corps. Skipper is Captain Daniel Pumphrey, a veteran of 51 years of sea service.

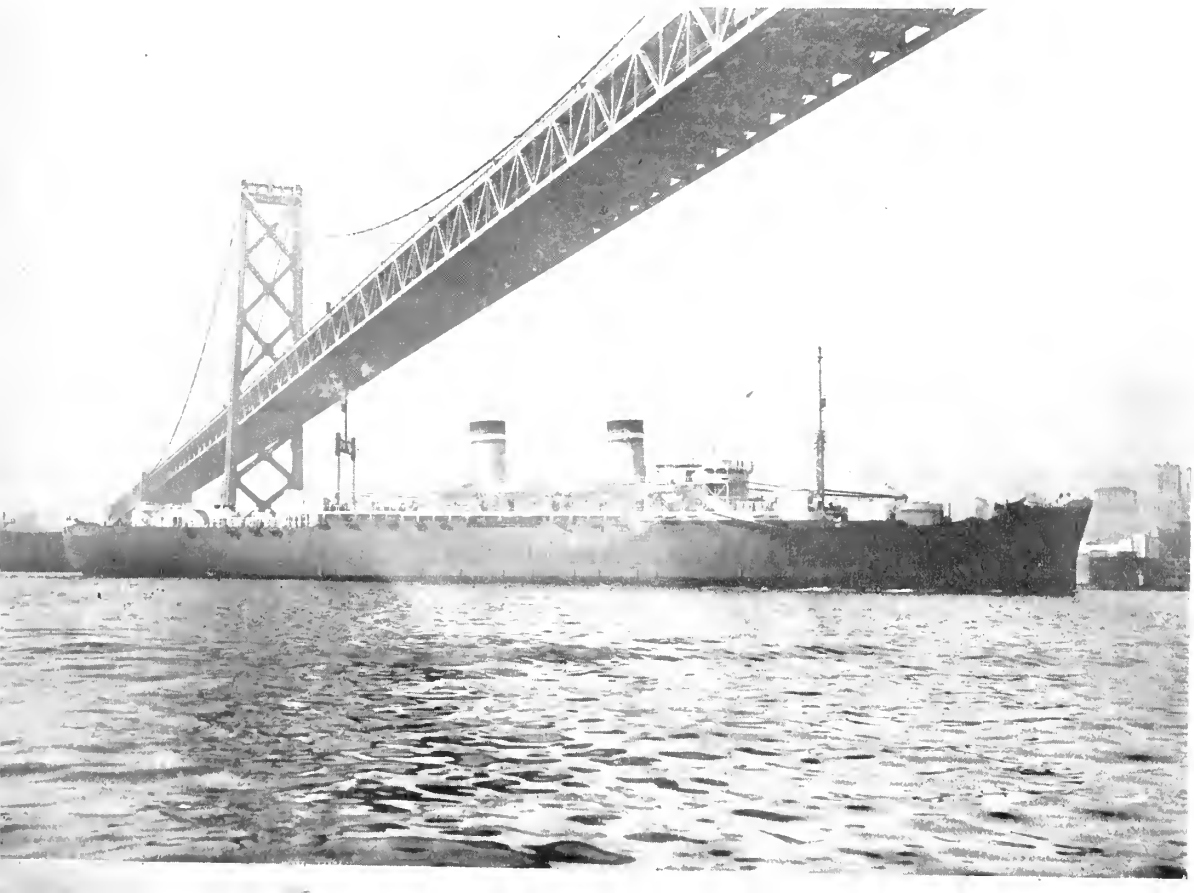
The P-2 Type

Vessels of this type have been featured in Pacific Marine Review in a number of issues, most important of which was the March issue on the American President Lines' new President Cleveland, which was built in the same yard.

As a transport, the ship was built with two engine rooms to prevent the crippling of the vessel in the event one of the engine rooms was damaged. This feature remains.

Conversion Details

The conversion job started on June 25, and was finished September 27. A major portion of the work consisted of changing ship accommodations from a Navy



The U. S. Army transport Admiral W. S. Sims on her trial run September 22 following conversion from a P-2 type Navy troop transport at Bethlehem Steel Company's San Francisco Yard.

TROOPSHIPS

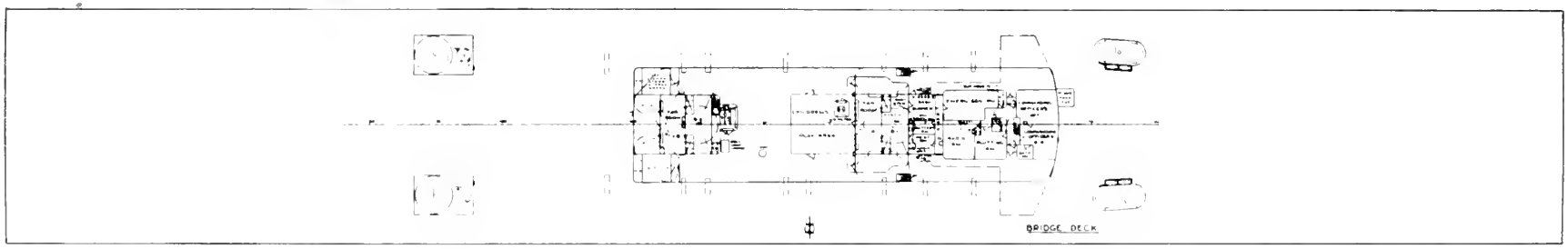
SCALE: 1/32 = 1'-0" DATE: 9-18-46

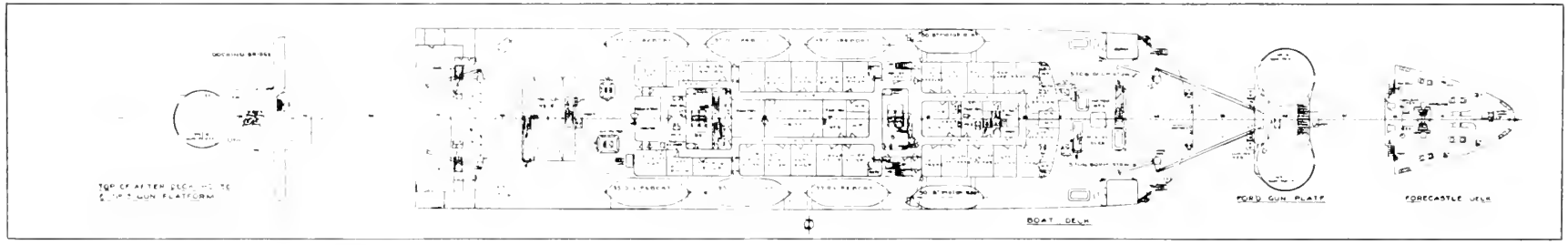
B & R Inc	HULL Nº	M.C. Nº	U.S.N. Nº	NAME

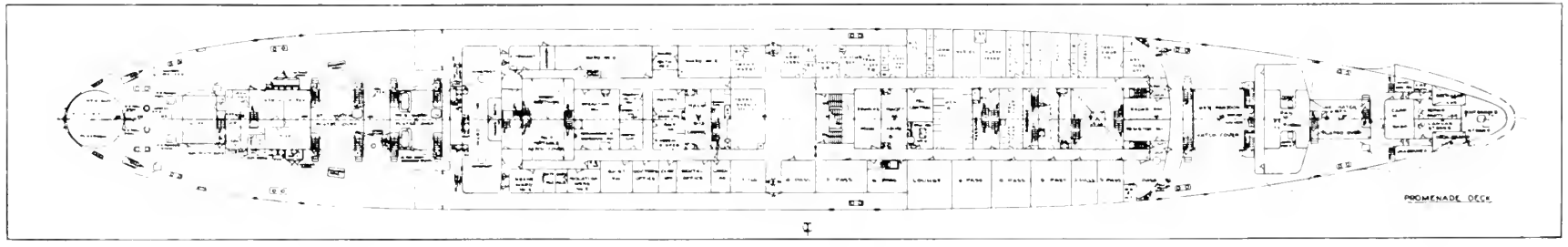
SERIAL Nº [redacted]

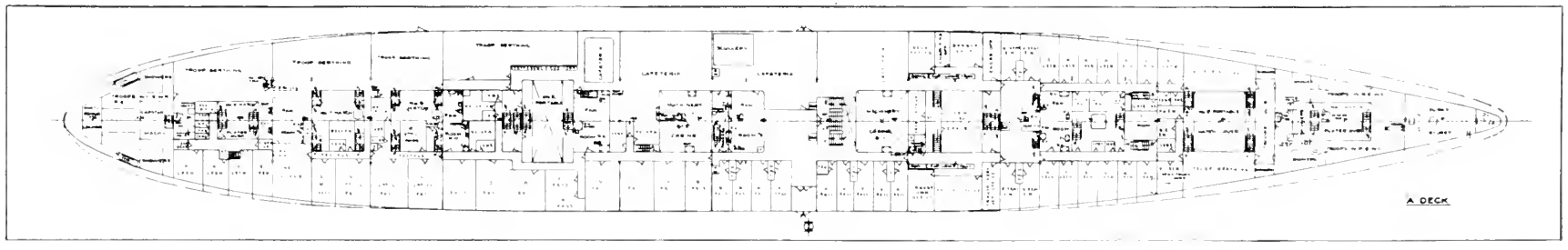
GENERAL ARRANGEMENT DECK PLANS OF ADMIRAL W. S. SIMS

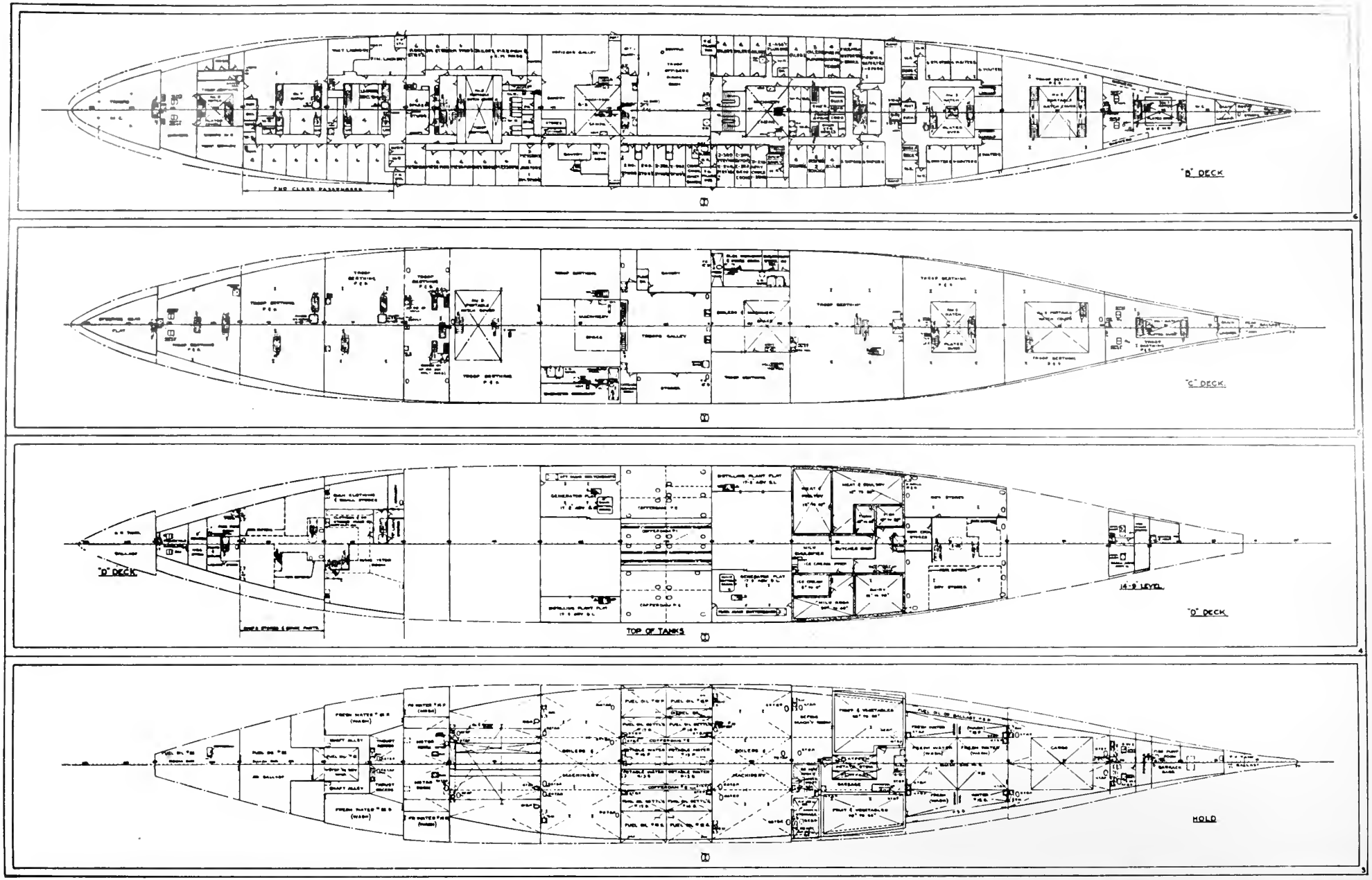
Other Decks on Page 54










"B" DECK
"C" DECK.
"D" DECK
TOP OF TANKS
14'-9" LEVEL
"D" DECK
HOLD

troop transport carrying 5000 troops, to an Army transport carrying

2,115 troops
302 passengers
293 civilian crew
37 military personnel

All troop accommodations on the lower decks were left intact. Those on the upper decks were made into staterooms for officers and dependents of Army personnel. New lifeboats were installed, four new remote reading boiler level indicators were added, as was also a new automatic galley drain sump tank, as the galley is below the waterline. New access tunnels were cut between forward and after engine rooms, and between aft engine room and port and starboard motors. Watertight doors are placed at each end of the tunnel, and can be operated from the main deck. The tunnels are to provide access to either engine room by the same crew. New type lifting gear was installed for quick inspection of turbine generator rotors.

One little item in the conversion job was the installation of four miles of hot and cold fresh water pipes in the new passenger area. Another is the needed laundry equipment for passenger use. Improvements were also made to the fire protection and extinguishing system. Additional cargo-handling facilities, new radar receiving and transmitting system, extensive electric lighting, and

increased height on the foremast to accommodate the radar antennae have been added.

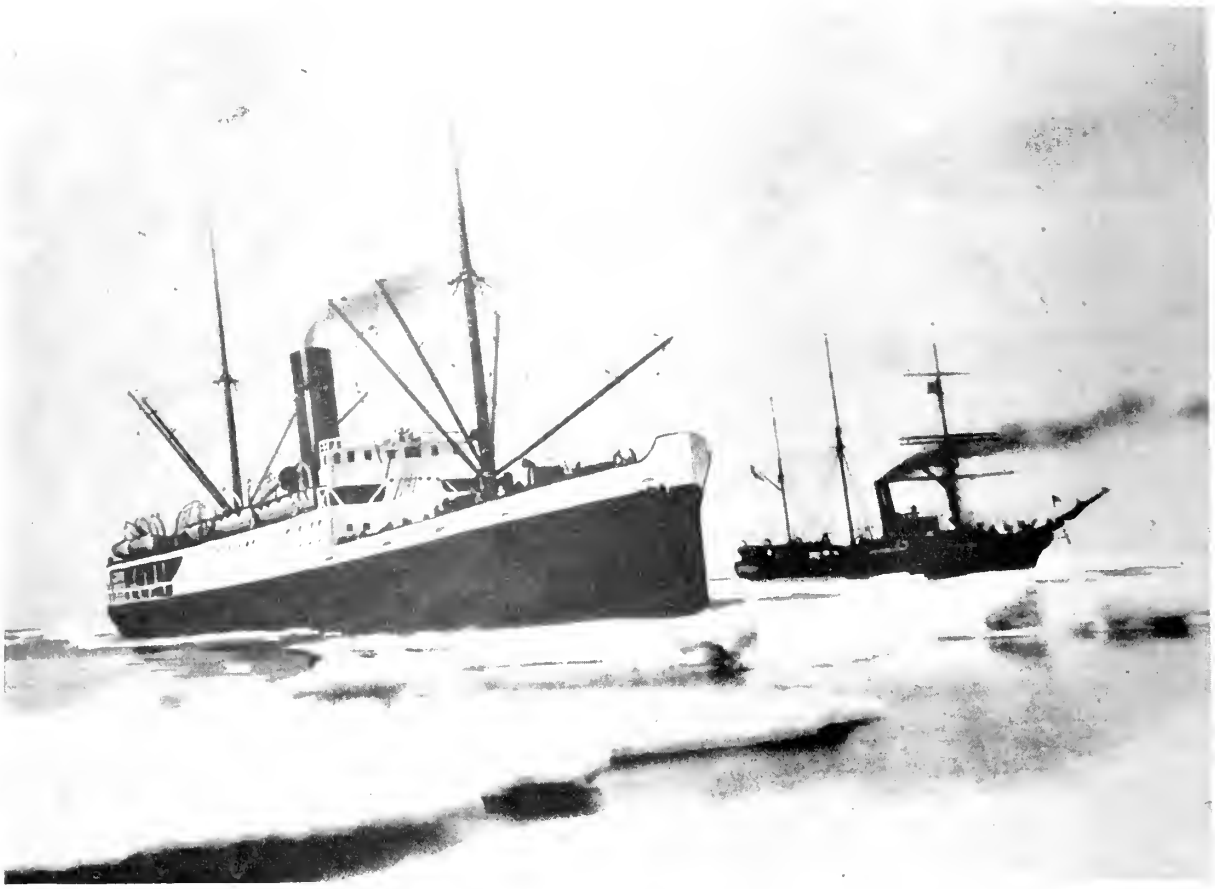
Other Army Conversion Jobs Being Done by Bethlehem

Besides converting the Admiral Sims from a Navy troop transport to an Army transport, Bethlehem Steel

(Please turn to page 126)

Above: Colonel James E. Sullivan, chief, Public Relations Division, San Francisco Port of Embarkation, inspecting Edison Hotpoint galley ovens.

Captain Daniel Pumphrey, master of the Admiral Sims, with Brig. General Robert Wylie, assistant chief of Transportation, U. S. Army and Brig. General Neal McKay, Commanding General, San Francisco Port of Embarkation.



Early in June, the Alaska Steamship Company's SS Victoria is the first to break Nome's winter isolation. The heavy ice-breaking iron hull of the Victoria pushes undisturbed through the ice. In the background is the famous Coast Guard Cutter Bear, which has played such an important role in assisting explorers of the North and South Pole regions.

The Victoria

—in Service Since 1870

Recently in Seattle one of our editors recognized the lines of a fine old vessel and inquired about her. He was handed a copy of the following letter written in July of last year by L. W. Baker, general manager of the Alaska Steamship Company to the San Francisco office of the War Shipping Administration. It tells an eloquent story, and we would not add to it if we could.

"GENTLEMEN:

"This will acknowledge receipt of your letter of June 29, 1945, in which you advise the Public Relations and Censorship Office of the War Shipping Administration in New York has written to you for information regarding the steamship Victoria, operated by our company for the War Shipping Administration.

"Briefly, the history of the SS Victoria, according to the information we have on her is as follows: She was built for the Cunard Line in 1870 by W. Denny and Brothers at Dumbarton and was launched as the Parthia. As originally built the Parthia had three masts on which sails were carried, and was fitted with a compound engine which was used more or less as an auxiliary, provision being made in the shaft alley to disconnect the shaft, allowing the propeller to idle when the wind was sufficient to maintain a good headway on the ship. To maintain alignment of the shaft when the wheel was idling, a

bearing was provided in the rubber post aft of the propeller.

"Her first fifteen years of service were in the North Atlantic, and we have no details of any of the vessel's activities being unusual, with the one exception that during the Egyptian campaign in 1881 the Parthia became a troopship for a time.

"In 1885 the Parthia was turned over to John Elder and Company, of Goven, in part payment for the new Etruria and Umbria, at which time she was overhauled and re-engined and assigned to the Guion Line, running to South America, Australia, the Hebrides and the Straits of Sunda. Her age, however, made her unsuitable for the transatlantic service, and she was sent to the Pacific in the early summer of 1887. She operated between Vancouver, B. C., and the Orient in connection with the Canadian Pacific Railway until replaced by the new Empresses in 1891. In that year she returned to Great Britain for an overhaul, and was renamed Victoria before returning to the Pacific in 1892.

"The Victoria then commenced operating from Tacoma, Washington, to the Orient in the service of the Northern Pacific Steamship Company and remained on this run until 1904, with the exception of three voyages made to Manila with troops in 1899-1900, and a single voyage to Nome, Alaska, in 1900.

"In October, 1898, the Victoria was transferred to United States Registry, and in 1901 she was purchased from her British owners by the Northern Pacific Steamship Company, a subsidiary of the Northern Pacific Railway. In 1904 the Victoria was sold to the Northwestern Improvement Company and was extensively rebuilt, her appearance changed by addition of more deck-houses, in preparation for service between Seattle and Nome, which she took up in the summer of 1904.

"In 1908 the Northwestern Steamship Company was merged with the Alaska Steamship Company, and it was in this way that we acquired her. In 1910 she was converted from a coal-burner to an oil-burner, and during the winter of 1924-25 was again extensively remodeled and modernized.

"From the time of her acquisition by this company until the fall of 1937 the Victoria operated exclusively in the Alaska trade as a freight and passenger carrier. For many years she was the first steamer to reach Nome, Alaska, after the ice break-up in Bering Sea in the late spring, and was often the last to leave Nome for the "outside" in the late fall just before navigation closed. During this time she carried many thousands of Alaskans and business men to and from the Seward Peninsula, and became a favorite and by-word with them.

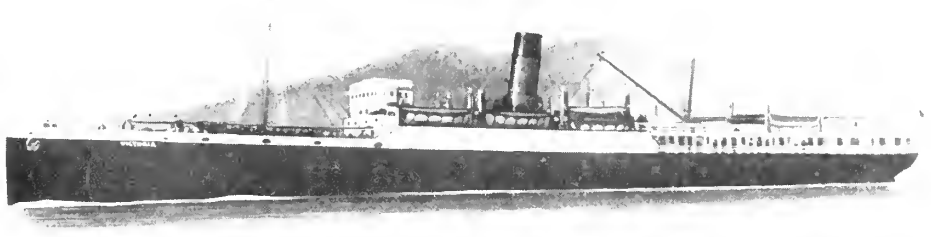
"Following completion of her 1937 season the Victoria was retired from service due to obsolescence brought about by governmental requirements. She was idle and laid up here in Seattle from that time until the winter of 1940-41. In the late summer of 1940, we were advised of the plans for construction of a Naval Base at Dutch Harbor, Alaska. The demands on our line for additional facilities to service this project made it necessary to add another unit to our fleet and this problem was met by converting the Victoria to a freighter. During the winter of 1940-41 the conversion of the Victoria was completed. Her passenger accommodations and much of her superstructure were removed and converted into cargo space and she commenced operation as a freighter in June, 1941. Due to her speed and capacity for carrying refrigerated cargo she has made a very satisfactory freighter.

"The present engine in the Victoria was built and installed in 1885 by the John Elder Company. It is of the triple expansion type and is unique in its valve gear. The valve motion is obtained from the crossheads and connection rod through 'links' and 'banjos' and bears a resemblance to the 'Bryce Douglass' valve gear. The cylinder dimensions are 31"—50"—76"; the stroke is 54".

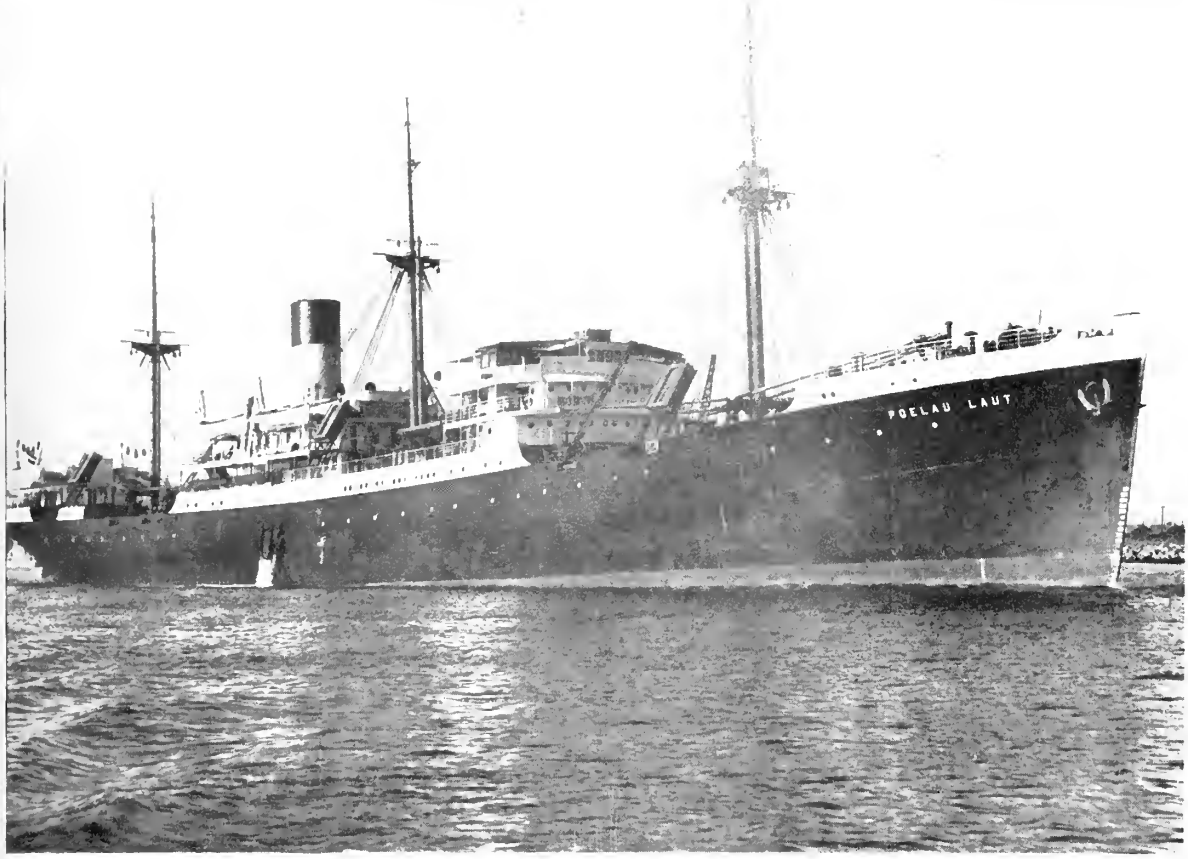
"The Victoria's original hull of heavy, hand-wrought Swedish iron plates remain unchanged. Despite the vessel's age, she continues to operate at an average sea speed of approximately 12 knots.

"As to the amounts of gold which the Victoria has brought out of Alaska there is no available record nor is it possible to make even a reasonable estimate. It has been said, however, that in the old days of the Nome

(Please turn to Page 134)



SS Victoria, well known in Alaskan waters.



M/S Poelau Laut after repair and refurbishing by Bethlehem Steel at its Terminal Island Shipyard.

Reconversion of M/S Poelau Laut

Captain Peter Kruyt, marine superintendent of the Netherlands Line.

EDITOR'S NOTE: *In the September issue of Pacific Marine Review the overhauling of the crankshaft of the Poelau Laut was described. This was one of the largest crankshaft jobs ever attempted.*

THE M/S POELAU LAUT IS THE ONLY SURVIVOR of three sister ships in the Poelau group, the other two—the M/S Poelau Tello and Poelau Bras—having been lost by torpedo action in the war. The name Poelau Laut means Sea Island, a small island of the Dutch East Indies.

The vessel was built in 1928 in Amsterdam, and until the time of the war was engaged in passenger, mail, and freight trade between Amsterdam and Batavia for the Netherlands Line. With the outset of the war all Dutch shipping came under the protective wing of the British Admiralty, and the Poelau Laut was leased to the War Shipping Administration to be used as a troop carrier.

After conversion she had a capacity for 2500 troops. These were housed in the upper cargo holds where tem-

porary facilities had been installed. The remaining portions of her holds still had a capacity for approximately 5,000 tons of troop gear or general cargo.

Her extreme length is 517 feet, her breadth 61 feet, and she is 36 feet 9 inches in depth to the upper deck. Classified as a 12,000 ton vessel, she is powered by an 8,000 hp. Sulzer Brothers diesel built at Winterthur, Switzerland. This is the third largest diesel afloat, each of her 8 cylinders imparting a push of 1,000 hp at each stroke. At full speed operation the engine turns over approximately 95 rpm and drives the vessel at about 16 knots. She has an 8,000 barrel oil capacity with a consumption of 126 barrels per day (approximately 300 miles). She has accommodations for approximately 60 passengers in beautifully paneled cabins. Her smoking salon is paneled in carved gum and red marble.

Before being returned to her owners, the Amsterdam-Batavia Lines, she was reconditioned in the San Pedro Yard of Bethlehem Steel Company's Shipbuilding Divi-

A partial top view of the huge diesel of the M/S Poelau Laut. The engine is about 60 feet long and 30 feet overall height.

At the engine room controls of the giant Sulzer Brothers diesel are shown: N. Kramer, second engineer; J. J. Reurts, West Coast Superintendent of Engineering for the Netherlands Line, and J. F. Nydam, chief engineer.

Above: W. A. Harrington, assistant manager and E. B. Powell, superintendent of Engineering, Bethlehem's San Pedro Yard.

At right: Officers of the Poelau Laut, left to right: W. Schor, 4th Mate; Simon Van Straten, radioman; W. A. Vonk, 2nd Mate; A. C. de Boer, 3rd Mate; H. E. Ruytenschildt, Captain; and H. Zeilmaker, 1st Mate.

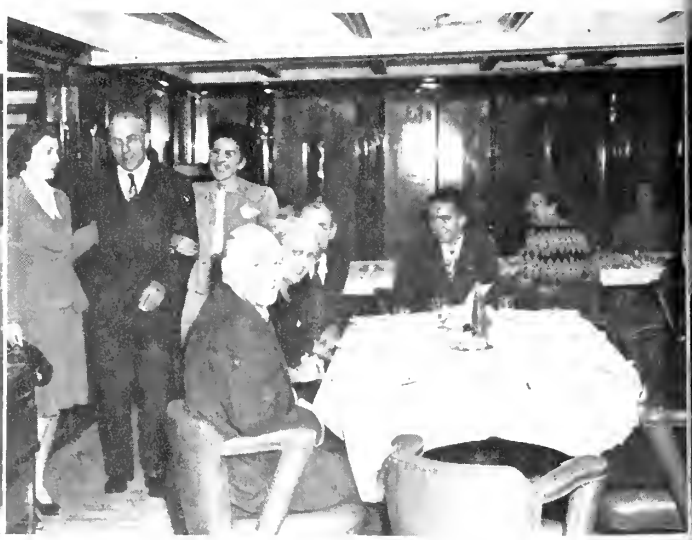
One of the comfortably appointed passenger cabins.

sion at the request of the War Shipping Administration. This reconversion proved to be rather extensive and provided West Coast ship repairmen with one of the biggest engine jobs that has ever been performed on the Pacific Coast. Investigation showed that the long months of continuous operation with little or no time for what should have been interim repairs had so damaged and worn the great crankshaft of the engine that it was necessary that it be replaced, as well as a general rebuilding of the entire engine and auxiliaries.

A spare half crankshaft which had been in Amsterdam throughout the war and the German occupation was discovered to be intact and was shipped to San Pedro for installation. A second half of the 92-ton shaft was rebuilt using the integrated facilities of Bethlehem's San Pedro and San Francisco Yards. From a huge forging approximately 25" in diameter new crankpins were turned and fitted into the webs of the old shafts and the whole realigned and machined to new shaft specifications. This half shaft was then returned to San Pedro for final alignment, installation, and fitting of new bearings.

The engine work, however, was not all that was required in the way of extreme skills and arts in the reconversion of this vessel. Cabins once beautifully paneled and varnished had been scarred and beaten by the traffic of many mean; the installation of troop quarters and accommodations had left their mark; and it was necessary that this woodwork and paneling be returned to its original state. To do this required men of a caliber almost extinct today. Here again Bethlehem's versatility and resources provided skilled cabinet makers and finishers to restore this delicate woodwork to its original beauty, even to the extent of reproducing a couple of articles of beautifully carved furniture which had been damaged beyond repair.

Below, left: E. B. Powell, supt. of Engineering, San Pedro Yard, Bethlehem; Frank Boomer (back to camera), Los Angeles surveyor for Lloyds of London; Tommy Mearns, surveyor, W.S.A.; and J. J. Reurts, West Coast Engineering Supt. for the Netherlands Line in the beautiful marble paneled smoking saloon aboard the Poelau Laut during sea trials after reconversion. At right: In the dining saloon of the M/S are: Captain Peter Kruyt, Frank Boomer, Mrs. J. J. Reurts, and Tommy Mearns.



Depressed Rail Rates

How They Undermine the Steamship Lines

The competitive plight of coastwise and intercoastal ships, threatening destruction of many normal water carrier services is a menace of gravest concern to the national welfare, and the United States Maritime Commission has so told the Interstate Commerce Commission in a brief vigorously renewing its request for an overall investigation of competitive rail rates and practices.

The Maritime Commission's original petition for an inquiry was filed last March. Subsequently the ICC asked for a bill of particulars, which was furnished June 28, and briefs have been filed by the various interests affected, with oral argument set for October 30.

Describing the dwindled volume of coastwise and intercoastal ocean traffic, the Maritime Commission's brief says:

"The fact that water carrier rates, because of comparatively low competitive rail rates, have not been able to be increased sufficiently to obtain adequate revenues has continued to preclude any substantial revival of private operation and continues to demand that immediate and vigorous action be taken to compel the readjustment of rail rates wherever warranted and wherever necessary to permit the water carriers to recapture their normal competitive position. Such action seems essential unless the railroads are to be permitted, by the pressure of concerted competitive practices, to accomplish the near-complete destruction of water carrier operations. The steamship lines should not be thus penalized for having been compelled to sacrifice their ships and their organizations and their entire trades for the exclusive prosecution of the war."

The brief also asserts the situation is having an adverse effect upon disposal of war-built merchant ships because "the attitude of many domestic operators with respect to purchase and charter of available vessels has been alarmingly apathetic and their reluctance to risk large capital investments is due to the present dismal prospects in the intercoastal and coastwise trades, primarily because of inadequate and depressed rates and long protracted delays inherent in the conventional procedures employed in the readjustment of such rates.

"The continued inability of the domestic water carriers to acquire new fleets and to maintain them successfully and efficiently in domestic trades can have only dangerous consequences if great emergencies ever again threaten our national security."

Reviewing events leading to passage of the Transportation Act of 1940, the brief continues:

"Clearly, emergency conditions and problems of such complexity and magnitude, involving the existence for the future of a major portion of the American Merchant Marine and of an integral part of the entire national transportation system, warrant the invocation of your [the ICC's] full powers of investigation provided for in the Interstate Commerce Act. It is difficult to imagine a situation which could have been more in the contemplation of Congress when it bestowed upon your Commission such broad investigatory powers and duties."

The brief discloses that competitive conditions in coastwise and intercoastal service are now such that the number of vessels allocated to it is less than one-third of the pre-war total.

In another development affecting freight rates, the Supreme Court agreed on October 14 to say what freight rates ought to be and how they shall be fixed by the ICC. The problem came to the court on appeal from an order growing out of the old complaint of Southern States that their industry has no chance to grow because freight rates are loaded against them. The high court's decision is sure to write a new chapter in rate law, either backing up the ICC in leveling off costs between sections of the country, or freezing the present rate system between narrow limits. And that likely would turn the question back to Congress for action.

In other proceedings, the Intercoastal Freight Association and the Pacific Coastwise Steamer Lines have made pleas similar to that of the Maritime Commission. For the Intercoastal the brief was signed by Harry S. Brown, chairman of the association and M. C. DeQuevedo, general counsel. For the Coastwise, the brief was prepared by C. R. Nickerson, secretary of the association, and by Joseph J. Geary of Lillick, Geary, Olson & Charles, attorneys.

Basis of Complaints

The Interstate Commerce Act, under which railroads, domestic water carriers, and highway carriers operate, authorizes rates to be fixed at "competitive" levels. And while the Act contains the so-called "long and short haul

clause' there are exceptions to that rule which are completely undermining domestic water shipping.

Under the rule permitting rates to be competitive, the railroads may, and do, quote rates to seaports that practically exclude competitive intercoastal ship lines. And under the "exceptions" to the long and short haul clause, the same thing is happening to the coastwise lines. This long and short haul rule requires that carriers may not charge a lower rate for a longer haul over the same line, in the same direction, and under similar conditions, the shorter included in the longer haul. It has been held that a lower rate to a greater distance was prima facie evidence of discrimination.

The Transportation Act of 1920 made the ICC responsible for making rail rates adequate for a *reasonable return* on the value of the property in transportation use.

The Transportation Act of 1940, under which the water carriers were brought under ICC regulation, specifies that rates be adequate to permit water, highway and rail carriers to meet the requirements of the postal service and the *national defense*. Water rates that do not pay costs and rail rates so low that shippers at other points must make up deficits are neither fair to the shipping public nor protective to the national defense. And when they not only do, but are actually planned to, destroy competitive services, they are contrary to the purposes of Congress in setting the country's transportation policy.

Examples of Depressed Coastwise Rates

A few examples of how the rate comparisons work out is shown in the following tabulation. For instance, the rate on rubber tires from Los Angeles to Seattle, a distance of 1274 miles, is 54c per 100 pounds. This is a coastwise run between ports. But from Los Angeles to Douglas, Arizona, *a distance of only 625 miles but without water competition, the rate is $1.05.* In other words, the people of Arizona are paying the bill for the railroad losses in keeping the steamship companies down. Here are other examples:

Commodity	Rate Application	Distance —Miles	Rate, per 100 lbs.
Beans—Dried	San Francisco—Seattle	901	$ .65
	Ventura—El Paso	888	1.08
" "	San Francisco—Portland	719	.41
	San Francisco—Ogden	784	.85
Canned Goods	San Francisco—Portland	719	.46
	San Francisco—Ogden	784	.72
Coffee	San Francisco—Portland	719	.40
	San Francisco—Ogden	784	.82
"	Los Angeles—Portland	1092	.56
	Portland—Ogden	1103	1.29
Dried Fruit	Los Angeles—Portland	1092	.77
	Portland—Ogden	1103	1.17
Lard Substitutes	San Francisco—Portland	719	.59
	San Francisco—Ogden	784	.81
Paper—Wrapping, Bags	Portland—San Francisco	719	.47
	San Francisco—Ogden	784	.78
Paper—Wrapping, Bags	Seattle—Los Angeles	1274	.53
	San Francisco—El Paso	1283	1.21
Rice	San Francisco—Portland	719	.36
	San Francisco—Ogden	784	.63
Rubber Tires	Los Angeles—Seattle	1274	.54
	San Francisco—El Paso	1283	1.33
Alcohol—Ethyl	Los Angeles—Seattle	1274	.84
	San Francisco—El Paso	1283	1.39
Alcohol—Denatured, etc.	San Francisco—Seattle	901	.68
	San Francisco—Phoenix	893	1.05
Sugar	San Francisco—Portland	719	.37
	San Francisco—Ogden	784	.77

There are many, many similar illustrations in the tariffs of the rail lines which can be presented to the Commission. They tell the same story, either the rates of the rail lines to the substantial consuming areas of Utah, Texas, Colorado and Arizona from the Pacific Coast are altogether too high, or the Pacific Coast maximum rates are altogether too low. Obviously the maximum rates are too low. If the Interstate Commerce Commission was to order the rail lines to apply the level of maximum rates on the same commodities destined to the interior points mentioned, it is as certain as night follows day that the cry of "confiscation" would emanate from every one of the freight offices of the Pacific Coast rail lines. It is these maximum rates of the rail lines that must be corrected—and promptly—if the Pacific Coast is going to have competitive steamer line services available for utilization by the shipping public.

It is not suggested that the rail lines be forced to increase these rates simply for the purpose of permitting the steamer lines to compete with them at a profit to the steamship companies. Paraphrasing the language of a high ranking naval officer of the United States, the steamer lines are perfectly agreeable to taking their competitive chance "with a willing enemy and an open sea." It is not felt, however, that reasonable competition is even remotely accessible as long as the maximum rates of the rail lines remain unquestioned. As an absolutely irreducible minimum, these maximum rates—intermediate in application—must be corrected—forcibly, if necessary, by orders of this Commission—if water carrier competition is going to be permitted to exist on the Pacific Coast for the benefit of the shipping public.

The Interstate Commerce Commission should conduct on its own motion the investigation which has been requested by the United States Maritime Commission and the War Shipping Administration, and in the course of that investigation should require the development of all the conditions of cost and operationg difficulties which face the rail lines in the development of their rates on purely Pacific Coast traffic. If in the course of this investigation the Interstate Commerce Commission will require the application of a reasonable level of rates for the rails in place of the existing depressed maximum rates, then the water lines are satisfied that there will be traffic available for both methods of transportation. More important, whatever traffic is available will, under the

direction of the Interstate Commerce Commission, be required to pay reasonable rates for the service. Certainly "the laborer is worthy of his hire."

Railroad Costs

The railroads can not afford to depress rates without loading the shortage on other shippers. In a special message addressed October 6 to its patrons and stockholders by the Pennsylvania Railroad, particular emphasis is placed upon the fact that the increases which the railroads are now seeking average only eighteen one-hundredths of a cent for carrying a ton of freight one mile.

How urgent the needs of the railroads have now become for higher freight rates is indicated by the way costs have been mounting.

Three increases since 1939 have raised railroad wages 51.1%. "It will take an extra $1,451,000,000 a year just to meet these wage increases; that is more than $3,900,000 a day," the Pennsylvania's message states.

As illustrating the mounting trend of material prices, cross-ties have risen 128.6%; freight car lining, 168.5%; steel rails 22.3%; and dining car commissary items, 91%. Coal, of which the railroads are the largest users in America, has risen $1.50 a ton, but for the average haul of 330 miles the railroads are getting only 7½c a ton more than before the war.

"The railroads are doing a peak business," continues the message, "and, as in all periods of peak business, should be making peak profits in order to keep pace with the country's growth." Instead, they are pictured as "having to pinch pennies to stay solvent."

The views of the Pennsylvania Railroad management are expressed in a new issue of "Train Talks," the publication that the railroad distributes from time to time to passengers on its trains and through other channels to patrons.

It is "a simple economic fact," "Train Talks" declares, "that the money needed to meet higher wages, higher prices, higher taxes and more costly social security, and to pay for the ravages of war and future improvements, simply can not be earned at present freight rates."

After World War I, the railroads had to borrow $10,000,000,000 for rehabilitation. That will be neither possible nor desirable now, "Train Talks" states. "So the railroads, this time, will have to rely chiefly upon adequate revenues to provide the money needed for restoration of facilities and continued progress.

"Only through increased rates can the railroads of America establish the economic basis that will enable them to get better cars, better engines, better equipment of all kinds, and perform better and increasingly attractive service for the American public."

Thus the railroads complain of their rate structure but object to any general rate investigation by the ICC and they deliberately set rates to port cities at figures which cannot be fair. The cost items of which they complain are the normal costs of running their business, expanded of course, along with most other commodities. Shipping by water has elements of cost which are *not* part of *steamship* management. They include

Marine Insurance
Switching at port of origin
Switching at port of destination
Wharfage and state tolls
Carloading

These inflated items often run water shipping above rail shipping. And the railroads do not make such contributions to the government as $5,000 per passage of the Panama Canal.

Naval Architects Meet in November

THE Fifty-fourth Annual Meeting of the Society of Naval Architects and Marine Engineers will meet at the Waldorf-Astoria November 13-14-15, and 16, opening with a session in the Jade Room when the president's address and the Annual Report of the Secretary-Treasurer will be read. Following the morning session, the following papers will be submitted for discussion:

1. "Design of Stacks to Minimize Smoke Nuisance," by Robert W. Nolan, member.

2. "German Wartime Technical Developments," by Commodore H. A. Schade, U.S.N., member.

The Second Technical Session will be held at 2:00 p.m. in the afternoon at which time the following papers will be read:

3. "Development of Ice-Breaking Vessels for the United States Coast Guard," by Rear Admiral Harvey F. Johnson, U.S.C.G., (Ret.), Council Member.

4. "Turning and Course-Keeping Qualities," by Professor Kenneth S. M. Davidson, member, and Dr. Leonard I. Schiff, visitor.

The Third Session will be held Friday morning, November 15, at which time the following papers will be presented for discussion:

5. "Alternating Current for Auxiliary Plants of Merchant Vessels," by Benjamin Fox and Harry C. Coleman, members.

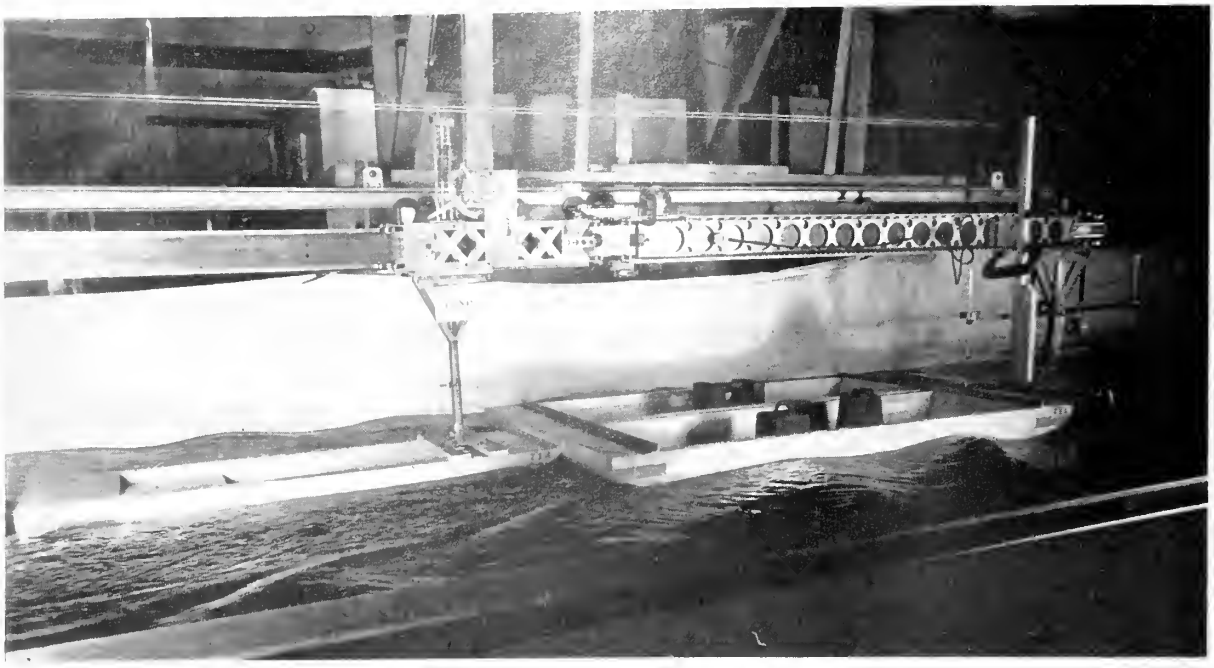
6. "Development of Steam Turbines for Main Propulsion of High-Powered Combatant Ships," by Glenn B. Warren, member.

The Fourth Session will be held in the afternoon of the same day, at which the following papers will be presented:

7. "Aspects of Large Passenger Liner Design," by James L. Bates and I. J. Wanless, members.

8. "A Pattern for Research in Naval Architecture," by Commander E. A. Wright, U.S.N., member.

The Fifty-fourth Annual Banquet of the Society will be held in the Grand Ballroom of the Waldorf, Friday evening, November 15, and the Annual Dinner Dance will be held Saturday evening, November 16.



Typical model test of barge fleet at the experimental towing tank at Stevens Institute of Technology, Hoboken, New Jersey. This view shows a shoal-draft tractor "pushing" two barges.

Experimental Tank Shows Savings

By ALLAN B. MURRAY, Assistant Director, Stevens Institute of Technology

DURING THE WAR YEARS there was very little new construction of privately-owned river barge transportation equipment. It is interesting to note that as new developments appear the integrated barge floats are gaining favor.

To the best of the writer's knowledge, the first fleet of integrated barges was built by the American Bridge Company in 1940. It consists of six barges having a combined capacity of about 53,000 barrels of oil. The fleet is set up two barges wide and three long, making a unit 585 feet long and 71 feet wide. Only the bows of the two forward barges and sterns of the two after barges are raked. All other ends are boxed, the total forming what closely approximates a large single barge.

Recently, two fleets have been built, each consisting of two barges of somewhat more than twice the capacity of the barges in the fleet of six above. These newer fleets have capacities of about 40,000 barrels and have total lengths of 480 and 490 feet. With this size, it is possible for the complete unit of two barges and towboat to negotiate the Ohio River locks without breaking up.

The small compact unit, which can lock without breaking up, certainly has advantages. However, it is known that a greater reduction of resistance per ton of displacement is obtained with larger fleets. In any case, important reductions of resistance are possible by eliminating the eddy drag between the barges.

Some time ago, a series of model tests were made at the Experimental Towing Tank in Hoboken, to find out just how much saving could be realized. With the permission of the client, the results of this investigation are outlined here. The tests compared a fleet of conventional barges with a fleet of integrated barges of the same dimensions. Figure 1 shows the difference in design between conventional fleet and integrated fleet.

Test runs were made at a number of drafts with a

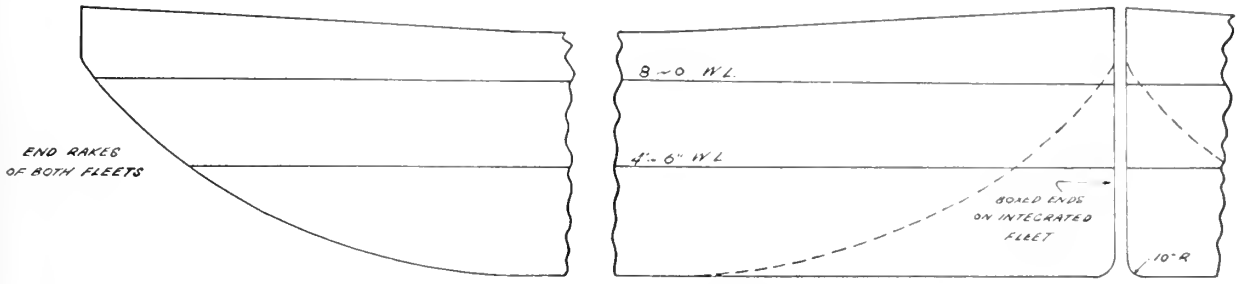


Fig. 1. Shows differences of adjoining ends for conventional and integrated fleets. Important increases of capacity are realized for the integrated fleet of same dimensions.

water depth of 9′ 0″, and at a constant draft of 4′ 6″ with various water depths up to 9′ 0″. Resistance curves for fleets of 7′ 0″ draft in 9′ 0″ of water have been selected for illustration. Figure 2 shows a reduction in resistance of 13 per cent for the integrated fleet at 6 miles per hour. The dotted curve represents the available pushing ability of a typical towboat for this size fleet. This shows a gain in speed from 5.86 mph to 6.12, or 4½ per cent. For upstream towing, against a current of 3 mph, the net gain is 9½ per cent. In fact, it has been found that savings of cost per barrel of oil transported are almost proportional to reduction of barge resistance. In this case, we also have the further gain of increases of capacity.

It is difficult to assess the savings due to increase in speed because of such variables as towboat power, river current, total trip time. The savings can be more easily demonstrated by utilizing resistance gains in increased cargo carrying. Figure 3 has been prepared from the data to show the total resistance versus draft for both fleets at a speed of 6 mph in 9′ 0″ of water. This chart shows that the integrated fleet at 7.55 feet of draft can be towed with the same resistance at 6 mph as the conventional fleet has for 7.0 feet of draft. This corresponds to an increase of total displacement of 13 per cent or 960 tons. This represents almost 7000 barrels of gasoline which is equivalent to a gain of 19 per cent, taking out the weight of the empty barges.

It might be argued that 7′ 0″ of draft in 9′ 0″ of water is an unusually small bottom clearance. The savings will be somewhat reduced where the ratio of draft to water depth is smaller. On the other hand, much greater advantages are obtained if the extreme case of 8′ 0″ draft in 9′ 0″ of water occurs. The actual fleet is used at the designed draft of 8′ 0″ in average depths of water somewhat over 9′ 0″. 51,000 barrels of oil are carried, whereas the conventional fleet at the same draft would carry 48,000 barrels. The reduction in towing

Fig. 2. Towing resistance of conventional and integrated fleets versus speed.

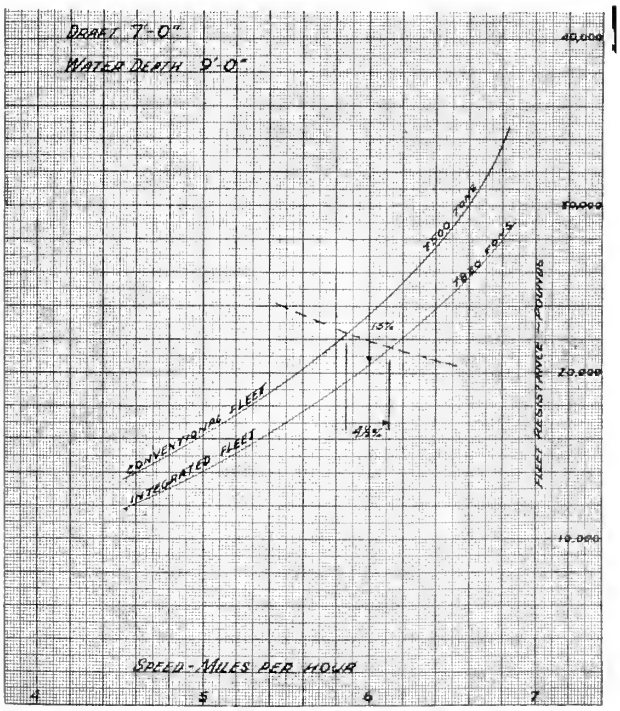
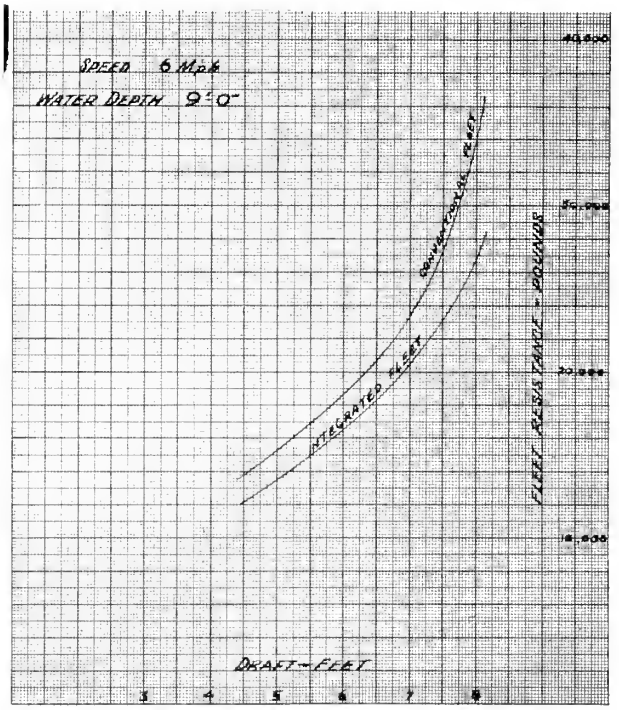


Fig. 3. Towing resistance of conventional and integrated fleets versus draft at 6 mph.



Model test of a barge fleet.

Showing the test from a distance.

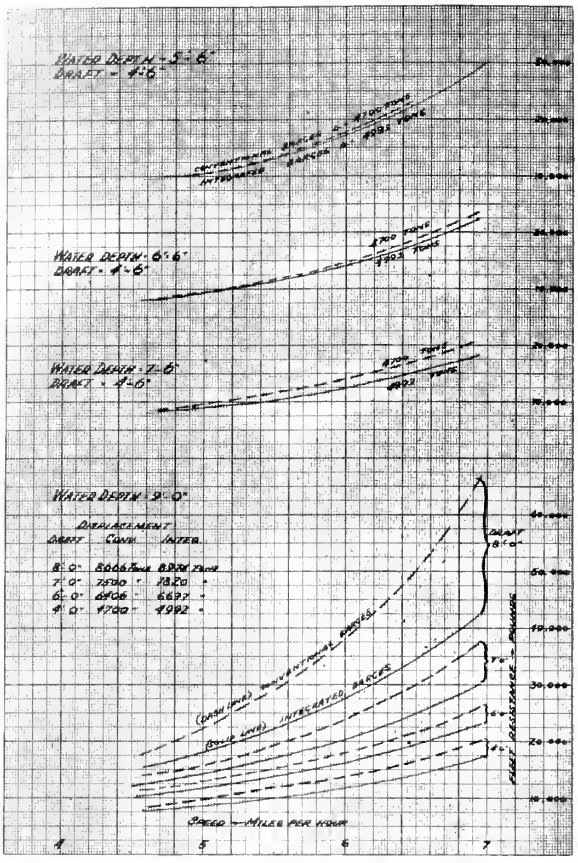


Fig. 4. Total resistance versus speed for conventional fleet and integrated fleet of barges at various combinations of draft and water depth.

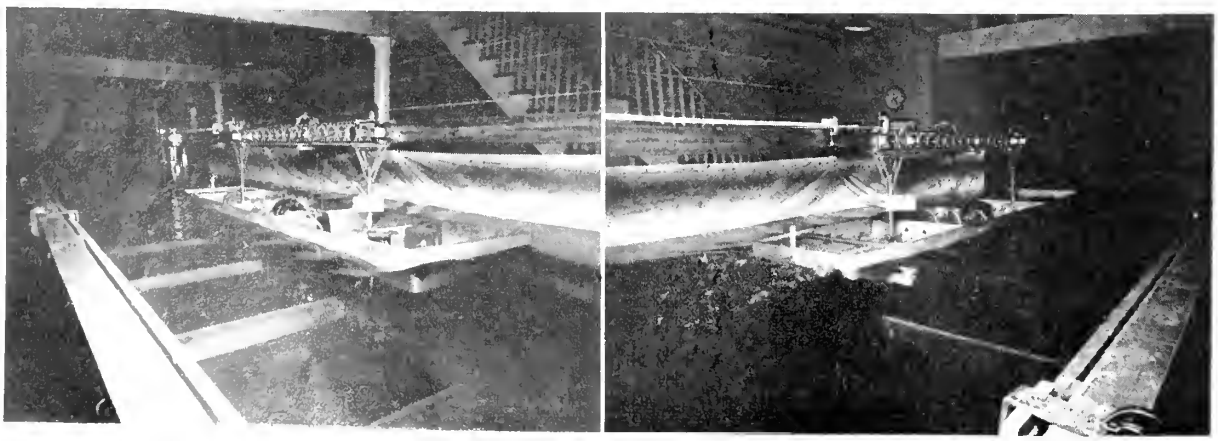
time for the whole trip is about 5 per cent. The complete set of resistance curves is given in Figure 4 so that, if one desires, figures may be developed for a variety of cases.

Often engineering gains in one characteristic are obtained at the expense of some other desirable characteristic, so that a compromise is necessary. Here we have one of those rare cases of gain without cost—reduced resistance, increased capacity and certainly no increase in cost of construction.

There will undoubtedly be some time lost in breaking up and fleeting at locks, due to the necessity of putting each barge in its proper place. This should not be much of a chore as the crew will soon work out an efficient system. Breaking up of the barges is not necessary in the Mississippi nor in the Ohio as far as Cincinnati as none of the locks are under 600 feet. The fleet can go through in one locking and the towboat in the next.

Of course, a fleet of integrated barges will not be very useful for way freight work. For petroleum transportation, however, where the barges can be uniformly loaded for a long trip, such equipment is ideally suited.

Typical self-propelled model test of river tow boat.



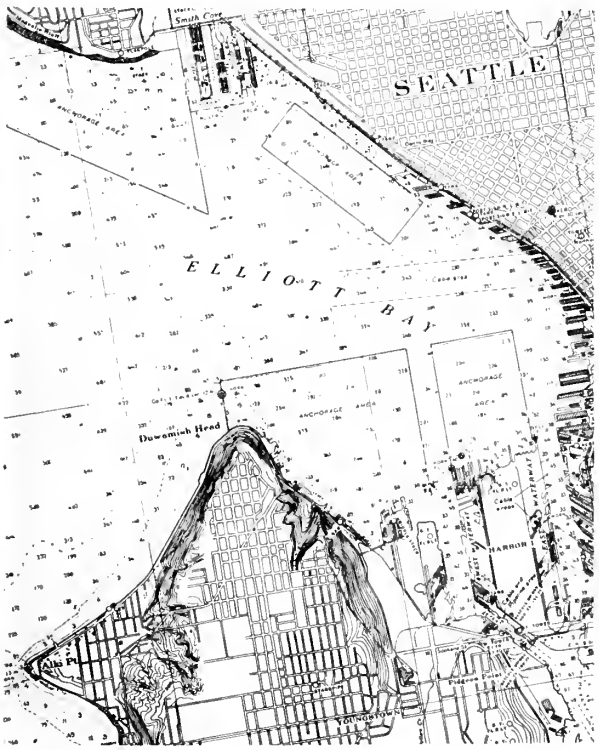
Radar—The Seeing Eye Of the Shipping Lanes

POSTWAR DESIGNED RADAR equipment for passenger and merchant ships was demonstrated recently in Seattle on the Black Ball Lines' ferry, the Enetai, with the General Electric Company's electronic navigator. Radar can detect the position of any above-water obstacle through darkness, fog and storm to a distance of 30 miles, and relay the object's position to the ship's skipper on a viewing screen inside the wheelhouse. Walter M. Boland of San Francisco, western district manager for General Electric's Electronics Department, predicted that "the new device will revolutionize 'thick weather' navigation, providing the mariner with an instrument to plot a safe course, even though his normal visibility is strongly limited by natural conditions."

Capt. John McLennan, a veteran of 35 years service on Puget Sound waters, said that in the past only sheer luck had pulled the ferry-boats through foul weather in dead of winter without mishaps when congested harbor conditions, narrow channels and presence of many islands have made navigation between Seattle and Bremerton complicated and hazardous.

The G-E electronic navigator will permit the helmsman to maneuver and to direct his ship with the utmost safety regardless of weather or the time of day, locating large objects such as shorelines as far away as 30 miles. As objects come within closer range, a simple turn of the knob on the radar set presents a scaled chart with an outer radius of six miles. If obstacles are even closer, another chart will give an outer radius of only two miles. On the Seattle-Bremerton run, the smaller ranges will be

Radar shot taken of the viewing screen of General Electric's electronic navigator aboard the Enetai. The blob of light in the center is the Enetai. Duwamish Head and horn are at about 7:30 and 700 feet away. Small blobs near the ferry-boat are rowboats. Other light spots are vessels anchored in the bay. The tip of Alki Point shows up clearly in lower left-hand corner. The little blob of light off the Point is buoy with light and bell.



Black Ball Lines, (Puget Sound), ferry Enetai equipped with electronic navigator.

Electronic navigator rotating antenna atop pilothouse of ferry Enetai.

used most frequently. Small objects such as bell-buoys are detectable up to four miles, ships up to six miles, and land masses up to thirty miles.

The navigator is composed of three main parts: (1) a rotating antenna atop the pilot house; (2) the viewing console on which the radar picture is presented to the navigator; and (3) if needed, a motor alternator which may be located in any convenient spot aboard.

The rotating antenna, or the "whirling eye" atop, is analogous to a searchlight in that it sends out beams to locate obstacles in the ship's path. However, the beams from the radar antenna are actually powerful radio micro-waves, capable of penetrating fog or any other atmospheric condition without hindrance. No matter what material the object is, these micro-waves bounce off and are scattered, and the "echoes" or scattered waves return to the rotating antenna which acts as a receiving antenna during the time intervals between the outgoing pulses. After being amplified, the "echoes" are made to appear as bright spots on the face of a cathode ray tube which is somewhat similar to a television screen tube. The image thus formed gives the operator a "radar picture" of the obstacle and the marker rings on the chart tell him just how far away it is.

The radar waves sent out from the ship's antenna travel with the speed of light, approximately 186,000 miles per second, and therefore require only about a millionth of a second to make the round trip to an object 200 yards away. Since the measure of distance to an obstacle is given with extreme accuracy by the marker circles, the system must be able to measure time down to 1/100 of a millionth of a second. According to G-E engineers, the measurement of distance so given is accurate to the point of 1 per cent.

The operator may change the scale of the field to cover either a two, six, or thirty-mile radius. In open seas, he will use the 30-mile range until an object approaches to within six miles. For very close work such as in congested harbors, he will use a two-mile radius chart on which objects may be observed down to about 200 yards. Thus, a ship's course can be altered in ample time regardless of the vessel's speed. It is a direct-reading instrument which requires no calculations for course determination. Extremely simple to operate, untrained persons can readily master it in an average of an hour's practice.

Thus, we find it an invaluable aid for use on coast-

Walter M. Boland, Western District manager, Electronics Department, G. E., observing obstacle - images appear on the viewing console of the electronic navigator aboard the Enetai.

wise steamers, ocean going liners, lake boats, tug boats, fishing boats, and ferries.

Smaller Types Coming

And General Electric will have in the near future small-scale radar sets for smaller fishing craft and pleasure boats which will be a simple "obstacle detector" to fit the smaller cabin and the smaller budget. As standard equipment on all types of vessel, the day of safer, faster, more economical maritime shipping is approaching on the high seas, lakes, harbors and bays, and rivers.

During the war, the Navy's complicated and powerful radar sets had at least thirty controls, but the General Electric set has seven of which only two are in constant use. Thus, simplicity of operation can be maintained as no shipping company wants to carry a crew of trained operators to handle its radar equipment. The design of radar for merchant ships must be reliable, simple to operate and inexpensive, providing only those controls whose operation is essential to the proper use of the equipment and misadjustment of which will not destroy its usefulness. The only controls falling in this category are the on/off switch, the brilliance control, and the sensitivity control. These latter two are necessary to accommodate the picture to the individual eye and the specific target under observation. Other controls should not concern the operator but be available, of course, for maintenance and service.

Closeup of rotating antenna atop pilothouse.

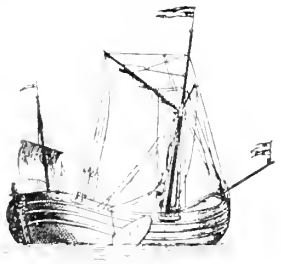
Adaptability of War Surplus Should be Checked

PROSPECTIVE BUYERS OF WAR SURPLUS engines should consult established distributors of the manufacturer of these engines for helpful suggestion and pertinent information about the possibility of converting them to peacetime use, according to the Bay Cities Equipment, Inc., General Motors diesel engine distributor at Oakland, California.

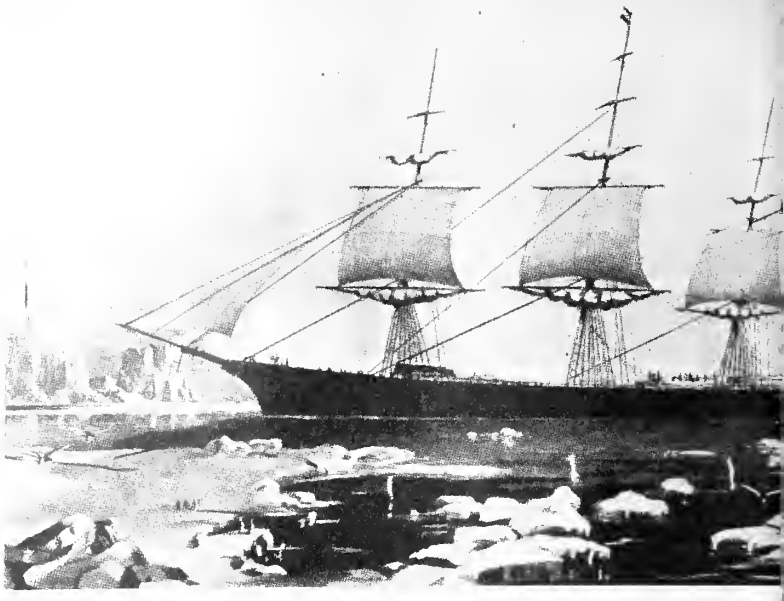
Both gasoline and diesel engines manufactured and fitted strictly for wartime uses are being offered to buyers today as "ideal for commercial use . . . built for long life, dependable service and economic operation." Although the General Motors diesel engines were built to meet military requirements, the most important of which was dependability, many of these surplus engines are not ideal for commercial use in their present form.

In fact, it would require a great deal of conversion to make them so for most applications. Furthermore, most diesel and gasoline engines manufactured during the war were built and adjusted to the highest possible power output, whereas in taking the most horsepower out of an engine, long life frequently must be sacrificed.

"We can understand the desire to purchase engines as cheaply as possible," says H. M. Estes, of Bay Cities Equipment, Inc. "We do hope, however, that the parties interested in surplus engines will consult their local distributors of the engines in question before making purchases of such equipment. By doing so, they will obtain invaluable advice concerning a given conversion to a particular installation; advice which may save them considerable grief later on. To put it bluntly, they should know what they are up against in connection with the conversion of such material to their uses so that they may proceed with their eyes open."



Clipper Ship Red Jacket



Red Jacket, length 260' and her tonnage 2030.

"In 1856 a slim, speedy looking clipper ship which was claimed to be one of the handsomest ships afloat, glided into Port Melbourne, Victoria. She was the famed American clipper Red Jacket and she loaded passengers and $650,000 worth of gold dust from the roaring goldfields of Victoria. Last week another ship, this time a husky freighter with the Stars and Stripes fluttering from her stem and the name 'Red Jacket' emblazoned on her bow dropped her hook in Port Melbourne. The modern 'Red Jacket,' however, wasn't carrying anything as romantic as gold, but in the true American tradition she carried goods which would in time be turned to gold—or its modern counterpart — American automobiles and oil. History had gone a full circle. In 1856 the Red Jacket took gold from Australia and its 1946 edition brought back goods."

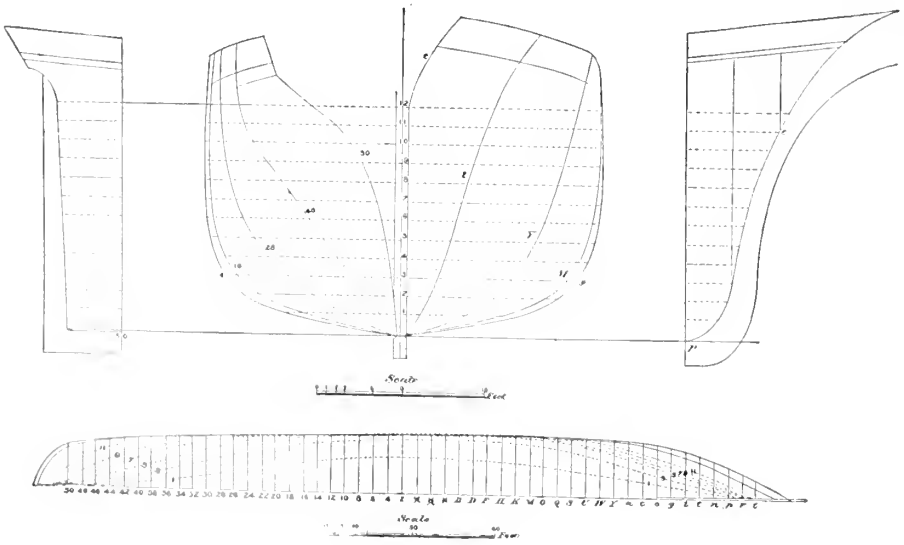
The above paragraph appeared in the Australian Weekly Review, Vol. III, No. 30, issued September 13, 1946, and is reprinted here to show that interest in these clipper ship names is world wide.

Red Jacket, an extreme clipper, was built at Rockland, Maine, by George Thomas in 1853 for Secomb and Taylor of Boston. Designed by the noted clipper ship architect, Samuel H. Pook, she was a trim, very beautiful craft and a very fast sailer. She was 260 feet long and had a registered measurement of 2030 tons.

In January, 1854, she ran from Sandy Hook into Liverpool in 14 days and 8 hours. On her arrival she was chartered by Pilkington and Watson, agents of the White Star Line, for a return voyage to Australia. She made such a good record on this voyage that Pilkington and Watson bought her for $150,000, immediately after her return to Liverpool. Her new owners put her in the Australian trade.

Thus the paragraph from the Australian Weekly Review reprinted above is shown to be chronologically incorrect, since the only appearance of clipper ship Red

(Please turn to Page 132)



Red Jacket, 2305 tons, built at Rockland, Maine, in 1853. Lines from Hall's Shipbuilding Industry of the United States, 1884.

Pacific WORLD TRADE
Reg. U. S. Pat. Off.

By T. Douglas MacMullen

China's tung oil which occupied an unrivaled position in the world market in pre-war days is gradually returning to its former pace of production. During the first quarter of this year 1,500,000 pounds had been shipped to the United States, about 20 to 30 per cent of its pre-war output. America has always been the best customer, using upwards of 100,000,000 pounds of tung oil in varnish and paint manufactures every year. But to the Chinese farmer, tung oil is only a by-product of his farm. He plants tung trees near his house to add beauty to the farm and to provide shade. The tung tree fruit is about the size of a peach and the oil is extracted by crushing the seeds of the fruit. The pictures on this and the next two pages follow the progress of China's tung oil from tree to delivery truck.

The Story of Tung Oil

These pictures of the Tung Oil Industry furnished through the courtesy of the China Magazine, published by the Chinese News Service, New York.

1 Fruits on tung tree ready for removal.

2 Farmers knocking fruits to the ground.

3 The tung tree fruits are gathered from the ground by workers and collected in large, deep baskets.

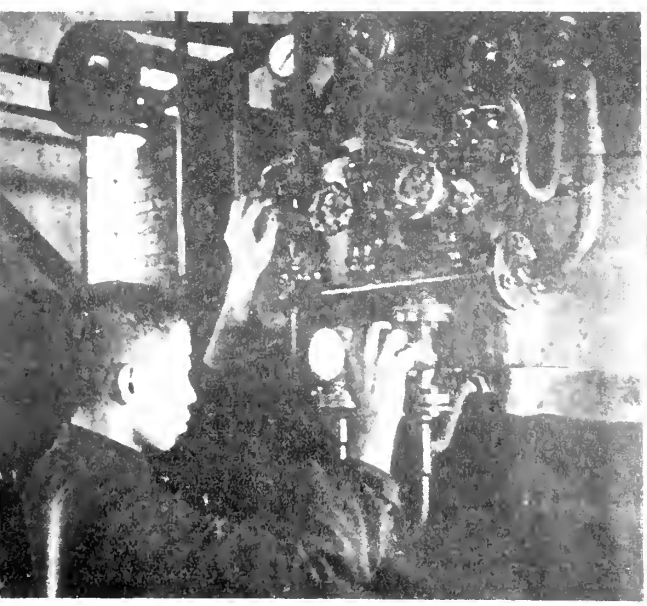
4 Here fruits are stored in corner until the pulpy outside rots, leaving large seeds, source of oil.

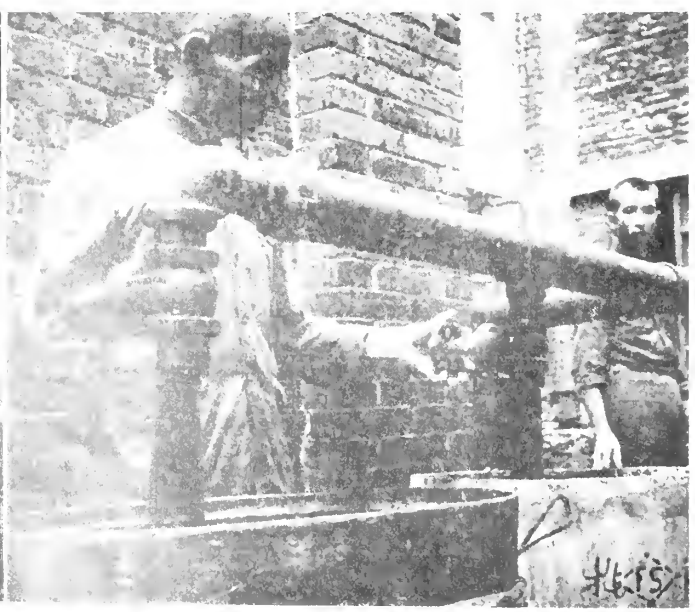
5 They are ground into a powder and pressed into cakes, which are then steamed to harden.

6 Old-fashioned method of pressing oil by a system of wedges. Wh is left is used for cattle feed

7 At more modern plant, worker studies pressure gage, controls machinery for extracting oil.

8 In same plant pipelines carry finished product from press to barreling to be packed for export.





CNS Photos

9 Drums of tung oil packed and lined up awaiting shipment. They are given final check-up, then marked.

10 Loading of oil drums onto the trucks. When a river oil barge is used tung oil is poured into the holds.

11 Truckloads of tung oil on road to distribution point. It will soon be on way to the United States.

Currency Values Present Problem

CONFERENCES EXTENDING OVER A PERIOD OF SEVERAL MONTHS are expected to be necessary for the fixing of par values of currencies, the task immedi ely ahead of the International Monetary Fund.

Many difficulties are anticipated in the light of the chaotic conditions still prevailing in many countries. Some of the 39-member nations may be unable to qualify for full participation in the first activities of the Fund.

Not a Currency Panacea

If the Fund commences exchange operations early in 1947, which is the present goal, more than a year will have elapsed since its establishment in December, 1945, following approval of the Bretton Woods agreements by the necessary number of nations. It is recognized that the Fund by itself is not a panacea for currency disorders but that if it is to operate successfully some measure of economic and financial stability must be obtained by other means.

The member nations have been notified to communicate to the Fund, within 30 days, the par values of their currencies in gold or United States dollars, as they existed in October, 1945, 60 days before the Fund agreement became effective. The Fund may accept such values as the basis of initial exchange rates for its operations or changes may be made either on its own motion or at the suggestion of members. After initial par values are fixed, member nations may buy foreign exchange from the Fund to meet temporary deficits in their international balances of payments.

Governors Meet Soon

In the light of the exchange rate problem now being faced, the first annual meeting of its Board of Governors held in Washington in September has special importance. The Board of Governors of the International Bank for Reconstruction and Development will meet at the same time.

It is expected the Bank will be ready to make its first loans before the Fund is in shape to begin exchange transactions. The Bank loans will be long-term in character while the Fund transactions will represent in effect short-term credits.

Chinese Art

Chinese paintings, often rolled into scrolls, are usually viewed bit by bit as the observer unwinds them, according to the Encyclopedia Britannica. In landscape paintings, the artist presents the picture in such a way that the observer actually seems to be passing through the country depicted.

Pacific World Trade

INGALLS TRAINS CHINESE SHIPBUILDERS

Through a special arrangement with the International Training Administration, four young Chinese marine engineers are currently undergoing a six-month course in practical shipbuilding at the Ingalls Shipbuilding Corporation in Pascagoula, Miss. The Easterners arrived in Pascagoula recently from Cambridge, Mass., where they took a preliminary course in naval architecture and marine engineering at MIT. They are shown above, with R. E. Lyons, foreman of the Mold Loft; Ensign Yen-Ting, of Tientsin; P. I. Chu, of Changshu; T. T. Lo, of Kweilin; Mr. Lyons; and Ensign T. S. Wei, of Chishieu.

Matson Naming New Ships

All Matson officials, department heads and employees were recently invited to submit suggestions for the naming of the new freight vessels now in process of acquisition for Matson's and Oceanic's postwar commercial service.

Names are now under consideration for sixteen large freighters, principally of the C-3 type, four bulk and lumber carriers of the Liberty type and four Oceanic freighters operating between the Pacific Coast and Australia-New Zealand.

Thus there will be three divisions of names:

(a) For sixteen C-3 type vessels operating between all mainland ports and Hawaii:

(b) For four Liberty-type vessels operating between Pacific Northwest ports and Hawaii; and

(c) For four Oceanic vessels plying between the West Coast and Australia-New Zealand.

A definite pattern should be followed in each of the three divisions. For example, it is considered desirable that the sixteen C-3's carry the identifying prefix "Hawaiian" in each case, followed by a distinctive name. All sixteen names should fall into a pattern or category, such as occupation, trees, flowers, etc.

Example:

Hawaiian Shipper	Hawaiian Importer
Hawaiian Planter	Hawaiian Banker
Hawaiian Merchant	Hawaiian Scientist
Hawaiian Exporter	

Names for the four Liberties in the Pacific Northwest service might follow a pattern such as:

Hawaiian Redwood	Hawaiian Spruce
Hawaiian Cedar	Hawaiian Oak
Hawaiian Fir	Hawaiian Birch

Suggestions are being received by the Public Relations Office.

Matson Gets Added Hangar In Oakland Program

An outstanding victory in the Oakland Chamber of Commerce-Oakland Port Commission fight to secure release of Oakland Municipal Airport facilities for civil aviation expansion was won with the announcement from Washington that all Army-held units have been declared surplus.

The action will release hangers 3 and 4 for allocation to the list of civil aviation concerns seeking space at the airport. Most of the concerns were formed by and employ World War II veterans exclusively.

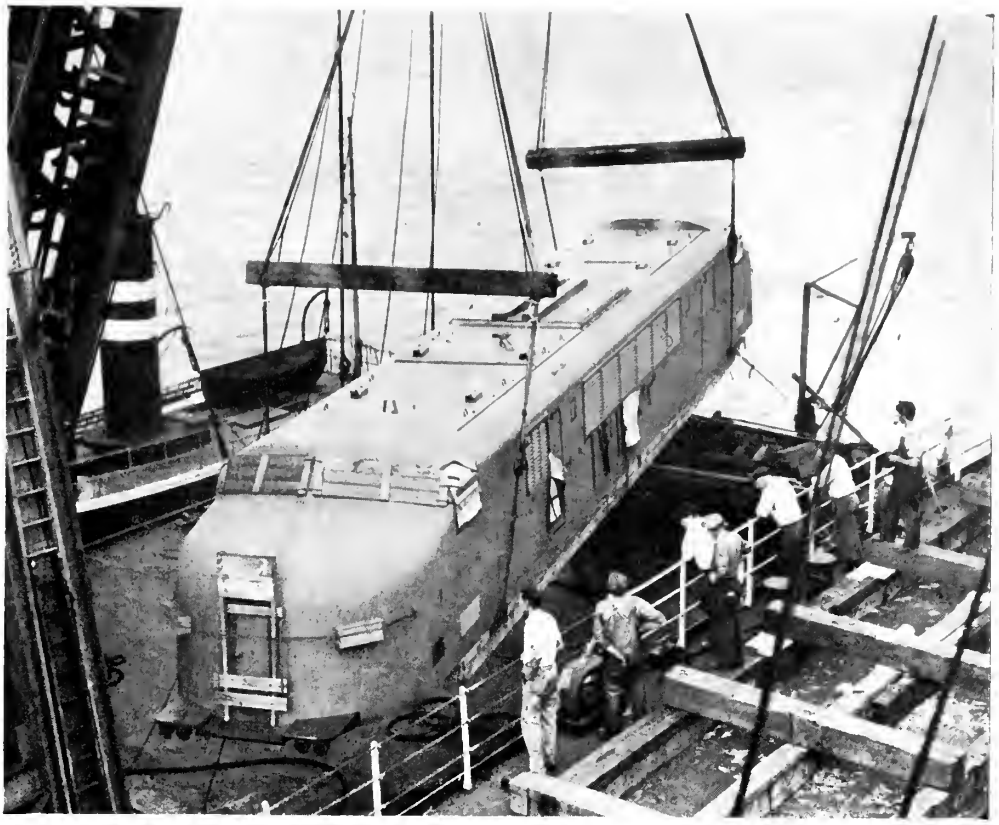
Present plans call for the allocation of Hangar 4 to the Air Transport Division of Matson Navigation Company for a multi-million dollar plane reconversion program to increase the division's employment from 600 to 1500 persons.

The release of the two hangars to civil aviation is expected to increase employment at the airport from the present 2000 to more than 3500, and the total payroll from $4,500,000 to $6,000,000 annually.

Firecrackers!

The first shipment of Chinese firecrackers to reach the United States since before the war reached San Francisco Bay October 14 aboard the SS Hamilton Victory, operated by American President Lines.

Originating in Hong Kong and Shanghai, the shipment comprises in excess of 5000 cases and is destined to importers in San Francisco and on the East Coast.



One of 18 huge electric locomotives being loaded aboard Moore McCormack cargo liner, Sweepstakes, enroute to South America.

Electric Locomotives for Brazil

THE MOORE-McCORMACK CARGO LINER Sweepstakes sailed for South America September 27 carrying among her cargo the first of 18 huge electric locomotives which will be shipped to Brazil for operation on the Paulista Railway. The locomotive, which weighed 182 tons, was built by the General Electric Company at its Erie, Pa. plant, and was loaded aboard the Sweepstakes at Pier B, Jersey City.

The cab of the locomotive, weighing 64 tons, the two trucks, each weighing 54 tons, and 10 tons of auxiliary parts were first towed alongside the ship in a carfloat and then lifted to the ship's deck by one of the largest Merritt-Chapman & Scott Company cranes. The locomotive is 75 feet long overall, and operates on 3000 volts d.c.

It is capable of maintaining a speed of 90 miles an hour and is rated continuously at 4050 hp. Its rated performance on an hourly basis is 4470 hp. This type of locomotive, according to Leonard L. Everson, railway specialist of General Electric, has the largest continuous rating in a single-cab d.c. machine built in the United States up to this time.

It was dismantled at Erie after construction and packed on four flat cars for shipment to Jersey City. It is being shipped to Brazil in its prime coat and after arrival at the port of Santos, where it will be unloaded, will receive its standard Paulista Railway running colors, black running gear and olive green cab.

The trucks of the locomotive were fabricated completely by the process of welding. The driving trucks are believed to be the largest single trucks ever built in the United States by this method.

The Paulista Railway, which runs north from the city of Sao Paulo through Brazil's rich coffee country, already has 34 General Electric locomotives in operation for switching, freight and passenger service. The first of these was purchased in 1921, the original order having called for eight freight and four passenger locomotives. The railway has 270 miles of electrified 1.6 meter gage trackage. To continue its program of electrification the railway recently acquired three complete motor-generator sub-stations and two sectionalizing stations, also built by General Electric.

Refrigerated Ships—

And the United Fruit Company's Program in Central America

As the United Fruit Company expands there is a definite link between the expansion and the welfare of the people of Middle America—that is, Central America, Mexico, the Caribbean islands, and the northern countries of South America. This is good business, for as many another industrial enterprise has proven, the prosperity, health, education and general advancement of the area it serves is the surest way to build for the future. The entire foreign trade industry is growing because of developments and expansions in other parts of the world. The United Fruit program for social betterment will be featured in an early issue.

But ships—fast modern ships—are the means of contact between the producers and the markets for their products—chiefly bananas.

The current song about keeping bananas does not make allowances for their transportation. Elaborate cooling is necessary and the refrigeration system on United Fruit Company ships constitutes a vital part of United Fruit service to Middle America economy and to the consuming public.

Recently six totally refrigerated ships were added to The Great White Fleet of United. Built especially for the transportation of refrigerated cargoes, the vessels are provided with five decks in each of No. 1 and No. 2 holds and three decks in each of No. 3 and No. 4 holds with a total capacity of 311,300 cubic feet.

There are a total of nine fan and air cooling coil assemblies, each consisting of two centrifugal fans and two brine coil batteries. Each assembly serves a separate insulated sub-division of the vessel.

Air leaving the cooling coils is distributed properly to all parts of the cargo stow through air ducts constructed along each side of each deck. Air returning from the cargo is returned from the deckhead at each air cooler assembly for recirculation. The entire system of air circulation and distribution is patented.

Cargo spaces are fitted throughout with deck gratings and bins for the transportation of fruit cargoes.

Each air cooler is arranged to supply the requisite amount of fresh air for cargo ventilation. This air is cooled before being circulated to the cargo and provision

Hull 458, the Parismina, United Fruit Company refrigerated cargo ship, the company's first peacetime ship after World War II. Picture was taken shortly after the keel was laid in December, 1945. Construction was at Newport News Shipbuilding & Dry Dock Co.

The Parismina prior to launching.

United Fruit Company's Parismina.

is made to exhaust an amount of air equal to that supplied from each space.

The air coolers are finned pipe coils each arranged over a pan provided with trapped scuppers which are lead to the drain wells in each hold in order to carry off condensation from the coils or water from defrosting when low temperatures are employed.

Refrigerating machinery using Freon-12 and Calcium Chloride brine is the heat transfer agent. There are three Freon-12 compressor units direct connected to their driving motors; six shell and tube Freon-12 condensers, two for each unit; three Freon-12 storage receivers; three operating receivers; three Freon-12 evaporators (brine coolers); three Freon-12 shell and tube heat exchangers and three electrically heated oil stills. Each evaporator is fitted with a Freon-12 liquid recirculating pump. Liquid control to the evaporators is automatically maintained by a diaphragm operated liquid expansion valve controlled by a float valve in the operating receiver.

Compressor capacity is controlled by unloading cylinders in two steps giving 25 per cent and 50 per cent capacity reduction. Further control is obtained from 50 per cent speed reduction of the driving motors. Each compressor is fitted with a shell and coil type direct expansion oil cooler.

Three horizontal centrifugal motor driven brine pumps and three vertical centrifugal motor driven sea water pumps are fitted. Both, the brine and sea water pumps, are arranged with cross-connections to allow a brine pump to be operated with any evaporator or a sea water pump to be operated with any condenser unit.

The compressors, condensers, receivers and sea water pumps are located in the after part of the main engine room. The evaporators are located in insulated chambers aft of the engine room in the shaft tunnel.

The brine circulating system is of the closed type with a brine balance and expansion tank located on the boat deck level. All brine flow control valves are concentrated in an insulated chamber centrally located adjacent to the compressors. From this point adjustment to air temperature in the cargo spaces is effected and provision has been made to circulate warm brine for heating or defrosting any one of the nine air cooler assemblies without interruption of cooling by the remaining batteries.

A small Freon-12 condensing unit driven by a 3 hbp motor is fitted as a purge and pumpout unit. With this unit, it is possible to pumpout or transfer Freon-12 from one system to another, or it can be operated in conjunction with an automatic purging device to purge air and other non-condensible gases from the three systems.

Throughout the installation detailed attention has been given to the arrangement in order to effect a minimum loss in cargo space and to obtain reliability in operation for the purpose for which the vessels are intended.

All equipment is designed and installed in accordance with the Bureau of Marine Inspection and Navigation, American Bureau of Shipping and the Owners requirements.

The ship's provision rooms, Scuttlebutt and a box for special refrigerated cargo of about 1800 cubic feet are refrigerated by two automatically controlled Freon-12 compressor units each having its own condenser and receiver.

Cooling is effected by direct expansion of Freon-12 in the coils of each box.

Recirculation of air is maintained in the meat room, vegetable room and special cargo box.

The two systems operate independently but are provided with the necessary means and capacity to allow one Freon-12 system to carry the entire load of both ship's stores and special cargo during an emergency.

Johnson Line Motorship Bolivia in Service

JOHNSON LINE WHICH RESUMED ITS EUROPEAN-PACIFIC COAST SERVICE late last year with modern fast passenger and freight motorships has added another new carrier to this trade.

The vessel is the Bolivia which sailed from Gothenburg on September 20, for principal ports in California, Oregon, Washington and British Columbia.

The Bolivia brought the first shipment of Finnish newsprint since the war. Before the war Finnish and Swedish newsprint figured prominently in all shipments aboard these vessels. Fred L. Doelker, Grace & Co.'s vice president, predicts that this commodity will shortly move in even larger volume on these ships.

Similar in type to the motorships Argentina and Panama, recently assigned and now operating regularly in this trade, the Bolivia has accommodations for thirty first cabin passengers. While limited, her appointments compare with those found on luxury liners.

Of especial interest to West Coast exporters and shippers is the 94,000 feet of reefer space on the Bolivia, which is installed with the latest compartments for fresh and canned fruits, vegetables and fish. Dried fruit compartments are of the latest design. She has the most modern cargo holds with loading and discharging gear to match.

Her master is Captain C. O. Holmberg, a regular prewar skipper of Johnson ships and widely known up and down this Coast.

Mackay Circuit to Nanking Opens

Warren Lee Pierson, president of the American Cable & Radio Corporation, announces the opening of a new, high speed, direct radio-telegraph circuit between the United States and Nanking, China, by the Mackay Radio and Telegraph Company, ACR's radio-telegraph subsidiary. The Mackay end of the circuit in the United States will be located at San Francisco.

All classifications of traffic—government, press, commercial and personal—will be handled over the new circuit at the simplified and reduced rates recently put into effect by the ACR system, Mr. Pierson announced.

Opening of the Nanking circuit adds another to the important list of world capitals with which direct, high speed communications service has been restored by Mackay Radio since the termination of hostilities. During the war, the Chinese capital was transferred from Nanking to Chungking. Mackay Radio maintained continuous radio-telegraph service with Chungking during the entire war period and the opening of the Nanking

Pacific World Trade

circuit signifies the importance of the re-establishment of Nanking as China's principal city.

Sudden & Christenson Forms New Foreign Trade Agency Unit

Formation of a new steamship unit—the Sudden & Christenson Overseas Corporation—with G. P. Bradford, resigned De La Rama executive, as its vice president and general manager is announced by A. B. Cahill, president of Sudden & Christenson, Inc.

The new company will act as steamship agents, charterers, ship brokers and brokers' agents in foreign trade exclusively. Details of the projected operations will be disclosed at a later date, it was stated.

Sudden & Christenson, a general steamship agency firm, represents the Waterman Steamship Corporation's Arrow Line and the Norwegian-flag Klavenes Line at all Pacific Coast ports.

Recently Bradford announced his resignation as executive officer in San Francisco and Pacific Coast manager of the Philippine-flag De La Rama Steamship Company.

Howland is Chief of U. S. Commercial Co.

Frank Howland, well known as Pacific Coast representative of the Lend-Lease Administration during the war years, and for his membership in the firm of Mattoon & Company before the war, has been appointed chief of the San Francisco office of the U. S. Commercial Co., succeeding Wallace D. Carr, resigned.

The U. S. Commercial Co., now a subsidiary of the Reconstruction Finance Corp., supplied seed and agricultural implements to the armed forces after the invasion of each island in the South and Central Pacific. This program enabled the armed forces to have fresh vegetables during their stay. Later, in conjunction with the Military Government, USCC opened and supplied trade stores in each area, to enable the natives to recover from Japanese exploitation.

The office has since expanded to handle shipments to the Philippines and do liaison work in connection with imports from Japan such as silk, tea, and tin.

John J. Judge, regional director of the Department of Commerce in San Francisco.

Presiding Judge

The appointment of John J. Judge as regional director of the Department of Commerce in San Francisco is announced by Carlton Hayward, director of the Field Service.

This region (Region 12) covers Northern and Central California and the State of Nevada. A district office is being organized in Reno. The San Francisco region formerly covered the entire Pacific Coast and the States of Idaho, Nevada and Arizona. Under the expanded field service program of the Department, regional offices have been established in Seattle and Los Angeles. This division of the area makes possible more intensive and concentrated efforts on behalf of industry and business, Mr. Hayward said.

The expanded Field Service now comprises 76 offices in the 14 geographical regions into which the country has been divided. The purpose of the enlarged program is to make more quickly available to a larger business audience up-to-date business, economic and technical information. A special counseling service is provided for war veterans and small businessmen. The 14 regional and 62 district offices also cooperate closely in regional, state and local efforts to foster and promote commerce.

Mr. Judge is a native of Waltham, Mass., a graduate of the University of California and a veteran of World War I. He was associated with the San Francisco office of the Department's Bureau of Foreign and Domestic Commerce for many years as commercial agent, district manager and regional manager. He occupied the last named position when appointed regional director.

B. S. Ohnick of Manila Visits U. S.

B. S. Ohnick, president of Globe Wireless, Philippines, was a delegate to the American Legion Convention in San Francisco, representing the Philippine Post.

Born in Arizona, Mr. Ohnick moved to Seattle at an early age, where he graduated from the University of Washington. He went to Manila in 1921, opened a law office and became known as one of the Philippines' most prominent attorneys.

In addition to being president of Globe Wireless Philippines (a wholly owned subsidiary of Globe Wireless, Ltd., of which Mr. R. Stanley Dollar is president), Mr. Ohnick is first vice president of Marsman and Company, one of the largest business firms in the Philippines.

He is director or member of the following clubs in Manila: University, Army and Navy, Polo, Swiss, Manila, Caloocan and Wack Wack.

He served in the Army in World War I, and during World War II was interned at Santo Tomas from 1942 until February, 1945.

One of his sons, Van Ohnick, accompanied by Howard Davender, Jr., Dick Baldwin and other former school chums of Brent College, Baguio, Philippines, were members of the initial landing on the Philippines. They helped liberate Mr. Ohnick and other internees at Santo Tomas.

B. S. Ohnick

Marine Insurance

Insurance Requirements on Ships Purchased by Foreign Governments

Details of insurance requirements which must be met by five foreign governments which are buying war-built merchant ships from this country on credit have been communicated to their representatives by Vice Admiral William W. Smith, chairman of the Maritime Commission. The nations concerned are France, Italy, the Netherlands, Norway and China, and they have been notified by letter that only a limited amount of the insurance required may be placed with their own underwriters.

The letters state all insurance shall be satisfactory to and approved by the Maritime Commission as to underwriters, terms of policies and amounts; all underwriters shall be suable in the United States and those other than American and British shall furnish the Commission with guarantees of their governments that dollar exchange will be made available if and when such underwriters are required to pay claims in U. S. dollars. Hull insurance shall be in an amount not less than the sales price of the ship and shall be on a form of policy which protects against partial losses as well as total losses, this insurance covering both marine and war risks.

The letters emphasize the Commission's strong preference that hull insurance be placed in the American market, but allows use of the British or local market of the mortgagors if the amount placed in the latter is small. If this limit is exceeded the excess must be reinsured with satisfactory underwriters on terms making them liable directly to the Maritime Commission. All policies, both hull and increased value of hull or "disbursements," shall be issued in the name of the mortgagor for account of whom it may concern and all claims shall be payable to the Maritime Commission in U. S. dollars.

However, in the event of partial loss claims, the Commission is willing to direct that these claims be paid to the purchasers, provided they are not in default under terms of the mortgages, the letters state. This procedure will avert the difficulties of transferring funds to the Commission and later transferring these funds to the shipowners.

Protection and indemnity insurance may be placed 100 per cent in the American, British or local market of the mortgagor on terms and in amounts which will protect the legal liabilities of the mortgagors, but in an amount not less than the indebtedness plus 10 per cent. This insurance also protects against liabilities arising from war perils.

The Division of Insurance of the Maritime Commission will be glad to discuss any phase of the above requirements which are not fully understood.

London Letter

By Our British Marine Insurance Correspondent

Government Control in Sweden

Sweden is one of the most important countries in respect of marine insurance, as it numbers numerous important insurance companies. Like the insurance people in most countries nowadays, Swedish marine underwriters are affected by Government control. This takes the form—for example—of the control of various commodities whereby governments undertake their own insurance. It is also pointed out that there is a tendency for various countries to further their nationalistic ambitions by trying to secure marine insurance for themselves when entering into or extending trade agreements. "Competition," states a well-informed correspondent, "especially that of the American market for the standard export commodities of the United States, has become more noticeable than before, during and after the war, a feature which, I feel convinced, is not typical of the Swedish market alone." Meanwhile, a committee, which has been sitting for many months, is still inquiring into the question of the socialization of insurance in Sweden and has not yet presented a report.

France

France is another country with a strong marine insurance interest. The fact that nearly all French vessels over

500 tons are still chartered by the French Government means that underwriters have to deal in effect with a single shipowner, who has it in his power—without any danger to himself, not being a limited company—to threaten the market with keeping risks for his private account.

Portgual

Portugal is taking an increasingly important part in the owning of ships, numerous contracts for new vessels having been placed with British shipbuilders in the past year or two. A copy has recently been received of the Portuguese schedule of rates equivalent to the English "Combined Marine Surcharges." It is more a complete tariff than a surcharge schedule, having both basic rates and surcharges set out in detail. The basic rates are for F.P.A. and W.A. Conditions, "under deck," with a third column of rates for insurances on deck cargo insured F.P.A. The surcharges are set out in a double column, one for non-liquids, covering theft and pilferage, and one for liquids. Owing to the entirely different make-up of the Portuguese and English schedules, it is very difficult to compare the two, but it is interesting to note that where in the English schedule the rates for voyages between Portugal and the United States are 2s.6d. per cent, 6s. per cent, 4s.9d. per cent, and 8s. per cent, the basic rates for the same voyages in the Portuguese schedule are 0.39 per cent. F.P.A. and 0.56 per cent. W.A. under deck and 0.78 per cent. F.P.A. on deck, while the surcharges for these voyages are 1.01 non-liquids and 2.02 liquids.

Captain Dannevig of Norway

London has lately had an interesting and important visitor in the person of Captain M. B. Dannevig, managing director of the Norwegian mutual club, "Bergens Skibsassuransforening." Captain Dannevig is well informed on the subject of Norwegian marine insurance, as he has just celebrated the 25th anniversary of his appointment as managing director. Trained in square rig, Captain Dannevig always intended to enter the marine insurance industry. He passed his master's examination in 1911, and his last command was the floating whaling factory Roald Amundsen, but not, of course, the vessel that now bears that famous name. Preparatory to entering insurance he passed his examination as an average adjuster, and it would be difficult to imagine better qualifications for the head of an important hull insurance club than he possesses. He says, in fact, that if he has a collision case to deal with, he only has to read the papers and he can envisage the whole circumstances. No doubt, his practical experience enables him to translate into actualities the well-known circumstances in which the logs of two ships prove that both kept a good look-out, both observed the rule of the road, both gave proper helm orders, and both collided in clear weather and good visibility.

Captain Dannevig has taken an important part in the affairs of the Norwegian market, being a past chairman of the Bergen Underwriters' Association and a member of the committee which drafted the General Statutes of Norwegian marine insurance of 1930, and he is a member of the Board of Det Norske Veritas. His Club is one of the leading mutual ship insurance concerns in Norway, being the result of the amalgamation of the Bergens Assuranceforening, founded in 1850, and the Bergens Dampskibsassuranceforening, founded in 1879.

Reports of Pilferage

The council of the Officers (Merchant Navy) Federation—which organization was inaugurated in London in 1928, its purpose being to provide a means whereby all organizations representing Merchant Navy captains, navigating, engineer and radio officers, pursers and ships' surgeons can collaborate through one central organization—deals as follows with pilferage in the Federation's annual report:

"Your Council regrets to report that during the year under review there has been a very serious increase in pilferage aboard ship, and there is unmistakable evidence that this increase cannot be solely attributed to shore-going thieves. There have been numerous convictions for pilferage proven against seafarers. The number of cases in which Shipmasters and Officers have been implicated has been, as was to be expected, very few indeed. During the year there was one very deplorable incident in which a Shipmaster and some of his officers were guilty, on their own admission, of pilferage. Their crime was, in view of their position of trust, more serious than that of the men under their command, and they have, of course, made themselves ineligible for membership of any federated organization.

"Shipmasters and officers are in duty bound to take very decisive action with any shoregoing person or seafarer whom they may discover guilty of pilferage. Unless effective action is taken by all concerned, much lasting damage may be done to the good name of British shipping generally. Consignees are concerned in receiving their goods in satisfactory order and in correct quantities, and the fact that they may be covered by insurance is of secondary importance to them.

"It would be a sorry day for British shipping if ever Lloyd's and the Marine Insurance Companies are compelled to quote discriminatory rates against British ships on account of abnormal claims experience on cargoes entrusted to British seafarers for safe keeping. The Council of the Federation urges upon federated shipmasters and officers to insist upon every possible action calculated speedily to

arrest a profoundly disturbing trend, which, if unchecked, may seriously imperil the reputation of British shipping.

"Your Council is assured that shipmasters and officers can count upon the full cooperation and support of the National Union of Seamen in bringing to punishment any who, by broaching cargo, may endanger the good name of the British Merchant Navy."

In this connection, a marine insurance authority comments:

"No one doubts the very serious losses sustained by pilferage, on marine shipments, but the report of the Officers' Federation, just issued, falls into a misstatement. Referring to pilferage proved against seafarers, it suggests that it would be a sorry day for British shipping if ever Lloyd's and the marine insurance companies were compelled to quote discriminatory rates against British ships on account of abnormal pilferage claims. The fact is that, although underwriters do pay such claims, they are subrogated, and are able to claim on the owners if it can be proved that the pilferage took place while the goods were in the ship, and these claims are dealt with by the P. and I. Clubs on behalf of owners. It is the 'office' that would have something to say to the master on the subject, and not underwriters. After all, I should think that the amount of pilferage on board ship is nothing like what takes place on land."

Socialized Insurance in Bulgaria

The following remarkable document—from "Behind the Iron Curtain"—has reached a few selected London (England) journals specializing in marine and other kinds of insurance:

"Memo: Author of the article, a native of Vienna, since 1908 with the Reinsurance Department of the 'Balkan' National Insurance Co. of Sofia, Bulgaria. During 1912-1913 in London with the 'Balkan's' representatives in that city, Messrs. A. J. Collins & Co., 71/72, King William St., E.C., and until the end of 1914 with the 'Balkan's' U. S. Branch in Hartford, Conn. (Messrs. Wm. C. Scheide & Co.). Since 1924 assistant manager with the General Reinsurance Co. 'Balkan,' Sofia, until June 30, 1946, when appointed a manager for Reinsurance with the National Insurance Institute of Sofia, Bulgaria.

"Sofia, September, 1946.

"Behind the Iron Curtain

"An Experiment in Democratizing Insurance?

"The New National Insurance Institute in Bulgaria.

"More than 50 years ago Bulgarian insurance started on its own way, making wide use of foreign experience. Two stock companies and two Co-operative Societies were the representatives of this Bulgarian initiative and in the first half of the period before World War I insurance business flourished and gained much prestige. After 1918, however, during the second phase the influx of some twenty new and unnecessary offices brought normal development to a standstill. Methods employed degenerated to such an extent that governmental measures became imperative. The new State Control Board checked the worst practices to a certain degree, but could neither stop decay nor bring to new life the prematurely aged bodies.

"All the time the social side of insurance was, if not wholly absent, at least left far in the background. No useful initiative or very little of it remained in the twenty odd companies when a new interference of the State after World War II became a necessity. A group of insurance men of the younger generation foresaw that an entirely new plan was needed to bring life into the bureaucratic-parasite structures of the majority of companies. Soon also the older members of the various staffs were of the opinion that only radical reforms could help. The Control Board was not powerful enough to rationalize and renew business enterprise. A bill was drafted, several committees took part and a big staff of specialists worked for many months.

"On June 27, 1946, the National Insurance Institute, an autonomous body with commercial character, was created. It represented the amalgamation of all stock and cooperative insurance societies under one central management rationalizing all services. Contrary to the social insurance in Bulgaria which covers compulsorily a large section of the population, the individual voluntary assurance in life, fire and marine shows a total number of insurance policies in force for the three branches of only 350,000, a rather modest figure taking into account the population figure of seven millions. This number of policies represents the efforts of a whole generation.

"One of the chief tasks of the new body therefore is to make insurance more popular, to democratize it. The Institute disposes of a staff with valuable experience. As soon as the monetary situation is cleared and that will soon be after peace with Bulgaria is concluded, commercial life will again normally develop. Remains still to be seen what special insurance clauses the Peace Treaty may contain with regard to some of the foreign companies which were transacting business in Bulgaria before the war. But with the conclusion of the peace treaty the Institute will start the new phase of Bulgarian insurance of carrying into the broad masses of the population the insurance idea on a voluntary basis. It will be a big task, but it will succeed driven by the vigorous forces of the young Republic.

"Sofia, September 10, 1946."

Admiralty Decisions

By HAROLD S. HOBBS
of San Francisco Bar

An Interesting Case on War Risk Insurance

A claim was recently made on a war risk policy where the loss was attributed to a "sovereign restraint" which it is claimed brings the loss within the terms of a war risk policy. The sovereign restraint in this case is a bit unique in that it merely consists of a voluntary act in order to procure marine and war risk insurance through the War Shipping Administration. The case was recently handed down from the United States Circuit Court of Appeals Second Circuit. The case is entitled Baker Castor Oil Company, Plaintiff - Appellant, vs. Insurance Company of North America, Defendant-Appellee.

In 1941, before the United States was at war, Lloyd Brasileiro, a department of the government of Brazil and the owner of three vessels here involved, the Commandante Pessoa, the Jaboatao, and the Lesteloide, applied to the United States Maritime Commission for and received "warrants" for its vessels. A shipowner receiving such warrants obligated himself to adhere to the rules and regulations of the Commission, including the routes and voyages which its vessels should undertake, and in return was entitled, among other benefits, to priority for facilities for loading and discharging cargo and for the procurement of bunker fuel or coal.

Early in 1942, the plaintiff-appellant shipped 44,967 bags of castor beans on the three named vessels, the bills of lading naming New York as the port of discharge but broad liberties were reserved to the carrier to proceed to and terminate the voyage at some other port in order to avoid war perils. This cargo was insured by the plaintiff with the defendant under two open policies, one of marine insurance, the other of war risk insurance which covered only while the cargo was aboard the overseas vessels from the port of loading in Brazil to the port of discharge in the United States. This latter policy, which is the only one sued on, provided:

> "I. This insurance is only against the risk of capture, seizure, destruction or damage by men of war, piracy, takings at sea, arrests, restraints and detainments and other warlike operations and acts of kings, princes and peoples in prosecution of hostilities or in the application of sanctions under international agreements, whether before or after declaration of war and whether by a belligerent or otherwise, including factions engaged in civil war, revolution, rebellion or insurrection, or civil strife arising therefrom, and including the risks of aerial bombardment, floating or stationary mines and stray or derelict torpedoes; but excluding claims for delay, deterioration, and/or loss of market, and warranted not to abandon (on any ground other than physical damage to ship or cargo) until after condemnation of the property insured. Also warranted not to abandon in case of blockade, and free from any claims for loss or expense in consequence of blockade or of any attempt to evade blockade; but in the event of blockade, to be at liberty to proceed to an open port and there end the voyage."

After the castor beans had been delivered to the carrier and the bills of lading issued therefor, Lloyd Brasileiro, because of recent sinkings of Brazilian ships by German submarines, ordered all its vessels into port pending arrangements for convoys to protect them from the menace of those submarines in the Atlantic. The owner's general agent in the United States then applied to the Wartime Insurance Committee of the War Shipping Administration for hull war risk insurance and was the next day informed by telephone that the applications would be granted if all the vessels would proceed to New Orleans instead of to New York. This condition upon the issuance of the hull insurance was confirmed by telegram. The agent informed the head office and a director of Lloyd Brasileiro of the condition, and the director then ordered all of his company's ships to proceed to New Orleans. The hull insurance was then issued, one clause stating:

> SPECIAL CONDITIONS
>
> "The owner of the vessel irrevocably and unconditionally agrees that in consideration of granting War Risk Insurance by the War Shipping Administration to follow the direction of the Administrator as to the Port or Ports of discharge, the nature and quantity of the cargo to be carried and as to freight rates. Any breach of this warranty shall automatically void this insurance from inception."

The named vessels proceeded to New Orleans and discharged the cargoes of castor beans. The plaintiff then shipped the beans by rail to its factory in Bayonne, N. J., at an additional freight charge of $39,249.58. Alleging that this additional cost was a loss proximately caused by the war perils insured against, the plaintiff brought this suit to recover that amount under the cargo war risk policy. The trial court found that the orders of Lloyd Brasileiro directing the conduct of its ships were confined to its own vessels and that they were given as a private owner not a sovereign. It was also found that the conditions upon the issue of warrants and hull insurance were voluntarily accepted by the owners and thus were not sovereign acts of the United States nor compelled by the United States Navy; but made no finding as to whether or not the loss was caused by sovereign acts of the German government within the terms of the policy. Judgment was entered for the defendant dismissing the complaint and the plaintiff appealed.

The district court correctly held that there were no acts by either the government of Brazil or that of the United States constituting a sovereign restraint within the terms of this war risk policy. As stated by that court: "Restraint of princes means the operation of the

sovereign power by an exercise of *vis major*,[1] in its sovereign capacity, controlling and divesting for the time, the dominion or authority of the owner over the ship. *Bradlie vs. Maryland Insurance Co.*, 37 U. S. 378, and in marine and war risk policies restraint of princes applies only to acts done in the exercise of the sovereign power. *Northern Pacific Ry. Co. vs. American Trading Co.*, 195 U. S. 439, p. 467; *The Claveresk*, 264 Fed. 276, p. 281." What Lloyd Brasileiro did as a private owner and with regard only to its own ships was not the exercise of any such sovereign power.

Nor were the acts of the War Shipping Administration and its branches an exercise of the sovereign power of the United States. Rather, those acts were the exercise of a right voluntarily conferred upon the War Shipping Administration by the owners in order to secure the warrants and hull insurance. The United States did not purport to deny all rights to any owner not obeying its rules, *Companie Chemin de Fer Paris-Orleans vs. Leeston Shipping Co., Ltd.*, (1919) 36 T. L. R. 68; on the contrary, it offered the positive inducement of certain privileges to those who would voluntarily cooperate with it to protect shipping. See *Aktiebolaget M. Bank vs. American Merchant Mar. Ins. Co.*

The appellant further argues that the diversion of the vessels to New Orleans was occasioned by the threat of the German submarines then active along our Atlantic coast, which was the real peril insured against, and that this threat was the real cause from which the loss was a consequence "naturally flowing from the peril insured against, or incident thereto" and therefore, "attributable to the peril itself." *Lanasa Fruit S. S. & I. Co. vs. Universal Ins. Co.* Had there been any "impact" of that risk insured against, the necessary consequences would have been covered by the policy. *Leyland Shipping Co. v. Norwich Union F. Ins. Soc.; Lanasa Fruit* case.

But here there was no such "impact." The loss resulted from the acts of the owner in avoiding that risk. And, although those acts in avoidance may have been such prudent acts as to excuse the shipowner, and although they may have been motivated by the presence of the war risk insured against, they were not, within the legal concept of cause, the result of that peril, and therefore, are not the result of "restraints and detainments and other warlike operations and acts of kings, princes and peoples in prosecution of hostilities * * *." *The Kronprinzessin Cecilie; The S. S. Styria vs. Morgan; Smith vs. Universal Ins. Co.; Queen Ins. Co. of Am. vs. Globe & Rutgers F. Ins. Co.*

Affirmed.

[1] Vis major, irresistible force.

Electric Power From Atomic Energy

PRODUCTION OF ELECTRIC POWER from atomic energy "in the course of time" was forecast by Harry A. Winne, vice president in charge of engineering policy of the General Electric Company, before the American Society of Mechanical Engineers.

Believing that "the introduction of atomic power into our economy will be very gradual and not at all upsetting to our present utility industry," Mr. Winne said that he looked for atomic energy to supplement and complement our present power sources, not to replace them.

Speaking at a luncheon meeting of the A.S.M.E. at Hotel Statler, Boston, the G-E official, who is a member of a board of consultants which assists the State Department's Committee on Atomic Energy, warned that many technical problems concerning atomic energy remain to be solved.

"Atomic energy is essentially a source of heat," said Winne. "We can foresee no way of converting it directly into usable electrical power in significant quantities. So we may look for the atomic power plant of the future to consist of the nuclear reactor, or so-called 'pile' in which heat will be generated by fission, and transferred through suitable means, probably with an intermediate transfer to some more or less conventional power generating unit, such as a steam turbine, a gas turbine, or a unit utilizing the vapor of mercury or some other substance."

Revealing that such a plant already is being engineered at Clinton laboratories at Oak Ridge, Tennessee, Mr. Winne pointed out that the Oak Ridge Project is "simply a pilot plant, a developmental installation, really practically a laboratory experiment."

Philippine Copper and Chrome Mines Resume Operations

Some of the copper and chrome mines in the Philippines will be in full production late this year or early in 1947.

A shipment of 5000 tons of chrome ore has already been made by one company, and 12,000 more tons are ready for shipment. Reconstruction work has started at mines of other companies, and operations will be resumed as soon as repairs are completed.

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Move to Shorten Ship Sales Procedure.
Panama Canal Pilotage Rates Are Higher Than in U. S. Ports.
Swedish Air Certificate to Shipping-Controlled Airline.

Move to Shorten Ship Sales Procedure

Efforts to work out a method of speeding up the consideration by the Maritime Commission of applications of ship operating companies to purchase vessels from the Commission's fleet are to be inaugurated within the Commission organization, we are reliably informed. The move is understood to be motivated by expressions of impatience on the part of prospective purchases of the tonnage, as well as within the Commission itself, at the long-drawn out procedure involved in the Commission handling of the matter at present, resulting in lengthy delay before the operating concerns are advised of disposition of their applications.

The existing procedure involves references of the purchase applications, or bids, and the internal recommendations, to numerous Divisions and Sections of the Commission for individual consideration and recommendation. These include, among others, the Vessel Disposal Division, where most of the recommendations originate, the Legal, Finance, Repair, Insurance, and many other divisions.

The Commission itself, anxious to shorten this ship-sales internal procedure, is reported to feel that some of the references may be eliminated where the Division is not directly concerned with the sale involved. It is hoped that these difficulties may be ironed out as a result of the scheduled conferences.

Panama Canal Pilot Rates Are Higher than in U. S. Ports

Pilotage rates for merchant ships in the Panama Canal Zone, on the basis of the distances the services are performed, are "very much higher" than for many major United States ports, The National Federation of American Shipping informed Panama Canal Governor J. C. Mehaffey.

Two months ago the Federation had protested "a 150 per cent increase" in Panama Canal pilotage tariffs, which became effective August 1, 1946. Governor Mehaffey informed the Federation that he would be glad to receive any information which would indicate that the increases were "out of line" with pilotage rates in major United States ports.

The Federation, using several major U. S. ports as examples, informed Governor Mehaffey that:

"At Baltimore, the pilotage is about 150 miles for which, at 30 foot draft, a charge of $165 is made as compared with $150 under the new Panama Canal schedule for a distance, in most cases, of about one mile."

The Federation added that at Philadelphia, the pilotage distance is about 88 miles, and the rate for vessels of 30 foot draft only $150; at New York from Ambrose Lightship to the Battery, a distance of 17 miles, the charge for vessels of 30 foot draft averages only $126.60; at Boston, from off the Graves to Boston Navy Yard, a distance of 9 miles, the tariff for vessels of 30 foot draft is $150.

The Federation explained that the Panama Canal pilotage rate of $150 for vessels 30 feet of draft and over did not include transit through the Canal itself. An additional toll is paid for Canal transits which includes whatever pilotage is necessary while in transit. The new pilotage rates are for port pilotage at Balboa and Cristobal only.

Old pilotage rates, prior to August 1, 1946, were $2 per foot of draft regardless of the draft of vessels, the Federation said. New rates start at $3 for vessels under 15 foot draft, and progressively increase to $5 per foot of draft for vessels 30 feet of draft and over.

Urging a review of the new Panama Canal pilotage rates, the Federation declared in a letter to Governor Mehaffey that "a comparison of services rendered by United States and Panama Canal pilots can indicate but one thing, and that is that the new Canal rates are out of line with United States port rates."

Swedish Air Certificate To Shipping-Controlled Airline

Information reaching the headquarters of the Sea-Air Committee in Washington from Sweden discloses that the Swedish Civil Aeronautics Board has officially given its approval to the integration of sea and air services in overseas air transportation.

In the opinion of applicant United States shipping lines the announcement of this new policy by the Swedish

government makes the policy of our own Civil Aeronautics Board, which forbids United States steamship lines to correlate sea and air, increasingly untenable, the Sea-Air Committee stated in making the announcement, adding that a Swedish airline, SILA, already has been certificated for service into the United States, and that Swedish-America Steamship Line is the largest private stockholder in SILA.

"The decision," the Sea-Air Committee continued, "developed out of the specific question of a route between Gothenburg and London. Gothenburg is the second largest city in Sweden and traditionally has extensive shipping and other business connections with the British capitol. In the course of their discussion of this question the CAB report stated that close cooperation between the Svenska Lloyd shipping and airline companies would be 'beneficial to the public.' The Swedish CAB further cited desirability of combined sea-air tickets, valid for one direction by air, the other by boat.

"In a view which disagrees directly with that taken so far by United States officials in regard to the possibilities of surface carriers influence retarding air line development, the Swedish CAB pointed out that Svenska Aero Lloyd will face competition not only from the Swedish airline operating on the Stockholm to London run but also from British-European Airway which would operate parallel services to Gothenburg.

"The Swedish Board recommended that Svenska Aero Lloyd A.B. of Gothenburg be awarded a five-year permit to operate scheduled services on the Gothenburg-London route. This marks the first departrure from the Swedish policy of giving A.B. Aero Transport a monopoly on all such services. Svenska Aero Lloyd is controlled by Rederi A.B. Svenska Lloyd, a shipping company.

"It is reported that this decision followed a long and bitter behind-the-scenes fight. Svenska Aero Lloyd has been one of the more powerful and active non-scheduled operators in Sweden."

Army Engineers to Build Permanent Reserve Fleet Sites

ARMY ENGINEERS WILL DEVELOP AND CONSTRUCT FIVE, and possibly six, permanent Reserve Fleet sites for the U. S. Maritime Commission. The Maritime Commission has transferred $10,000,000 to the Army Engineers to cover the estimated cost of this program.

The five assured sites will be located in the James River, at Lee Hall, Virginia; Brunswick River, Wilmington, North Carolina; Tensaw River, Mobile, Alabama; The Neches River, Beaumont, Texas; and Suisun Bay, Benicia, California. The sixth site under consideration is one of two located in the Columbia River area. These locations do not include certain sites which will be utilized for a period of two or three years each while disposition is being made of certain over-age, damaged or unwanted types of vessels. According to information available, the Reserve Fleet Division of the Commission will be required to maintain in permanent reserve approximately 2500 merchant vessels.

To some extent, the locations of the sites was determined by the number of vessels finishing their last voyages in the Atlantic, Gulf and Pacific ports. While it previously appeared that two sites would be necessary on each of the three coasts, fewer ships than were anticipated have been terminating their last pre-reserve voyages in Pacific ports. This led to holding up one Pacific site. Inquiry by the Reserve Fleet Division of the Maritime Commission indicates that less than 900 Commission-owned ships will end their careers in Pacific ports. If this information proves correct and it is taken into consideration that from 400 to 500 of these ships will not be required for permanent reserve, only one site may be necessary on the Pacific coast.

Repair Jobs to Go to Private Yards

Each of the permanent sites will be equipped with a dry dock for the preservation of bottoms of the vessels. A 15,000-ton steel dry dock will be installed at the James River site and 12,000-ton wooden dry docks at the other sites. These will be surplus dry docks, obtained from the Navy Department, and will be used for inspection purposes only. If such inspection reveals need of repairs on any vessel, the job will be handled commercially.

The James River site, approximately 25 miles northwest of Newport News, Virginia, was originally selected as temporary, but in view of the scarcity of suitable sites on the Atlantic coast and the cost of developing them, plus the fact that it can accommodate 600 to 700 vessels, the Maritime Commission changed it to permanent status. Wind and weather conditions are satisfactory, based on experience of 20 years during which a reserve fleet was located at the same place after the last war.

At the time the Commission requested the Army

(Please turn to page 130)

Valve Problems

With special reference to the poppet valves of internal combustion engines.*

THE VALVE MECHANISM is the heart of any engine. Valve leakage will shorten the life expectancy of the entire unit. The poppet type valve of an internal combustion engine if not properly engaged with its seat, is subjected to the passage across its face of high pressure gases at temperatures of 3000° F. or higher. It is therefore highly important to secure and maintain perfect alignment between the valve, the seat, and the guide.

Assuming that the face of a new valve is concentric with its stem the first step in installation is to make sure that the bore of the guide allows proper clearance for the stem of the valve. A safe rule is to allow one-thousandth of an inch clearance for every one-eighth of stem diameter in exhaust valves, and one-thousandth of an inch clearance for every three-sixteenths inch of stem diameter for inlet valves. A more exact recommended clearance for the more common valve stem sizes appears in Table I herewith. Clearances less than those indicated are apt to result in stuck valve stems when the engine warms up. Greater clearances will cause the valve to "wallow out" the seat.

TABLE I
***AVERAGE* CLEARANCE**

NOMINAL DIA.	INLET	EXHAUST
½	.002 "-.004 "	.003"-.005"
⅝	.0025"-.0045"	.004"-.006"
¾	.003 "-.005 "	.005"-.007"
⅞	.004 "-.006 "	.006"-.008"
1	.0045"-.0065"	.007"-.009"
1⅛	.005 "-.007 "	.008"-.010"
1¼	.0055"-.0075"	.009"-.011"
1⅜	.006 "-.008 "	.010"-.012"
1½	.007 "-.009 "	.011"-.013"
1⅝	.0075"-.0095"	.012"-.014"

Valve Servicing

When removed for servicing, valves should be carefully checked for wear and straightness of stem and, if necessary, should be refaced by grinding either in a lathe or in a special valve refacing grinder. Concentricity of valve face with stem should be held within a maximum total runout of three-thousandths of an inch.

Unless trenches are washed out across the face of the valve the face should be ground to exactly match the face angle of the valve seat. If the valve face is trenched it should be ground to an angle ½° less than the angle of the seat. This will cause the valve mechanism to exert greater pressure on the upper edge of the valve face and assure better sealing of the valve on the seat.

Valve faces are usually made wider than seat faces and are designed to overlap the seat face on both upper and lower edges. This provides more positive sealing; prevents undue seat and guide wear from misalignment; and lessens the chance of valve head doing a "reverse umbrella."

Valve face and seat face widths vary with peculiarities of design and of valve operating mechanism. About 90 per cent of the heat absorbed by the head of an exhaust valve must be transferred through its face during the short interval it rests on the seat and the contact area must be large enough to properly effect this transfer. On the other hand, if the area is too large, resulting in low unit pressure, there may be leakage across the valve face. Inlet and fuel injection valves have no heat transfer problem and are usually designed with relatively narrow faces.

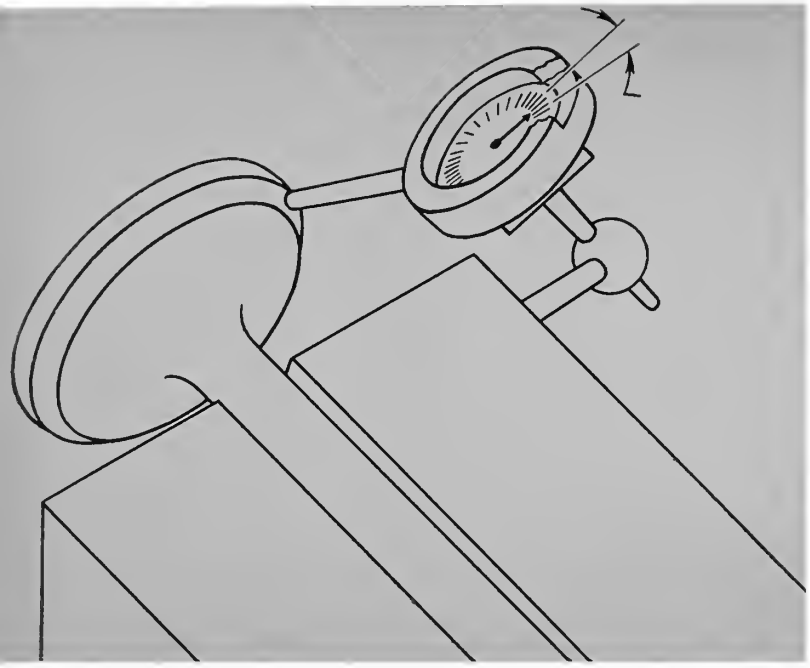
Valve Seats

Engine manufacturers generally equip their engines with removable exhaust valve seats. This is accomplished by means of a ring insert installed in a counterbore with an interference fit. Experience has shown that it is practically impossible to install an insert with an interference fit and have a perfect flat contact between the bottom of the insert and the bottom of the counterbore. For this reason it is imperative that there be perfect contact between the outer face of the insert and the inner face of the counterbore. It is comparatively easy to grind a smooth finish on the outer face of the insert. Grinding a smooth face on the inner face of the counterbore is a very much more difficult process. Thompson Products Inc., have recently developed and made available a rotary type valve seat grinder which will grind counterbores from 3¾-inch to 11-inch diameters.

Valve Seat Installations

A chart showing proper allowances for interference fits of insert and counterbore is shown herewith. The inserts should be shrunk before pressing into place. Dry ice, propane, or butane are suitable for shrinking. Average

* Abstract of an analysis of valve problems published by Thompson Products Inc., Bell, California.



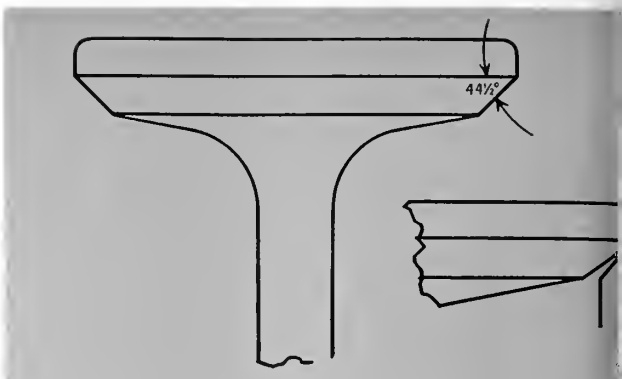


Fig. 2: Exaggerated view of facing operation described in text.

Fig. 1: Method of checking concentricity by means of dial test indicator.

cooling for shrinkage purposes takes about 30 minutes. Some operators prefer to heat the head as well as cool the insert. If this method is used boiling water should be the heating agent. Never use a torch.

Illustrated in the sketch herewith is a handy tool for driving the insert into the counterbore. This tool is made from a bar of steel at least ½" larger in diameter than the bore of the valve guide, and long enough to extend well into the guide on one end and about 6" above the cylinder head on the other. All of this bar except 6 inches is turned down to a sliding fit in the bore of the guide. A steel disc ½ inch to 1 inch thick is machined

WALL THICKNESS	OUTSIDE DIAMETER																			
	0	1	2	3	4	5	6	7	8	9	10									
1/16	006	006																		
1/8	003	003	005	006																
3/16	002	002	003	004	005	006														
1/4	0015	002	002	003	004	005	005	006												
5/16	0012	002	002	003	004	004	005	005	006											
3/8	001	002	002	003	003	004	004	005	005	006	006									
7/16	00086	002	002	003	003	003	004	004	005	005	006	006								
1/2	00075	002	002	002	003	003	003	004	004	005	005	005	006	006						
9/16	00067	002	002	002	003	003	003	004	004	004	005	005	005	006	006					
5/8	0006	002	002	002	002	003	003	003	004	004	004	005	005	005	005	006	006			
11/16	00055	002	002	002	002	003	003	003	004	004	004	004	005	005	005	006				
3/4	0005	002	002	002	002	003	003	003	003	004	004	004	004	005	005	005				
13/16	00046	002	002	002	002	003	003	003	003	003	004	004	004	004	005					
7/8	00043	002	002	002	002	002	003	003	003	003	003	004	004	004	004					
15/16	0004	002	002	002	002	002	003	003	003	003	003	004	004	004						
1	00038	002	002	002	002	002	002	003	003	003	003	003	004	004						
1 1/16	00035	002	002	002	002	002	002	003	003	003	003	003	004							
1 1/8	00033	001	002	002	002	002	002	002	003	003	003	003	003							
1 3/16	00032	002	002	002	002	002	002	003	003	003	003	003								
1 1/4	0003	002	002	002	002	002	002	002	003	003	003	003								
1 5/16	00029	002	002	002	002	002	002	002	003	003	003	003								
1 3/8	00027	001	002	002	002	002	002	002	002	003	003	003								
1 7/16	00026	002	002	002	002	002	002	002	002	003	003									
1 1/2	00025	002	002	002	002	002	002	002	002	003	003									
1 9/16	00024	002	002	002	002	002	002	002	002	002	002									
1 5/8	00023	001	002	002	002	002	002	002	002	002	002									
1 11/16	00022	002	002	002	002	002	002	002	002	002	002									
1 3/4	00022	002	002	002	002	002	002	002	002	002	002									

INTERFERENCE FIT IN THOUSANDTHS

to an outside diameter slightly less than that of the insert and to a shoulder slightly less in diameter than the inside bore of the insert. This disc is then bored at its center with a hole that forms an easy slip fit on the rod.

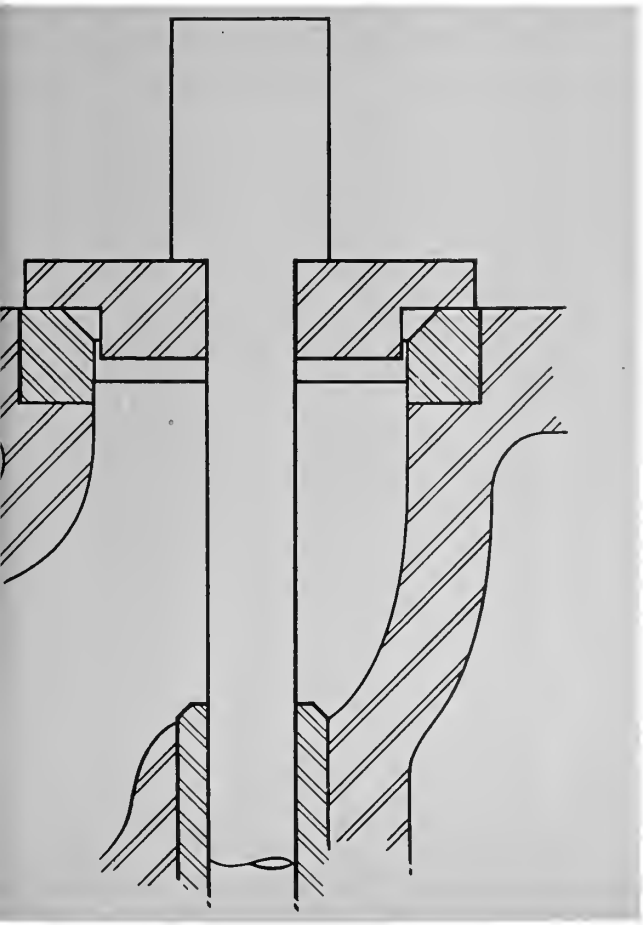
Assembled and fitted over the insert, as shown in the sketch, this tool can be used to drive home the insert ring with no danger of cracking or distorting that ring. After the insert is driven home and allowed to set until it comes to room temperature the cylinder head should be peened lightly against the chamfer on the upper outside edge of the insert. This will prevent the insert becoming wedged under the valve head should it loosen in the counterbore due to cracked cylinder head or other causes.

Grinding Valve Seats

The seat angle on the insert is ground either with an automotive type concentric valve seat grinder in small sizes or with a rotary type grinder in larger sizes. Both types are capable of grinding seat face angle to within one-thousandth of an inch of concentricity between seat and guide. After grinding the seat should be checked against the valve face: by applying a thin coat of Prussian Blue on the latter and rotating it on the seat without pressure; or by lapping it in lightly with a fine grade water soluble valve grinding compound.

Sometimes in regrinding valve seats it is necessary to remove considerable stock and the valve seat face may become wider than the valve face. In this case it is advisable to narrow the seat face by grinding with a wheel whose face is dressed to an angle about 15° flatter than the face of the seat. The upper diameter of the seat face should always be one-sixteenth of an inch less than the upper diameter of the valve face.

Fig. 3: Seat inserting tool made from steel bar stock and steel disk machined to proper size.



The less an alloy steel valve is ground with grinding compound the better it will function. High heat resisting alloys have a much larger coefficient of expansion than low alloys or than cast iron and will not seat in the same position when hot as when cold. Because of this characteristic any grinding that leaves a ridge on the seat or valve face is dangerous since, although the valve seats perfectly when cold, it may ride on the ridge and leak when heated. Hence is recommended that, when a valve has to be ground in, no more pressure should be used than the weight of the valve, and valve and seat should be frequently cleaned and new compound applied.

If seat inserts have to be removed the method illustrated should be used. This requires a piece of hardened suare steel cut to a length slightly greater than the inside diameter of the insert and beveled on each end at approximately 45° to almost a sharp edge. This bar is placed under the lower inside edge of insert and a round steel rod put through the guide to drive the bar and insert out of the counterbore. The bar and rod should be rotated slightly after each hammer blow. Special valve seat removing tools operating on the toggle joint principle are available.

Valve Guides

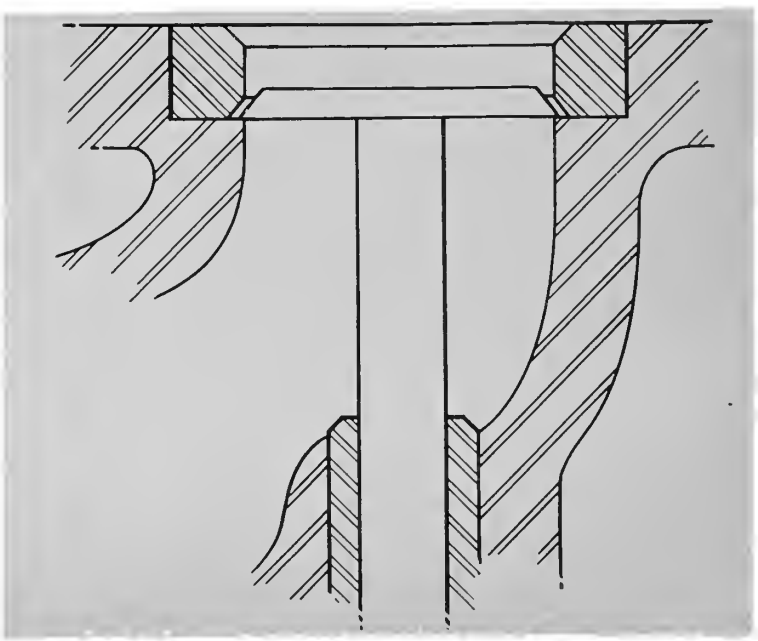
The valve guide is a very important factor in the operation of valves. Guides are usually fitted into the cylinder head or block with an interference fit of one-thousandth of an inch to the inch of outside diameter of guide. Guides should be pressed in or out by means of a hydraulic or screw press, or if neither of these are available by means of the homemade driving bar illustrated. Lubrication of valve guides should be underdone rather than overdone. It is better to replace a guide than to lose a valve. Heat treated nickel iron guides, with ground or hone finished bores in conjunction with heat treated steel valve stems, will run for long periods with little or no lubrication.

Valve Springs

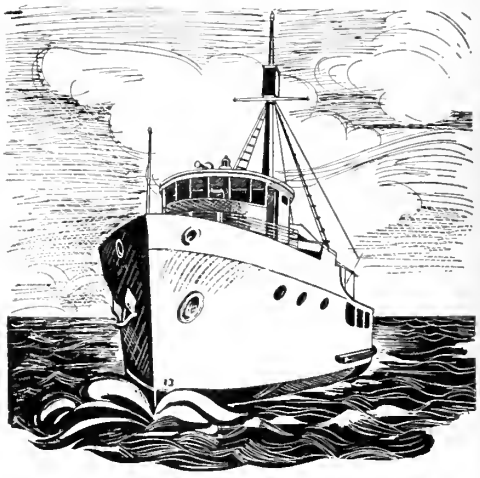
The most common valve spring trouble in cam operated valves is breakage and hammering out of the valve

(Please turn to page 122)

Fig. 4: Tool for removal of valve seat inserts.



Coast COMMERCIAL CRAFT

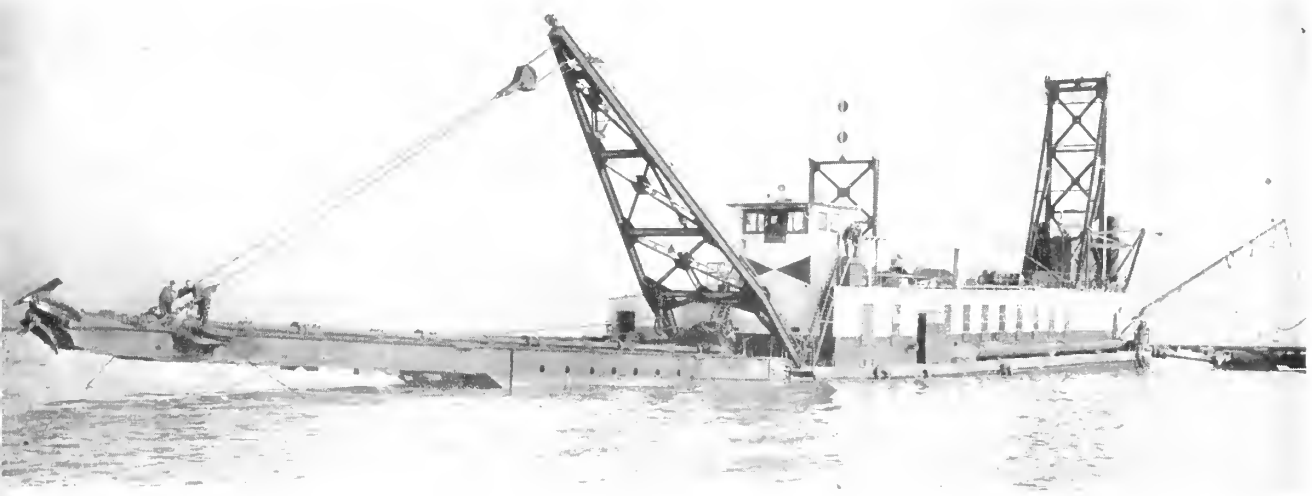


Dredge Building on the Pacific Coast

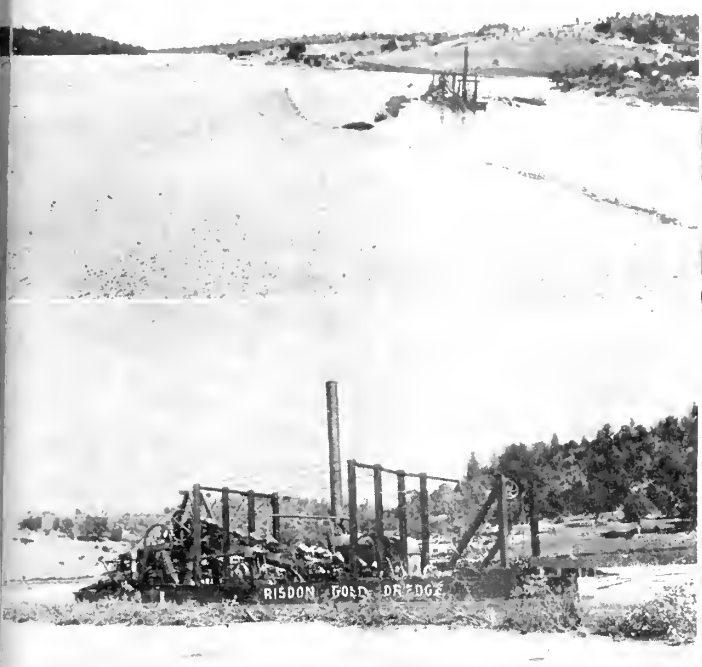
THE SQUAT, UNROMANTIC APPEARING DREDGE, digger of river and harbor bottoms and searcher for gold, today plays an important though little publicized role in the economic life of the nation. Owing to the heavy punishment they take in dredging harbor mouths, maintaining depths around piers and in channels and for building river levees, new dredges still have to be built and existing ones kept in top operating condition.

Because of experience gained by Bethlehem Steel Company's San Francisco Yard in building, repairing and providing replacement parts for all types of dredges ever since it built the first successful gold dredge in America in 1897, and because it is the largest privately, operated ship repair yard in the United States, it has been able to maintain a top position today in this line of business.

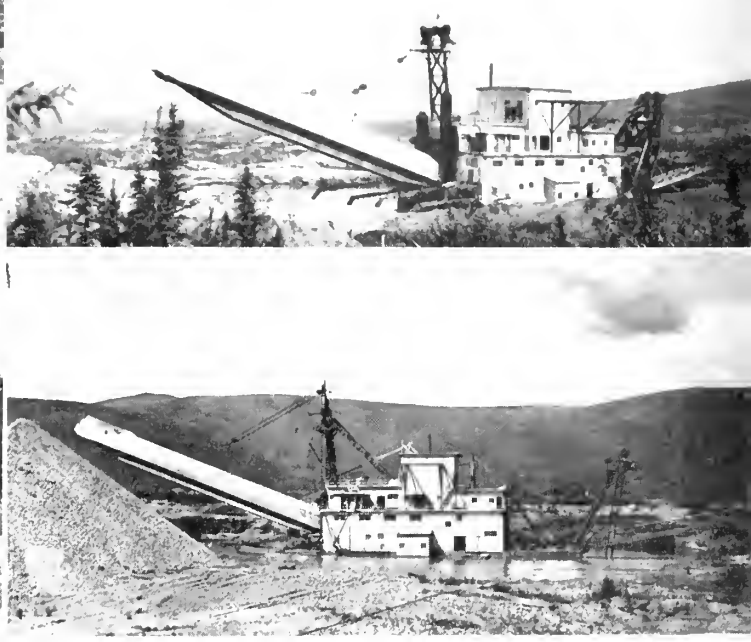
Dredge repairs take equipment and machinery, as well as drydock, slipway and wharf facilities, and San Francisco's are the most complete and modern on the coast. Of particular importance to dredge repair operations are the Yard's high-and-heavy-lift cranes (some of 75-ton capacity); its four floating drydocks (one of 23,000-ton capacity); its two machine shops; its plate



Altered dredge with digging ladder raised. Note cutter head and crew members servicing cutter shaft bearings.



The Archimedes, first successful gold dredge in America, built at Risdon Iron Works in 1897, shown operating in the Yuba River east of Marysville.



Typical modern type gold dredge, built by Bethlehem's San Francisco Yard, in operation in Alaska in 1929.

shop (equipped with a 100-ton keel bending press and a 500-ton joggling press); its blacksmith shop, (equipped with a 1000-ton hydraulic press); its brass foundry, which can handle 35,000 lbs. of molten metal in one heat; and its heating treating facilities for annealing large pre-fabricated assemblies.

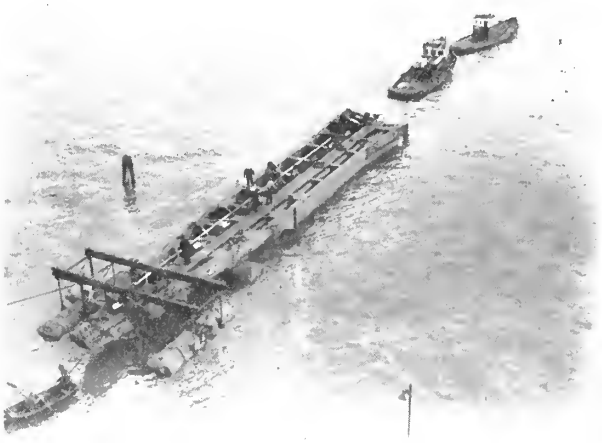
First successful gold dredging operations in the world started in 1882, and these were in New Zealand. Fifteen years later, Bethlehem's San Francisco Yard, at that time the Risdon Iron Works, built the first successful gold dredge in America. It was called the Archimedes and was designed by and built for R. H. Postlethwaite, chief dredging engineer for the Risdon Iron Works, who operated it in the Yuba River east of Marysville, California. The dredge was a success during its first year of operation. Then tragedy struck. The Yuba River flooded and the Archimedes was lost.

The Risdon Iron Works also built, a year later, the second successful gold dredge in America. This was known as the Couch No. 1 and was built for Captain Couch and W. P. Hammon, founder of the Yuba Consolidated Gold Fields. It operated for many years in the Oroville Gold Fields and set the pattern for gold dredging operations in California.

During the period from 1897 to 1911, when the Risdon Iron Works merged with the Union Iron Works, the company designed and built 63 gold dredges, many of which were shipped to dredging fields all over the world.

During one year of this period Risdon was competing with the Union Iron Works, right next door, in the construction of gold dredges. Union Iron Works, however, didn't turn out its first dredge until 1910. From that year up until 1929 the company built 20 gold dredges, including a single order for five for the U. S. Smelting, Refining & Mining Co. at Fairbanks, Alaska. These were built during the two year period 1927-1929.

In 1929 the San Francisco Yard, then Bethlehem Ship-



125' long digging ladder for dredge Papoose shown after being launched at Bethlehem's San Francisco Yard. The ladder, which had been lengthened from 90' to 125', was then installed in the dredge.

building Corporation, Ltd., built its last hydraulic suction dredge, the Papoose, which in World War II saw service in the Pacific for the U. S. Army Engineers. All told, Bethlehem has constructed five dredges of this type, which are used primarily for harbor work.

Prior to 1929 the Yard, in addition to its gold and suction dredges, built four large clamshell dredges for levee construction on the tributary rivers of the San Francisco Bay, and for harbor dredging around piers.

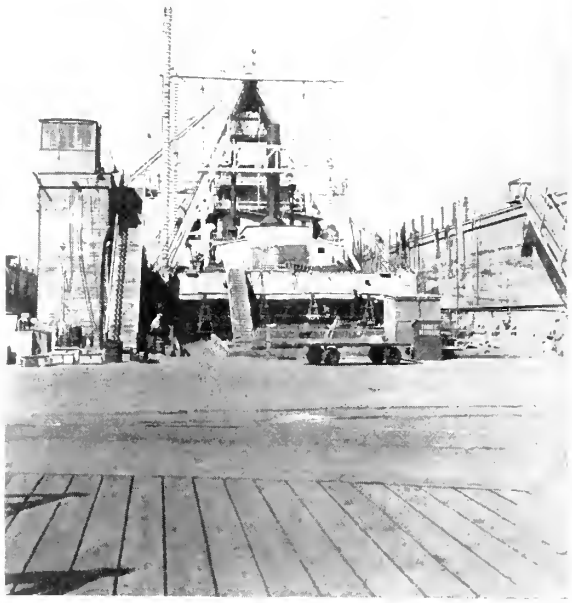
Over a mile of wire rope in the following lengths was used in the Neptune job:

Topping lift	2,080′	1¼″
Boom and spreader stays	2,200′	1¼″
Side guys	456′	1¾″
Bucket cables, each	700′	1½″
Twister rope	400′	¾″
Life line	225′	⅝″

From 1929 to 1937, the year Bethlehem's San Francisco Yard built its last complete drege, the seagoing hopper dredge Pacific for the U. S. Army Engineers, the bulk of its dredge business consisted of furnishing many large parts for all types of dredges, such as hulls, digging ladders, machinery and replacement parts.

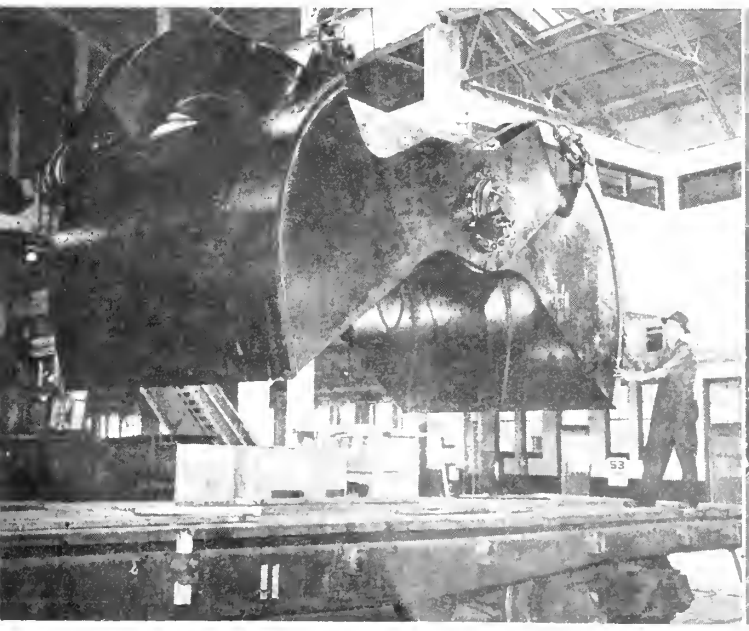
During World War II, the dredge Papoose, built by Bethlehem in 1929, also went to war. The San Francisco Yard performed a major alteration job to enable it to do hydraulic dredging at the unusual depth of 100 feet. The work was done in such a way that after its deep dredging job was done, the dredge could readily be reconverted to its former condition.

The alteration job consisted mainly of increasing the

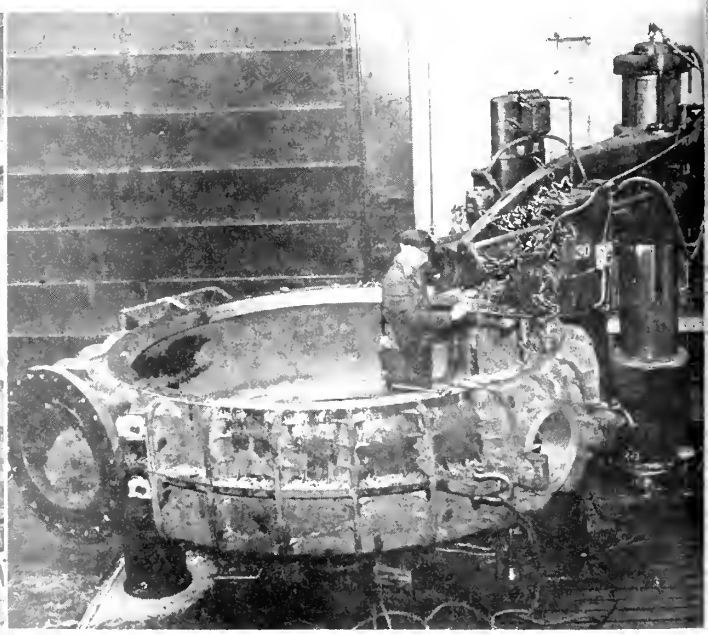


A typical example of dredge overhaul and repair operations at Bethlehem Steel Company's San Francisco Yard is that performed on bucket-type dredge, Neptune, shown in one of the Yard's four dry docks. The Neptune, which is owned by the Olympian Dredging Company of San Francisco, was operated by the U. S. Army Engineers in the Pacific for three years during the war, and has just been returned to its owner. The 212-foot dredging boom was assembled and re-rigged with over a mile of wire cables.

Below, left: 17-ton clam shell type dredge bucket, with a 10 cubic yard capacity, built at Bethlehem Steel Company's San Francisco Yard for the Olympian Dredging Company, San Francisco. This is one of the largest of its type ever built and will be used for harbor work in the Bay Area.

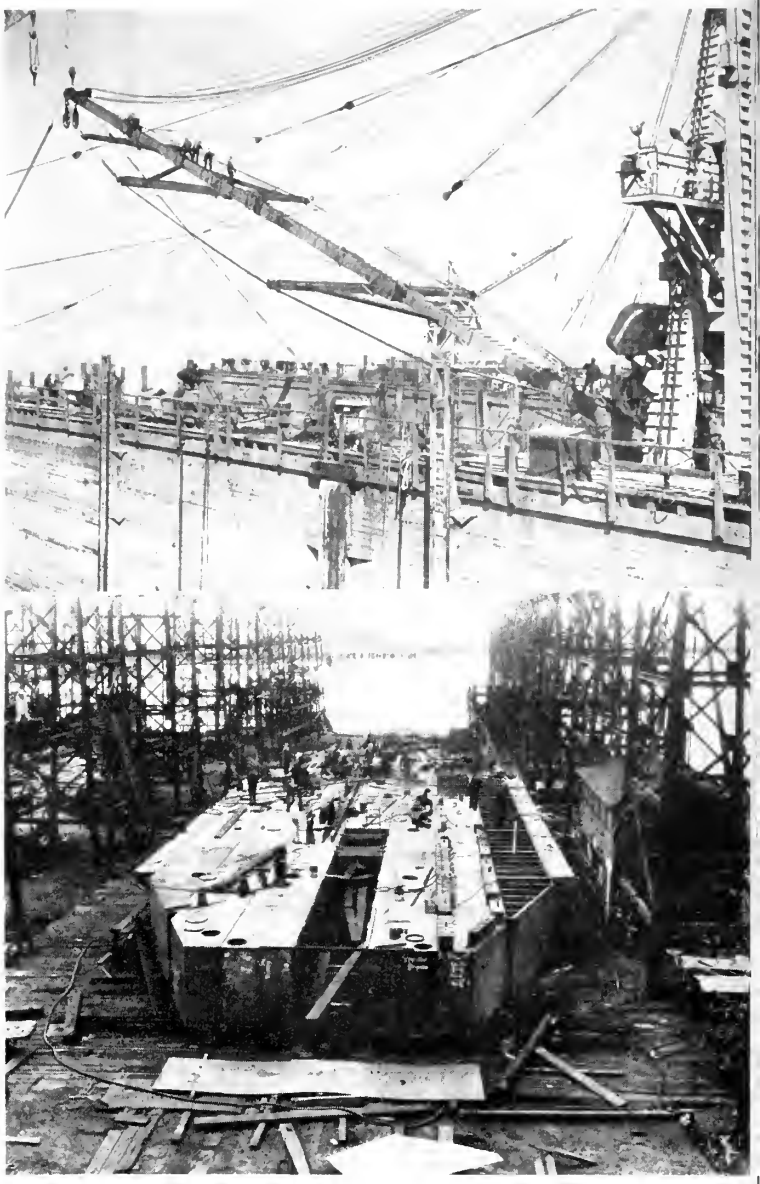


Below, right: Drilling and tapping 1½" diameter stud holes for cover plate in 30" dredge pump casing for suction dredge San Diego. Work being done on drill press in machine shop at Bethlehem Steel Company's San Francisco Yard is typical of unusual jobs performed at this yard. Casing has a diameter of 9 feet and weighs approximately 14 tons.



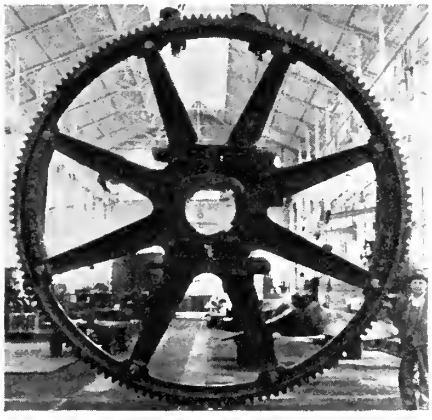
length of the digging ladder from 75 feet to 125 feet, lengthening the hull from 96 feet to 136 feet, installing a new three-way anchoring arrangement, and moving the cutter drive gear to a new position in the hull end of the ladder.

A typical example of the San Francisco Yard's peacetime dredge overhaul and repair operations is seen in the work performed on the bucket type dredge Neptune, loaned to the U. S. Army Engineers during the war, which underwent a complete overhaul job before being returned to its owners for levee building on the Sacramento River.



Another typical example of dredge overhaul and repair operations at Bethlehem Steel Company's San Francisco Yard. This is also a view of the bucket-type dredge Neptune, shown in one of the Yard's four dry docks. The Neptune, which is owned by the Olympian Dredging Company of San Francisco, was operated by the U. S. Army Engineers in the Pacific for three years during the war, and has just been returned to its owner. The 212-foot dredging boom was assembled and re-rigged with over a mile of wire cables.

The dredge was drydocked and its hull replanked with 1200 sq. ft. of planking. The whole hull was then resheathed with redwood sheathing. All machinery was overhauled and repaired, and its 212-foot, 60-ton dredging boom assembled and rerigged in what constituted the largest rigging job performed by the Yard since the first part of the war.



14-ton bull gear for dredge having a capacity of 12 cubic feet. Gear was built at Bethlehem's San Francisco Yard.

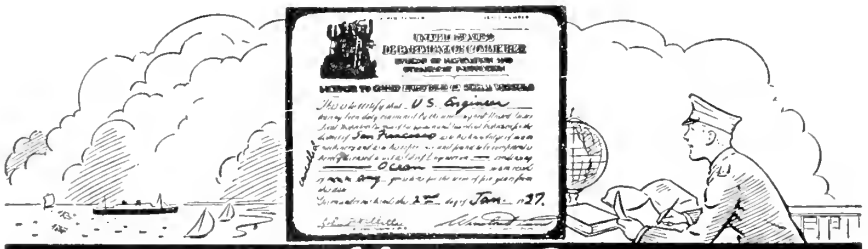
Pontoon dredge hull being assembled on slipways at Bethlehem Steel Company's San Francisco Yard.

Merchant Marine Cadet Rolls Still Open

Deadline has been extended to November 28 for high school seniors to apply for training as cadet-midshipmen in the U. S. Merchant Marine Cadet Corps.

Youths 16½ to 21 years of age who desire to become officers in the U. S. Merchant Marine and qualify for the class, starting February, 1947, may take the entrance examination at the U. S. Merchant Marine Cadet Corps District Office, 1000 Geary Street, San Francisco. Applications should be filed immediately and not later than November 28, 1946 at the San Francisco Office.

The training course is of four years duration and is the equal of a college education with pay. Included in the course is one year of training at the U. S. Merchant Marine Cadet Corps School at San Mateo, California, one year of actual training aboard a merchant or training ship at sea and the final two years at the U. S. Merchant Marine Academy, Kings Point, New York. Graduates qualify as licensed officers in the U. S. Merchant Marine with commissions as Ensign, U. S. Maritime Service, and Ensign, U. S. Naval Reserve.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

Boiler Problems

When Colonel John Stevens built the first steamboat on the Hudson River in 1804 the argument started. It continued through the first Babcock & Wilcox boiler installation on the U. S. Quartermaster Department ship Monroe in 1875, on through 1897 when the first marine boiler was patented by W. D. Hoxie, then vice-president of the Babcock & Wilcox Company, until the "battle of the boilers" when the water-tube boiler competed with the Scotch boiler. Incidentally W. D. Hoxie was the uncle of the popular V. M. "Joe" Hoxie well known on the Pacific Coast. The argument was finally settled by steam pressures climbing above the practical limit of pressure for Scotch boilers. However, the five main boiler problems through the years have always been the same. They are (1) keeping good water in the boiler; (2) keeping the water in sight in the water gauge; (3) venting and draining superheaters during starting-up and shutting-down; (4) keeping the boilers clean on the gas side; and (5) teaching firemen how to light off a burner correctly.

Feed Water

No attempt will be made to discuss feed water treatment as the subject is too involved for the time available. Generally, the problem is to keep hardness, alkalinity, and chlorinity within proper limits and to eliminate oil and air from the feed water. It should be added that because the hardness, alkalinity, and chlorinity, oil and air are kept within limits is no guarantee that the boiler has properly conditioned feed water. This is because the amount of chemicals used to attain these limits may have been large enough to build up the total solids in the boiler water to the point where priming occurs. When this happens, water containing solids is carried over into the superheater where the water is generated into steam, depositing its solids. The solids act as a scale, reducing the flow of heat through the wall of the tube, and if of sufficient thickness will allow the tube to overheat and rupture. Total solids can be controlled by using one or more of the blow-down lines.

Troubles from oil are easily recognized by tubes bowing upward. Scale or low water cause the tubes to bow downward.

Deaeration of the feed water is a practice which has been required since the advent of higher working pressure and economizers. The solubility of oxygen increases with pressure and as a result, if any of the modern ships in the range of 450 psi working pressure were designed without deaerating feed water heaters, oxygen corrosion would make their operation impractical.

Water Gauge

With one exception the water level of B&W boilers is designed to be carried in the center line of the drum. The exception is on one particular class of Naval vessels which carries the water level slightly below the center of the glass. With feed water regulators, the water level is usually carried at the center line of the glass at full power. Generally speaking, however, with any reasonable amount of total solids in the feed water and any reasonable rating on the boiler, no trouble will be experienced if the water level is kept in sight in the glass. If it goes above the top of the glass, carry-over can be expected. It it goes below the bottom of the glass, overheated tubes can be expected due to low water.

Misunderstanding of the problem of shrink and swell leads some engineers to feel that their automatic feed water regulators are not operating properly. When the working pressure in the drum changes the steam bubbles under the water level expand or contract causing the water level to rise or fall. In other words, for a given amount of water and steam in the boiler, the water level might be at half glass when the working pressure is 450 psi. For the same amount of water and steam in the same boiler the water level might be 3 inches above the center line of the water gauge if the pressure dropped to 425 psi. Control of water level is based on constant working pressure in the drum.

Superheaters

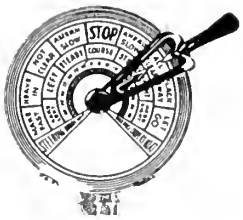
A flow of steam must be maintained through the super-

(Please turn to Page 130)

Abstract of an address by W. B. Hill before the San Francisco Society of Port Engineers at San Francisco June 5th 1946.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

The Sextant

The Art of Taking Sights

(Continued from September)

Taking Sights in Rough Weather

On a small ship the use of a sextant in rough weather is not an easy matter. The eye is only a few feet from the sea, and as the horizon is not far away it is frequently obscured by waves. Care must be taken that the reflected image of the sun is brought down to the actual horizon and not to a false horizon or to an intervening wave. In a rough sea the actual sight should be taken just when the ship is on top of a wave, and as the tops of waves make a false horizon, sights should be taken from as high a point as is practicable. Whenever possible bring the sun or star nearly ahead or astern, as a ship usually pitches less than she rolls. If the converse is the case, however, then bring the heavenly body abeam. Short-handed in a small ship, it may be best at times to heave to in order to get a good sight.

In rough weather three or even as many as a half dozen sights should be taken, and the mean of the altitudes and the times used. Any obviously bad sights should be disregarded. When observing the meridian altitude on a very small ship, such as a ship's lifeboat or yacht in rough weather, the rise and fall due to the waves causes the sea horizon to fluctuate by the small amount due to the alteration in the observer's height of eye. As it is impossible to keep the sun's limb in constant contact with the horizon, it is preferable to take a number of observations close to noon in quick succession, continuing to do so until it is obvious that the altitude is decreasing. While generally the mean of these observations would be taken as the maximum or meridian altitude, if the mean of the the meridian altitude the greatest accuracy will be obhighest and the two altitudes on either side be taken as tained.

Taking the Time

Different ships—different fashions. While in small ships a single observer may have to do the whole operation himself, it is usually the custom to have a quartermaster, A. B., or Ordinary, take the time for the observer, using the sextant. Except in the case of the meridian altitude of a body (when the time is not required), an observer should ask his timekeeper to stand by to take the time at the time of observation. In most ships a stop watch is used, and as the observer sings out "mark," the timekeeper clicks the stop watch and sets it going.

Where no stop watch is aboard, the timekeeper should be stationed near the open chronometer with paper and pencil ready. When the observer has the object close to the horizon, he should sing out "stand-by," *which should be repeated by his timekeeper* (this is important), who should then stand with his eyes fixed on the chronometer face and count off the seconds. When the observer makes exact contact and feels that he has a good sight, he should sing out "mark," and the timekeeper will record the exact second of hearing this call, then the minute and finally the hour. He should immediately check this, especially the minute, to make sure that the chronometer has not been read in error. *An error of one minute of time means an error of 15 miles.* The ship's time should also be noted.

The patent log reading should always be taken at the same time, so that the dead reckoning position may be calculated. On ships where the speed and distance run is calculated from the engine revolutions it is important not to omit to record the ship's time of observation.

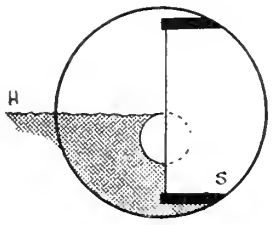
Observations of the Sun

Sun sights may be taken at any time after the sun has risen about 10° above the horizon. Observations nearer to the horizon than this should not be taken because of refraction (which is the "bending" that rays of light are subjected to when passing through layers of atmosphere of different densities). At other times refraction must be guarded against very carefully, as heat waves fre-

quently put sights many miles in error. Very little is known about this abnormality, which often displaces the apparent horizon up to as much as 17 miles.

When deciding on the appropriate time to take a second sight, frequently, owing to a sky partially overcast, we may have to work fast. If the sun appears through the clouds but shows no apparent "limb," but is just a blur (sailors call this a "ball of wool"), and we are particularly anxious to get a sight, take the center of the sun, but do not apply any correction to it. If this is worked out it will be found to give a good approximate result within several miles, which is all that can be expected under such circumstances.

When the sun's lower limb is obscured, the upper limb may be shot, in which case subtract twice the sun's semi-diameter (given in the Nautical Almanac for every day), and apply the corrections in the A, B, C Tables in the usual way. Figure 18 illustrates an observation of the sun's upper limb.



Observing the Sun's Upper Limb

Since we know that when the sun is on the observer's meridian it must bear either true north or true south, the compass bearing of the sun should be taken at this time, especially if the sun's altitude is not more than 40°. The difference between these two bearings is, of course, the compass error for that particular heading of the ship.

Observations of the Stars

When observing stars beware of a false horizon—one can usually rely upon the evening horizon more than the morning horizon. If desiring to observe stars during the hours of darkness (not at twilight), it will be found that the planets and bright stars of the first magnitude throw a reflection or halo on the horizon, which makes it extremely difficult to get proper contact. It is much better to observe smaller stars of the second or third magnitude, as on a dark but clear night a smaller star is more easily defined on the horizon.

When taking star observations, if a star is not on the meridian at the best time for seeing the horizon, do not wait for the meridian altitude, because by waiting the observation may be missed if the sky becomes clouded over, but take the observation at once (noting exact time of sight) and work the sight as an ex-meridian. Generally about twilight there will be one star or more on or near the meridian, so try to observe one to the northward and one to the southward.

When taking star observations it is best to take meridian altitude observations first and then take the other stars as rapidly as possible. Such observations may be called "simultaneous" if observed within two or three minutes of each other. When observing stars in bad or cloudy weather don't worry if the particular star cannot be identified; shoot it anyway (noting the time and altitude in the usual manner) and identify it later.

Observations of Polaris

If Polaris were situated exactly at the North Pole then its true altitude at any place in the Northern Hemisphere would be the latitude of the place. For instance, on the Equator the altitude of Polaris is 0°. However, Polaris moves slightly each year, and revolves daily around the North Pole at a distance of about 1¼° from it. The problem of determining your latitude by an observation of Polaris really becomes a special case of an ex-meridian. Latitude may be obtained from an observation of Polaris at any time it is visible to an observer in the Northern Hemisphere. It should be observed always at dawn or evening twilight, thus getting one position line in the easiest manner possible. Polaris is not a very bright star—being of the second magnitude only—and when visible its altitude should be observed in the usual way for stars.

Simultaneous Sights

"Simultaneous" sights of two or more bodies are, of course, not necessarily simultaneous, as a short interval elapses between observations. However, if three or four observations are taken within five minutes they are assumed to be "simultaneous" for plotting purposes, although each sight is calculated with its own respective chronometer time. Any ship's position should be determined at least twice daily by observations, and following are the several methods available in the order of preference:

(1) Sun and planet; moon and planet; or sun and moon in the daytime.

(2) Simultaneous stars; stars and moon; stars and planet or planet and moon.

(3) "Running fix" from sun in the daytime or the sun and a star at twilight or dawn.

A "P.V." Sight

A "P. V." sight is one taken when the object is on the prime vertical—that is, when it bears due east or west (true). We know that if an object bears due north or south the position line runs east or west; that is, the position line corresponds exactly to a parallel of latitude; and this, therefore, is the reason why the most accurate latitude is obtained from a meridian altitude. Now then, when the sun bears due east or west (true), the position line must run north and south. That is, the position line in this case corresponds to a meridian of longitude, and this is, therefore, the reason why a "P. V." sight gives the most accurate longitude.

On the Ways—

SHIPS IN THE MAKING

Launching USS Des Moines

On Friday, September 27, 1946, at 1 o'clock, a big cruiser, first of its class, from a design developed during the recent war, was launched at the Quincy Yard of the Bethlehem Steel Company, Shipbuilding Division, in Quincy, Massachusetts.

This new cruiser was christened Des Moines; she will be the second United States warship to bear this name.

Many people still living will recall the launching forty-four years ago, on September 20, 1902, of the first cruiser Des Moines. That event was of particular interest because this old Des Moines was the first vessel to be built at the site of the present Quincy Yard by the organization then known as the Fore River Ship and Engine Company.

In the years that followed, the Yard prospered and grew. In 1913, it was acquired by the Bethlehem Steel Corporation, and, under their control, continued to expand its shipbuilding activities. In the forty-six years that have passed since the keel for the first Des Moines was laid, 440 vessels have been launched at this shipyard, with several more having been assembled, then shipped in parts for re-assembly elsewhere. This long list includes ships of nearly every type; trawlers, tugs, cargo ships, passenger vessels, dredges, light vessels, car floats, tankers, ferries, Coast Guard cutters, submarines, cruisers, destroyers, aircraft carriers, battleships, destroyer-escort vessels, tank landing ships (LST's), and others.

The new Des Moines will be the largest cruiser yet built at the Quincy Yard. 716 feet in length overall, she is about 40 feet longer than the recent heavy cruisers of the Baltimore class of which eleven have been built at Quincy. The design of this new warship is a development from the later Baltimore class cruisers, incorporating features decided upon as a result of experience in naval warfare.

Armament of the new Des Moines will consist of eight-inch guns in triple mounts, five-inch guns in twin mounts, and 40-millimeter and 20-millimeter machine guns. As in other recent cruisers, scouting and observation planes will be carried; a hangar will be provided aft, and catapults and airplane crane on deck.

The vessels will be propelled by geared turbines driving quadruple screws. Steam will be supplied by oil-burning water-tube boilers.

Her complement is tentatively set at 112 officers and 1692 men—nearly six times the size of that of the earlier Des Moines.

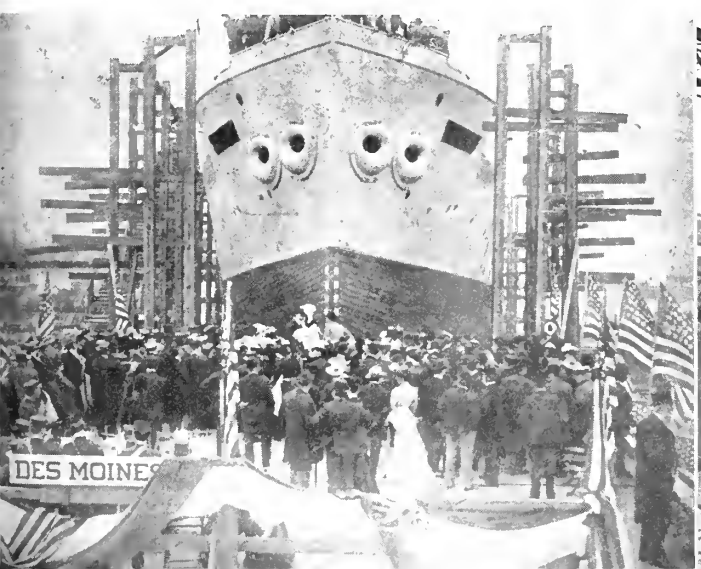
The combined launching weight of the Des Moines and cradle was about 11,200 long tons. With two ways, each having an effective width of five feet, the average pressure on the grease was about 2 tons per square foot. The launchways are 24′ 6″ apart, center to center; they are cambered to a radius of 75,000 feet, with a slope under the center of gravity of the ship, in starting position, of $\frac{5}{8}$ inch per foot.

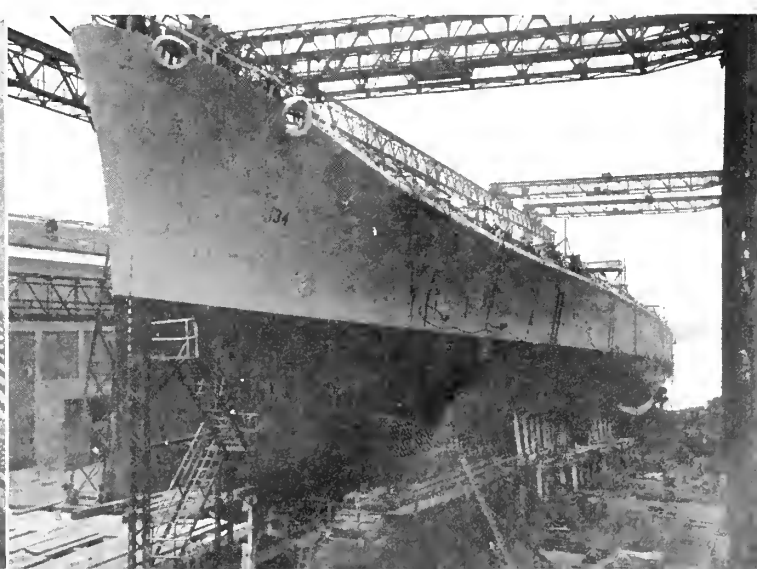
Des Moines was released, at the moment of launching, by four mechanical triggers, electrically controlled by solenoids from a single contact. These triggers, designed and built at the Quincy Yard, have been used many times in recent launchings, and have been proven very satisfactory.

The ship was stopped, after leaving the ways, by six chain drags, grouped in three 25-ton piles on each side of the vessel.

Keel for Des Moines was laid on May 28, 1945. Construction has progressed rapidly. A sister cruiser is also under construction at the Quincy Yard.

Below, left: A pre-launching picture of the first ship to have the name of Des Moines. It was U. S. Protected Cruiser Des Moines. This launching took place September 20, 1902. It is interesting to note that below the water line, yellow pine sheathing was attached to the ship by use of bolts. Although not visible in the picture, copper sheets covered the yellow pine sheathing to protect it while in southern waters. At right: A pre-launching picture of the USS Des Moines on the way at Quincy Yard, September 27, 1946.





SWAN ISLAND LAUNCHES THREE

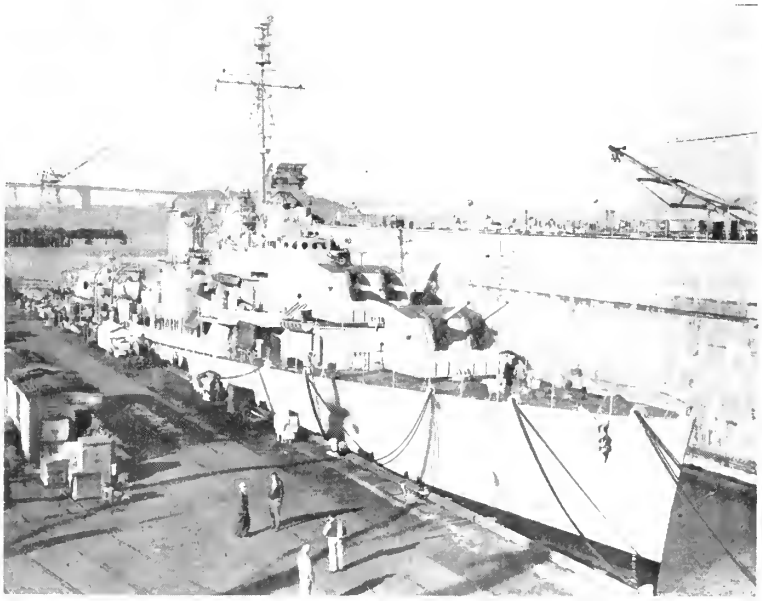
Alcoa Cavalier, first of Portland's three post-war ships to be launched by Kaiser Company, Swan Island, for the Alcoa Steamship Company, is shown shortly before she was launched September 25. Sponsor of the combined cargo and passenger vessel was Mrs. C. S. Thayer, wife of the manager of Alcoa's aluminum plant at Vancouver, Washington.

Bethlehem-Sparrows Point Shipyard, Inc., was launched October 2, at 12 noon. These vessels are the largest built in the Port of Baltimore and largest and fastest bulk carriers afloat.

The sponsor was Senora Elena W. de Mora, wife of the Chilean Ambassador to the United States, who will be accompanied by her husband, Commander and Mrs. Luis Recart, Naval Attache at the Chilean Embassy in Washington, and Mr. and Mrs. Mario Illanes, Chilean Minister of Commerce.

New Destroyer Commissioned

USS Henley (D. D. 762), 2200-ton destroyer built at Bethlehem Steel Company's San Francisco Yard, was commissioned October 8 at the yard. Captain E. V. Raines, USN, assistant Port Director for the 12th Naval District Headquarters, accepted the ship on behalf of the Navy and turned her over to Comdr. D. L. Moody, USN, of Williamsburg, Kentucky, the vessel's new skipper.



Chilore Launched

The SS Chilore, fifth of eight in a series of 24,000 deadweight ton bulk ore carriers being built at the

Above, right: USS Henley, new destroyer built at Bethlehem's San Francisco yard.

TODD EXPANSION

Todd Shipyards Corporation, which owns and operates six major repair yards on the Atlantic, Gulf and Pacific coasts, announced September 29 that it is taking over operation of the Charleston Shipbuilding and Dry Dock Company in South Carolina, effective October 1, 1946. This plant covers an area of 19 acres, with 1400 feet of waterfront, and has dry docks, berthing space, shipways, railroad trackage, cranes, modern shops and machine tools, for the repair, overhaul and conversion of ships and other floating equipment.

More Army Transports Reconverted

Reconversion of the 23,000-ton Admiral H. T. Mayo, former Navy transport and latest addition to the Army's growing fleet of troopships, was completed at Todd Shipyards Corporation's Brooklyn division, and the vessel was delivered to the Army Transport Service after a trial run September 23.

Admiral Mayo, as a Navy transport carried a total of 5478 persons, with space for 4543 troops. As an Army ship she will take 38 first class passengers, 255 second class passengers, 2250 troops and a crew of 340. Extensive alterations in cabins and berthing quarters, cutting her carrying capacity almost by half, allow considerably more room and comfort for Army and War Department personnel and their families.

An outstanding feature of the reconversion was the construction of a steel tunnel, 53 feet long, seven feet high and three feet wide, connecting the forward and after engine rooms. As the vessel was constructed, it was necessary for officers and crew members to go above deck and down to pass from one engine room to the other.

From the forward engine room, this tunnel leads through the fresh water tank to the after engine room, then through the Number 5 hold to the after motor room. The Mayo is one of four P-2's to be similarly converted for the Army from Navy transports by Todd yards. Two others are the Admiral W. L. Capps and the General William R. Weigel, completed at the Todd Hoboken division, and the General John Pope, undergoing reconversion at the Brooklyn division.

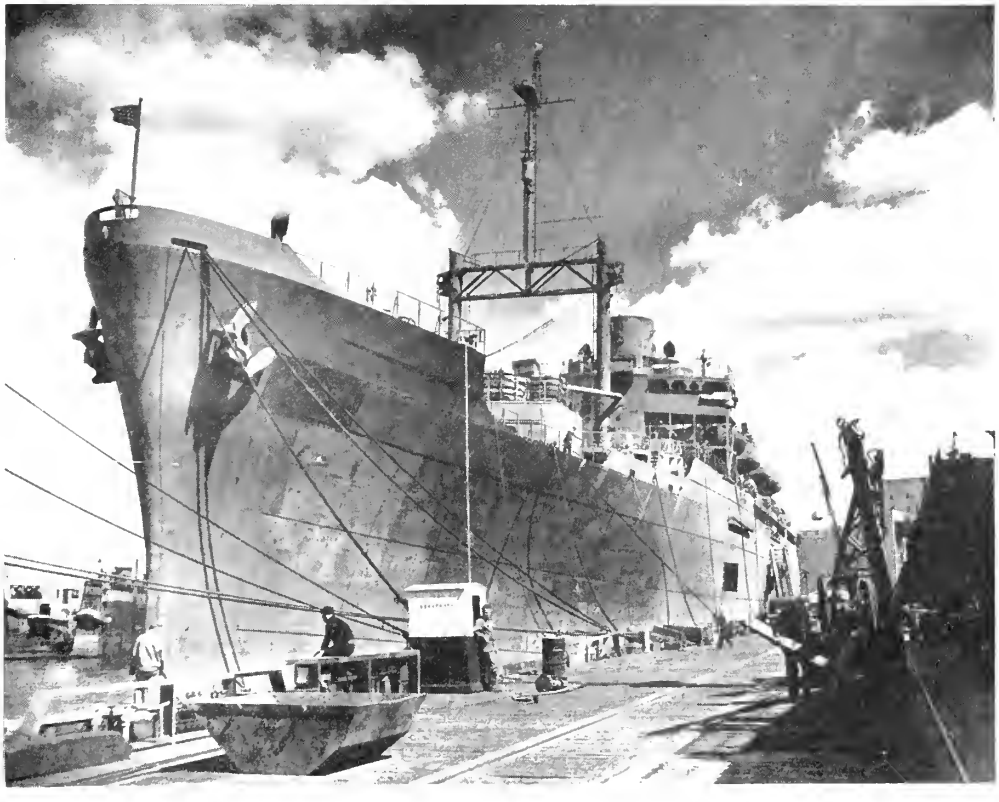
Four-bed rooms, with upper berths that fold into the wall like Pullmans, and with adjoining baths for each series of two rooms, have been installed on the promenade deck. Accommodations for some 250 passengers, in rooms with from two to eight berths, have been completed on A and B decks. The ship's ventilating system has been extended to carry fresh cool air to all sections of the vessel, including new crew quarters. A new officers' pantry, which will serve passengers as well, has been built on B deck, and a new crew pantry added, on the same deck.

Six additional life-boats and davits are now installed on the vessel, and some of the rafts have been removed

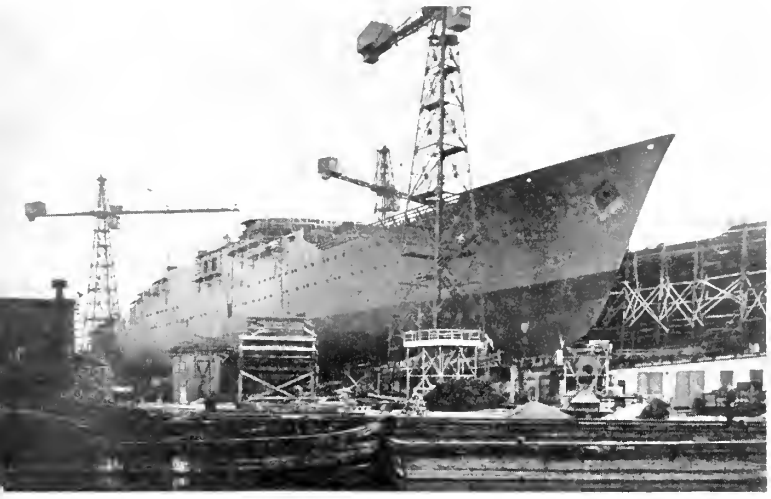
General repairs were performed on the ship's engines and machinery, and the ship was drydocked for tailshaft inspection and adjustment. The vessel's bottom hull was painted with anti-fouling plastic paint.

Two Bulk Carriers at Federal

Federal Shipbuilding and Dry Dock Company at its Kearny, New Jersey yard, has begun construction work on two gypsum-rock-carrying vessels for the Panama Gypsum Co. These vessels will be 436 feet long and will have a cargo cubic capacity of 300,000 cu. ft. All electric power on board will be alternating current. Both hulls are scheduled for delivery in the spring of 1947.



Admiral H. T. Mayo, former Navy transport, reconverted by Todd Shipyards Corporation's Brooklyn division, recently joined the fleet of Army troopships which will number 150 vessels when the program is completed. The Admiral Mayo is one of four 23,000-ton P-2 vessels converted by Todd from Navy transports for the Army's transportation fleet.



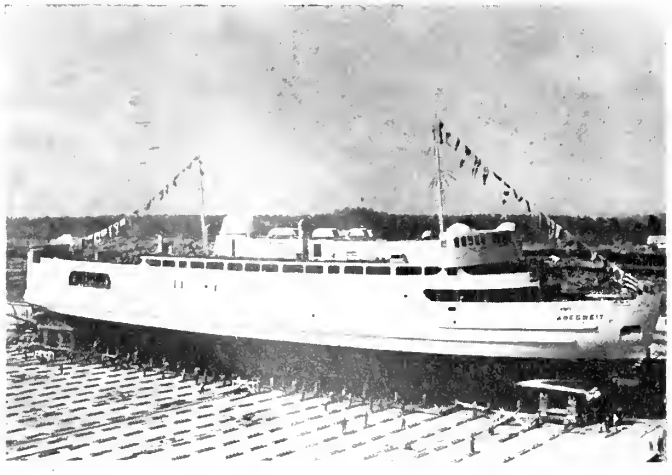
The Swedish America Line's new passenger vessel of 11,000 gross tons, (largest passenger liner ever built in a Swedish shipyard) was launched on September 9 at the Gotaverken shipyard, Sweden. In ordinary Atlantic service she will take 360 passengers and 3000 tons of cargo. The picture shows the vessel on the stocks. Note shape of hawsepipe.

Foreign Shipbuilding Notes

BRITISH • Lloyds Register reports that British merchant shipbuilding is at its highest level since 1922. As of July, 1946, 1,764,943 gross tons of shipping were under construction in Great Britain and Ireland, representing 53.9 per cent of the world's shipbuilding program. During the second quarter of this year construction was started on 329,084 gross tons, and 347,405 tons were launched. About 247,500 tons, 14 per cent of this total, was for foreign registration. The other shipbuilding countries in order of importance are: America, 386,583 tons; Sweden, 190,170 tons; British Dominions, 169,673 tons; Italy, 140,887 tons; Denmark, 139,650 tons; Holland, 132,183 tons; Spain, 92,376 tons; and others approximately 250,000 tons.

AUSTRALIA • Lloyds list reports that costs of shipbuilding and ship repair in Australia is very high and threatening to go higher. Building for replacement entails a cost 2½ to 3 times greater than the cost of original vessels. This refers to comparatively new vessels lost during the war.

DENMARK • On April 1, Danish shipyards had on hand orders for 60 vessels with a total measurement of 415,000 gross tons and an approximate value of $112,698,000. These included tankers, fruit carriers, passenger and cargo liners, cargo ships, and several of special design such as a whaling mother ship and refinery of 23,500 dw tons. Thirty-seven of these vessels are for Danish owners, fourteen for Norwegian owners, five for French owners, and four for Iceland.



Ice - breaking train ferry Abegwait, ready for launching at Sorel, Quebec, Canada.

Ice-Breaking Car Ferry

The world's largest ice-breaking train ferry, the 7600-ton Abegweit, was launched at Sorel, Quebec, Canada, on September 21 by Marine Industries Limited, amid predictions that she would be in service between Prince Edward Island and the New Brunswick mainland by next summer.

There was a minimum of ceremony as the 372-foot quadruple-screw stream-liner slid into the Richelieu River a few hundred feet from the St. Lawrence. Christening will take place later, after more of the interior work has been completed.

Besides being the largest ship of her kind in the world, the Abegweit is the biggest all-welded vessel ever built in Canada, the heaviest ship—4300 tons in terms of launching weight—yet turned out by a Canadian shipyard, and the world's most modern icebreaker.

In addition, she was launched from the world's largest marine railway—the 1200-foot ship carrier of Marine Industries. Outranking all these things in the eyes of shipbuilders was the fact that the Abegweit marks a new phase of Canadian construction in that she is the first heavyweight peacetime "specialty" ship built in the Dominion.

Carrying a name long famous in Prince Edward Island, the Abegweit has a capacity of 19 railway freight cars, 60 automobiles and 950 passengers. She is designed for a top speed of 16½ knots, and has been built throughout to do one special job—to cross Northumberland Straits from Borden, P.E.I., to Cape Torementine, N. B., on schedule winter or summer.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

First in line for banquet is Vernon Showell. Captain Blackstone (upper right) official ticket taker. Dad Le Count (seated) chief purser of events.

BND Jr.

Propeller Golf Tourney Great Success

Another successful golf tourney goes down in the records of the Propeller Club of the United States, Port of San Francisco.

Time: September 20. Place: Lakeside Country Club. Cast of characters: Four-score Propellers who were piped aboard by Chairman Bob Lillevand and a satin-smooth committee appointed by W. Edgar Martin, this year's Program Builder.

Featured again this year were a kaleidoscopic array of prizes, from which winning golfers and holders of lucky door checks selected handsome objet-d'art and stuff!

George Swett kept the golf players honest and tallied scores with the able help of Les White.

Winning golfers included such indomitables as tourney cup winner Emmett Ahern, for low net, and Trev Smith, low gross winner. Other golf winners were Eddie Martin, Bill Empey and Vernon Showell.

The prizes were distributed over a period of two hours after a sump-

▲ This foursome on the 18th . . . Luce, Schwartz, Beckers and Avila.

◀ Official scorers: George E. Swett (center) assisted by Les White (left); J. E. Peggs and Bob Lillevand (standing) just kibitzing

Harry Thompson, Grace Line, and George McCord of Arrow.

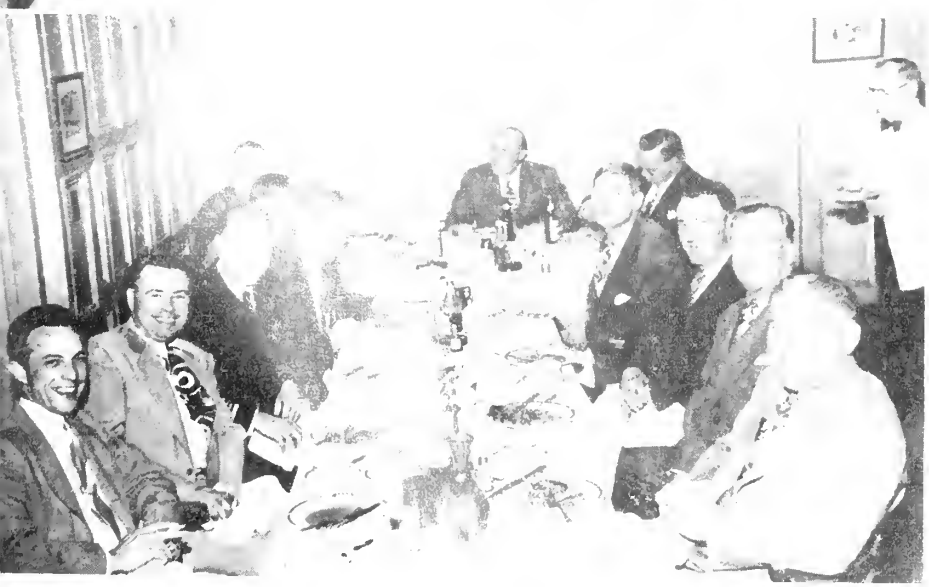
◀

Jim Hines, next to John MacArthur (extreme right) regaled this shipload with his faithful banjo.

▼

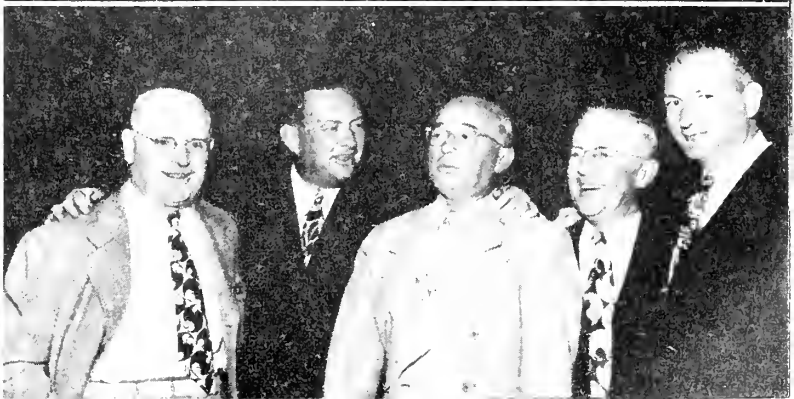
tuous banquet with Bern De Rochie doing a bang-bang job at the microphone. The prize donors were acclaimed: Allied Produce Co.; George Armes; Geo. F. Arata Co.; Challenge Cream and Butter Assn.; Dahl-Beck Electric Co.; Dohrmann Hotel Supply Co.; The Guide; John Greany, Bethlehem; Golden State Co., Ltd.; Haas Bros.; Harry T. Haviside, H. T. Haviside Co.; C. J. Hendry Co.; Edw. L. Houck; Marine Electric Co.; C. W. Marwedel Co.; Joseph A. Moore, Jr., Moore Dry Dock Co.; M. & N. Distributors, Judd Napp Cigars; O'Brien, Sportorno, Mitchell; Frank O'Connor, Donavin Lumber Co.; Pacific Paint & Varnish Co.; A. Paladini, Inc.; Harry W. Parsons, H. W. Parsons Engineering Co.; The Log; Pacific Marine Review; Poultry Producers of Cen-

Bern DeRochie (upper right) made suckers of these horseshoe pitchers who formerly bowed to Carroll Reeves (with Calipers), dethroned champ. Referee (upper left) is Bob Lillevand. Clyde Williamson (center), Walter Hill, Sam Hawkins (right foreground), a tyro who shows considerable promise.



tral California; Joe Roberts, Henry Klang; S & W Fine Foods; Tom Short, Thos. A. Short Co.; Bob Spear, Foster Wheeler Co.; "Salute to Major Jim Swett!", Geo. E. Swett Co.; L. T. Snow & Co.; Sunset Produce Co.; Schweitzer & Co.; Standard Distributors Co.; Tiedemann & McMorran; Tubbs Cordage Co.; Fairbanks Morse Co., Roger Murray; Toumey Electric Co.; Weeks-Howe Emerson; The Young Co.; and A. Levy-J. Zentner.

Eric Pedley selects a handsome crystal set as his prize. General Chairman Ed Martin (right) won capital prize—a Servacart—for golf honors.
Arthur Forster strikes oil!
Prize dispensers at work. Martin, DeRochie, White, and Swett.
Below (left): Bob Spear, Sewell Knapp and Harry Parsons.
Below (right): H. H. Pierson, B. H. Parkinson, Jr., Creighton Peet, Arthur Poole and Ben Parkinson, Sr.
At bottom (left): House Chairman, Ed Martin; Golf Chairman, Bob Lillevand, Banquet Chairman, Rudy De Gorog; Horseshoes, Carroll Reeves.
At bottom (right): Golfers Essner, Peggs, Nolan, Greany and Ahern.



Martin Turner Distributors For Condenser Service

Condenser Service and Engineering Company of Hoboken, New Jersey, have announced the appointment of Martin and Turner as distributors for their broad line of products and services.

Conseco's ability and reputation is well known and of long standing in engineering, manufacture and maintenance of steam condensers, evaporators, distillers, heat exchangers, strainers, filters, separators and many specialties connected with maintenance and servicing of such equipment.

While Conseco's factories are centered in New Jersey, installation, service and maintenance work has been done here on the Pacific Coast as well as in many other parts of the United States. It is for the purpose of broadening the firm's Pacific Coast business that Martin and Turner have come into the picture.

Martin and Turner, who deal in marine and industrial supplies, have offices in Wilmington and San Francisco, their home office being in Wilmington.

In January of this year the San Francisco office moved into new quarters at 134 Sacramento, at which time management was assumed by Eric L. Pedley, who received his discharge from the Army Air Corps and associated himself with James S. Martin and C. Russell Turner, thereby rejoining two business partners of prewar days.

In Southern California the Edward M. Ornitz Company represent Conseco in specific items and will continue to do so. In Northern California Terco Products will continue to handle fleurites and Universal bevel gears manufactured by Conseco.

Other personnel of the San Francisco office:

L. E. (Cap) Rogers, who has been with the San Francisco office since its opening in 1943.

Josiah N. Knowles, a Lieutenant Commander in the U. S. Navy during the war, well known in the Bay Area.

C. A. Kumle, for many years with Luckenbach Steamship Company.

A. M. Christianer, Socony Paint Products representative for many years in the San Francisco Bay Area.

Tubbs Cordage "Cloverleaf" Brand Title Wins Award

Tubbs Cordage Company of San Francisco was honored recently when Irwin M. Lord, production manager, received the Brand Names Foundation "Certificate of Public Service" at a banquet at the Palace Hotel in that city.

The award, given in recognition of 55 years of use of Tubbs Cordage Company's "Cloverleaf" brand, was witnessed by business and industrial leaders, and newspaper, magazine, radio and advertising executives. The Foundation's coveted certificate is awarded only to companies whose brand names have been in continuous use for 50 years or more, and was created to emphasize the proved value of brand names to both supplier and consumer.

Tubbs Cordage Company's original rope mill was established on San Francisco Bay in 1856—over 90 years ago. The well-known "Cloverleaf" brand has been utilized on both rope and twine to denote the highest quality product of the Tubbs mills.

Herman D. Nichols, vice president of Tubbs Cordage Company, returned recently from Manila, P. I., where for several months he has been active in the work of rehabilitation of the cordage industry.

Shoreside Personalities

EUGENE "GENE" HOFFMAN, publicity and advertising director for the American President Lines, has returned to his duties after hospitalization and convalescence for two months. Mr. Hoffman is also secretary-treasurer of the Port of San Francisco Propeller Club.

* * *

At the meeting of the Board of Directors of C. C. Moore & Co., engineers, of San Francisco, the Pacific Coast branch of The Babcock & Wilcox Company, manufacturers of water tube steam boilers, the following officers were elected: Elgin Stoddard, chairman of the board; H. H. Smith, president; F. S. Cummings, vice president; D. P. Vail, commercial vice president, located in Los Angeles.

* * *

PACIFIC FAR EAST LINE PORT CAPTAIN: Appointment of Captain W. T. Lion as port captain of the recently organized Pacific Far East Line, Inc., of San Francisco, was recently announced. A native of San Francisco, he was formerly Pacific Coast marine superintendent for Moore-McCormack Lines, Inc.

* * *

Toumey Electric Represents Pilot Marine Corp. of New York

Toumey Electric and Engineering Co., of 115-117 Steuart Street, San Francisco, have been appointed marine distributors and service engineers for the Pilot Marine Corporation of New York.

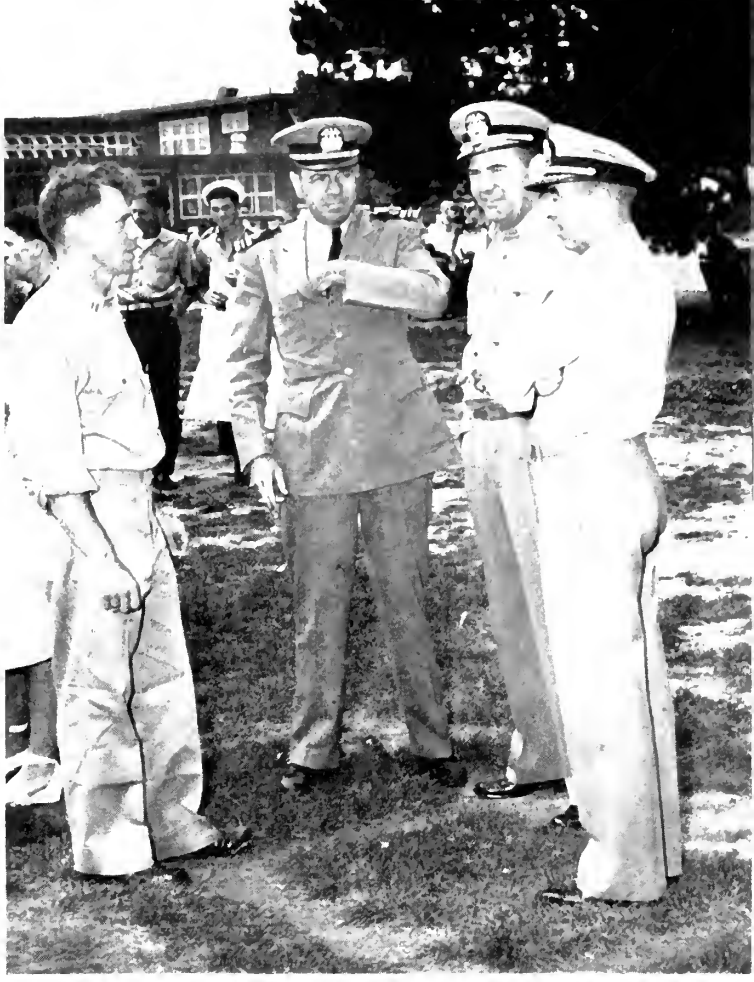
Pilot Marine Corporation are manufacturers now, as they were during the war, of salinity indicators (both currents); rudder angle indicators (both currents); liquid level meters and controls; smoke density indicators; duplex course telegraphs; engine order telegraphs, electrical; docking telegraphs, electrical; combined steering telegraphs and rudder angle indicators; revolution order telegraphs; sound systems; loud speakers; loud hailer systems (two and three mile range types). Other equipment includes telephone systems (both manual and automatic); sound powered telephones; bells, horns and signals and switching devices and relays.

Sea Scouts Visit Alameda Training Station

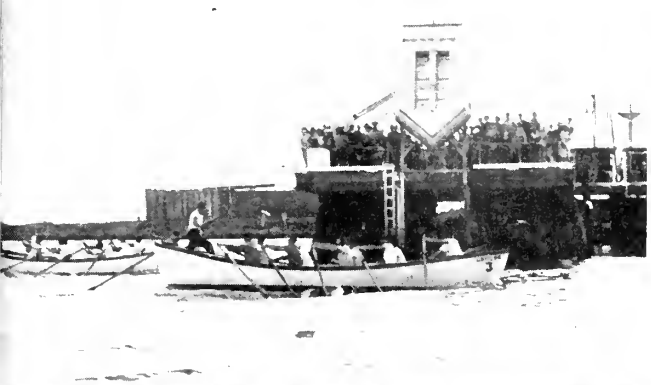
Some 700 Sea Scouts who attended the 11th Annual Sea Scout Regatta at the U. S. Maritime Service Training Station, Alameda, California, were given an entertaining and educational program for their entire three-day stay at the Station. Most of these youths came from northern California

Captain Malcolm E. Crossman, USMS, superintendent, with the staff of officers, greeted the Sea Scouts and their leaders. He piloted the fast moving events of the activities scheduled so that it was generally acclaimed one of the most successful on record.

Looks of astonished wonderment and wide open mouths of amazement followed as they were shown through various departments of the station. More important were the keen, thought provoking questions which these hundreds of sea-going lads brought forth. They had read and been told of what it takes to make a mammoth sea liner go. Here they were seeing the actual demonstration of component parts of the engine room, the intricacies and varied training that go to make up the skilled navigators and the stress laid on the safety-at-sea program.



Left to right: Lt. Ross Dixon, welfare officer, Alameda; Lt. Comdr. Frank L. Dwinnell, U. S. M. S. West Coast Public Relations officer; Commodore H. H. Dreany, assistant commandant, U. S. Maritime Service; and Captain M. E. Crossman, superintendent, U. S. Maritime Service Tarining Station, Alameda.



PICNIC AT OFFICERS TRAINING SCHOOL AT ALAMEDA.

Section 71E wins free-for-all boat race.

Soft ball game, officers vs. enlisted men.

Men in training at the U.S.M.S.T.S. give a demonstration of swimming through burning gasoline. This was taught at USMS schools during the war as a part of the "Sea Safety Course."

EAGER EYES AND EARS FOR ENGINE ROOM INSTRUCTION

A group of cadet-midshipmen at the U. S. Merchant Marine Cadet Corps School, San Mateo, California, listen eagerly as one of the classmates gives a talk on the ship's engine.

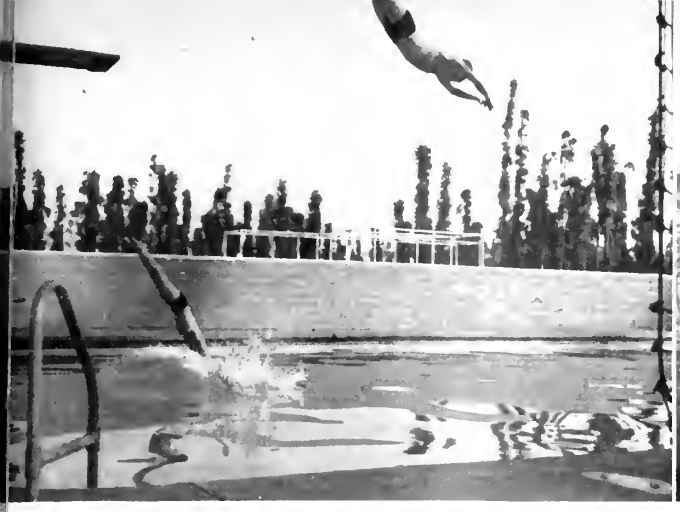
U. S. Merchant Marine Cadet Corps School, San Mateo

The inauguration of a four year, peacetime course for the United States Merchant Marine Cadet Corps closely followed the advent of the cessation of hostilities ending World War II. In replacing the stepped up emergency schedule, at one time an eighteen months' course, the lengthened program saw its birth at the U. S. Merchant Marine Cadet Corps School at Coyote Point, San Mateo, California, with the arrival of some 240 men this summer.

Captain Arthur O. Brady, USMS, superintendent, U. S. Merchant Marine Cadet Corps School, San Mateo, California.

Known as "fourth classmen," these cadet-midshipmen will enter their third class period in May, 1947. Another group of approximately the same size is scheduled to enter on February 1, 1947.

The U. S. Merchant Marine Cadet Corps took another long stride forward toward international recognition when the 79th Congress, in executive session, passed the act cited as the "Philippine Rehabilitation Act of 1946," which provided, in part, for the U. S. Maritime Commission to accept applications each year for 50 Filipinos, designated by the President of the Philippines, to receive instruction in the U. S. Merchant Marine Cadet Corps at a U. S. Merchant Marine Cadet Corps School. This is part of the good neighbor policy of the United States in doing its share to rehabilitate the Philippines. The 50 Filipinos selected, plus 50 more to be designated each year for the next five years, will be trained in the United States for duty in the Philippine Merchant Marine only.



A portion of the huge open air swimming pool at the U. S. Merchant Marine Cadet Corps School, San Mateo, where, under the watchful eye of Lieutenant Commander John D. Baker, USMS, Athletic Director, cadet-midshipmen enjoy a daily plunge. . . . The SC1315, training vessel of the U. S. Merchant Marine Cadet Corps School, San Mateo, California, returns to Nichols pier at the school after being repainted and repaired in dry dock.

This training program is to help the Filipinos in building their own merchant marine.

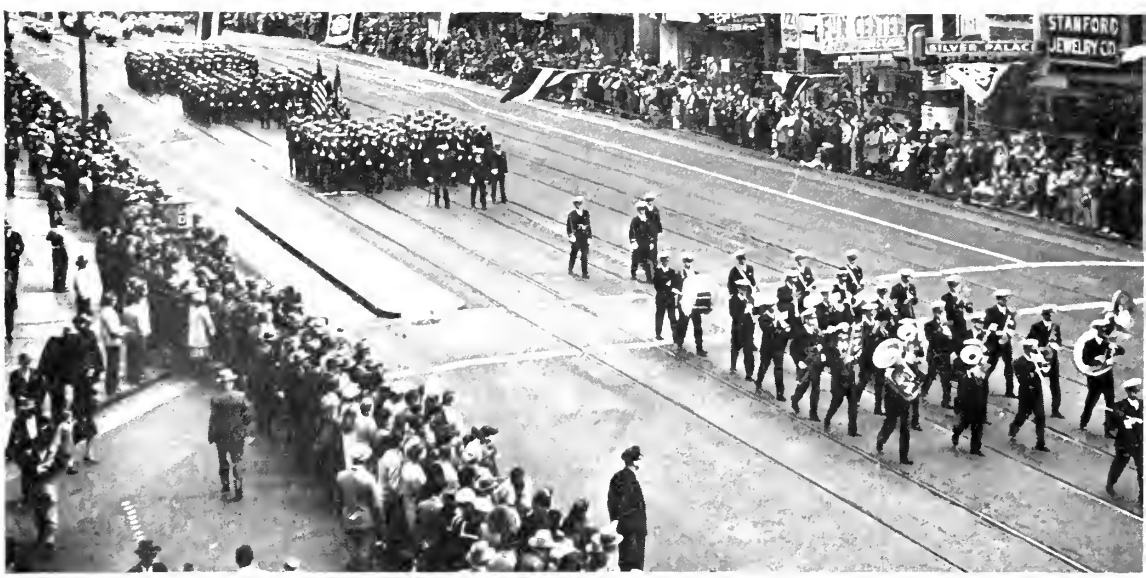
Captain Arthur O. Brady, USMS, superintendent of the U. S. Merchant Marine Cadet Corps School, San Mateo, is completing plans to receive the first group of 50 Filipino Cadet-Midshipmen who are scheduled to report at San Mateo on February 1, 1947.

Lt. Commander Charles L. Sauerbier, USMS, has returned to the San Mateo School as Head of the Department of Nautical Science. He replaces William Carrick, USMS, who has been serving as Acting Head. Commander Sauerbier had previously served at San Mateo, while on active duty with the Navy, in the capacity of Secretary of the Academic Board, and as such played a prominent part in the establishment of the four year course, while such a course was in its very early and formative stage.

Lt. Commander Sauerbier's final tour of duty in the Navy, included among other duties, that of Port Director at Tsingtao, China, and later Executive Officer of Naval Port Facilities in the same spot, at which time he won his discharge. His career in the Merchant Marine started upon graduation from the California Maritime Academy in 1934 and lasted for eight years during which time he served with the Dollar Line, Grace Line, Matson Line and the Richfield Oil Company. He first started teaching in January, 1942, at the U. S. Merchant Marine Cadet Corps School then located on Treasure Island.

The training vessel S. C. 1315, acquired by the Cadet School early this year, recently underwent repairs and a new paint job at the Antioch drydock. The vessel, which took part in the invasions of Leyte and Okinawa, was selected by Captain Brady for the School when it was placed on the inactive list by the Navy earlier this year. Its equipment is the finest and latest.

Lieutenant Commander John D. Baker, USMS, director of athletics, at the San Mateo school and formerly football coach at George Washington University, is planning an active program of varied sports for the cadet-midshipmen this season.



BATTALION TO APPEAR AT FOOTBALL GAME

Two hundred and fifty cadet-midshipmen of the U. S. Merchant Marine Cadet Corps School, San Mateo, California, made the first appearance on Market Street for the present class when the battalion and band took part in the California Admission Day Parade in San Francisco on September 9, 1946. Plans are now being completed for the battalion to play between halves at the football game between the 49ers and the Dons at Kezar Stadium, San Francisco, on Sunday, December 8.

Stanley E. Allen returns to Marine Department of Standard of California.

Stanley E. Allen is Back

Stanley E. Allen is back with Standard of California and hundreds of Bay Maritimers will be glad to learn that this grand "old timer" has rejoined merchant marine ranks after his glorious career of the past several years with the Navy.

Most of us immediately associate Stanley with the original Propeller Club of California . . . now the Mariners Club. Since the creation of this renowned organization in the loft of Paladini on a certain Saturday afternoon, many, many years ago, Stanley Allen was perennial secretary and spark-plug until the outbreak of the war, when he joined up—for valuable work with the Navy with the Caribbean his zone of action. He has returned to his San Francisco friends with the rank of Lieutenant Commander.

The Standard Oil files indicate his record of 35 years of employment with the company. Since August he has been serving as shore captain, operating tanker vessels out of Richmond. His old shipmates will hope to see him around his old stamping grounds again!

During his Navy career he received many citations, including the Legion of Merit award for exceptionally meritorious conduct in performance of outstanding service in the furtherance of the war effort of the United Nations by establishing and maintaining the Harbor Security Office, Headquarters All Forces, Aruba-Curacao. Through his efforts he improved the port security of San Juan and Trinidad and speeded up the turn-around of shipping vital to the prosecution of the war.

Massenberg Assistant Manager Of United Engineering

Jack Massenberg was recently appointed assistant manager of the United Engineering Company, Alameda and San Francisco. Massenberg was with the U. S. Maritime Commission's Regional Office in Oakland in the early days of the war, and in 1942 was transferred to the Atlantic Coast. His marine engineering career was started in Newport News, and he has since occupied executive positions with the Dravo Contracting Company, Pittsburgh, Pennsylvania; Toledo Shipbuilding Co., Toledo, Ohio; and more recently with the Ingalls Shipbuilding Co., of Pascagoula, Mississippi. Previous to transferring to the U. S. Maritime Commission, he was with the U. S. Navy Department in Washington, D. C.

WOAMM'S HEAR WORLD TRAVELER
Mrs. Frank Johnston, Mrs. Walter C. Lowdermilk, world traveler and lecturer who spoke at the October meeting of the Women's Organization for the American Merchant Marine in San Francisco; Mrs. Harry W. Parsons, president of the WOAMM's, Mrs. Earle H. Carder, Mrs. Alfred Pittman, and Mrs. Harold V. Jennings, guest of Mrs. Parsons.

Paul A. Flinn

Flinn S. F. Manager Of Atlas Paint

Paul A. Flinn recently was appointed San Francisco manager of Atlas Paint & Varnish Co. with offices at 201 First Street. Edw. W. Whittemore, one of the owners of Atlas Paint Company, made the appointment on a visit to San Francisco.

Flinn has spent considerable time and is well known in the marine industry in the Bay area where he was with General Engineering & Dry Dock Company and United Engineering, Alameda. He left Western Ship Service Company of San Francisco to take this appointment.

Atlas Marine Paint & Varnish Company manufacture marine paints for all type of vessels, both wood and steel, including fishing craft.

The Maritime Pacific Supply Company of Seattle are the distributors for the company's marine protective coatings in the Pacific North West Area.

Hunter & Webb Of San Francisco

Captain A. T. "Al" Hunter, a popular figure around Pacific Coast shipping circles, and Harold K. Webb are now in partnership as Hunter & Webb, located at 15 Drumm Street. They are engaged in the marine surveying business.

Mr. Webb was a commander in charge of repairs for the Navy. Captain Hunter has been afloat and ashore out of this port for more than 35 years as skipper, bar pilot, and operating manager for the General Steamship Corporation. He is also active in American Legion and Propeller Club affairs.

G. E. Robertson, in charge of sales and manufacturing of Welin Davit & Boat Company, Pacific Coast Division.

Pacific Coast Offices of Welin Davit

The headquarters on the Pacific Coast of the Welin Davit and Boat Company are now located at 272 Steuart Street, San Francisco. The home plant and offices of this well-known company are in Perth Amboy, New Jersey.

All the company's manufacturing and sales facilities on the coast are under the direct supervision of George E. Robertson, who joined the company here in 1942 as field engineer. The following year he became sales manager for the Pacific Coast Division of the company, selling direct to shipyards and shipowners. In January of this year he was appointed to his present position.

Robertson is an old-time seagoing man, having been connected with the U. S. Coast Guard prior to the first world war, during which conflict he served in the U. S. Navy. On cessation of hostilities he served for several years as deck officer in the merchant marine.

Carrier Corp. Appointment

Appointment of Arthur P. Shanklin as vice president and general sales manager of Carrier Corporation is announced by Edward T. Murphy, senior vice president.

Mr. Shanklin will be in charge of all of Carrier's domestic sales activities, effective November 1, 1946.

A vice president of Carrier Corporation since 1941, Mr. Shanklin has been associated with the company since his graduation from the University of Kentucky in 1922. During this period he has served in many sales and executive capacities and at present is vice president in charge of dealer sales.

Arthur P. Shanklin, vice president and general sales manager, Carrier Corp.

Fred M. Rohrer, vice president of Grace Line Inc.

Grace Line Appoints New Operating Head

Grace Line, Inc., announces the appointment of Fred M. Rohrer as vice president in charge of operations, succeeding Philip B. Iglehart, who has resigned.

Well known in shipping circles, Rohrer brings to his new position the benefit of wide and varied experience gained in 34 years in the steamship business, of which 31 have been spent in the service of the Grace Line.

He began his career in 1912 when he joined the Pacific Mail. His association with the Grace Line dates from 1915 when it became identified with the Pacific Mail. His appointment as assistant Pacific Coast manager in 1934 culminated 19 years of service with the line in various capacities on the Pacific Coast.

Rohrer came to New York in 1938 to act as assistant to the executive vice president, the late Daulton Mann. Elected a vice president in 1942, he was placed in charge of all Gulf operations with headquarters at New Orleans, where he served until his return to the New York office in 1944.

Bethlehem Promotions

Arthur Hiltebrant, general manager, New York District, Bethlehem Steel Company, Shipbuilding Division, announces organizational changes, effective immediately, involving the company's Hoboken, Brooklyn 56th Street and Brooklyn 27th Street yards.

The changes include appointment of W. D. Mitchell, formerly assistant manager of the Brooklyn 56th Street yard, to the post of assistant manager, Hoboken yard; of E. L. Koppe, formerly yard superintendent of the Brooklyn 56th Street yard, to assistant manager of that yard; and of Douglas Mansell, formerly of the New York sales office, to assistant to manager, Hoboken yard.

At the Brooklyn 27th Street yard, T. A. Crane is appointed assistant manager of that yard.

Skinner Engine Agent

The Skinner Engine Company of Erie, Pennsylvania, recently announced the appointment of H. H. Van Atten, as district sales representative. He has been associated with the company at Erie since 1929. His new location is at 426-A Temple Bar Building, Cincinnati, Ohio.

Harbor Boat Building Exec's

Executives of Harbor Boat Building Company of Terminal Island, California, aboard a large tuna clipper, Maderiense, now being reconverted from war duty to the tuna trade. Left to right: Al W. Rados, assistant secretary and purchasing agent, J. D. Hamilton, secretary-treasurer, Myles Rados, vice president, and John Rados, president.

One of 12 barges built for the City of New York goes down the ways at Bethlehem's Staten Island Yard.

BETHLEHEM-BUILT BARGES

Designed and Constructed to meet your specific needs

Bethlehem's all-welded hopper-type barge is an example of the superiority of Bethlehem-built harbor craft. This barge, although constructed at low cost, has the following features:

- **Smooth cargo spaces.**
- **Double shell and bottom.**
- **High degree of compartmentation.**
- **Longitudinally reinforced side shell and hopper.**
- **Advanced method of bottom framing.***
- **Improved system for water drainage.**
- **Exceptional ruggedness with no sacrifice of pay-load.**
- **Excellent towing characteristics.**
- **Maximum service at minimum cost.**

**Patent Pending*

Consult us regarding your barge requirements.

SHIPBUILDING . . . SHIP CONVERSIONS . . . SHIP REPAIRS
NAVAL ARCHITECTS and MARINE ENGINEERS

BETHLEHEM STEEL COMPANY

Shipbuilding Division

GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY

BETHLEHEM SHIPBUILDING YARDS

QUINCY YARD
Quincy, Mass.

STATEN ISLAND YARD
Staten Island, N. Y.

BETHLEHEM-SPARROWS POINT SHIPYARD, INC.
Sparrows Point, Md.

SAN FRANCISCO YARD
San Francisco, Calif.

BETHLEHEM-ALAMEDA SHIPYARD, INC.
Alameda, Calif.

SAN PEDRO YARD
Terminal Island, San Pedro, Calif.

SHIP REPAIR YARDS

BOSTON HARBOR
Atlantic Yard
Simpson Yard

NEW YORK HARBOR
Brooklyn 27th Street Yard
Brooklyn 56th Street Yard
Hoboken Yard
Staten Island Yard

BALTIMORE HARBOR
Baltimore Yard

SAN FRANCISCO HARBOR
San Francisco Yard
Alameda Yard

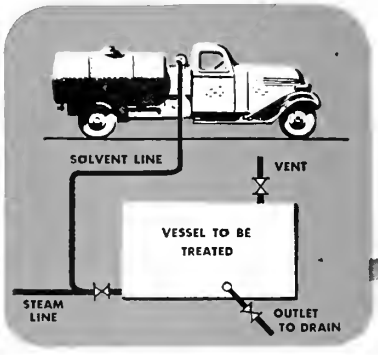
SAN PEDRO HARBOR
(Port of Los Angeles)
San Pedro Yard

NO MORE "BLACK GANGS"

MARINE SCALE REMOVAL NOW DONE THE SCIENTIFIC WAY

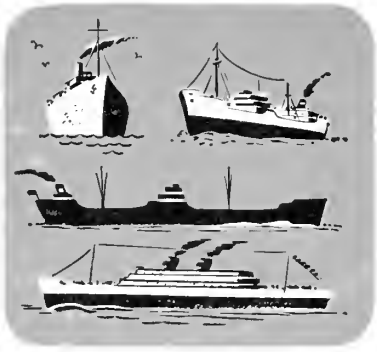
The modern ICI way removes scales and sludges from marine equipment by safe and successful application of chemical treatment. This service includes complete analysis to determine exact type of scale, and often requires both tests of its chemical solubility and X-Ray examination for identification of complex substances.

With the proper solvents determined, International dock-side equipment, manned by expert technicians, is available at any day and hour. This specially-designed equipment includes all required trucks, tanks, pumps, motors and fittings for immediate introduction of the right solvents into the unit to be cleaned.



A schematic diagram of a typical hook-up for the modern, economical, safe and time-saving method of removing water-deposited scales and sludges from all types of marine equipment. The chemical solvents penetrate wherever water can flow, so that all interior surfaces are thoroughly cleaned.

Heat transfer units are quickly restored to original efficiency—excessive cost of manual cleaning is eliminated—no dismantling or disassembly is necessary and time off the line is reduced to a matter of hours. All this adds up to more profit for you.



It makes no difference what type your ship may be, ICI scientific methods and modern equipment are equally applicable to boilers, exchangers, water filters, condensers, water tanks, water lines, economizers and the host of other products with the same characteristics.

Call ICI and watch your operating efficiency go up while your cleaning costs go down. Remember, with ICI you have less down time; no disturbance; fuel costs are cut; every surface area, whether curved, plain or tubular, is thoroughly cleaned. Investigate this service now.

Licensed under processes practiced by Dowell, Incorporated, a subsidiary of the Dow Chemical Company.

CHEMICAL SERVICE DEPARTMENT
INTERNATIONAL CEMENTERS, INC.

LONG BEACH, CALIFORNIA

Service Offices: Long Beach, Calif.—Tel. 48591 • Oakland, Calif.—Tel. HIgate 6168

SUISUN BAY PERMANENT BASE TO COST $638,000

As part of a program by U. S. Army engineers, the lay-up fleet base at Suisun Bay, California is to be made into a permanent base at a cost of $638,975. In addition to the California base, there is to be one at Puget Sound which with others on the East and Gulf Coasts will require expenditures totalling $10,000,000. Most bases will have floating drydocks but they will come from Navy surplus. Principal cost involved will be for piers, sheds, dredging and utilities.

* * * * *

SHIP CONSTRUCTION PROGRAM WILL PROCEED

The Maritime Commission is still working on plans for big passenger liners and an announcement regarding them is expected soon. The American Export Lines announces that as soon as the tax question is decided favorably, some $50,000,000 will be spent on three 20,000 ton ships. Other companies are known to have plans in the works for new passenger ships.

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INTERIOR DESIGNER SELECTED FOR S.S. ARGENTINA

The Argentina, to be chartered to the Moore-McCormack Lines, will have her interior fittings designed by Donald Deskey Associates of New York City.

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ADDITIONAL C TYPE ALLOCATIONS

In addition to allocations previously recorded here, the Maritime Commission on October 22 announced approval of the following applications:

6	C2-S-AJ1	to A. H. Bull & Company,
3	"	" Alcoa Steamship Company,
4	"	" Oceanic Steamship Company (Matson)
4	"	" Strachan Steamship Company,
2	C2-S-B1	" Sprague Steamship Company,
6	"	" States Marine Corp.,
9	"	" U. S. Lines

Applications still being processed are as follows:

5	C3-S-A3 and C3-E	to American Export Lines,
4	" " "	to Waterman Steamship Corp.,
5	C2-S-AJ1	to Coastwise Line (Pacific Far East),
1	"	to Grace Line,
6	"	to Lykes Brothers Steamship Company,
4	"	to Waterman Steamship Company,
5	C2-S-B1	to Agwilines,
3	"	to Grace Line,
4	"	to Lykes Brothers Steamship Company,

SHIP SCALING AND PAINTING RULES CHANGED

Contracts for ship scaling and painting not done under WARSHIPLUMPSUMREP shall, on and after October 7, 1946, be contracted for on a fixed price basis only, the Maritime Commission has announced in Supplement No. 4 to Operations Regulation No. 12 (Former Series of W.S.A.). The new regulation applies only to vessels operated under General Agency Agreements, and supersedes the authority as to ship scaling and painting contained in Regulation No. 12, dated September 12, 1942.

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DELTA QUEEN FOR SALE

Until November 20, 2:30 P.M., EST, the Maritime Commission will receive bids for the sternwheel river passenger steamer Delta Queen now in the Suisun Bay reserve fleet.

It has been suggested that the ship is wanted for excursion service on San Francisco Bay and the California rivers.

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MARITIME COMMISSION CLOSING FOREIGN OFFICES

The Maritime Commission has been maintaining offices in Europe and Asia and closed 11 of them September 30, with 10 more scheduled for closing October 31.

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BETHLEHEM EXPANSION PLANS

H. H. Fuller, President of Bethlehem Pacific Coast Steel Corp., announced on October 21 that his company is expanding in Seattle, Los Angeles and South San Francisco, including rebuilding the Seattle bolt and nut plant, doubling the facilities at the Los Angeles steel plant and completing a new mill depot in San Francisco. The company now operates 13 establishments on the West coast and 9 supply stores in the California oil fields.

* * * * *

U. S. STEEL ANNOUNCES GENEVA BASING POINT

Effective October 14, the Geneva Steel Company established Geneva, Utah, as a basing point for sales of the products of the Geneva plant. This activity comes under the jurisdiction of Columbia Steel Company of San Francisco, a subsidiary of U. S. Steel.

* * * * *

MARINE SURPLUSES DIMINISHING RAPIDLY

Seventy-two per cent of all marine items declared surplus by the Maritime Commission have now been sold for a total of over $86,000,000.

This surplus has had a drugging effect on the market for marine materials and this condition is approaching termination.

* * * * *

U. S. LINES INSTALLING RADAR

Twenty ships of the U. S. Lines including the America are being equipped with the Raytheon Mfg. Co.'s Pathfinder radar sets. Nineteen of the ships are the C2 cargo design.

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BIG CHRISTMAS G. I. CARGO

American ships will carry to overseas soldiers more than 150,000,000 pounds of Christmas mail, which added to other commercial and holiday mail will require 4,300 railroad cars and 3,000,000 mail bags for transportation to the ports of San Francisco and New York. This is more than 8 ship loads.

MARITIME COMMISSION ANALIZING SHIP BUILDING REQUIREMENTS

Analysts of the Maritime Commission are basing the future ship building program, in addition to the number and types of ships needed, on certain other interesting points. One of them is to build ships enough to keep private shipyards in operation. Another is to provide employment for a nucleus of skilled workers to maintain the industry. Another is to determine how many of the 48 states would be benefited by the manufacture of materials for shipbuilding and the number of allied industries in each state that would be benefited.

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SWEDEN APPROVES AIR SERVICE FOR SHIP LINE

The Swedish Civil Aeronautics Board has approved integrated sea and air passenger services with the statement that such a combination is beneficial to the public. The Government has also approved air service from Sweden into the United States by an air line which is largely owned by the Swedish American Steamship Line. This type of service is prohibited to American steamship companies for operation either to foreign overseas points or to domestic overseas points.

* * * * *

BIDS WANTED ON RECONDITIONING

Until November 6, 12:15 P.M., EST, the Maritime Commission will receive bids for the reconditioning of the SS Del Santos (EX Talisman). This vessel will be operated by the Mississippi Shipping Company, New Orleans.

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PRICES FIXED FOR ADDITIONAL VESSELS BY MARITIME COMMISSION

The Maritime Commission announces prices for additional types of vessels in accordance with the Ships Sales Act of 1946 as follows:

Type of vessel	Prewar domestic cost	Domestic war cost	Unadjusted Statutory sales price	Floor price
Dry cargo			50% 1941 cost	35% war cost
C2-S1-AJ4**	$3,280,000		$1,640,000	
Combination cargo-passenger				
C3 P&C**	3,800,000	$4,940,000	1,900,000	$1,729,000
Passenger and cargo	3,300,000	4,300,409	1,650,000	1,505,143
P1-S2-L2	3,615,000*	5,018,004*	1,807,500*	1,756,301*
P2	6,949,967*	9,647,293*	3,474,983*	3,376,553*
YF covered barge	161,000	209,300	80,500	73,255

*Price based on bareboat ship after removal of national defense features and without passenger accommodations or additional cargo handling gear.

**For adjustment for prior sales; not available for disposal. In the case of the C2-S1-AJ4, the purchaser's contract shall provide for payment of the floor price if the floor price calculated upon the war-built cost (when available later) is higher than the statutory sales price, and for adjustment of the statutory sales price if the difference between the domestic war cost and the prewar domestic cost is greater than 80%.

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HANDY & HARMAN OPENING IN LOS ANGELES

The New York firm of Handy & Harman is completing a plant at 3625 Medford Street, Los Angeles, to refine silver and gold, roll sheet stock, and process industrial alloys. Operations will begin about November 1. Herman A. Folgner is West Coast manager.

FIRST POSTWAR TANKER CONTRACT

The first postwar contract for construction of an ocean going tanker has been negotiated between Bethlehem and Gulf Oil Corp. The new single screw bulk oil tanker, approximately 13,000 deadweight tons and 450 feet long, is similar to those built for Gulf before the war. The new vessel is scheduled to be delivered in May 1947.

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BOAT SALES

There are many small boats of various types being offered for sale by the Maritime Commission and reports of these sales reach the office of the Pacific Marine Review regularly. If our readers would care to have them recorded here in order to develop the sale of repair or replacement parts, or for insurance purposes, we would be glad to be so advised.

* * * * *

DIESEL-ELECTRIC POWER FOR ORE SHIP

During September the Inland Steel Company's freighter E. J. Block was tested in Lake Erie. The vessel is the first Diesel-electric ore carrier on the Great Lakes. In a crash stop test, the vessel proceeding at 13 miles an hour was reversed and brought to a dead stop in 1,650 feet.

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ADEL EXPANDS

The Adel Precision Products Corp., Los Angeles, has acquired the Aerco Corp. and will operate the new acquisition as a subsidiary.

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HIGGINS TO LEASE DELTA YARD

Andrew J. Higgins is arranging to lease the yard of the Delta Shipbuilding Company at New Orleans when the plant is released by the Maritime Commission. Higgins plans to build 25 ocean going ships at a cost of $80,000,000 for a foreign government. His present plants are not equipped to build deep sea vessels.

* * * * *

DOLLAR AIR LINES

Articles of Incorporation were filed during September by the Dollar Air Lines Inc., with a capitalization of $300,000. President of the company is R. Stanley Dollar, Jr. The company plans to engage in air freight transportation and will operate non-scheduled flights to domestic and overseas destinations.

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TODD SHIPYARDS TAKES OVER CHARLESTON PLANT

The Todd Shipyards Corporation which owns and operates 6 shipyards on the Atlantic, Gulf and Pacific Coasts took over operation of the Charleston Shipbuilding and Drydock Company at Charleston, South Carolina, on October 1.

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NETHERLANDS WANTS VICTORY SHIPS

The Netherlands Government is reported to have arranged to purchase 13 Victory ships from the Maritime Commission as soon as such vessels are available. All Victorys in suitable condition are now in operation under charter, most of them on intercoastal runs. As soon as they can be replaced, the Netherlands Government will complete this purchase which will increase the number of ships under application from that source to 46.

EARLE M. JORGENSEN CO.

COLOR CHART

CARBON AND ALLOY STEEL BARS & BILLETS

When small diameter bars are supplied in an analysis identified by two colors, such as A-4142, one end is painted one color and opposite end other color.

MILD STEEL		A-2335/40 ANNEALED BARS and UNANN. BILLETS	
C-1019 H.R. FORGING QUALITY BARS and BILLETS, also C.F. and T. & P. BARS		A-3141 ANNEALED BARS and UNANN. BILLETS	
PLOW STEEL (Hot Rolled) B-1112 COLD FINISHED BARS		A-4142 ANNEALED BARS and UNANN. BILLETS	
B-1113 C.F. BARS		A-4142 HEAT TREATED BARS	
C-1040 H.R. FORGING QUALITY BARS and BILLETS AN-QQ-S-684a (4130) HEAT TREATED & C.F. BARS		A-4620 BARS and BILLETS	
AN-QQ-S-684a (4130) ANNEALED BARS and UNANN. BILLETS		A-4815/20 ANNEALED BARS and UNANN. BILLETS	
STRESSPROOF BARS (C.F. also Ground) AN-QQ-S-752a (4140) H.R. ANN. BARS and UNANN. BILLETS		A-8717 BARS and BILLETS	
AN-QQ-S-756a (4340) ANNEALED BARS and UNANN. BILLETS		A-8742 HEAT TREATED BARS	
No. 39 MACHINERY STEEL (Hot Rolled Bars) A-4130 POLISH ROD STEEL (Cold Finished Bars)		A-8742 ANNEALED BARS and UNANN. BILLETS	
C-1019 PRECISION SHAFTING C-1095 H.R. SPRING STEEL		E-52100 SPHEROIDIZED ANNEALED, BEARING QUALITY BARS and BILLETS	
C-1117 BARS			
C-1137 BARS			
A-2317 BARS and BILLETS			

PLATES AND SHEETS

SPEED TREAT	SPEED CASE
FIREBOX	BOILER FLANGE
MAYARI R	ABRASION RESISTING
HIGH CARBON (C-1042)	AN-QQ-S-685 (4130) Normalized

TOOL STEEL BARS & BILLETS

Squares are shown to illustrate side striping of certain brands.

GRAPH-MO	B.T.R.
XX	OMEGA
X	W.H.C.
SPECIAL HIGH SPEED	PREMIER ALLOY CHISEL
445 HOT WORK	LEHIGH S TEMPER

STAINLESS BARS & BILLETS

Type numbers are stamped on Stainless Steel Sheets and Plates.

TYPE 303	TYPE 440-A
TYPE 416	TYPE 440-C

EXPLANATION

This chart shows colors of only the most widely used steels. Refer to our Stock List for identification colors of other steels.

Where a certain color identifies more than one type of steel, the *finish* is specified to enable identification. For example, a bar with ends only Green is Plow Steel if *hot rolled* and B-1112 if *cold finished*. If ends are Green and *side is striped* Green, it is XX Tool Steel. Stainless steels may be distinguished from other steels by their distinctive finish. Therefore, while Green is also used for Type 416 Stainless, it tells *which type* of Stainless Steel it is rather than to distinguish it from Plow Steel or B-1112.

Get your free copy of this steel identification color chart—see *next page for details.*

Jorgensen's new steel identification color chart gives the answer

Jorgensen carries a large and diversified stock of carbon, alloy, stainless and tool steels and identifies each analysis with a color or combination of colors. Users of Jorgensen steels are supplied with a color chart (see other side of this page) to enable them to identify, quickly and positively, any of the various analyses which comprise their particular requirements.

A reproduction of this color chart, mounted on cardboard, may be obtained by writing or telephoning the Jorgensen office nearest you. It is also available in a larger size (14″ x 18″) and if you would prefer that size, please ask for the wall chart.

Of course, there is no charge for any number of either the small or the wall charts that you can use.

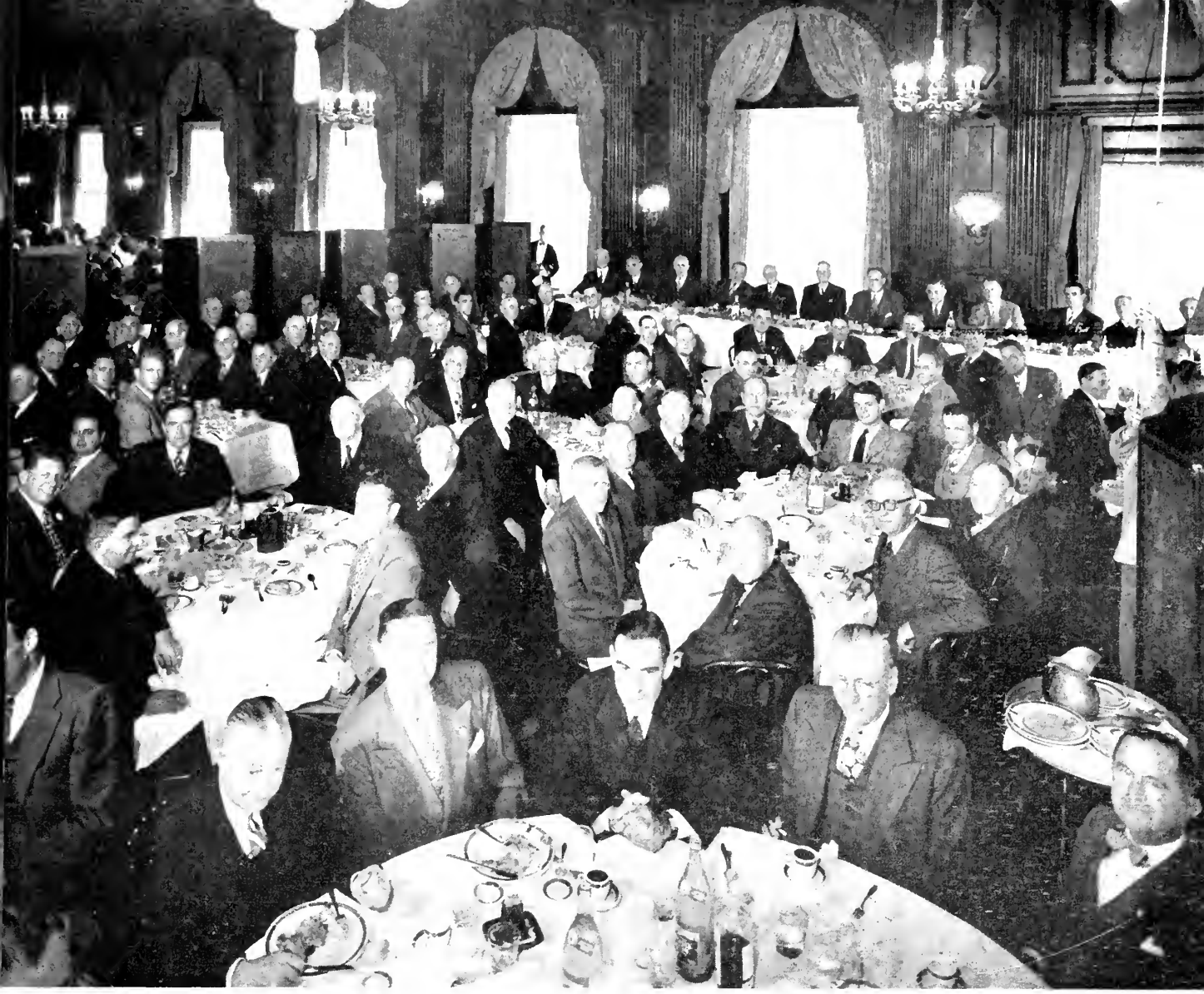
EARLE M. JORGENSEN STEEL

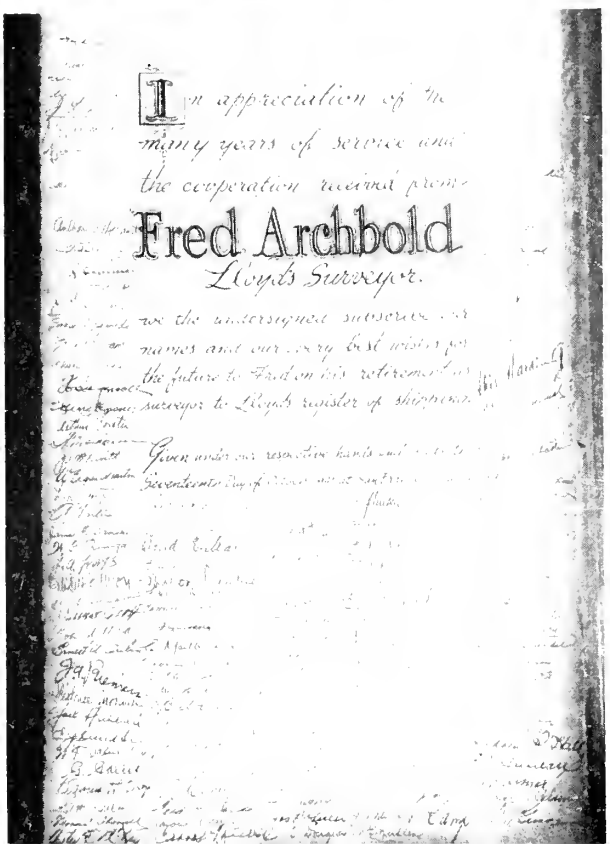
LOS ANGELES
10510 S. Alameda
LUcas 0281

SAN FRANCISCO
Ask Operator for
Enterprise 10942

OAKLAND
1657 22nd Street
Higate 2030

HOUSTON
5311 Clinton Drive
Charter 4-1761





Two Great Tributes to Fred Archbold

It was truly a "gathering of the clan" of shipbuilders and marine engineers of the Bay Area the evening of October 16, in the Bohemian Club in San Francisco. They assembled to do honor to Fred Archbold, retired as Senior Surveyor Lloyds' Register of Shipping. The chairman of the evening was W. M. Laughton, who handled his duties in his usual witty and inimitable style.

The industry turned out again for a further tribute at a Commercial Club luncheon, (shown in part above), presided over by Capt. A. F. Pillsbury and Ed Hough.

Mr. Archbold has been 30 years with Lloyds, in Japan Los Angeles and San Francisco, and succeeded David Millar, who retired in 1942.

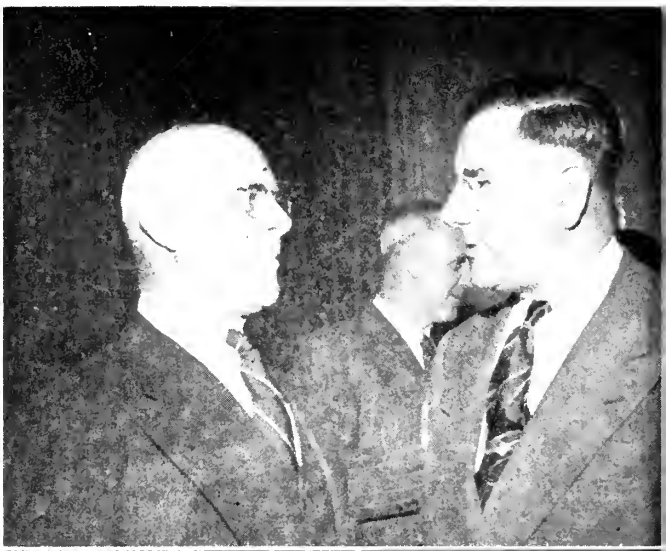
◀ Robert Christy, W. F. Laughton, Captain A. Pillsbury and Ed Hough.

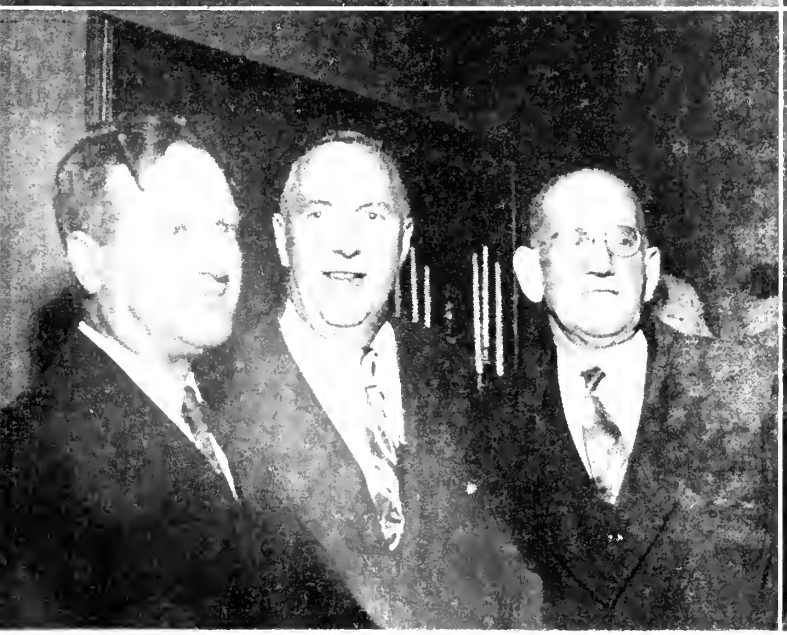
▼ Below, left: Fred Archbold and David Millar.

Below, right Tom Plant and Arthur Forester.

At Bottom, left: John Clerico, J. H. Camp and Fred Ritchie.

At Bottom, right: Sewell Knapp and Godfrey Waters.





▲ Above, left: Tom Plant, Earl Marlborough and Thomas J. Cokely.

Above, right: F. G. Wilkenson, J. L. Prentiss, Ed Schneider, David Millar, and W. L. Martignoni. ▲

At right: J. Jacobsen, L. H. Pringle, A. Ramsey, V. Dacquisto, C. Miller. ▶

At right, bottom: Hal Moore, Captain E. Palmer, Earl Marlborough, Sewell Knapp and M. G. Bartlett. ▼

▼ Below: Thomas Smith, Charles B. Purcell, Emmet J. Ahern, James H. Camp, Robert Murphy, O. S. Negaard.

▲

Above. Joseph Moore and H. Fawke.

▲

Above, left. Harry Clegg J. Jacobsen, F G. Wilkenson and J. H Camp.

◀

At left: Fred Archbold, W. M Laughton, Robert Christy, David Millar, and Andrew Hall.

Below, left Claude Knudsen, Fred Archbold and P. Coxon.

◀

General Office and staff, 1946. Phil Pope, Conie Holubar, Bill Eggers, Clarence Hawks, Lou Bizal, Linn Hunt in clockwise order.

60th Year for Marine Electric

The Marine Electric Company of San Francisco, which will celebrate its 60th year in the business some time this year, has the unique record of surviving three wars and their accompanying depressions.

Originally known as the D. D. Waas Company when it was established in 1886, the name was changed to the Marine Electric Company shortly after the Spanish-American War in 1898. The electrical industry was in its infancy at that time, so in addition to the repairing and servicing of batteries, the major part of the company's business consisted of the manufacture of ships' rails. Due to the increased electrification of ships' lighting plants during the Spanish-American War, the company was really well established in the marine electrical field at the conclusion of these hostilities.

Bill Cathcart, general manager of Marine Electric Co.

D. D. Waas died in 1904, and two employees—Lou Helm and Mike Quinn—thereafter purchased the business and operated it on a partnership basis until 1919 when Helm bought out Quinn's interest. The business was incorporated in 1923, and operated under Helm's direction until the time of his death in 1930.

At the time of the 1906 fire, the firm's facilities were completely destroyed at 34 East Street (Embarcadero).

but in 1907 new facilities were established at the present location, 195 Fremont Street and corner of Howard Street.

A remarkable feature of the company is the length of service of some of its employees. Bill Eggers, the assistant manager, started work in 1913, and aside from his Army service in the first World War, has been continuously employed. Bill Cathcart, vice president and general manager, joined the organization in 1925. Other employees with long service are: Jack O'Hare, treasurer and general superintendent, 29 years; Conie Halubar, outside superintendent, 28 years; Willie Tholke, fire alarm specialist, 27 years; Jim Murphy, sales engineer, 22 years.

The company maintains complete equipment and skilled personnel for the handling of all types of electrical installations, repairs and service. Ship refrigeration, which developed into an important factor in the business since the start of the last war, has continued to increase. The installation and servicing of any type of refrigeration system can be undertaken, and spare parts for all makes of compressors and related equipment are carried in stock.

The Marine Electric Company represents the following companies:

The Diehl Manufacturing Co.—
Makers of electric fans and blowers

Servel, Inc.—
Makers of refrigeration compressors

Automatic Electric Sales Corp.—
Makers of sound power telephones

Edison G. E. Appliance Co.—
Makers of electric galley equipment

H.R.S. Marine Radio—
Makers of radio telephones

Last year the company was appointed the Bay Area contractor for the Chrysler Air Temp.

A complete line of watertight fixtures and fittings for marine use, carbon motor and generator brushes, are also manufactured at the company's plant.

▲

Machine shop, manufacturing watertight electric fixtures. Corner of motor and generator rewinding shop.

Marine Electric Co. staff in 1908 at present site. Included in the group are Messrs. Stoll, Wright, M. Murray, Beck, Harms, Charles Glickborg, Peterson, Swope, Tony, Arthur Urgins, Al Hammerston, L. E. Helm

◄

Mechanical Handling Must Come—*(Concluded from October issue)*

By WILLIAM C. CROSBY

There is the question of pallet loads shifting either on the truck or in the ship. To avoid this, some shippers are gluing their unit loads together, others are strapping them to the pallet with steel, some are experimenting with paper tape. But even without these aids there is little reason for such a load to shift on a truck if it fits the truck and is properly dunnaged. The same goes for the hold of the ship. As a matter of fact, I recently inspected a shipment of pineapples which had been stowed on pallets and the vessel had gone through a hurricane. When the hatch was opened, there was no noticeable movement of those pineapples and they were unloaded with the greatest dispatch.

What will labor's reaction be to all this? That is more difficult and requires an intelligent, far-sighted approach that only too frequently has been lacking in our labor relations. But the fact remains that there are clear indications that top labor leaders are coming to realize that only through increased production can they hope to get higher wages. Since this would give that increased production, there appears to be no reason why the problem cannot be worked out. So far unions have cooperated on experiments along these lines. And, as a matter of fact, if they don't cooperate on increasing production along some lines, the steamers are doomed anyway.

There is also a big problem in the matter of designing the pallet that will fit all of the various handlings and shippings and at the same time be inexpensive and easily repaired. This will have to be a matter of adjustment and compromise. The answer can be found. The important thing from the steamship point of view is to get in there first so that they won't have to do all of the compromising.

Incidentally, the railroads, never noted for being in front on new ideas, are apparently taking considerable interest in unit loads as something to be talked about. However, so far they seem to feel it is a problem for the shipper, not them. Hence the steamship lines alone are in the key position to guide the development to suit themselves.

Somebody wants to know who will pay for the pallets. Ultimately the pallets will be paid for by the trade out of the savings made in handling. The proportion to be laid out by each carrier or handler will depend on the savings he makes and negotiation. Until very cheap, expendable pallets come on the market, and they are just around the corner, a rental basis is probably the solution with ownership possibly vested in a corporation set up for that purpose. Such a corporation would also handle the movement of pallets from one type of carrier to another. There is no real problem here. Freight cars move over many railroads. Reusable bottles, beer cases, many other items are easily handled in this way. And a pallet interchange, which is being set up in the Port of New York, has apparently solved most of the problems in this connection.

So it goes. There are probably other and unforeseen bugs. But they certainly are no more serious than many other problems which have been solved by American engineering and energy.

One major danger does exist, however, and that is that localized movements of this sort may be set up without guidance or over-all planning. With all the talk and thinking that is going on along these lines, with all the experiments and actual recognition of the possible savings, shippers, trucklines, and others will be starting unit shipments. One large glass manufacturing company has already queried its customers asking if they are prepared to receive palletized shipments. A number of other manufacturers are said to be doing the same thing.

One liquor firm is shipping rum on pallets.

The whole movement is in the air and is coming just as sure as taxes. But the danger, so far as the intercoastal lines are concerned, is that these little localized movements will develop along lines that will mean little or nothing in savings to them. An inch difference in the size of a pallet could theoretically make the difference as to whether it was profitable or unprofitable for the steamship lines to handle it.

It certainly would appear like wisdom on their part to make absolutely certain that the unit loads of the future fit their operations and their cargo spaces. If they don't take the lead, the whole thing can develop haphazardly and there can be more sizes of units than there are sizes of boxes, or at worst the units can be specifically designed to fit perfectly on a freight car but very indifferently in a cargo hold.

What agency is best in position to clutch this problem and develop it, commodity by commodity, based on the individual conditions surrounding each interested party? In my mind, there is no question. It belongs to the intercoastal steamship operators as the group having primary interest. They are the connecting link between the East and West Coasts, and they obtain the greatest share of the through revenue. What is more important, they have more to gain through long range planning and the attaching of tonnage to water movement than anyone else.

This could be handled by the Intercoastal Conference. It would seem that the time has passed for rate matters to be the only thing cleared through the Conferences.

(Continued on Page 122)

Mechanical Handling Must Come

(Continued from Page 120)

With rising costs, operations now loom as the most enormous single problem.

If the Intercoastal Conference were to assign one or two experienced operational analysts with practical experience and knowledge of the latest methods, they could take each volume commodity separately and work out in detail the unit packaging most desirable for every operation clear through from the shipper to the consignee. The trucking industry would be sure to support such an undertaking in the hope of eliminating the delays that plague them at every pier. Certainly, the California terminals and ports would help for the savings they could realize. And so would the shipper, provided he could see a clear-cut savings and provided he was approached by a representative of all lines rather than any one particular line.

Such a service, whether it consisted of one man or a small office, could handle many of the experiments and contacts that will be required. It could consult with shippers who have already started programs of their own It could set up unit load and packaging standards that would cut down materially on many of the costs that now plague the steamship operators such as claims and pilferage.

If such a move is not made, it is not beyond possibility that a government agency may take the step in connection with establishing rates. The American public must eventually be given the most economical transportation that modern methods can make possible.

The opportunity is here and now for the Intercoastal Steamship Lines. It may not be here tomorrow. If they move now, there is every hope for healthy, sound success. If not, the chance may never come again.

Valve Problems

(Continued from Page 89)

seat, caused usually by a spring that is too weak. With a strong spring the valve stem will keep cam contact at all times. If a sticky valve is operated with a weak spring the cam may break contact and strike the valve stem with considerable force when it makes contact. Valve springs should be tested for compression pressures at each valve servicing period. If a regular spring tester is not available a comparative test may be made with a small platform scale as shown in the illustration. First compress a new spring to operatng length at open valve position and note the reading. Then test each of the used springs and reject all that show readings of 10 per cent or more under the reading for the new spring.

Timing

Exhaust valve timing is very important in four cycle engines. This timing is best checked by use of the light spring indicator diagram. Net gains in power of the order of 5 to 10 per cent have been gained by opening the exhaust valves earlier and higher and closing them later, thus clearing out all the burned gasses before filling the cylinder with fresh air. Timing by the setting of the inlet valve only will often throw the exhaust valve operation out of synchronism with the piston travel.

Ignition timing ties in very closely with correct valve timing. The most satisfactory method is by use of the stroboscopic neon timing light in combination with a flywheel marked to indicate dead center for each of the cylinders and graduated to show the desirable point of ignition. When the flywheel is rotated and the marked points coincide exactly with the flashes of the neon light then the ignition timing is correct. If not the proper adjustment should be made.

In operation great care should be taken to see that the cooling water passages in the cylinder heads are kept free from scale and any other impediments. If necessary the installation should be converted into a closed cooling system using treated water.

Tanker F. S. Bryant

(Continued from Page 47)

pump room has a Worthigton vertical duplex 10″ x 7″ x 10″, 275 gpm, reciprocating steam drive bilge pump.

Navigating Equipment

In the chart room and wheelhouse the most modern navigating and control equipment is installed, as follows: Three U. S. Navy Standard, Kelvin-White make, liquid compasses are fitted, one with binnacle, on top of the wheel house, one with binnacle in wheel house, and one aft on stand on poop deck house; two 6 inch aneroid barometers in chart room and captain's office; one Lietz electrically operated patent sounding machine on bridge; one Fathometer; one Walker ship's log; two chronometers; two clinometers, one in wheelhouse, one in pump room; two 18 inch pilot incandescent searchlights; one Sperry electrical helm angle indicator; and one Mackay radio direction finder. In addition to all this, is the Sperry complete master gyro compass with a steering repeater at gyro pilot and four hearing repeaters, one at radio direction finder, one at each wing of bridge, and one on wheel house top. A complete gyro pilot steering stand is fitted in the wheelhouse and equipment for electric and gyro steering in the steering gear room. A 3-day continuous course recorder is installed in the wheelhouse.

Deck Machinery

The deck machinery is all by American Engineering Company, for steam drive and designed to handle its loads at a minimum steam condition of 100 psi and to normally work on 140 psi.

One spur geared double reduction windlass capable of hoisting simultaneously both anchors from a depth of 30 fathoms at a speed of 30 ft. pm is installed on the forecastle. Smooth gypsy heads 23.5″ x 27″ are fitted on the intermediate gear shaft. Naco cast steel anchor chain is used. There are 6 mooring winches each capable of exerting an out-haul pull of 20,000 pounds. These

(Please turn to Page 124)

Tanker F. S. Bryant

(Continued from page 122)

are located: one on poop deck aft; two at quarters on top of poop deck house; two on frecastle deck; and one on upper deck forward. All drums have winding speed of 130 fpm and a capacity to accommodate 1300 feet of 1¼ inch cable. One heavy duty warping winch is installed on the upper deck amidships. It is of the double spur geared type with single drum and an extension shaft and bearings for two-gypsy heads.

Two cargo winches arranged for single lever operation by one man are installed directly aft of the forward dry cargo hatch.

An American Engineering Company electro-hydraulic type steering gear handles the rudder. This gear is fitted with two Hele-Shaw hydraulic pumps driven by electric motors each of sufficient capacity to handle the gear. Manual steering is accomplished from the deck above by means of a Hele-Shaw hydraulic pump that actuates two auxiliary hydraulic rams working on the tiller. In the specifications for these tankers, the rugged character of hull construction and machinery design predominates. All ratings of power producing and power using units are very conservative and it is apparent in all parts of the structure and its equipment that reliability at sea and low maintenance costs are more important to the designer than savings in weight or in the last ounces of fuel economy.

Briggs New U. S. Lines' Passenger Head at S. F.

Donald V. Briggs has been anpointed to the post of district passenger manager of the United States Lines at San Francisco. He has been with the shipping company since 1923. As assistant manager of the agency department at New York for a number of years, he was well known to travel agents throughout the country.

Mr. Briggs served as liaison officer in ports of embarkation throughout the country including San Francisco where he was chief of the Liaison Section from July to December, 1945. At that time he was recalled to the Hampton Roads Port of Embarkation to serve as executive officer and later commanding officer. When he was released from active service in July, 1946, he held the rank of lieutenant colonel.

Comdr. Phillips' Appointment With N. F. A. S.

Lieut. Comdr. Edward C. Phillips, USCGR, well known in marine and aviation communications, is appointed assistant to the Director of Telecommunications of National Federation of American Shipping.

The appointment was announced by Almon E. Roth, Federation president. Comdr. Phillips will serve as an assistant to Commodore E. M. Webster, the Federation's Director of Telecommunications. Webster is now in Moscow attending a five-nation parley on Telecommunications.

Shoreside Personalities

Shortly after DONALD V. BRIGGS was discharged from the Army (with the rank of Lieutenant Colonel) he was appointed San Francisco district passenger manager for the United States Lines in San Francisco. He is located at 222 Sansome Street. Briggs has been associated with the steamship business for some 23 years.

* * *

H. BOYCE LUCKETT, who was with the Washington offices of the American President Lines, is now located in the San Francisco offices as an executive assistant to President Henry F. Grady. Luckett served in the Navy as Lieutenant Commander and was attached to the War Shipping Administration.

* * *

ASSOCIATION OF CLYDE M. SHUMAKER, well-known Pacific Coast steamship man, with Lloyd Shipping Company of San Francisco was announced. He recently was discharged from the Army with the rank of major following overseas service in the Pacific. Before the war, he was associated with Oliver J. Olson & Company, Coastwise Line, and the Panama Railway Company. Lloyd Shipping Company operates a cargo, refrigerator, and passenger service between California ports, Mexico, Central America, and Panama.

STATEMENT OF OWNERSHIP

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of PACIFIC MARINE REVIEW, published monthly at San Francisco, California, for September 24, 1946, State of California, County of San Francisco.

Before me, a notary in and for the State and county aforesaid, personally appeared MR. JAMES S. HINES, who, having been duly sworn according to law, deposes and says that he is the Publisher and Partner of the PACIFIC MARINE REVIEW, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, JAMES S. HINES, 500 Sansome St., San Francisco 11.

Editor, ALEXANDER J. DICKIE, 500 Sansome St., San Francisco 11.

Managing Editor, T. DOUGLAS MacMULLEN, 500 Sansome St., San Francisco 11.

Business Manager, BERNARD N. DeROCHIE, 500 Sansome St., San Francisco 11.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

JAMES S. HINES PUBLISHING COMPANY, 500 Sansome St., San Francisco 11.

James S. Hines, Partner, 500 Sansome St., San Francisco 11.

Mary G. Hines, Partner, 500 Sansome St., San Francisco 11.

B. N. DeRochie, Partner, 500 Sansome St., San Francisco 11.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

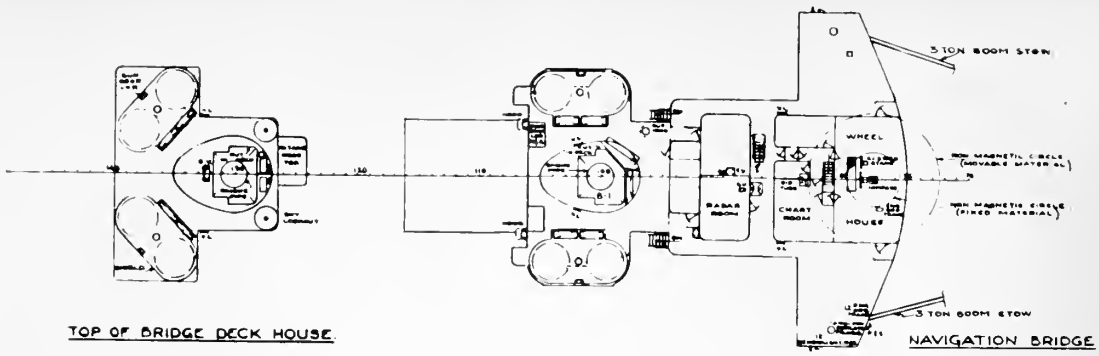
4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAMES S. HINES (Signed)
Publisher and Partner.

Sworn to and subscribed before me this 24th day of September, 1946.

FLORENCE HANEY
(SEAL) Notary Public in and for the City and County of San Francisco, State of California.

(My commission expires May 23, 1949)



Transport Admiral Sims Converted

(Continued from page 55)

Company's San Francisco Yard has already completed conversion work on the Admiral Hughes. Another Bethlehem-Alameda built Navy troop transport has been converted at its San Pedro Yard. Two other vessels of the same type, both built at Bethlehem-Alameda Shipyard, Inc., have been converted at the company's New York Yards. In addition to the five vessels above mentioned, Bethlehem's Shipbuilding Division has been awarded similar conversions to Army transports on 13 other modern vessels.

But even with this job the Army is not through. The Sims will be back in the yard in February for further alterations.

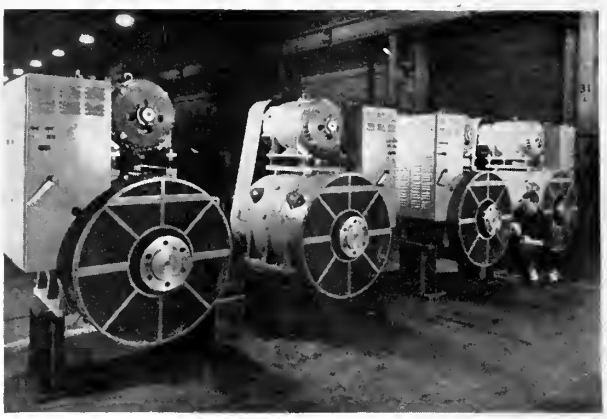
CHARACTERISTICS

Length Overall	609′ 5¾″
" 32 Ft. Waterline	593′ 2 ″
" 29 Ft. Waterline	590′ 0 ″
" Bet. Perpendiculars	573′ 0 ″
Beam molded	75′ 6 ″
Draft Subdivision	30′ 0 ″
Draft Scantling	32′ 0 ″
Normal Shaft Horsepower	18,000
Sustained Sea Speed	19 Knots
Depth Molded Promenade Deck	61′ 6 ″
Height Upper Deck to Promenade Deck	9′ 0 ″
" A Deck to Upper Deck	9′ 0 ″
" B Deck to A Deck	9′ 0 ″
" C Deck to B Deck	8′ 6 ″

General Engineering's Metalizing process being used on an anchor windlass clutch drum in one of our San Francisco shops. The process has been of great value in repairing main engine crankshafts and connecting rods showing wear or chattered marks. It has also been used extensively in repairing drive shafts which have been badly pitted or corroded. We will welcome your inquiries concerning our metal spraying process.

Keep Posted

New Equipment and Literature for Yard, Ship and Dock



Allis-Chalmers 540 kw d.c. propulsion generator of a new design.

New Design of Allis-Chalmers Propulsion Generators

Allis-Chalmers 540 kw d.c. propulsion generators of a new design, 685 hp motors and controls are installed in two new all-steel diesel-electric ferryboats, one of which was launched at the Jakobson Shipyards at Oyster Bay, L. I., in May with the second scheduled for launching there before the end of the year.

The vessels, designed for passenger and vehicle transportation service between 69th Street, Brooklyn, and St. George, Staten Island, New York, and operated by Electric Ferries, Inc., New York, are unique in that they have 1350 shp divided between two propellers, one on each end of the same shaft. The Allis-Chalmers propulsion control affords finger-tip pilot house control over the movement of the vessel and assures a smooth flow of power at all speeds. A combination of generator field control and engine governor control makes it possibe to operate the propulsion motors at any speed within their range, forward or astern, without slowing the engine below one-half of rated speed.

All four propulsion generators for the two ferryboats are shown viewed from the coupling end on the shipping floor of the Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin. Mounted on top of each generator is a belted 35 kw exciter, which furnishes auxiliary power as well as excitation.

STEAM CONDENSERS is the title of Catalog No. 1461 which contains the latest information on the modern dual bank designs of C. H. Wheeler of Philadelphia. Typical tube sheet arrangements for large, medium and small condensers that have been installed by Wheeler in central power stations and industrial power plants throughout the country appear on the pages of this catalog.

New Smooth Speed Boat Seat Units

Riding the waves in a motor or speed boat, even in rough or choppy waters at high speed, soon will be as smooth as riding in a passenger car on a paved highway.

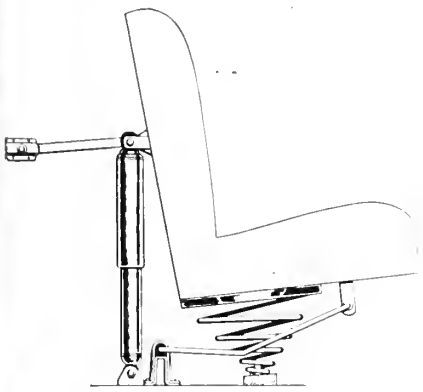
A new hydraulically controlled easy-ride boat seat unit, consisting of two double-action hydraulic shock absorbers, two variable rate coil springs and a torsion bar, cushions the ride and eliminates the jars and jolts of boat operation.

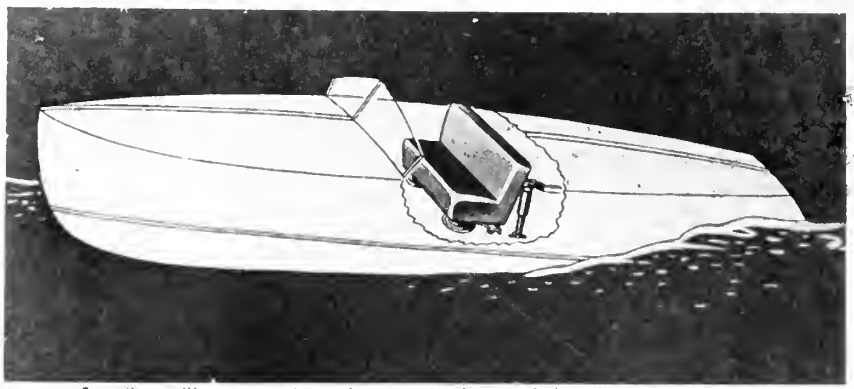
The unit, manufactured by the Monroe Auto Equipment Company of Monroe, Michigan, is the result of exhaustive tests on several makes of new model motor and speed boats. The unit incorporates the same principles used by the company in the production of hydraulic easy-ride seats for farm tractors, trucks and other vehicles.

Designed to smooth out the spanking and tossing which often mars the pleasure of boating, the boat seat unit is being confined to an original equipment product for the present, and is not yet available for installation on boats now in use.

Construction is of the unit type so that it may be used as a mounting for whatever type of seat used on the boat. The two shock absorbers control the action of the two variable rate springs, and the torsion bar principle offers a guide for holding the movement of the seat to a given plane, allowing one person or several to ride with the same smoothness.

Two double action hydraulic shock absorbers control the cushioning effect of the two variable rate coil springs on the bottom of the new easy-ride boat seat. A torsion bar provides a guide for holding the movement of the seat to a given plane, assuring the same smooth ride regardless of the weight of the person or persons on the seat.





Smoother sailing on rough or choppy water is one of the advantages of the new hydraulically controlled easy-ride boat seat shown above.

Boiler Problems

(Continued from page 94)

heater tubes and headers whenever the following conditions obtain: (1) main and auxiliary stop valves are shut; (2) a burner is in use; or (3) the furnace is hot enough to overheat the superheater tubes. These conditions are usually met when starting up a boiler, before it is placed on the line; or after shutting down a boiler, after the main and auxiliary stop valves have been closed. To protect the superheater during these times it is necessary to open the vent valve at the superheater outlet. A flow of steam will then be maintained through the superheater and keep the tubes and headers cool so that no damage will result from overheating.

Cleaning Gas Side

Considerable troubles have been experienced, particularly with modern boilers with air heaters or economizers, due to carbon deposits on the gas side of the boiler. Here again, the troubles usually occur during low load periods such as starting-up or shutting-down.

In order to have a fire you must have combustible matter such as carbon, a supply of oxygen, and some means of ignition such as a spark. All troubles of this nature can be avoided by keeping the tubes free of carbon by judicious use of the soot blowers and maintaining good combustion using correct oil temperature and pressure. The oil should be heated to a temperature corresponding to a viscosity of 150 SSU and oil pressure maintained above 100 psi at the burner at all times. If this is done and sufficient air is available, proper combustion will result completely burning out the oil and allowing no carbon residue to accumulate on the tubes. Gas side should be inspected frequently and hand-lanced with air or steam if deposits accumulate.

Lighting Burners

Too many firemen are in the habit of lighting burners from hot brickwork or from other burners in service instead of using a torch.

Proper procedure is to make sure that the oil is at the proper temperature, as discussed above, and at a minimum pressure of 100 psi at the burner, and that a sufficient supply of air for combustion is available, before attempting to light a burner. With these conditions, if the burner does not light within 5 seconds, the oil should be shut off and the setting purged by running a fan for at least 5 minutes before a second attempt is made to light off the burner. It these instructions are followed, furnace explosions can be avoided.

These, of course, are not all the troubles that are experienced with boilers, but they are the major ones which cause large losses of time and expense.

Keep Posted

Portable Fire Extinguisher

A carbon dioxide portable fire extinguisher, called CD-Sno Fog, has been introduced on the market by the General Detroit Corp. and the General Pacific Corp. This extinguisher is one of a complete line of Underwriters' approved fire extinguishers and allied products.

CD-Sno Fog is especially recommended for fighting fires in electrical equipment, oil, grease, and flammable liquids. Since the carbon dioxide is a non-conductor, it is safe to use on electrical fires even while the current is on. It leaves no stain on clothing, equipment, or premises, and is said to be harmless even when used around food. It is equally effective in hot or sub-zero temperature.

The extinguisher is made in 2, 4, 7½, 10, 15, 20, 50, 75, and 100-pound sizes.

General Detroit Corp. CD-Sno Fog

CHICAGO-LATROBE TWIST DRILL WORKS have published a circular on Heavy Duty Drills, explaining the drill uses and incorporating a chart on diameter inches and price lists for the various lengths of the high speed heavy duty taper shank drills.

(Please turn to page 136)

Army Engineers to Build Permanent Reserve Fleet Sites

(Continued from page 86)

Engineers to undertake the permanent reserve sites program, development of the Brunswick site was under way and the dredging is now close to 50 per cent completed. Latest calculations show this site capable of caring for about 390 vessels at the maximum.

The Tensaw and Mobile Rivers flow from the north into Mobile Bay near Mobile, Alabama. Investigation shows that a site capable of holding more than 700 vessels can be developed in the Tensaw about 20 miles from Mobile. At present, about 150 vessels are moored in the Mobile River but it was found that the larger site in the Tensaw can be developed as cheaply as a 450-vessel site in the Mobile River and the larger capacity site was selected.

Difficulties encountered in acquiring land have delayed the commencement of dredging at the Neches River site, previously approved by the Maritime Commission. These difficulties have now been overcome. It will hold approximately 500 vessels.

The Suisun Bay site can accommodate approximately 500 vessels and now has about 360 vessels moored in it. It was originally selected as a temporary site but has now been made permanent.

Los Angeles Office for Globe

Globe Wireless, Ltd., has reopened its Los Angeles office with Herbert C. Hendry, manager in charge. The new location is in the A. G. Bartlett Building, 215 West Seventh Street, telephone VAndyke 1638.

R. Stanley Dollar, Globe's president, made this announcement and added: "This is a public relations office provided to better serve the communicating public, by assisting former patrons and all new customers in the proper routing of their transpacific messages to insure prompt and accurate service." Due to changes in pick-up and delivery methods resulting from the Western Union and Postal Telegraph merger in 1943, Globe Wireless cannot accept traffic at its new Los Angeles office.

Founded in 1928 by the late Captain Robert Dollar, as the Dollaradio and used in conjunction with his vast fleet of Dollar ships continually sailing around the world, the present Globe Wireless system entered the public communications field on April 20, 1934, with the opening of the Manila station.

Following the plan of its founder, Captain Robert Dollar, who was known the world over as the "Grand Old Man of the Pacific," Globe Wireless concentrates in communications to the Pacific Far Eastern area.

In addition to the headquarters in San Francisco, Globe offices are now located in New York City, Los Angeles, Honolulu, Manila, and Shanghai.

New Book on Preformed Wire Rope

The Preformed Wire Rope Information Bureau has just published a new book "Preformed Wire Rope —What It Is—What It Does."

Although preformed wire rope has rapidly advanced in universal acceptance since its introduction in 1924, any survey, according to the bureau, would turn up many wire rope users who never heard of the word "preformed." Realizing this, the Bureau has issued a book which capably answers the elementary question: "What is preformed wire rope?"

Well illustrated, and in three colors, this book tells the story of the development of preformed wire rope and what that development has meant to all industry. In non-technical language it tells what the preforming process does to the wires in a rope and what effect it has on the rope's final service.

Copies of the new book may be obtained by writing any wire rope manufacturer or the Preformed Wire Rope Information Bureau, 520 North Michigan Ave., Chicago 11.

Clipper Ship Red Jacket

(Continued from Page 70)

Jacket at Melbourne under the American flag was in 1854.

On her first voyage out from Liverpool to Melbourne she made the passage in 69 days and 11 hours, an average of 200 miles a day or 8⅓ knots for the 13,880 nautical miles logged. To appreciate the remarkable nature of such a sailing, one has only to remember that the crack yachts designed to compete for the America's cup often run that race at an average speed of less than 6 knots. To have driven the Red Jacket at this pace with the steam engines and boilers available in those days would have consumed approximately 3500 tons of coal. Her total carrying capacity was not more than 2500 tons. Her modern namesake would make that voyage in 35 days carrying around 7500 tons of cargo at a fuel consumption of approximately 1600 tons of bunker oil. On the return of this voyage she carried $1,000,000 worth of Australian gold and had an exciting time with ice floes rounding the Horn.

For several years Red Jacket rivaled Donald McKay's Lightning as the fastest clipper ship in the British Merchant Marine and the fastest built in an American shipyard. Like many another fine American built clipper she ended her days in the lumber trade from Canada to Great Britain.

The Victoria—In Service Since 1870

(Continued from Page 57)

trade it was a common occurrence for the Victoria to handle as high as two million dollars per trip in gold from the Seward Peninsula gold fields. In the old days the bricks were shipped in canvas bags valued at twenty thousand dollars each and it was said at times there was not enough safe room to stow the gold away and part of it was carried in the Purser's office on the floors.

"Considering the many years the Victoria has operated in the Alaska routes her career has been surprisingly free of accidents. We have only a meager record of but two. In 1907 prior to the vessel's acquisition by this company, the Victoria is said to have struck an iceberg near Nome, filling her No. 2 lower hold with water raising to within a few inches of the main deck; however her forward and after bulkhead held, the cargo was discharged, temporary repairs were made and the vessel came back to Seattle and was repaired at the Navy Yard in Bremerton. The second accident occurred during, or about the year 1910 when the Victoria struck on the south end of Hinchinbrook Island. So far as we know these are the only two marine accidents of any importance which have befallen the ship.

"The present tonnage of the Victoria is gross, 3656; net, 2022; deadweight, 2840. Her length over-all is 370 feet 27 inches; beam molded, 40 feet, 4 inches; and depth to main deck, 28 feet.

"Since being commissioned as a freighter in June, 1941, the Victoria has made 46 voyages between Seattle and ports in Alaska as far west as Dutch Harbor. During this time she has carried approximately 110,000 manifest tons of cargo northbound from Seattle, a large part of which has been construction material for the many military projects which have been undertaken in Alaska since 1941, as well as equipment and subsistence for military personnel. During this same period she has brought back to Seattle approximately 32,000 manifest tons of cargo, primarily Alaska canned salmon and fisheries products.

"The Victoria's war service has not been marked by any enemy action, accidents, rescues or specific incidents of unusual nature. She does, however, carry the same armament and naval gun crew accompaniment as is assigned to other vessels of comparable size in the Alaska trade.

"Naturally, the Victoria is well known on this coast, and is quite often the subject of newspaper and magazine stories; and we receive many inquiries and letters concerning her. Among these is one which we consider outstanding, and which I am taking the liberty of quoting, as it very aptly voices our sentiments for our remarkable old ship:

> "'I have just noticed in the "Times" that the old Victoria is again going into service in the Alaska trade. I have not heard any mention of the old Vic for a long time and I wondered what had become of her.
>
> "'I am probably only one of thousands who have a sentimental affection for this grand old ship, the great-grandmother of Alaska shipping, the almost lone survivor of all proud fleets now wrecked or on the bottom of the ocean. The old Vic has a charmed life. She is the phantom of the Northwest.
>
> "'For many years she carried the products of my farm, mostly eggs, to Nome. She gave faithful service to hundreds of thousands in ordinary times and in cases of emergency. Like only a very few inanimate things, she has become endowed with a mystic personality which comes to us out of the past with all the charm and sweetness of a gracious woman and the rugged character of a strong man.
>
> "'When, if ever, the old Vic goes to her final rest, on the bottom of the sea or the inglorious junk yard, many a strong man will shed a reverent tear over the passing of a staunch old friend. We wish she might sail on forever, if only a phantom ship, whose appearance might ever continue to bring pleasant memories and hopes of future joy.'

"It is hoped the above information will serve the purposes which prompted the request you have made. However, if further information is desired in any particular respect, please do not hesitate to let us know."

Very truly yours,
L. W. BAKER.

Keep Posted

Types of tools made by Swiss converter.

The Oxford Swiss Type Converter

Oxford Engineering, Inc., of Oxford, Michigan, offers a new Swiss type converter, designed to make any lathe or similar tool into a quantity production machine for multi-diameter parts. This converter has been tested and perfected by more than three years' use in war contract work.

The manufacturer states that this converter offers unusual economies both in original and maintenance costs, since it can be used with any standard lathe. Tooling is by means of simple cams, which the user can make in his own plant. When not in use, the Oxford Swiss type converter can be removed and stored, so that the lathe can be used for other work.

The converter produces any part from a needle point to ½" OD and from ¼" length to six feet. The manufacturer states that ground stock is unnecessary, production being fast and accurate with any kind of cold-finished stock, including stainless steel, ordinary cold-rolled, brass and aluminum.

The Swiss Converter at work.

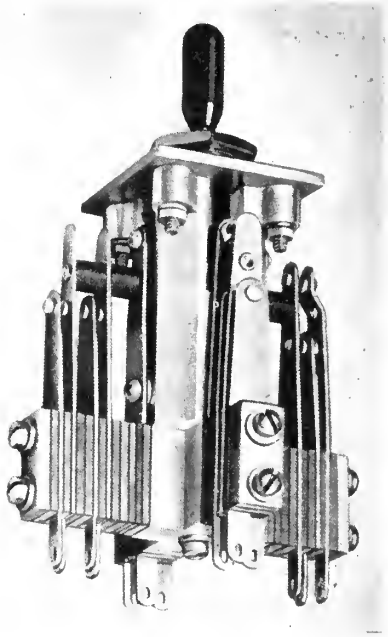
Model MCF, the New Five-Position Switch

General Control Co. of Boston, has announced the new Model MCF, a five-position cam-lever switch, designed especially for ease in assembly and wiring. The two features which provide this are single hole mounting of the switch frame to the panel and the single bolt assembly of the contact block to the switch frame. The single bolt assembly permits soldering of the wiring to the contacts to be done where it is most convenient: away from other units, even at a bench if desired.

The switch is locking or non-locking in all positions except the center position, which is always locking. The motion of the switch from the center to all switching positions is in a straight line. This, plus the positive roller action, results in maximum ease of operation.

The MCF is especially designed for those applications in the electronic and communications fields where it is imperative that only the desired circuit is closed.

General Control's five position switch.



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Pacific MARINE REVIEW

DECEMBER 1946

(See article on pages 110-111)

MEN and ROPE

One coil of rope may look like another. It would take a true rope expert to determine the difference in quality.

But the men who ultimately **use** the rope know that there is a difference—a difference in wear and in dependability.

Perhaps the reason that the name of Tubbs has stood for rope leadership in the West for almost a century is a combination of **two** things — Men and Rope. In the Tubbs Mills are men with a background of decades of "know how" in fine rope making. Back this with finest fiber—precision machinery —and you have the combination of **MEN AND ROPE** that means "plus" rope value.

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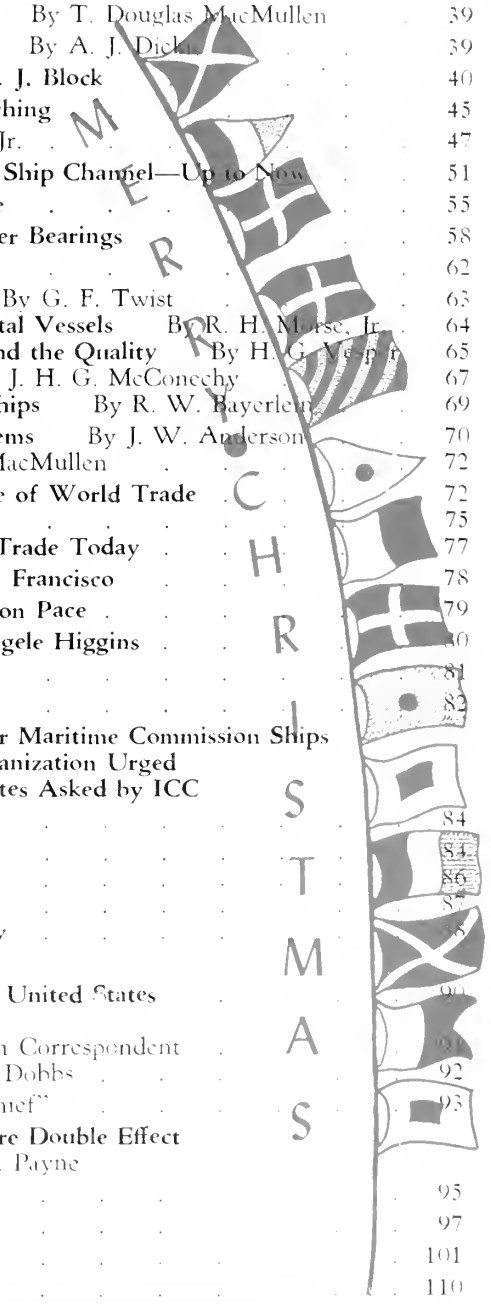

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Pacific MARINE REVIEW

Chain Reactions— As Shipbuilding Lags

By T. Douglas MacMullen

The atomic blasts brought many new words into popular use, among them "chain reactions," referring to the fact that those devastating displacements were due, not to the explosion of a single particle, but to the action of one isotope upon another.

In everyday life, none of us stand alone. Everything we do depends in some measure on the actions of others. So it is also with nations—and with industries.

In the complex shipping industry, there are so many divergent interests that its past success—or survival—has been due more to its dependence on the basic strength of some of its well-managed units than to any common recognition or appreciation or its problems by the Government, the public, or by the industry itself. The maritime industry relies on the reactions of many others, far beyond its ken.

A strike in the mines is immediately felt in the factories and on the railways. When the trains stop, there is no cargo for ships.

When the ships stop—*when the ships stop*—half of the income of the cotton south, a third of the west's farm produce, a third of the east's machinery and automobile production, *stops moving to market,* for the market is overseas.

And when the ships stop, we begin to do without all the things we lacked during the war—rubber, coffee, tin, quinine, sugar, paint, food oils, silk—*and those industries stop, too.*

These are merely the industries that need the cargoes of ships. There are other industries, and people, who need the ships themselves. They are the people of port cities, the insurance people, the exporters and importers, the ship-operating companies, the crews, and shipyards. The reaction runs up and down the chain.

Shipping is vitally important to America. It is so important that there never should have been all these months between war's end and the laying down of new ships. We must have ships of certain types, and we know that they must be built. We know that cargoes are waiting and passenger lists mounting interminably. Shipyards, and their trained personnel, must be kept active. The reaction reaches throughout our national life.

Why the delay?

Propulsion Power For Merchant Vessels

By A. J. Dickie

The selection of propulsion machinery for merchant vessels is becoming increasingly complex, particularly in the middle range of powers.

For vessels requiring powers from 100 shp to 2000 shp the choice has simmered down to an almost universal trend toward the diesel engine. For vessels requiring 2000 to 20,000 shp there is still great competition between steam and diesel with the gas turbine coming in as a possible third competitor. In this range of powers there is a further element of competition between the various methods of connecting the prime mover to the propeller shaft. Shall this gearing be mechanical, electro-mechanical, electrical generator to electric motor, Bowes electrical, hydraulic, or hydraulic-mechanical? These methods, of course, are all applicable in the power ranges above and below these medium limits.

Before final decision on any vessel or series of vessels, the executives of any steamship line should have prepared (by its technical staff and the technical staff of the shipyard with which they are working) a complete survey of the considerations affecting the operation of these drives and their effect on the design of the vessel.

Each type of prime mover and each type of drive connection has its ideal application. The requirements of the service of a vessel in any particular trade route indicate the ideal prime mover for that vessel.

On other pages of this issue will be found a symposium dealing with the present status and trends of the diesel marine power plant. In future issues we expect to have similar symposiums on the high pressure turbine and its drive connections; the gas turbine and its gearing; and possibly the combination reciprocating-turbine drive.

There are great possibilities in bridge control of the engine room including all auxiliaries and even of cargo handling, which have been recognized and successfully achieved in the lower power ranges. From a purely engineering and design viewpoint, there would seem to be no reason why these should not be extended to the medium power range with tremendous economic advantage. To fully realize such advantage would, of course, require a realistic appraisement of manning scales for American sea-going vessels.

Ore Carrier Converted To Diesel

Thirty-Eight Year Old Steamer Completely Reconstructed

THE E. J. BLOCK, converted from steam, ran trials on September 17. The test run of this big vessel on Lake Erie out of Lorain, Ohio, where she has been converted from steam, was attended by about 150 interested business and technical men. The E. J. Block is owned by the Inland Steel Company, Chicago, Illinois, who spared no expense in making her the best equipped and most modern merchant ship on the Lakes.

Since sails made way for steam many generations ago on these vast inland seas, the ore transportation industry has been closely linked to coal fuel for ship propulsion. Many of the major iron-ore mining and steel producing companies have their own coal properties, so naturally have used the available supply for fuel purposes. Independent transporting concerns have had little incentive to turn to diesel power because the coal industry forms an important customer, and bunker coal has always been obtainable at inland ports along the ore-carrying routes.

Consequently, coal and ore have been almost inseparable on the Great Lakes, and the only intrusion of oil power into this steadfast family circle prior to the inception of the electric-propelled E. J. Block, has been the operation of two diesel-driven ore carriers employing the direct-drive system of propulsion. The Inland Steel Company owns a number of coal mines and also buys large quantities of coal for use at Indiana Harbor. However, the company is free from direct business tie-ups with coal, and their ships do not carry coal. Consequently, the use of coal was not a compelling factor in the selection of the E. J. Block's new power plant. Diesel-electric drive appealed to them because they possess knowledge of its advantages by reason of having operating records of their own land power plants and locomotives over a period of years.

The ore transportation of the Great Lakes is a very sizable business, and in 1945, shipments of iron ore aggregated 75,714,750 gross tons, compared with 55,246,-197 net tons of coal and 674,280,552 bushels of grain. This means that the bulk of all iron ore produced in the country is transported along Lake routes in bulk cargo ships of United States registration with a total tonnage aggregating 2,220,739 tons gross.

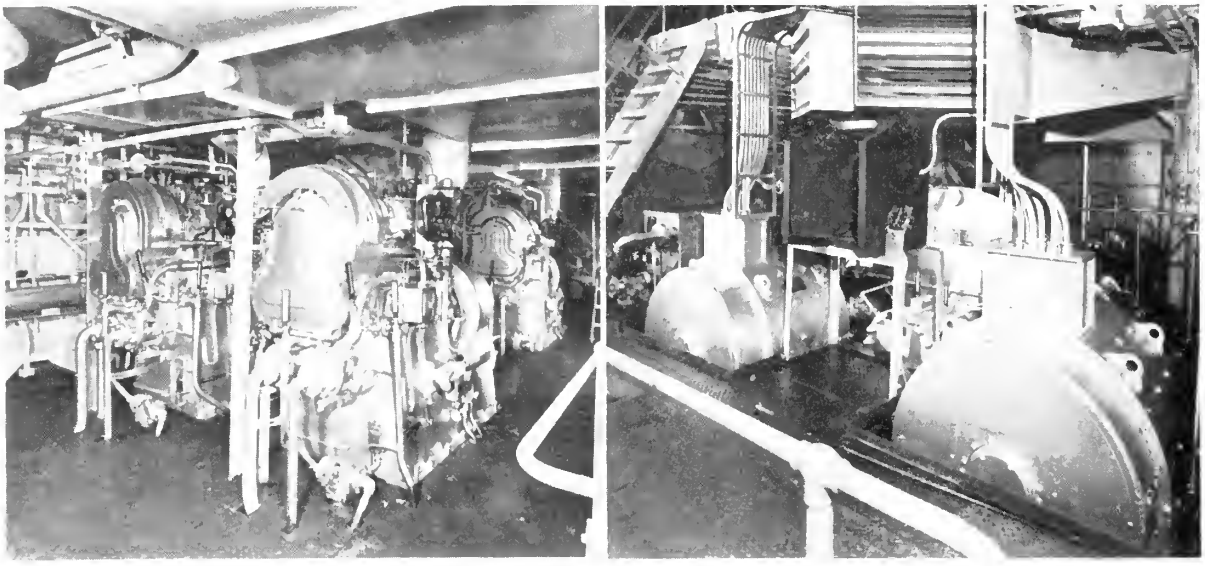
The E. J. Block is not a new ship. She is 38 years old, having been built in 1908 at the old and extinct Bay

The E. J. Block, first diesel-electric ore carrier on the Great Lakes.

City, Michigan, shipyard, formerly operated by the American Shipbuilding Company, at whose Lorain (Ohio) plant the conversion work has been carried out. The hull and framing were found to be in excellent condition; but her 1610 bhp steam reciprocating engine and Scotch boilers were worn out and due for replacement. As her owners wanted a modern and efficient ship as quickly as possible, they decided to make the "Block" a diesel-electric ship rather than to install new boilers. At the same time it was planned to reconstruct the fore-and-aft deck houses, install all new auxiliary and deck machinery, steering gear, windlasses, etc., and thoroughly modernize her from stem to stern and from mast head to the double-bottom compartment tops. This work has taken nearly one year which is reasonably good in these days of strikes and material shortages. Her owners now possess what certainly is as fine a ship of her type as is to be found anywhere on the Great Lakes.

One important advantage that has resulted from the rebuilding of the ship and the scrapping of her massive reciprocating steam engine and Scotch boilers and replacing them with much smaller but more powerful General Motors Cleveland Diesel engines and electric transmission equipment, is the ability to carry 1000 tons more cargo. Another economic gain is that two men less are needed in the engine room. Her daily consumption of oil fuel will undoubtedly compare favorably with her former consumption of coal and be in line with past experiences where diesel-electric drive shows a decided economic gain.

Except for the steel hull and frames, the entire ship has been reconstructed and thoroughly modernized. All new cabins and day quarters have been built and furnished, as well as equipped with as many bathrooms and showers as a moderate sized hotel; electric cooking has been installed; an electric hatch crane lifts and closes the hatches over the ore holds; electric mooring winches are arranged fore and aft; electric windlasses raise and lower the 5000-pound anchors; electro-hydro steering gear now does the work of the old steam gear, is electrically controlled from the pilot house, and holds the ship on a true course with the aid of an automatic gyro apparatus



Above, left: Starboard view, looking forward, three auxiliary diesel generator sets, each rated 100 kw, ac at 1200 rpm.

Right: The two diesel driven generators transmit current through the switchboard and control stand to two electric propulsion motors, each rated 1020 hp at 700/875 rpm and turning the propeller shaft through a reduction gearing at 73 to 91 rpm.

known as "Metal Mike" while the helmsman merely looks on. There is a ship-to-shore radio telephone; radio direction finder, and pilot house control of the propelling machinery which enables the navigation officer to reduce or increase speed or reverse the propelling motors almost instantly without signaling on the telegraph to the engineer on watch below. Forced ventilation throughout the ship keeps the air in the crew and passenger quarters fresh, and there are facilities for warming the incoming air during the colder months of the operation period. Two laundries have been provided. Last, but not least, Radar for all-weather navigation will be installed as soon as the equipment is delivered. Complete modernization of the ship's superstructure is emphasized in the attractive appearance of the raised forecastle with its reconstructed forward deckhouse, and the new after deckhouse topped with its large, shortened, modern funnel in which the exhaust from the engines is deadened.

The E. J. Block has the following dimensions:

Length over-all	552 ft. 0 in.
Length B.P.	539 ft. 10 in.
Breadth	56 ft. 0 in.
Depth	31 ft. 0 in.
Draft, loaded	21 ft. 7 in.
Gross tonnage	6,929 tons
Cargo capacity	11,000 tons
Power	2,000 S.H.P.

As one descends the engine room ladders, the main diesel engines and generator units look so amazingly small in comparison with the old steam machinery that it hardly seems possible for them to be powerful enough to drive a 14-ft. 6-in bronze wheel and propel the loaded ship at a speed three times as fast as an energetic man walks. But they can, and do; and they turned the propeller at any speed from almost zero to 86 rpm on trials. The total loss in power through the transmission sequence of the diesel-electric drive system of propulsion is less than the frictional loss of the old, slow-running reciprocating steam engine that was directly connected to the propeller shaft. Because the latter was directly connected to the propeller shaft, it necessarily had to be of very heavy and massive construction and had to do the work by sheer brute force, rather than the use of the leverage principle. Converting the ship's power from steam to diesel-electric drive is designed to increase the carrying capacity of the vessel as well as lower operating costs. Previously, 13 men were needed in the engine and boiler rooms, but now only 11 men are carried.

The main engines consist of two Model 12-278A General Motors, Cleveland Diesel Engine Division, two-cycle, V-type, diesel engines of 1200 bhp each, at 750 rpm. Instead of a power impulse every other downward stroke like the gasoline engine of an automobile, or the heavier type four-cycle diesels, the G.M. two-cycle diesels produce a power impulse with every revolution, which makes for far greater power within the compactness of a smaller and lighter weight engine. This engine having a bore of $8\frac{3}{4}$" and a stroke of $10\frac{1}{2}$", has a piston speed of 1313 ft./min. when operating at its rated speed, with full power available through electric drive on the propeller over a shaft speed range of 73 to 86 rpm.

Mounted on a common, fabricated steel sub-base of each diesel is a propulsion generator of the direct current type rated at 814 kw, 560 volts, 1454 amperes at 750 rpm, as well as a direct current exciter generator (direct-connected to the propulsion generator) rated at 24 kw, 120 volts, 200 amperes and turning at 375/750 rpm. The two propulsion generators are shunt wound, with starting fields to enable the diesel engines that drive the propulsion generators to be started by using the corre-

sponding generator as a starting motor when supplied by a 64-volt starting battery.

The propulsion generator is self-ventilated with built-in fan and at normal load its field current registers 24 amperes. The current produced from the two diesel driven generators is transmitted through a switchboard to two electric propulsion motors, each rated at 1020 horsepower, 860 volts, 1454 amperes with revolutions per minute at 700/875. These motors turn the propeller shaft through a 9.625 to 1 reduction gear unit having a rating of 2000 shp and capable of full rated power at 73 to 91 shaft rpm. In this way, small high-speed, light-weight units drive the 14-ft. 6-in, diameter propeller. The propulsion motors are reversible and capable of continuous operation, without exceeding the specified temperature rise, at all speeds ahead and astern up to and including rated speed. They deliver rated power continuously at any speed between 700 and 875 rpm.

Ore boats, when loaded, carry heavy cargoes and therefore have a wide range between light and loaded draft, resulting in considerable variation in power requirements and vessel speed. The General Motors Diesel-Electric Drive system of propulsion, as installed in the E. J. Block fully provides for this variation in operating conditions, for when heavily loaded and operating at lower than rated speed, say as low as 80 per cent propeller speed (700 rpm motor speed), the full rated horsepower can be applied to the slower turning propeller through increased excitation of the motor field. In effect, this means increased torque is applied to the propeller shaft, creating a harder working propeller to compensate for the slower turning, and in this way vessel speed is more closely maintained under heavily loaded conditions.

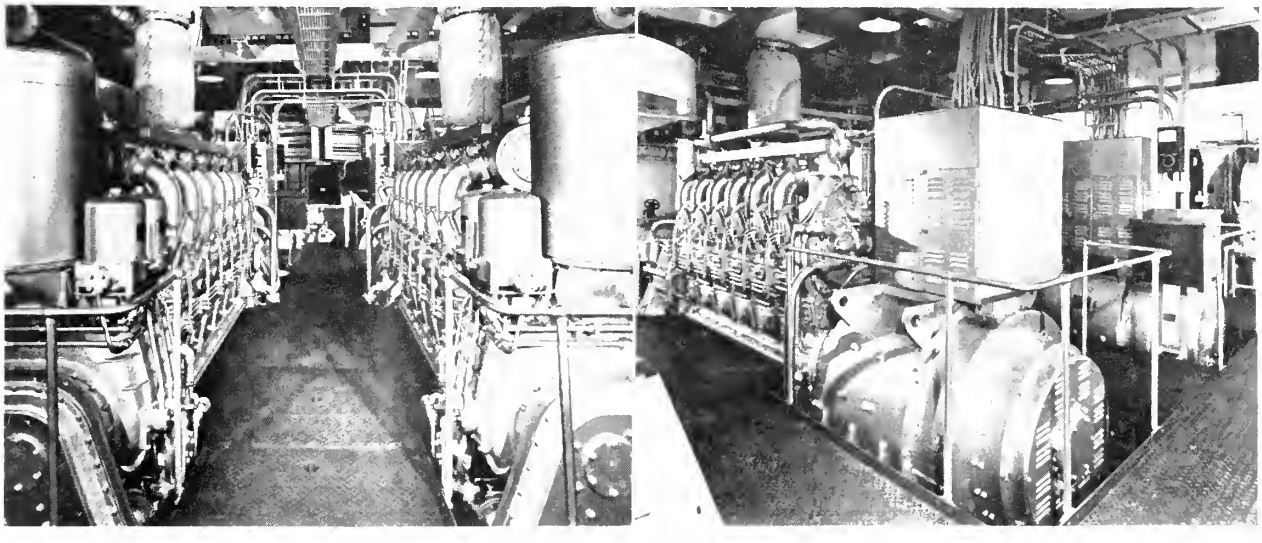
Flexibility of vessel and propulsion control is further demonstrated when operating in heavy fog, a dangerous and expensive impediment to navigation on the Great Lakes, or similar conditions requiring curtailment of vessel speed. The propulsion electrical power system consists of the two propulsion motors and the two main diesel driven generators connected in series in what is called the propulsion loop. Either generator may be disconnected from the propulsion loop and the system operated with only one generator, or one diesel engine and one generator may be disconnected for maximum utilization of economical engine power during prolonged periods of reduced propeller speed and power.

Synchronized units under fully automatic control and in the hands of one operator harness the power of the diesel engines, convert that power to electrical power and distribute it to move and operate the E. J. Block efficiently and economically.

Propulsion control is simple, for a single speed control handwheel, located on the engineroom control stand, provides smooth control of speed, power and direction of the rotation of the propeller from standstill to full rated speed. In addition to engineroom propulsion control, remote control is provided from the pilot house. Operation of the pilothouse control stand handle produces the same smooth control of propeller speed and power, ahead or astern, as provided by the engineroom control stand handwheel. The design of the propulsion control system permits movement of the engineroom control handwheel, or the remote control stand handle from full speed ahead to full astern, or vice versa, at will, thereby eliminating the necessity of methodical manipulation of control and providing maximum maneuverability of the vessel.

A single motor field controller handwheel, also located on the engineroom control stand, varies the field current of the motors which, in effect, varies the speed reduction ratio between the diesel engines and the propeller. Con-

Two twelve cylinder diesel engine generating sets, each rated 1200 bhp, 814 kw, at 750 rpm, provide propulsion power.



sequently, maximum utilization of engine power is permitted at all times when using one or two enginess under propeller load conditions or changes in draft or trim of the vessel.

The auxiliary control system covers the control of both exciters, rated at 24 kw each, and for engine starting battery charging. It provides a means of supplying a constant voltage direct current for the propulsion control system from either exciter and a constant voltage direct current for a ship's service bus from either exciter. Normal operation is to have one exciter supply the propulsion control system and to have the other exciter supply the ship's service bus. Engine starting battery charging is obtained from the ship's service bus when either exciter is supplying the main ship's service bus.

Installation of the G.M. Diesel-Electric drive system in the E. J. Block provides full protection for the propulsion equipment against excessive currents during the regular maneuvering against possible short circuits in the propulsion system. Each propulsion engine is likewise protected against being driven in reverse by its generator due to engine failure. In addition, overload and short circuit protection is provided for each exciter when used to supply the ship's service bus. Meters, indicating lamps and switch handle positions serve to keep the operator informed at all times of conditions in all principal circuits. Necessary meters for propulsion control are also provided in the pilothouse. Flexibility in power and vessel control, under all the various operating conditions common to ore-carrying vessels, are demostrated in the operation of the E. J. Block, and the "fine points" of G.M. diesel-electric drive propulsion are readily noticeable in the smooth manner in which this vessel performs.

The E. J. Block will ply between Indiana Harbor, Indiana, and Superior, Wisconsin; Marquette, Michigan, and Port Inland, Michigan. It is a 1640-mile round trip from Indiana Harbor to Superior and, of course, a much shorter distance to any one of the other ports mentioned. On any given trip, the ship goes to only one of the ports mentioned and returns. Because the longest round trip to Superior covers a distance of 1640 miles the saving in fuel that has to be carried is quite important. The time saved in re-fueling the ship should be a factor toward increased mileage and greater hauled tonnage over a navigation season. The increased draft allowable, by reason of the new hatches that have been fitted, result in an additional cargo capacity of 1000 tons, and the total hold capacity is now 11,000 tons. Due to existing bulkheads not being changed, full advantage could not be taken of the smaller space required by the diesel-electric machinery. But, it was possible to take advantage of and erect at the forward end of the engineroom a large fuel tank of 57,732 gallon capacity, a location of advantage over the use of a double bottom because of the frequency with which lake ships land against the docks and their nearness to the bottom. There is an extra fuel tank of 1019 gallons and a lube oil tank of 1532 gallons. The engine room, following Great Lakes practice, is aft.

For auxiliary power there are three General Motors

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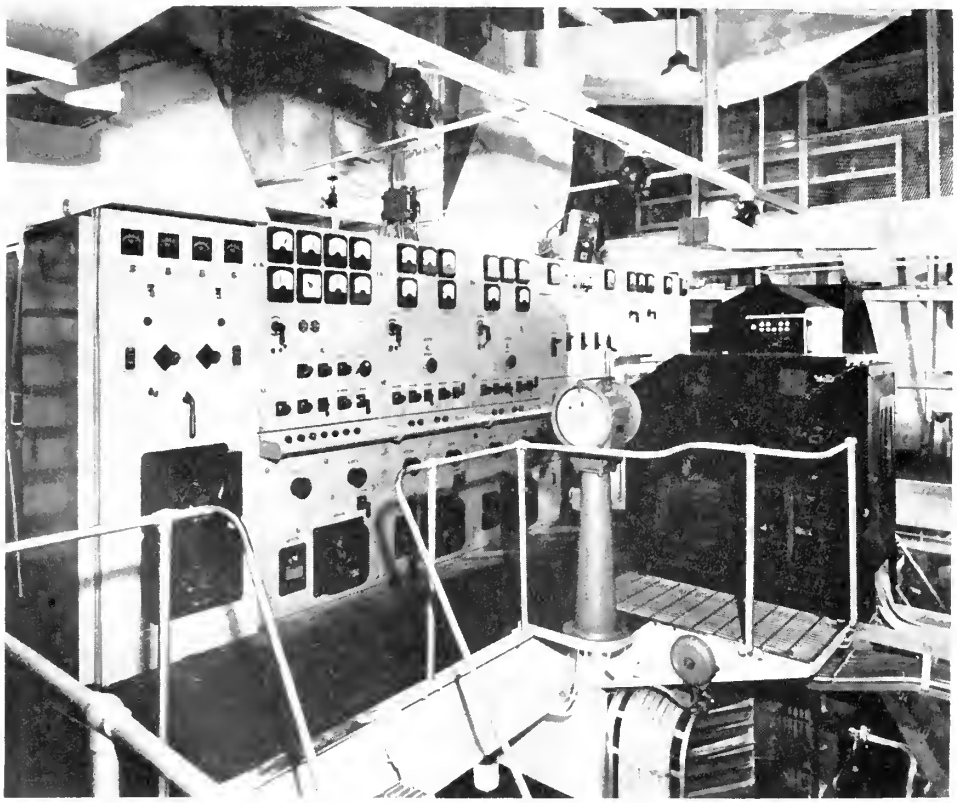

Control stand and switchboard in the engine room. Propeller control is likewise provided by remote control from the pilothouse.

The President Wilson on the ways, (extreme left) and the President Cleveland at the outfitting dock at Bethlehem-Alameda Shipyard.

The President Wilson— Latest APL Launching

THE SS PRESIDENT WILSON, second and last of the 22,900-ton luxury liners being built at Bethlehem-Alameda Shipyard, Inc., for the American President Lines, was launched at 11:45 a. m., Sunday, November 24. The Wilson and the President Cleveland, which has already been launched and which is scheduled for delivery in April, 1947, are the two largest merchant vessels ever to be built on the Pacific Coast.

The vessel is being built under a U. S. Maritime Commission contract for operation by the American President Lines.

Mrs. E. Russell Lutz, wife of the Executive Vice President of the American President Lines, acted as sponsor, and the launching will be featured in the January issue of PACIFIC MARINE REVIEW.

Combining the latest design in passenger accommodations with the most modern machinery and equipment obtainable, the President Wilson will carry 552 cabin and tourist passengers and a crew of 338, in addition to mail, refrigerator and express package cargo. Measuring 610 feet in length and 75 feet in width, the Wilson's 20,000 horsepower turbo-electric motors will propel the vessel at a maximum speed of 21 knots.

Originally laid down on November 27, 1944, as a Navy P2-type troop transport, the huge ship has undergone extensive changes following the war to convert her

for American President Lines' fast transpacific passenger trade.

The P-2's are somewhat smaller and less pretentious than the late Presidents Hoover and Coolidge, but in many respects, notably in refinements and comforts of passenger accommodations, they will be superior to the former transpacific luxury liners.

It is evident that these new P-2 President liners are all that their designers, builders and outfitters claim for them. They are truly fine ships, trim, safe and serviceable, styled and built in the best American tradition. And yet, insofar as American President Lines' long-range plans for the Pacific are concerned, they are merely interim ships; highly satisfactory for the urgent near-term job at hand, but destined within a few years to yield to even larger, much faster and more luxurious passenger express liners.

An indication of the many facilities which will be provided for the comfort and entertainment of the passenger is seen in plans for two swimming pools—both cabin and tourist—libraries, sound motion picture facilities, massage rooms, barber and beauty shops and gymnasium. All cabins and public rooms will be air conditioned. Photographs, oil murals and framed pictures will adorn the walls of the lounges and dining rooms. Steam heated kennels are even provided for transporting dogs and other pets.

The ship's electric kitchen facilities are ultra-modern, even providing for a magic eye on the galley doors.

The President Cleveland and the President Wilson are the last of an original contract for ten troopships for the Navy. Eight of these Bethlehem-built ships, which saw extensive wartime service with the Navy, have been converted into Army transports and now are being operated by the Army Transport Service to carry Army personnel and their dependents to and from far off Pacific Stations.

The President Wilson is scheduled for delivery in July, 1947.

To every businessman, farmer, or ordinary citizen, new ships for the Orient are important news. American ships and American shipping organizations can and will help the American manufacturer, the American producer, the American exporter, to sell his products and enlarge his overseas markets. The American importer and our friends abroad also will find these new ships adaptable for every purpose.

Most people now agree that an expanding foreign trade is absolutely necessary to our national prosperity. These new ships are to be a part of our American Merchant Marine, for the greater prosperity of every American family.

Left to right: Fred Jennings, who will be Chief Engineer on the President Cleveland and Jack Paton, (D.S.M. winner on late SS President Coolidge) who will be Chief Engineer on new SS President Wilson.

Gas Turbine Alloys

By C. T. EVANS, Jr., Chief Metallurgist
Elliott Company, Jeannette, Pa.

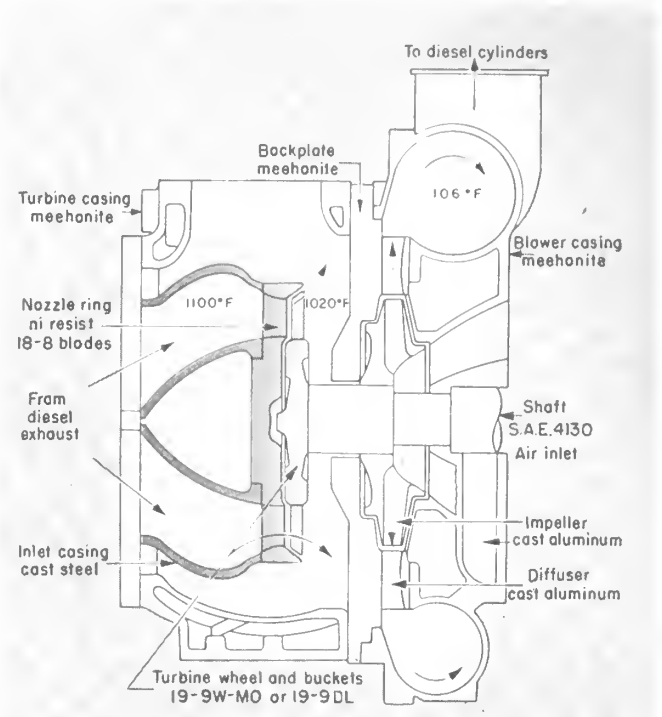

Fig. 1—Elliott-Buchi turbocharger for four-cycle diesel engines.

IT MAY SURPRISE SOME READERS of this article to discover that the 19-9 W-Mo special heat-resisting alloy used in Elliott Company's pioneer 2500-hp gas turbine power plant, unvieled in 1945, had already been in use for more than four years in the production of the same company's 4-cycle diesel engine turbochargers. A great deal has been written lately about the rapid progress in the field of gas turbine materials. Yet, in spite of the fact that many hundreds of new compositions have been thoroughly tested since 1941, this composition remains in the front rank of gas turbine materials, and is considered a "super alloy" (note Class A, Fig. 4, Table 1). This term originated with the War Production Board.

In 1941, when the writer was employed at Universal-Cyclops Steel Corporation in Titusville, Pa., R. B. Smith and J. R. McDermet, then assistant chief engineer and chief engineer of Elliott Company, respectively, came to us for help with the turbocharger problem. Urgency was the watchword, since the Navy desperately needed these units to power P-C boats and other heavy-duty craft then being constructed for the Defense Program. Maximum temperature was to be 1020° F. (a dull red heat—note Fig. 1) with stresses up to 26,000 psi. Trouble had been experienced with 18% chromium, 8% nickel, 3% molybdenum steel (A.I.S.I. Type 316), previously the strongest high-temperature alloy commercially available.

Although 19-9 W-Mo as we know it now was still in the laboratory stage, an intensive program was immediately undertaken by both companies to develop the alloy for this application. The first trial wheels and buckets were immediately successful. Nevertheless, it required more than a year to work out a wholly satisfactory forging practice for the discs.

Meanwhile, basic creep and stress-to-rupture information was being obtained through 1400° F.

The high values secured "confirmed" the outstanding service performance (regrettably a typical metallurgical "cart before the horse").

The specification for the rotating parts of the 2500-hp marine gas turbine, first considered by Elliott in 1942, was "maximum temperature—1200° F., maximum working stress—6000 psi, expected service life—10 years"; 19-9 W-Mo looked entirely adequate. Check tests run by the contracting agency (U. S. Navy, Bureau of Ships) were better than the data which had been obtained by Universal-Cyclops, and this clinched the matter (note Fig. 2).

Since then, a basic improvement has been made on 19-9 W-Mo to produce a still better Class A material, 19-9 DL. It was necessary to use this stronger material in the bolts for the 2500-hp plant, and it is coming into some of the newer turbocharger designs.

But enough of history. What are we using in the three new 3000-hp marine units now being built under con-

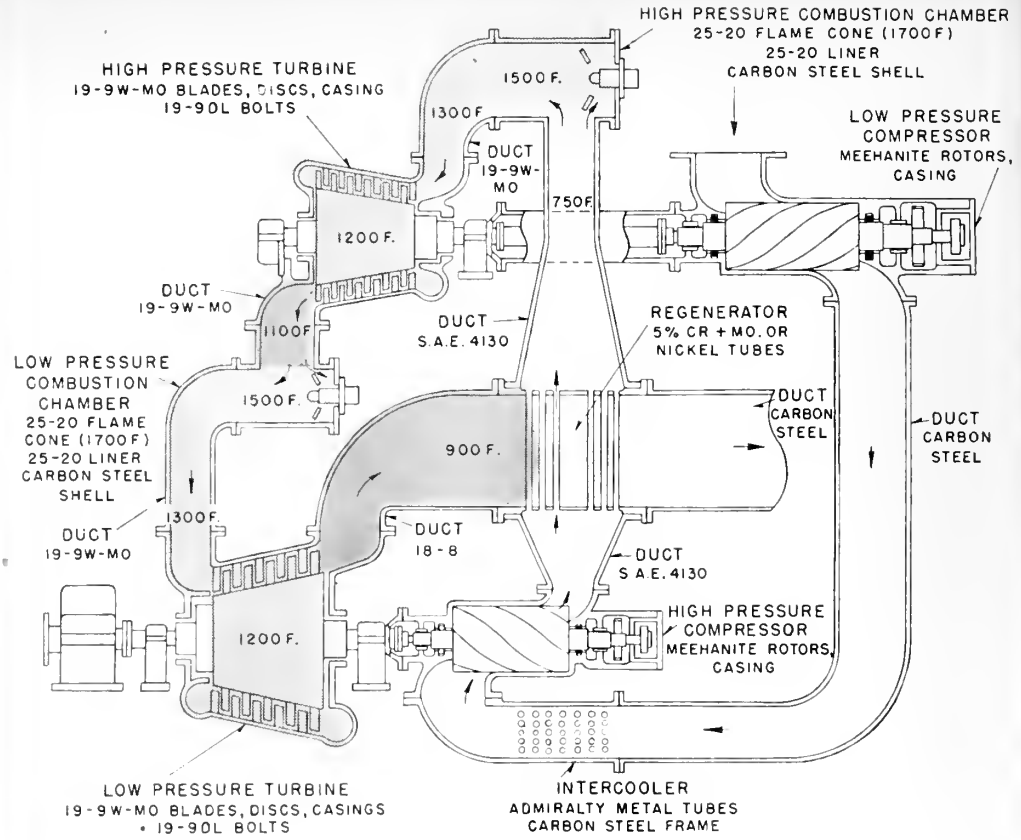

Fig 2—Elliott 2500 hp ship propulsion gas turbine (1945)

tract with the Navy and the Maritime Commission? Note the temperature changes in Figs. 1, 2, and 3. The new specification for the rotating parts is—maximum temperature 1400° F., maximum working stress 8000 psi.

It was seen immediately that no Class A material could be used for the highly stressed rotating parts in the new plants and allow for a sufficient factor of safety. Instead, 19-9 W-Mo is relegated to low-stress duct work. A Class

TABLE I—Typical Analyses, Sources,

Chemical Analysis

CLASS A—WROUGHT ALLOYS, NORMALLY USED AS WORKED AND STRESS RELIEVED

Trade Name	C	Mn	Si	Cr	Ni	Co	Mo	W	Cb	Ti	N	Others
19-9 W-Mo	0.10	0.60	0.50	19.00	9.00	.....	0.40	1.25	0.40	0.35	.....	
19-9 DL	0.30	0.75	0.50	19.00	9.00	.....	1.25	1.25	0.40	0.35	.....	
Timken 16-25-6	0.08	1.50	0.80	16.50	25.00	.....	6.25	.....	.....	.....	0.10	
17-W	0.30	0.60	1.00	13.00	20.00	.....	0.60	2.25	.....	.....	.....	
Gamma Columbium	0.40	1.00	1.00	15.00	25.00	.....	4.00	.....	4.00	.....	.....	

CLASS B—WROUGHT ALLOYS, NORMALLY HEAT-TREATED

S-495	0.40	0.75	0.65	14.00	20.00	.....	4.00	4.00	4.00	.....	.....	
S-590	0.40	0.75	0.65	20.00	20.00	20.00	4.00	4.00	4.00	.....	.....	
S-816	0.40	0.75	0.65	20.00	20.00	44.00	4.00	4.00	4.00	.....	.....	
N-155	0.15	1.00	0.50	21.00	20.00	20.00	3.00	2.00	1.00	.....	0.12	
K-42-B	0.05	0.70	0.40	18.00	42.00	22.00	.....	.....	.....	2.50	.....	Al=0.60
Inconel X	0.04	0.75	0.50	15.00	73.00	.....	.....	.....	1.00	2.50	.....	Al=0.60
Hastelloy B	0.05	0.60	0.25	.....	65.00	.....	29.00	.....	.....	.....	.....	

CLASS C—CAST ALLOYS

Vitallium	0.30	0.30	0.25	28.50	2.00	62.00	5.50	.....	.....	.....	.....	Fe=1.00
6059	0.40	0.30	0.25	26.00	33.00	33.00	5.00	.....	.....	.....	.....	Fe=1.00
X-40	0.50	.....	.....	25.00	10.00	55.00	.....	7.00	.....	.....	.....	Fe=0.60

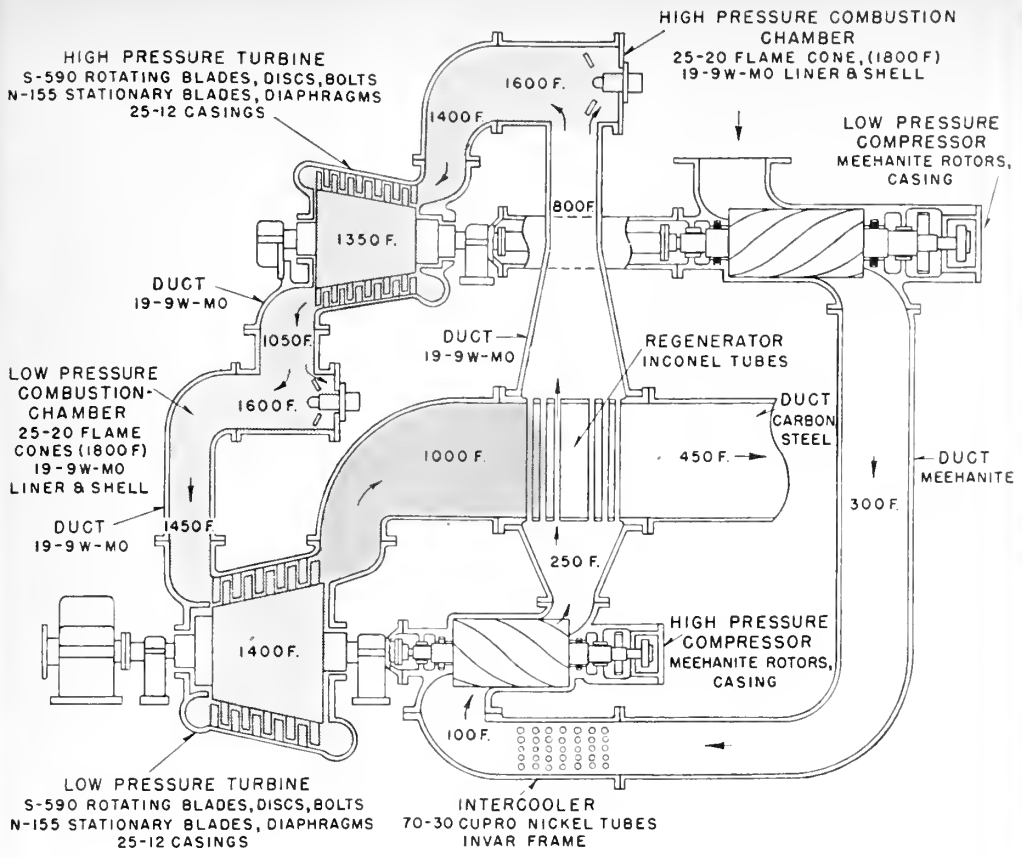

Fig 3—Proposed Elliot 3000 hp ship propulsion gas turbine

B alloy was selected for the rotating parts (note Fig. 4, Table I). Allegheny-Ludlum's S-590 will "carry the ball" on these new units. This composition was first perfected in 1944.

The new plants are obviously more complex metallurgically than the original 2500-hp machine. One thing they have in common: The rotating discs and blading are formed from wrought material exhibiting a high

and Applications of Some Super Alloys

(Balance==Iron)

Manufacturer	Applications
Universal-Cyclops	Elliott-Buchi turbochargers; Elliott and Allis-Chalmers gas turbines.
Universal-Cyclops (and others)	Elliott-Buchi turbochargers and gas turbines; Westinghouse jet engines.
Timken Roller Bearing Company	General Electric aircraft turbosupercharger wheels; Allis-Chalmers gas turbines.
Universal-Cyclops	General Electric aircraft turbosuperchargers (early).
Allegheny-Ludlum	General Electric aircraft turbosuperchargers (limited production).
Allegheny-Ludlum	General Electric aircraft turbosuperchargers (limited production).
Allegheny-Ludlum	Elliott gas turbines.
Allegheny-Ludlum	General Electric jet engines.
Haynes-Stellite; Universal-Cyclops; Crucible	Aircraft gas turbines.
Westinghouse	Westinghouse jet engines; Wright Aeronautical turbosuperchargers.
International Nickel Company	Aircraft gas turbines.
Haynes-Stellite	General Electric jet engines.
Haynes-Stellite; Austenal (and others)	General Electric aircraft turbosuperchargers; G. E. and Westinghouse jet engines.
Haynes-Stellite	G.E. aircraft turbosuperchargers; G.E. and Westinghouse jet engines (limited production).
Haynes-Stellite	G.E. aircraft turbosuperchargers; G.E. and Westinghouse jet engines (limited production).

degree of stability at the operating temperature. 19-9 W-Mo and S-590 do not become brittle under load at operating temperatures.

One of the reasons why castings are not being specified for the rotating parts of these machines is that castings do become brittle under load at temperature. A decision to use heat-resisting alloy castings in gas turbine rotating parts would be similar to a decision to substitute cast iron for steel in steam turbines. We do not feel prepared yet to take this step for long-time units, although the high-strength properties of castings at high temperatures are very tempting (note Class C, Fig. 4, Table 1).

An extended discussion of high-temperature metallurgy in relation to the numerous spectacular developments of recent years (including jet propulsion) cannot be attempted here. Five references are listed at the end of this article. Reprints of references 2 and 4 are available.

In addition, much detailed test information on the "super alloys" was presented in an open meeting during the A.S.T.M. Conference in Buffalo, N. Y., on June 26. Reference 4 and the A.S.T.M. Meeting summarized the important government research carried out during the war by the National Advisory Committee for Aeronautics and the National Defense Research Council. Much of these data will be published by the A.S.T.M. within a few months.

Some random notes may be of general interest:

1. The mechanical engineering problems in applying super alloys to gas turbines are often under-rated. Ordinary design concepts do not apply. Carbon steel or cast iron, the basic engineering materials at room temperature, are essentially elastic (i.e., they retain their physical dimensions in accordance with well-understood laws, unless inadvertently overstressed). Super alloys at operating temperatures are essentially plastic (i.e., they change shape permanently even under relatively light loads). Yet turbine tolerances are among the closest known to industry. One might wonder what the designer of vertical boring mills would do if he were told he had to use lead (which creeps at room temperature) as his basic material.
2. The super alloys are only "super" if they are intelligently handled and applied. The new materials are outstanding over the old established alloys such as 18% chromium—8% nickel, 25% chromium—20% nickel, 15% chromium—35% nickel, 28% chromium, Inconel, etc., only throughout a relatively narrow temperature range. Super alloys are not likely to replace the older materials for furnace parts, carburizing boxes, etc., where strength is secondary to high temperature stability and resistance to special corrosive conditions.
3. In the large power gas turbine field, economics will act unfavorably toward many of the new super alloys and will dictate a careful search of the properties of the compositions which are more lean in scarce and expensive alloying elements, such as cobalt and columbium. Furthermore, as pointed out in reference 2, many of the older, cheaper metals have valuable properties which are rapidly being recognized. It will be noted, Fig. 3, that numerous older materials are being employed in new designs.
4. So much attention has been given to the obviously critical problem of rotating discs and blades that relatively little trouble can be expected with these parts. Rather, stationary elements, such as ducts, where thermal gradients from cycling operations may produce transitory high stress levels, have already given some trouble, and may be expected to give more until the principles of their design and metallurgy are more fully understood. As an example, combustion chamber liners on jet engines

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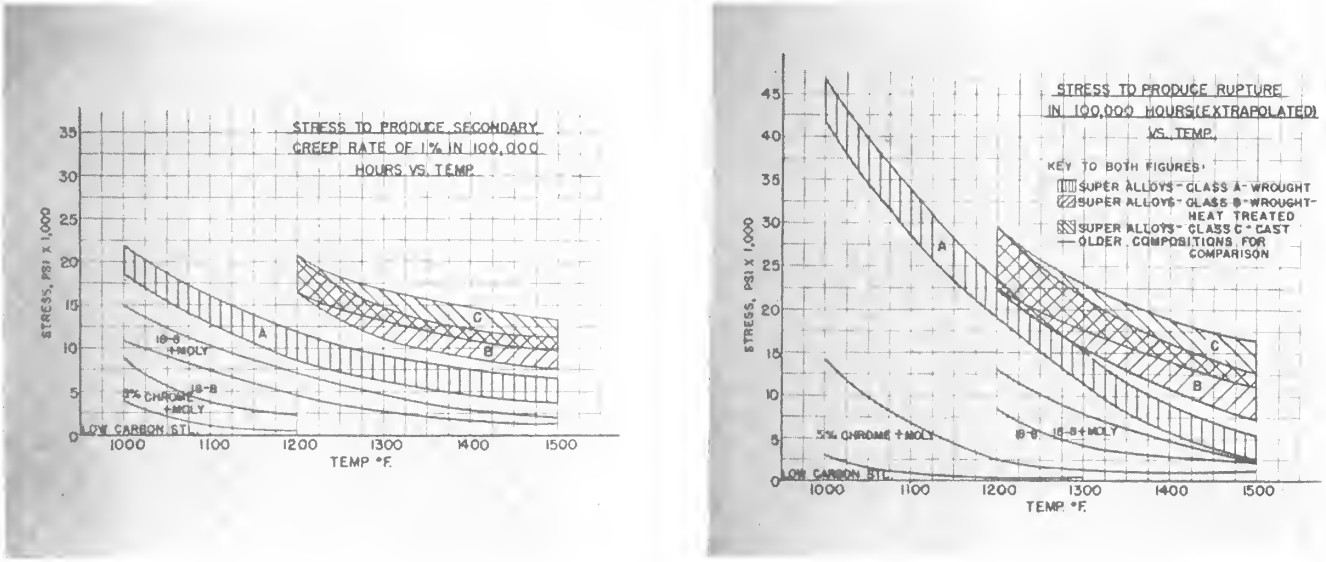
Fig. 4—Range of creep and stress-to-rupture properties of three classes of super alloys, compared to older materials.



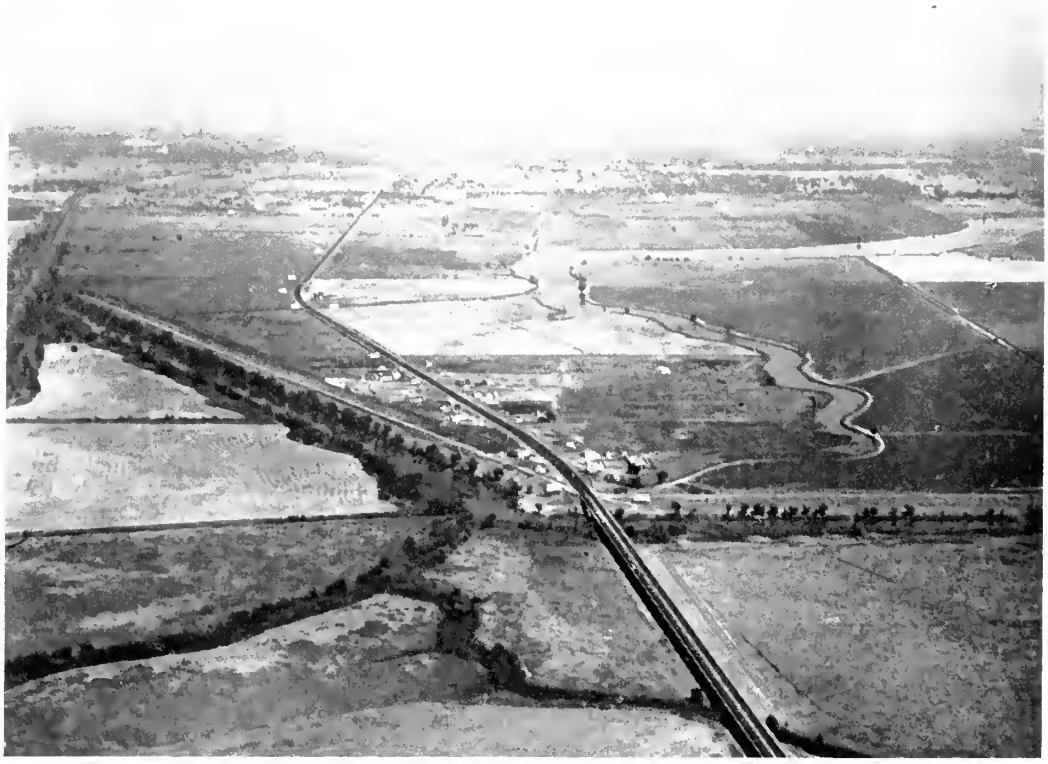
Artist's conception of the Sacramento Deep Water Ship Channel. This drawing has been prepared and circulated locally by the Sacramento Chamber of Commerce.

A Report on the Sacramento Deep Water Ship Channel—Up to Now

A FEW MONTHS OVER A YEAR AGO there was quite a flurry of news reports and a few unofficial peeks at a plan just recommended by the U. S. District Engineer in Sacramento and the Division Engineer in San Francisco for the construction of a deep water ship channel to Sacramento. About the only official speculation that came out of a press conference was an answer given by General Thomas M. Robins, then Deputy Chief of Engineers, who was asked about the channel's chances. Said the General: "Once approved by the men in the field, and indorsed by the Division, like action may be expected up the line. Congress may approve something we do not recommend, but it rarely disapproves our recommendations."

A look at the last Rivers and Harbors Bill indicates that the General was pretty fair at calling his shot. For the deep water enthusiasts it was a happy ending to a long first round. The idea has been talked about for more than 20 years. It can hardly be said that the Engineer Corps snapped it up and ran with it, eager to spend some public money. Of course, having a job authorized by law, and getting money to build it are two different things, as the Engineers have discovered on California flood control authorizations. One step is handled by a legislative committee; the other, usually a year or so later, by an appropriations committee.

Presently therefore, the Corps feels that it has done its part by making a study and submitting a report. Further, the Sacramento Chamber of Commerce is at the height of an energetic drive with petitions in hand to effect the formation of a Port District by Sacramento and Yolo Counties. This is the first of several steps that will be necessary to meet required local participation in the

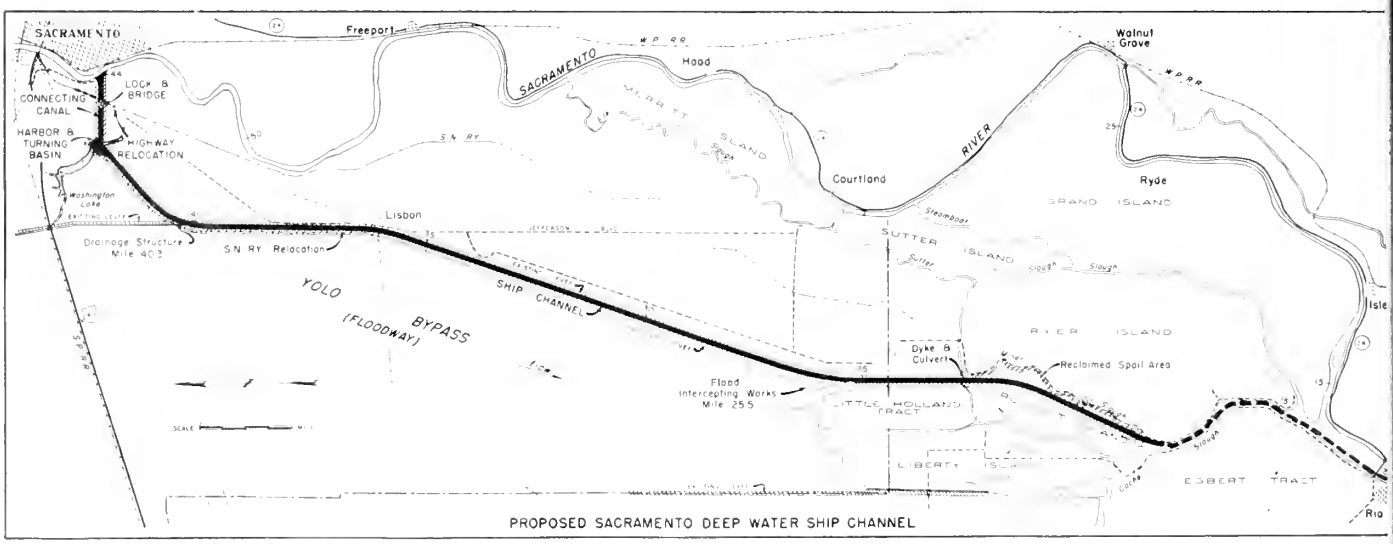


Air view of turning basin site at Washington Lake. In lower left, U. S. Highway 40 is just clearing the Yolo By-Pass on its way to Sacramento, barely discernable on the horizon.

project. (On this point the Engineers' report provides that local interests will furnish free of cost to the government all necessary rights of way, including utility changes and modifications plus any increased annual maintenance and operation costs which might result from these changes; that local interests will agree to provide, maintain and operate adequate terminal facilities at Washington Lake. The matter of salinity repulsion has received continued attention as described in detail later in this report.

So with this as a preface, PACIFIC MARINE REVIEW has prevailed upon the Army Engineers to go over some of the features of the channel plan, and the following is a roundup of views and information from the district engineer and his staff at Sacramento:

Colonel Lester F. Rhodes, the district engineer, pointed out that the plan has run a long series of hurdles by way of public hearings, including those of the Congress, so that by the time construction is actually started, authority to do so will have been well established. "The idea," he said, "of bringing deep water vessels from San Francisco to Sacramento is not a new one. It is natural for such a



PROPOSED SACRAMENTO DEEP WATER SHIP CHANNEL

notion to occur in an expanding industrial area that finds itself scarcely twenty feet above sea level with very little physical obstacle between it and the waterways of the world. Therefore it is not surprising that the State of California herself first put the plan on paper in a study carried out in 1922.

"Three years later the Sacramento Deep Water Commission retained the services of two consulting engineers, C. E. Grunsky and Leonard M. Cox, to examine the economic aspects for such a waterway with terminal facilities in this city.

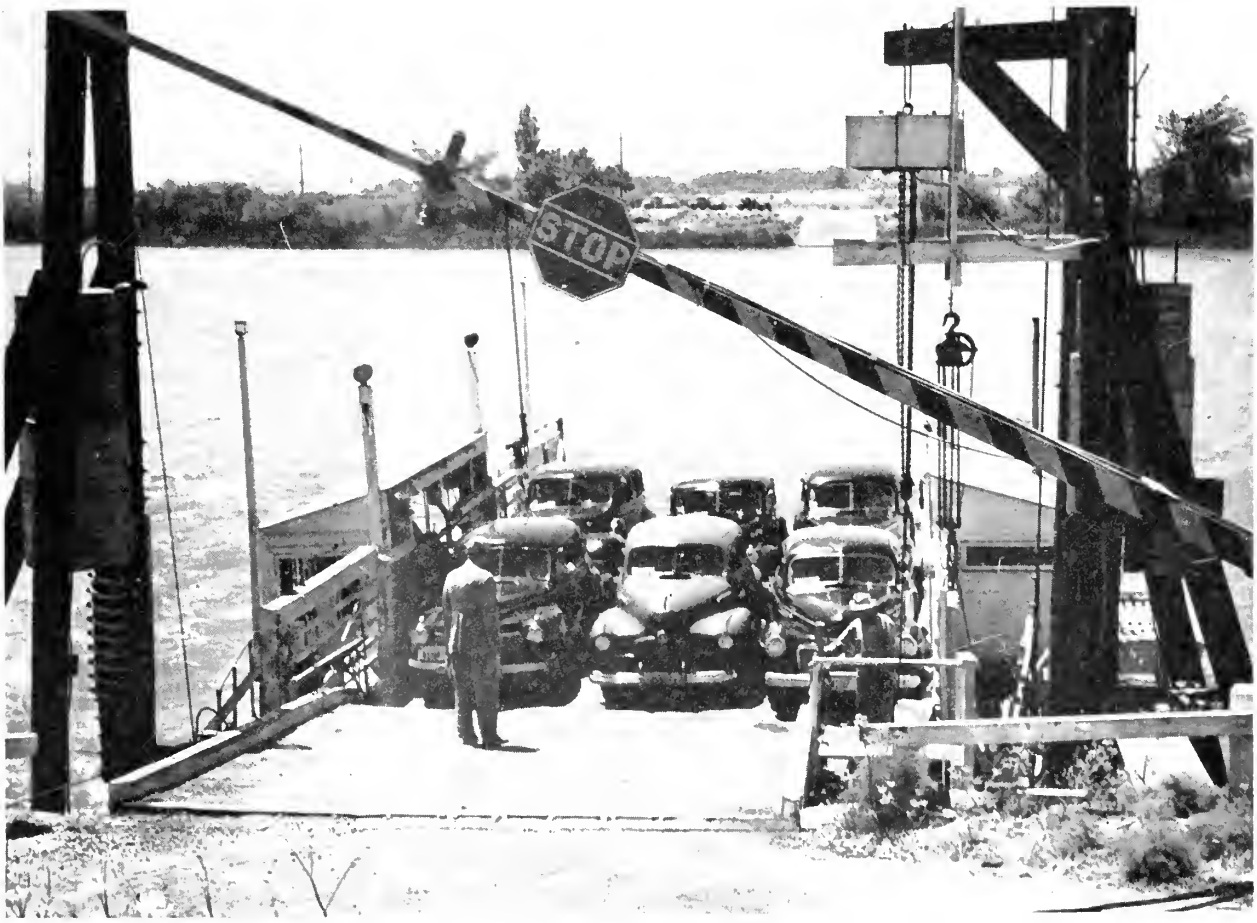
"Any such plan was soon to be associated with the federal government which, through the Corps of Engineers, had been maintaining the Sacramento River through removal of hazards to navigation and repair of flood damage since 1875. So the Corps was soon asked to review its navigation reports with the view of exploring the practicability for such a ship channel.

"The alignment proposed by the State Engineer ran generally east of the river on the opposite side of the present alignment. It had a turning basin in Beach Lake, about six miles from town, and following somewhat the route of the Southern Pacific Railroad, cut across Andrus Island and entered the San Joaquin River at the mouth of Seven Mile Slough. At the time the plan had merit, but conditions change and what would have been the location of terminal facilities is now a built-up residential area in and around Land Park.

"Our office did not approve the plan, and continued to rely on the regular 10-foot channel in the river itself for navigation needs. With a Congressional resolution directing us to review our studies, it was found that a satisfactory alignment could be made by using the existing Yolo By-Pass, a floodway for diverting dangerous flows around the city of Sacramento. This would give us Washington Lake, practically in town and as yet undeveloped, for a turning basin, plus a nearly straight shoot to Prospect Island where we could enter Cache Slough, follow it to the river just above Rio Vista, and so on down the river itself for 15 miles with access to deep water in Suisun Bay at Collinsville. Between the turning basin and Sacramento's present riverfront a barge canal can be constructed—a direct run of about a mile and a half. The whole route from Sacramento to the sea, as now proposed, is 44 miles—a saving of 30 miles round trip over the river route."

As to the major physical characteristics, channel depth is to be 30 feet (at mean lower low water) and a bottom

Congressional party getting across Cashe Slough at a point where the ship channel would follow it on the way to the Sacramento River just above Rio Vista.



A group representing the House Committee on Rivers and Harbors making a physical inspection of the proposed ship channel course in the summer of 1945. Colonel Lester F. Rhodes, Sacramento District Engineer pointing out location of turning basin in Washington Lake.

—Sacramento Bee Photo

width of 300 feet from Collinsville to Mile 18.5, and a bottom width of 200 feet above that point. Width on all curves is 300 feet. The turning basin cited in the plan would be 1000 feet wide and 1200 feet long. The connecting barge canal is figured for a bottom width of 120 feet and a depth of 11 feet. Included is a navigation lock with chamber dimensions tentatively set at 60 by 425 feet (lock to be described later). Other features mention a drainage culvert designed for a capacity of 3000 c.f.s. having controllable head gates located at Mile 40.3 so as to permit flows from the borrow pit of the Yolo By-Pass easterly levee to pass under the spoil bank into the ship channel. A similar flow would be permitted between Miner Slough and the ship channel at Mile 23.1 by means of a 4-foot culvert.

Getting back to the lock in the barge canal: This of course is needed because of a differential water stage between the Sacramento River and the turning basin. The chamber as proposed would be a trapezoidal section paved with riprap and provided with timber trestle walkways and buffers on the clearance lines. Guide walls 400 feet in length would likewise be of timber construction. Sector lock gates would be installed and would obviate the need of filling valves. A single leaf, bascule type bridge would be supported on the lock wall masonry to reduce costs of foundations and also provide for economical operation, since one operator could handle both the bridge and the lock. The bridge would carry two lanes of highway traffic and a single track electric railway (Holland Branch, Sacramento Northern Railway). The lock would be supplemented with auxiliary facilities to provide for the movement of fish whether the lock is in operation or not.

Naturally, the biggest job will be one of earth moving, about 67,482,000 cubic yards of it. Asked how he thought it would be done, J. R. Morton of Sacramento's Construction Branch said, "From Collinsville to Mile 18.5 it will be straight suction dredging. Going up from this point, the channel will cut across Prospect Island. Prior to dredging across Prospect it will be necessary to construct a new levee along the westerly side of the proposed channel as replacement for the existing east levee of this island. Then the material dredged from Prospect Island will be pumped to the east of the ship channel and deposited in Miner Slough and that easterly portion of Prospect Island that was cut off by the channel.

"From Egbert Cut to Washington Lake, excavation is to be by long-boom dragline and suction dredge. In order to work a number of suction dredges in this stretch it will be necessary to do some cleaning and deepening of the existing borrow pit paralleling the east levee of the Yolo By-Pass. With this done, the water in the old borrow pit can be raised, and dredges floated to the locations desired. The barge canal will be dug by suction dredge and dragline. Our guess as to construction time is three years with an average employment of around 750 men. . . . A lot of this work is a machinery job."

Morton also pointed out that the State Highway Division has completed a portion of a new bridge at Rio Vista. The westerly end of it has been held up pending construction of the ship channel. At this point a bridge will need horizontal clearance between pier fenders of 250 feet.

R. H. Thompson, also of the construction branch, added the observation that the proposed alignment is very satisfactory so far as it avoids disrupting things as they are. Considering its length through highly developed country, it is surprising to note that the only good land it touches is an eight-mile stretch above Cache Slough where a couple of islands are trimmed on the edges, and again between Yolo By-Pass and Washington Lake (2½ miles), and lastly the route of the barge canal. The only buildings in the path of the channel are to be found in one small island camp. As to utility changes, Thompson says, "Power and telephone lines will need to be moved at only eight places, nine miles of railroad will be rerouted—in some respects to an even more favorable

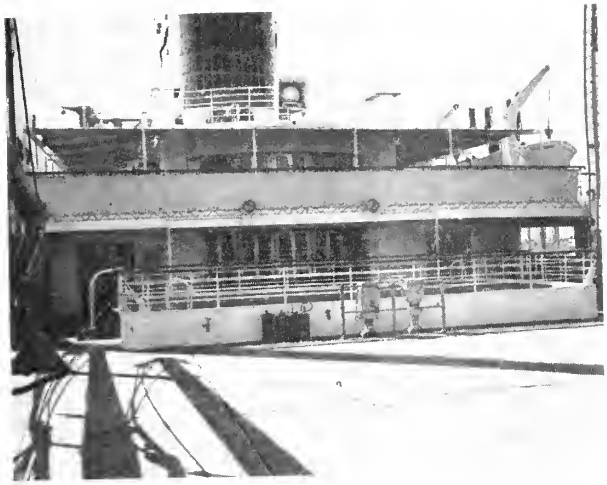
(Please turn to page 127)

The reconverted President Monroe.

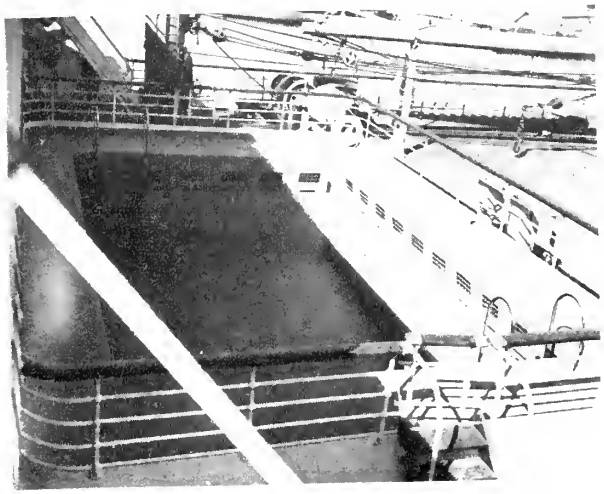
Reconversion of SS President Monroe

SS PRESIDENT MONROE, the former troop transport AP-104, has been at the Todd Pacific Shipyards, San Pedro, since May 18, 1946, undergoing a reconversion from her wartime transport service.

The vessel has been restored to its original condition.



▲ Looking forward from after end of deckhouse. Swimming pool rails in center.



The Swimming Pool on the President Monroe. ►

The Library on President Monroe.

that of a combination passenger and cargo liner for the American President Lines. This necessitated removing the added accommodations, including the quarters and mess kitchens erected in the holds for 2100 troops and officers. In addition to the removal of all military features, this transition involved the installation and redecorating of staterooms and public areas such as the social hall, card and game room, library, bar and cocktail room, promenade deck and the retiling of the swimming pool for 90 first class passengers; also the complete overhaul of the propulsion and auxiliary machinery, life-saving and navigation equipment, as well as new refrigeration equipment, and installation of new equipment for the galleys. Our illustrations give a good idea of the decorative treatment in the public rooms.

The crew's quarters also were thoroughly reconditioned

Cocktail Lounge

Dining Saloon

Music Room

Forward end of Main Lounge.

and redecorated and provided with airports throughout.

The President Monroe is one of the larger conversions of the postwar era, completed in the Los Angeles Harbor by Todd.

Her hull and machinery characteristics are identical with those of SS President Polk, which were fully described in the October 1946 issue of PACIFIC MARINE REVIEW. Her single screw driven by a cross compound double reduction geared steam turbine rated at 8500 shp propels her easily at 16.5 knots loaded sea speed.

After end of Main Lounge

Starboard side of Main Lounge

New Trend Toward Marine Use of Roller Bearings

Successful Installation on Navy, Coast Guard and Maritime Commission Vessels Demonstrate Advantages for Private Shipbuilders in Planning Postwar Competition

ONE OF THE MOST IMPORTANT engineering advancements in the American marine industry in years is the trend that developed during the war toward more widespread use of self-aligning roller bearings for propeller shaft and stern tube applications.

Although anti-friction bearings long have been a basic part of the machinery of most industries and for years have been employed with a high degree of success by European shipbuilders, their use in the American marine field prior to the war largely was confined to auxiliary equipment.

An entirely different picture is presented today, however. Not only were roller bearings installed on scores of American vessels built for wartime use, but now that emphasis is again on private construction, they are receiving considerable attention in postwar designing. Already some postwar applications have been made.

The scope of the change is seen in the fact that approximately 75 Coast Guard craft, ranging from river boats to 255-foot cutters; a large Navy transport, 50 Army tugs and 26 tankers built for the U. S. Maritime Commission now operate with roller bearings either in the steady bearing position or the stern tube.

All these applications utilize the spherical roller bearings made by SKF Industries, Inc., of Philadelphia. The SKF bearings have proven especially suitable, due to their inherent property of self-alignment, their low friction coefficient and other advantageous features.

As long ago as 15 years foreign shipbuilders established to their satisfaction through extensive tests and usage that roller bearings offer very definite advantages. Among these are reduced over-all construction cost, lower maintenance costs, less vibration, elimination of hot bearings, less trouble with stern tubes and a substantial reduction in power losses.

At the start of World War II, 167 ocean-going foreign vessels were operating with roller bearings in the steady bearing positions. Eleven foreign vessels were using this type bearing in the stern tube mounting. These large-scale installations were due primarily to a careful study made by the Hamburg Shipbuilding Research Institute in 1930 of the power losses in propeller shafts mounted on plain sleeve-type bearings.

Using a torsion meter developed for the study, the Institute found that in average ships, in which engines are near the midship position, the power lost in the shaft bearings was between 5 and 6 per cent.

Since the friction co-efficient in the SKF spherical roller bearing is only .003, it became evident that by use of this bearing the majority of the entire friction losses resulting from plain bearings could be saved.

By the most accurate methods available, it has been estimated that the friction loss in the stern tube alone when using plain bearings is about 2 per cent. Most of this loss also can be saved through the use of roller bearings, although it must be remembered that there still will be some loss from the sealing rings.

Another important advantage offered by the spherical roller bearing is that its self-aligning principle compensates for misalignment caused by shaft deflections due to weaves and thus permits heavy loads to be distributed evenly over rollers.

Even the best plain bearings are affected by hull deflections and consequent shaft deflections, causing periodic excess edge loading, particularly in heavy seas. Distribution of cargo also may cause a constant hull deflection and may result in a more or less constant excess loading in the bearings. The length and rigidity of plain bearings frequently amplify a load concentration at their ends.

The SKF spherical roller bearing is a self-contained unit particularly suitable for carrying high loads. This bearing has two rows of barrel-shaped rollers, both rows having a common spherical raceway in the outer ring so that the bearing is completely self-aligning. The rollers are guided by a center flange between the two raceways of the inner ring. The large number of effectively guided rollers give the bearing a very high load carrying capacity. Due to the self-alignment feature this cannot be jeopardized by misalignment between the shaft and the bearing housing.

The SKF spherical roller thrust bearing presents the desirable characteristics of high load capacity, rolling

The USS LeJeune, first American naval vessel of her size with propeller shafts mounted on roller bearings.

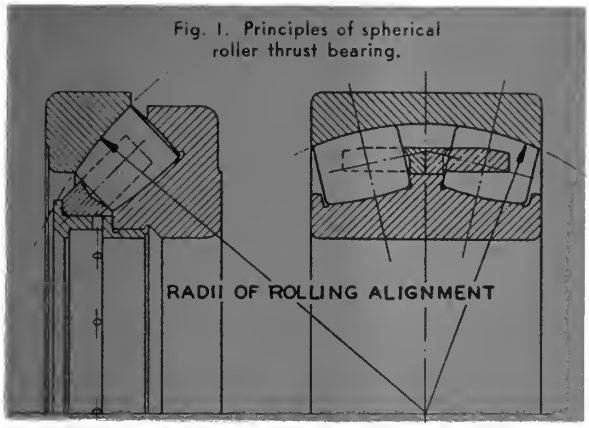


Fig. 1. Principles of spherical roller thrust bearing.

alignment, ability to run at sustained high speed and a very low friction. This bearing does not require special provisions for oil cooling at marine propeller shaft normal speeds.

This bearing is very similar to the radial spherical roller bearing of which it is actually a variation with an exceptionally large contact angle. The bearing is self-aligning around the center of the spherical roller path of the outer ring as illustrated in Fig. 1. The drawing in Fig. 2 is a typical application of this type bearing in a thrust block. The bearing can be similarly mounted in a ship's stern tube at the forward end of the tail shaft in a housing secured to the forward end of the tube.

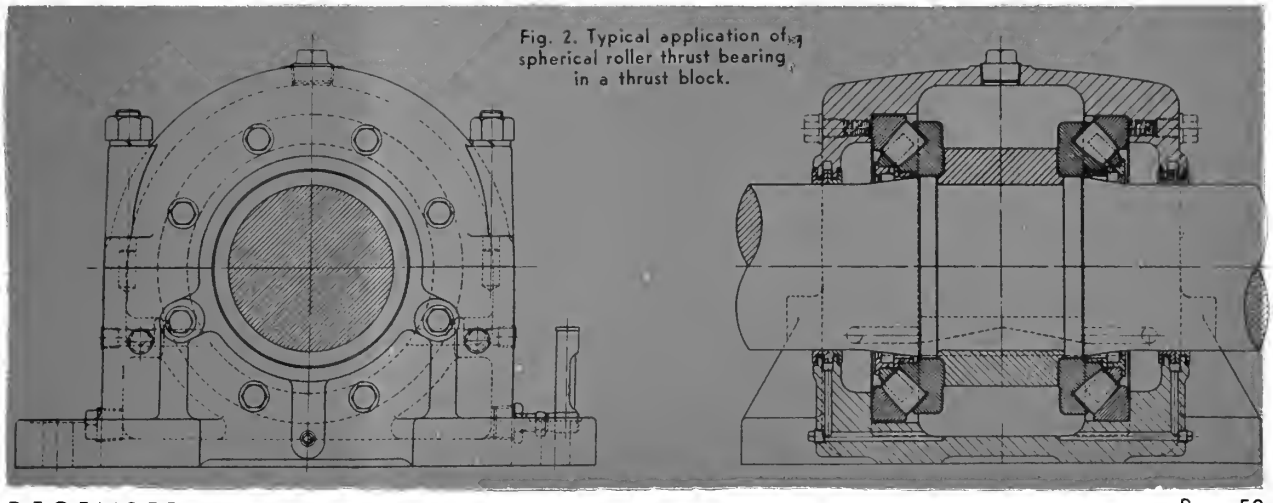


Fig. 2. Typical application of spherical roller thrust bearing in a thrust block.

One of the spherical roller bearings on the USS LeJeune, with top housing removed to permit inspection.

Fig. 3 is a design of this type used on several Coast Guard 255-foot cruising cutters.

Although the two bearings shown in Figs. 2 and 3 are not mounted so that the spherical roller paths of their outer rings have a common center for their radii of curvature the assembly is still self-aligning. This is accomplished by having the outer ring of one of the bearings radially free in the housing bore and the outer ring of the second bearing an axially sliding fit and relatively fixed radially in the housing. In doing this, the center of radius of curvature of the bearing with the relatively fixed outer ring becomes the center of alignment of the shaft at the thrust bearing location. The center of curvature of the outer ring of the radially free bearing will shift with the shaft angle of misalignment. The ring not being confined radially will automatically align itself with any change in its center of curvature. The outer rings are kept constantly in contact with their respective roller sets by a series of springs that press against the outer ring shoulder faces. This arrangement keeps the bearing mounting axially tight but allows for expansion under temperature changes that would develop overloading if shimming had been employed and too much axial clearance had been removed.

In the United States, the Coast Guard was the first to make use of roller bearings for stern tube applications. Starting with the 180-foot cutter, Cactus, which was commissioned in 1942, the Coast Guard installed SKF spherical roller bearings on 39 180-foot cutters, 13 255-foot cutters, the 225-foot cutter Storis, 9 110-foot steel tugs, 12 65-foot wooden harbor craft and various river boats such as the Lantana, Cosmos and Forsythia.

On the 180-foot and 255-foot cutters the forward stern tube bearings are spherical roller thrust bearings which carry a radial load from the shaft and propulsion thrust. In this particular application, locating the thrust carrier in the forward end of the stern tube simplifies the shafting arrangement by eliminating the necessity for an independent thrust block on an intermediate shaft. It also permits the propulsion motor to be located further aft than would be possible otherwise.

The larger Coast Guard vessels employ an electric motor drive directly connected to the tail shaft. On some, the motor bearings consist of two spherical roller bearings in independent pedestal blocks fore and aft of the motor. On the 180-foot cutters and the 225-foot cutter, Storis, the thrust bearing in the forward end of the stern tube also acts as the motor aft bearing, thereby eliminating the aft pedestal block. Accurate positioning of the motor shaft is maintained at all times by the extremely small radial clearance of the spherical roller bearing.

As shown in Fig. 4, spherical roller bearings are mounted on the tail shaft by means of an adapter sleeve. The bearing and sleeve assembly can be readily mounted on standard commercial shaft. The after bearing is mounted within a cartridge housing inserted in the stern frame aft of the stern tube. An L-shaped flanged housing bolted to the bulkhead at the forward end of the stern tube provides the support for the forward bearing in the tube.

Both ends of the tube are enclosed with axial rubbing type seals as manufactured by the Syntron Company of

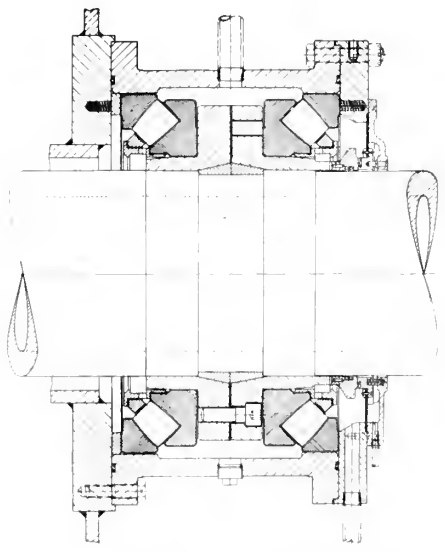


Fig. 3. Design showing the mounting of the spherical roller thrust bearing in a stern tube. This design is used on several Coast Guard 255-foot cruising cutters.

Homer City, Pa. The entire assembly operates under a slight oil pressure supplied from an oil tank located above the ship's water line. With the entire tail shaft and bearings operating under oil, it is unnecessary to provide bronze liners. There is no shaft rub, as both the seals and the bearings rotate with the shafting. The assembly can be furnished with both the bearings in the tube carrying radial load only (Fig. 4) or the forward bearing, with variations in design, can be utilized as the propeller thrust carrier.

The USS Le Jeune, or Ap-74, one of the Navy's top-ranking transports from standpoint of performance, offers an outstanding example of the use made in the United States of roller bearings for the line shaft. The Le Jeune is a vessel of 16,662 gross tons and is propelled at 18 knots by twin screws, with 6750 hp on each of her 150-foot long 15⅝-inch diameter line shafts. Thirteen pedestals fitted with SKF roller bearings support each shaft.

Commissioned in 1944, the vessel immediately was placed in transport service and within 22 months made 18 Atlantic crossings. During that period the bearings operated with complete satisfaction and a minimum of maintenance attention. Under inspection on April 9, 1946, after her 18th crossing, the bearings showed no measurable wear. At that time, the Le Jeune had been under way 8859 hours. The shafts had made 42,162,524 revolutions and the propulsion plant had to its credit 151,066 engine miles. Two additional Atlantic crossings were made after the inspection and the vessel now is being used in the Pacific transport service.

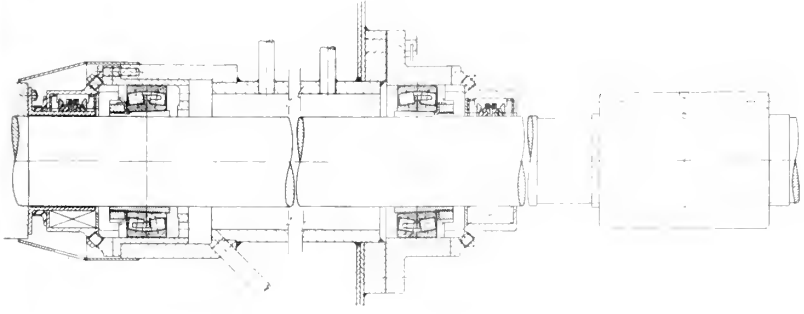
By means of tapered adapter sleeves, the vessel's line shaft bearings are mounted in a manner similar to the tail shaft bearings. A cross section of the assembly is shown in Fig. 5. The line shaft sections are joined by removable flange couplings bolted to the shaft. It should be noted that roller bearings cannot be installed on a shaft that has integrally forged flanges. SKF has developed a coupling illustrated in Fig. 4 for use with the roller bearings, which already has undergone severe tests by company engineers and the Navy and has been approved by Lloyds.

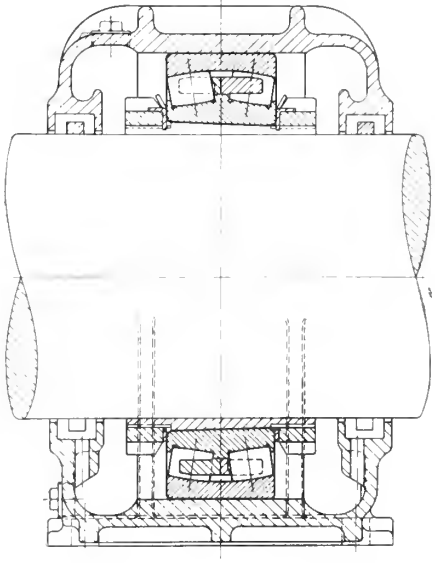
An interesting aspect of roller bearing applications in the American marine field is that they are by no means limited to the propulsion shafting. For many years they have been used extensively as rudder carrier bearings on craft ranging from yachts to ocean-going vessels. Because of their frictionless characteristic and freedom from maintenance requirements, they are particularly suitable to the rudder location. Similarly, they are found in reduction gears, pump motors and the various types of auxiliary deck equipment.

Shaft alley of the USS LeJeune, showing one of her propeller shafts. After 18 Atlantic crossings these bearings showed no measurable wear. Each is 15⅝ inches diameter, delivers 750 hp, and is mounted on 13 bearings.

Fig. 4 (below): Mounting of spherical roller bearings on the tail shaft by means of an adapter sleeve.

Fig. 5 (at right): Cross section showing the mounting of spherical roller breagins on the line shaft.





Harvey T. Hill, executive director, Diesel Engine Manufacturers Assn.

◄

E. J. Schwanhausser, vice president of Worthington Pump and Machinery Corp., and president of D.E.M.A.

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A Symposium on Marine Diesel Power

NOVEMBER 7TH, 1946, might well have been designated Diesel Day in San Francisco. On that date the Diesel Engine Manufacturers Association invited the marine industry to the St. Francis Hotel for an excellent lunch and a discussion of the application of the diesel engine to marine propulsion. Experts from all over the country read papers covering various phases of this subject. Many moot points were completely analyzed—some stock objections given a decent burial.

On the same day was held a dinner of the Northern California section of the Society of Naval Architects and Marine Engineers, and they also had this subject up for a paper and discussion.

In presenting abstracts of this material, we wish to make it clear that the opinions and conclusions recorded are those of the authors of these papers, and not necessarily those of PACIFIC MARINE REVIEW. We hold now, as always, that the decision as to the best power plant for any ship is a matter of engineering analysis of the particular hull and the particular service involved.

Prior to this meeting, DEMA had sent a communication to the marine industry of America asking that industry to submit questions that were in its mind as to the application of the diesel as a marine prime mover. The papers were addressed to answering the questions sent in.

E. J. Schwanhausser, vice president of Worthington Pump and Machinery Corporation, and president of the DEMA, introduced the speakers, and moderated the meeting very graciously. Following are abstracts of the papers presented:

The Cleveland Diesel Engine Division of General Motors Corporation put on a very graphic talkie-movie depicting the rapid advance of the diesel as a marine power plant in all classes of naval and commercial craft, and featuring a dialogue between an old coal-burning harbor tug and a modern diesel electric tug.

Head Table at San Francisco's Diesel Day: (left to right) Hans Bohuslav, vice president of Sterling Engine Co., R. M. Pearson, Superior Division of National Supply Co., R. S. Lorimer, Lorimer Diesel Engine Co.; Thos. E. Hughes, Cleveland Diesel Engine Division of General Motors, Gordon Lefebvre, Cooper-Bessemer; R. W. Bayerlein, manager of Heavy Machinery Division of Nordberg Manufacturing Co., Chas. S. Herbert, Enterprise Engine and Foundry Co.; and Robert H. Morse, Jr., Fairbanks, Morse and Co.

Otto H. Fischer, president of Union Diesel Engine Company, Oakland, California—a pioneer internal combustion engine builder on the Pacific Coast.

G. F. Twist, vice president and general manager, of the Atlas Imperial Engine Company of Oakland, California.

Vessels Other Than Ocean Going——

By G. F. TWIST, Vice-president and General Manager of Imperial Diesel Engine Company

This paper, presented by G. F. Twist, vice president and general manager of Atlas Imperial Diesel Engine Company, was in answer to the question, "Why have practically all the fishing fleets, tugboats, tow boats, and ferries on the West Coast adopted diesel engines for their power?"

The first West Coast built internal combustion engine—a gasoline or distillate engine—was placed on the market about 1885, and fishermen, particularly those working out of Astoria, Oregon, began to install them in their boats. By 1900, dozens of these engines were in use. The distance between ports on the Pacific Coast led to a demand for complete reliability, and West Coast builders developed a heavy-duty, slow-speed engine that proved very satisfactory, and very economical on four to five cents a gallon distillate. Among the early builders were Union, Standard, Imperial, Western-Enterprise, Hicks, Golden Gate, Economy, Acme, Atlas, and others. These engines came almost universally into use for the services and field under discussion, and proved so popular that a large export business was developed, particularly to Australia and New Zealand.

When the growing demand for gasoline in the automotive field began to increase the price of distillate, West Coast users, about 1914, began to seriously consider the diesel engine. In that year, a 120 hp Nelseco diesel was installed in the Warrior, a Puget Sound cannery tender, and made an excellent record for economy. Two more Nelseco diesels were installed in 1915 in the tug Chicamauga, and the messenger boat Suquamish.

Meantime, West Coast builders of heavy-duty, slow-speed distillate engines were experimenting with diesels of their own design, or to be built under license. By the end of 1915, the first Pacific Coast built diesel—an Atlas—was delivered. The rapidly rising cost of distillate, and the fact that Pacific Coast users were accustomed to the heavy-duty, slow-speed type of engine, resulted in the enthusiastic acceptance of diesel prime movers.

So that cheaper fuel can be used, there is from time to time, talk of high pressure steam supplanting diesel power in vessels such as Purse Seiners and Tuna Clippers. Only recently, estimates made covering a steam plant, suitable for use in a Tuna Clipper, indicated the fuel consumption in gallons per hour would be at least twice that of a diesel powered vessel. Some of the large Tuna Clippers have a fuel tank capacity of 50,000 gallons. What would happen to the fish carrying capacity if the fuel capacity were doubled in order to maintain the same cruising radius?

The diesel engine has been adopted as a source of power, not only for practically all large fishing boats, tugboats, towboats, and ferries on the West Coast, but also for railroads, farms, dredgers, mines, and dozens of other activities essential to civilization. Because of its reliability, low operating cost, and low fuel consumption, the diesel engine has earned and continues, to maintain its place as a dominant factor in Pacific Coast commerce and industry.

Continuation of the Head Table (L. to R.). H. G. Vesper, president of California Research Corp., subsidiary of Standard of California, E. J. Schwanhausser, vice president of Worthington Pump & Machinery Corp.; G. F. Twist, Atlas Imperial Diesel Diesel Engine Co.; J. H. G. McConechy, Sun Shipbuilding & Dry Dock Co., C. G. Patch, Joshua Hendy, Otto H. Fischer, Union Diesel Engine Co.; James H. Frink, Washington Iron Works, and Charles M. Reagle, Cooper-Bessemer

Diesel Power versus Steam Power In Coastal Vessels

By R. H. MORSE, Jr., Vice President and General Sales Manager, Fairbanks, Morse & Co.

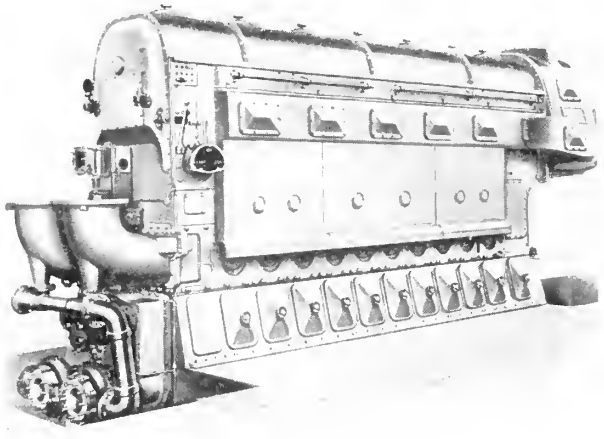
Mr. Morse draws his comparisons from both European and American sources.

In Europe, from 1930 to 1939, about 80 per cent of the coastal vessels built on the Continent, and 50 per cent of those built in Great Britain, were for diesel power. Since the war, these percentages have risen to 90 per cent diesel for the Continent, and 80 per cent diesel for Britain. Two of the most important British coaster owners have not built a steamer since their first motorship was delivered, one in 1934, the other in 1936. These two companies, Coast Lines, Ltd., and General Steam Navigation Company, Ltd., now have under construction nine and seven motorships, respectively. The reason for the preference is the lower overall cost of operation. A 1000 shp vessel at present Brirish fuel prices would consume 4.3 tons of diesel oil per day of 24 hours at full power, costing in British currency, 22 pounds-10 shillings per day. A coal-burning steam plant of same power would consume 17 tons of coal, costing 51 pounds. An oil-burning steamer would rake 8.5 tons of oil, costing 37 pounds. The diesel would have large advantages in lesser space and weight for the plant, and less weight of fuel for the same cruising radius, all resulting in more freight capacity.

On the total world's shipbuilding program, America is building 20,000 tons of motorships—the rest of the world is building 4,165,000 tons of motorships. We are building 380,000 tons of steamers—our competitors are building 1,826,000 tons of steamers. Our program is 5 per cent diesel and 95 per cent steam—competitors' program is 68 per cent diesel and 32 per cent steam.

Robert H. Morse, Jr., vice president and general sales manager, Fairbanks, Morse & Co.

Fairbanks-Morse 10 cylinder, model 38D8-1/8 P. Diesel engine of the opposed piston type.



The American comparison of diesel and steam drive is taken from the records of the Maritime Commission C-1-A and C-1-B motorships and steamers. Forty of these motorships (all powered with twin 6-cylinder, two-stroke cycle engines, rated 2075 shp at 200 rpm, and connected through electric coupling and reduction gearing to a single propeller) show an average fuel consumption of 0.32 bbls. per mile—or 3.18 miles per barrel—for all purposes. The spread in fuel consumption (in spite of great variation in experience and skill of personnel, and widely different services) was only 2.70 to 3.56 miles per barrel, or compared with the larger figure, 24 per cent. Comparing these figures with the records of a similar number of C-1 steamers, we find a spread from 1.26 to 2.07 miles per barrel, or practically 40 per cent. This comparison shows not only the superior

(Please turn to page 142)

H. G. Vesper, president of California Research Corporation, a subsidiary of Standard of California.

Diesel Fuels—The Supply, The Cost, and The Quality

By H. G. VESPER,
President, California Research Corporation

I have been asked to cover briefly five questions relating generally to diesel fuels. These fall into two groups. The first three questions deal mainly with the future availability of diesel fuel for marine use and the economics of this product with particular relation to bunker fuel oil. The other two questions involve diesel fuel quality.

The first question is as follows:

"Before the war diesel fuel on the West Coast cost little more than Bunker C, but today the cost of diesel fuel is considerably higher than Bunker C. What can be expected in the future as to the relative cost of these two fuels?"

There are two different types of diesel fuels involved. The principal one is doubtless what we would term "bunker diesel fuel." This is the material generally employed for the larger, slower speed marine diesels, and is a somewhat heavier product than the diesel fuel ordinarily used in the smaller high speed engines ashore. The latter product, known as "regular diesel fuel," is the material generally sold in smaller unit quantities to such vessels as fishing boats and pleasure craft equipped with higher speed marine engines. These two types of diesel fuels will be mentioned separately where differentiation is necessary; otherwise the statements made will apply to both.

Actual cost figures do not bear out the inference in the first part of this question that the cost of diesel fuel has increased relative to that of bunker fuel oil. For reference I have taken established price postings for San Francisco Bay delivery. For bunker diesel the price ratio between diesel and fuel oil averaged 1.69 during the four prewar years. This means that the actual bunker diesel fuel price averaged 1.69 times the actual fuel oil price. The lowest ratio during this period was 1.58 and the highest 1.88. The ratio at the present time is 1.73 which is almost identical with the average prewar figure. The wartime ratio was of course distorted by OPA ceiling limitations on diesel fuel whereas fuel oil price ceilings were actually increased during the war period.

An examination of the price picture on regular diesel fuel by the usual method of pipe line delivery discloses a similar situation. Between 1938 and 1941 the ratio of this grade of diesel fuel compared with bunker fuel oil fluctuated from 2.00 to 2.63. The average was approximately 2.29. The corresponding ratio now is 2.26.

From these figures it is apparent that the present cost of diesel fuel for marine use corresponds closely in ratio to bunker fuel oil cost as compared with the average prewar level, although of course the actual cost level is slightly higher in both cases.

There are many factors involved in attempting to predict what may happen to this price ratio in the future. Being a residual product the price of fuel oil does not have to reflect production cost to the same extent as diesel fuel. Furthermore, it is influenced to a considerable extent by the prices of competitive fuels in fields of use other than marine. However, this is equally true of diesel fuel. Ultimately, distillate fuels such as diesel fuel will have to realize to the refiner a value equal to the worth of the stock in terms of its gasoline content minus a small processing cost. This is true because the modern petroleum refinery has become a great deal more flexible in its operation than was the case a few years ago. By virtue of this it is now possible to convert diesel fuel in large measure to gasoline if desired, with a relatively small processing cost for this operation. Therefore, where the total petroleum demand is high the refiner will naturally seek to use this flexibility to upgrade the crude oil used as raw material to the maximum possible extent in producing high yield finished products.

This would not necessarily be true in the event of a considerable surplus of either crude oil or stored products. However, the total petroleum inventories on the Pacific Coast reached a very low level at the end of the war and have stayed relatively low since that time, due to the very high demand. Best available predictions are that the demand will continue at an increasing level and that unless major new fields are discovered—and this seems unlikely—it will be necessary to augment California crude oil production by importing crude or finished products or both by around 1950. This should not give cause for alarm because there are a number of

sources from which such importation can readily be accomplished.

In considering the effect of this on marine diesel fuel it is appropriate to use an approximate ratio of "use" value with fuel oil. It may be established conservatively that one barrel of diesel fuel does the work of at least two barrels of fuel oil for ocean-going vessels. Therefore, the present price ratio of 1.73 for bunker diesel could increase considerably before the break even point would be reached.

As pointed out above, the present tendency is to convert a barrel of crude petroleum into its most valuable products. In the past gasoline has been the controlling product but today diesel fuel is approaching parity with gasoline. Diesel fuel is definitely no longer a by-product. With the refinery flexibility previously mentioned and the rapidly growing demand for diesel fuel the economic law of supply and demand will tend to keep the price relationship of gasoline and diesel fuel within narrow limits, while bunker fuel oil prices will probably lag behind due to the relative inefficiency of this fuel and because there is a practical limit to the conversion through cracking of fuel oil to gasoline and diesel fuel; if the residual fuel cannot be upgraded economically, it will of necessity sell at a lower price.

I would therefore expect some further increase in the future in the relative price for diesel fuel as compared with fuel oil but do not believe this will reach a point that will make diesel fuel unattractive for marine diesel use.

In this connection, mention should be made of the possible use of residual fuel oil for marine diesels. While technically feasible in some engines, it is doubtful this will become an important factor in the economics of the diesel fuel situation in the near future because of the relatively small volume involved.

The second question presented to me is:

"Would there be enough diesel fuel for West Coast vessels if there should be a decided shift to diesel propelled vessels?"

In 1946 all fuel oil bunkers, excluding military, on the Pacific Coast are estimated at about 45,000 barrels daily. If all such vessels bunkering on the coast were converted to diesel power immediately it would require an additional 20,000 barrels daily of diesel fuel to meet the requirements.

Even in this extreme case let us examine the effect on the oil industry. The additional quantity of diesel fuel would doubtless be supplied by diverting that amount from distillate fractions now used by refiners to feed to cracking units of various types for conversion to gasoline. Another method of making this gasoline is to crack straight run fuel oil instead of distillate. Currently, there is sufficient straight run fuel oil being produced in California that is not being charged to cracking units to offset fully the amount of diesel fuel that would be diverted. In other words it would only be necessary on an industry-wide basis to charge about 30,000 barrels daily of uncracked fuel oil to cracking units in place of the 20,000 barrels of diesel fuel diverted to marine use. This would yield about the same total quantity of gasoline as a net result since the cracking yield from diesel fuel is about one-half and from fuel oil about one-third, and would still leave some 15,000 barrels daily of fuel oil from the original bunker quantity plus an additional quantity from the cracking operation available for other fuel oil markets.

Actually the conversion of marine power to diesel will not proceed at any such rate—even though you gentlemen would of course like to see it. According to the best estimates I have available, about 17 per cent of total Pacific Coast bunkers were diesel fuel in 1942. This dropped during the latter part of the war period to about 10 per cent and has this year come back to about 19 per cent. We look forward to a steady increase in this ratio, with diesel fuel reaching perhaps one-third of all bunker requirements by 1950.

In view of the above discussion it can be concluded definitely that there will be ample diesel fuel available to meet any foreseeable demand for marine use during the period we are facing. However, as pointed out previously, the price of the diesel fuel must be such that it would be just as economical to sell it for this purpose as to further process it for sale as gasoline. Therefore it is likely that increased supplies will involve some increase in price in the long-range picture.

The third question on fuel economics is as follows:

"Does the diesel engine industry feel there is any potential danger in the trend of oil companies away from the production of heavier fuels and toward the complete utilization of petroleum products in by-product services? We know that many companies are going out of the heavy oil business altogether. Is there any danger that this will show up with an eventual shortage and higher cost of products ranging from the Bunker C through the diesel fuels?"

This has already been answered as far as possible shortages and higher costs are concerned. It is quite true that the current trend in the petroleum industry is toward reduced yield of residual fuel oil and increased yields of distillate fuels including diesel. With proper price adjustments this trend could be substantially accelerated.

There are many reasons for this proportionate increase in the distillate fuel requirement. The more important are:

1. The tremendous growth of oil for home heating, especially in the Pacific Northwest.

2. Large conversion of locomotive power to diesel. In 1940 there were 799 diesel locomotives and over 40,000 steam units. In 1944 the diesel units had increased to 3022. As of early this year there were 367 diesel locomotives on order and only 81 steam. It is estimated the railroad demand for diesel fuel by 1950 will be as much as nine times that of 1941!

3. There is an accelerated transition going on from

gasoline units to diesel powered equipment for trucks, especially in the larger over-the-road units so widely used in the West.

4. Bus operation is showing a very definite trend toward increased utilization of diesel power.

5. There is a growing use by industry of diesel fuel for miscellaneous power.

The trend toward increasing output of chemical products and by-products from petroleum is also very definite, but the volume involved is negligible in comparison with the volume of diesel fuel or fuel oil and this will probably be the case for some time to come.

Following are the two questions involving diesel fuel quality:

(1) "What is the consensus of manufacturers of marine diesel engines as to the future importance of cetane number in marine diesel fuels?—of volatility of marine diesel fuels?"

(2) "Have diesel engine manufacturers attempted to determine whether fuel contact with salt water is detrimental?"

Since these questions are directed primarily to the engine manufacturers I do not feel in a position to attempt definite answers. However, I can make some general comments which may be of interest.

One great advantage of diesel power especially in the larger, slower speed units is their ability to perform well on a fairly wide variety of fuels. In general they are not particularly critical as to cetane number or volatility, providing the actual boiling points of the fuel are sufficiently heavy to assure adequate penetration into the combustion chamber. However, the smaller, high speed units often used as auxiliary engines have a more discriminating fuel appetite. These engines are generally much more critical as to fuel ignition characteristics and volatility range. This presents a problem both to the engine designer and to the operator. If both types of engines are operated on the conventional type of bunker diesel fuel the high speed units will be penalized somewhat. If, on the other hand, the more costly diesel fuel suited to the high speed units is used for both power plants, considerable extra expense of operation results.

Although complicating storage problems somewhat, one solution justifying careful thought is dual supply of fuels, each of which best meets the needs of the engine served. This would involve a more volatile, higher cetane fuel for auxiliaries and a lower cetane, higher boiling fuel for main engines. Naturally both types of fuels should at all times maintain rigid standards as to cleanliness and uniformity.

It is well known that salt water does a fuel no good. With heavy fuels emulsion troubles may be encountered which in turn complicate the problem of purification and may be the means of carrying rust and other abrasives through circulating pumps—with attendant wear. With the motion of a ship, water suspensions are liable to occur even in the absence of true emulsions. The importance of water—either fresh or salt—from a corrosion standpoint is not thoroughly determined, but it is known that destructive erosion will occur if liquid water is injected along with the fuel. In any case it is highly desirable that the fuel reaching the injectors be completely water free.

Diesel Drive for Large Tankers

By J. H. G. McConechy, Chief Engineer, Sun Shipbuilding & Dry Dock Co.

The main advantage of a diesel engine propelling plant in a tanker or cargo vessel is the low cost of operation which includes a comparatively low fuel rate, low maintenance cost, and the ability of the vessel to carry more pay-load in place of fuel. On a series of six vessels, each equipped with a four-cylinder engine with independent motor-driven scavenge blowers and developing 6000 shp at 92 rpm and 6600 shp maximum continuous rating at 95 rpm, an average overall fuel rate of .384# per shp at normal rating was obtained. At 10 per cent overload, or 6600 shp, the overall fuel rate was .402# per shp hour. These rates are all referred to 19500 btu per lb. oil. The fuel rate at normal power, .384#/shp, as compared to about .60#/shp in the average modern steam propelled

J. H. G. McConechy, chief engineer, Sun Shipbuilding & Dry Dock Co.

cargo vessel, permits a material gain in pay-load carrying capacity where definite voyage routes are established.

These overall fuel rates include: diesel driven generators furnishing 550 kw for the total auxiliary load; the steam driven boiler feed pump; fuel oil heating; and quarters heating load. The steam load demand during normal operation is generated with the diesel engine gas exhaust boiler.

In one series of tankers powered by a diesel engine having a normal capacity of 7500 shp at 94 rpm, and 8250 shp at 97 rpm, two 300 kw turbo-generator units were installed, which are operated with saturated steam generated in a diesel engine exhaust gas boiler at a steam pressure of 190#/sq. in. ga. at the turbine throttle, the turbine exhausting into a vacuum of 26-inch Hg.

The entire engine room electrical load at sea, together with the auxiliary steam load, that is, boiler feed pump, fuel oil heating, evaporators, domestic hot water heating and quarters heating, is carried by the exhaust gas boiler. When maneuvering, the necessary steam load is furnished by a stand-by oil fired boiler. The fuel consumption of this installation was .360# per shp hour at the normal rating of 7500 shp, with an electric load of 186 kw.

Another series of vessels with a main propulsion diesel engine with attached scavenge pump and developing a normal rating of 7500 shp at 94 rpm and 8250 shp maximum continuous rating at 97 rpm, the overall fuel consumption was .3695# per shp per hour, including 190 kw electric load from diesel driven generators.

SOME YEARLY AVERAGES FOR A FLEET OF 11 DIESEL DRIVE TANKERS

	1937	1938	1939	1940
Average No. days in port per vessel	56.7	25.1	49.2	54.1
Average No. days in shipyard	7.36	4.2	4.9	7.4
Average No. days at sea	101.9	146.5	107.4	110.
Average miles traveled	80578.	41496.	84530.	84216.
Average fuel consumption in barrels	35951.	17307.3	38258.	39829.
Average No. trips per year	19.9	10.3	21.8	22.5
Average barrels fuel per trip	1805.	1685.	1753.	1766.
Average barrels fuel per mile	2.24	2.4	2.21	2.24
Average barrels per day including pumping cargo in port	101.9	100.	107.4	110.
Average yearly engine room repairs not including boilers	1977.	2334.	3143.	4484.

Average cost of repairs per vessel per year over a period of four (4) years: $2985.00.

In these tests, two fuel oil meters, tested by the U. S. Navy, were placed in series in the supply and return lines. Fuel oil heat values were determined by the Bureau of Standards, Washington. Horsepower developed was averaged by torsionmeter installed on the line shafting and checked by indicator cards. In all trials, fuel oil between 16° to 20° A.P.I. gravity was used. Heavier oils can be used successfully if heating is applied to bring the oil to the required viscosity for injection.

PERFORMANCE OF A FLEET OF FOUR DIESEL DRIVE TANKERS FOR ONE YEAR

	(A)	(B)	(C)	(D)
No. days in port	180	85	83	86
No. days in shipyard	25	11	11	32
No. days at sea	160	270	271	248
Total miles traveled	41354	83855	86483	77638
Fuel oil main engine at sea (bbls)	16371	32900	30952	28390
No. of round trips (cargoes carried)	40	23	24	21
Average cargo (long tons)	16223	11400	11518	11512
Maintenance cost main engine	$340	$4163	.....	$6860
I.H.P. Average	3634	4021	4507	4141

Vessel "A" was engaged in short trips.

The initial cost of engine room machinery and equipment required for various types of drives for a given shp output as installed in tankers (assuming the cost of pumping equipment and deck machinery to be constant in all cases), should be as follows:

Direct diesel drive	**$1,000,000.00**
Geared diesel drive, two engines with electric couplings and reduction gears	**1,195,000.00**
Cross compound turbine with double reduction gears and high pressure boilers	**1,000,000.00**
Turbo electric	**1,090,000.00**

The engines in the group of four vessels were installed in 1937, and all of the original cylinder liners are still in use. A recent calibration of the liners in one engine showed a maximum fore and aft wear of .099 inches, and a maximum wear thwartship of .094 inches. The wear on the other cylinders was considerably less than these figures. Records of other engines show liners in use for over a period of ten years.

The maintenance costs on diesel engines can be kept to a minimum by a careful routine check of the more important parts, especially the fuel injection mechanism.

Lubricating oil consumption on the five (5) cylinder 7500 shp engines should not exceed three to five gallons per day crankcase oil, and five (5) gallons per day cylinder oil. For smaller engines, crankcase oil consumption will remain about constant. The cylinder oil consumption will vary according to the number of cylinders; in a four (4) cylinder engine the consumption should be about four (4) gallons per day.

Why Diesel Power in Our Merchant Ships

By R. W. BAYERLEIN
Manager Heavy Machinery Division
Nordberg Manufacturing Co.

R. W. Bayerlein, manager Heavy Machinery Division, Nordberg Manufacturing Co.

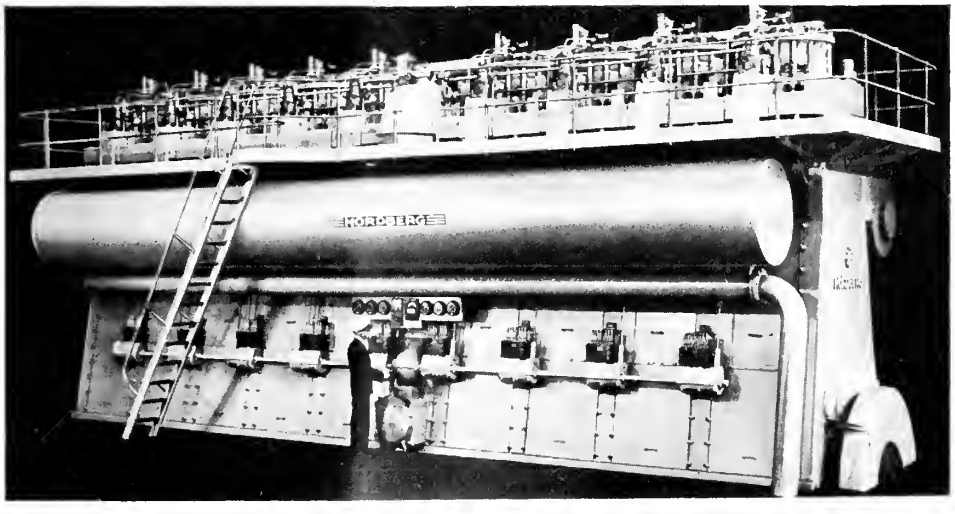
The pattern of the nation's peacetime merchant marine was drawn when the Maritime Commission officially designated 32 foreign trade routes and services as "essential." The routes, especially interesting to the West Coast, include the long transpacific route—San Francisco-Honolulu-Guam-Manila-Hong Kong-Yokohama-Vladivostok-San Francisco.

A Nordberg diesel-propelled vessel, the Emory Victory, of 6000 shp, maintaining 15.5 knots on this route, showed an overall fuel consumption of 0.39 lbs. per shp hour, or about 2.25 miles per barrel. The total fuel required for this 15,000 mile route is 6800 barrels, or 990 tons. A Victory type steam-propelled vessel, maintaining 15.5 knots, requires about 0.6 lbs. per shp hour for all purposes, or about 1.33 miles per gallon. This means a total for the round voyage of 11,500 bbls., or 1770 tons. The fuel used by the motorship cost $1.60 a barrel, and that by the steamer, $1.40 a barrel in San Francisco, so that the motorship's fuel for the round trip totaled $10,900, and that for the steamer, $16,200. So that the diesel-drive ship in this case saves $5300 per round trip in fuel costs, and at the same time saves 780 tons of pay-load capacity.

In lube oil consumption, the Emory average over four of these long voyages was 17.2 gals. cylinder oil, and 12.4 gals. crankcase oil per day, or a total of 1720 gals. cylinder oil, and 1240 gals. crankcase oil. This would total, at average price, $1356 per trip. Deducting this from the $5300 fuel oil savings leaves a net saving of $3944 per trip in the engine operating cost, assuming that the turbine job uses no lube oil of any kind.

The development of the modern marine diesel to a point of unexcelled performance, and resultant low maintenance, has been demonstrated in a number of vessels. I believe the maintenance cost of a modern diesel engine today does not exceed the cost of maintenance of a steamer of the same power with attendance to turbines, gears, boilers, condensers, pumps, and a host of other gear. Actual maintenance records of many of the motorships, as well as the steamers, built from 1940 on, are not available, and if they were, would be of little value due to adverse operating conditions to which many were subjected. However, some records investigated showed a

(Please turn to page 142)



Nine cylinder Nordberg diesel engine of the type used on the U. S. M. C. Victory motorships. This one is installed aboard the Emory Victory.

Some Marine Diesel Installation Problems

By J. W. ANDERSON

THE PROBLEM OF POWERING a vessel varies from that of a rowboat to an ocean liner. At the lower end of the scale we begin with gasoline outboard motors. At the upper end of the scale the usual choice is steam turbines with electric or geared drive to the propellers. The great bulk of installations is in small or moderate horsepowers where there is available a choice of prime movers and of various methods of drives.

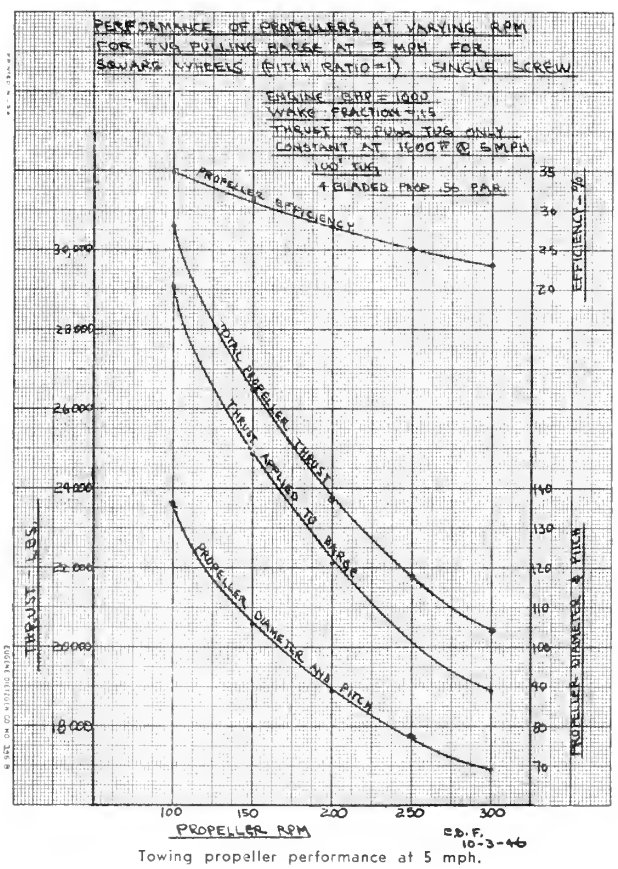
In general, gasoline and diesel engines compete at the lower end of the scale for power. For intermediate horsepowers, diesel engines are quite the usual choice.

This discussion is concerned with some of the reasons for choice between the gasoline and diesel engines at the lower end of the scale, and is particularly interested in some propulsion problems in connection with the propeller and the drive between the engine and the propeller.

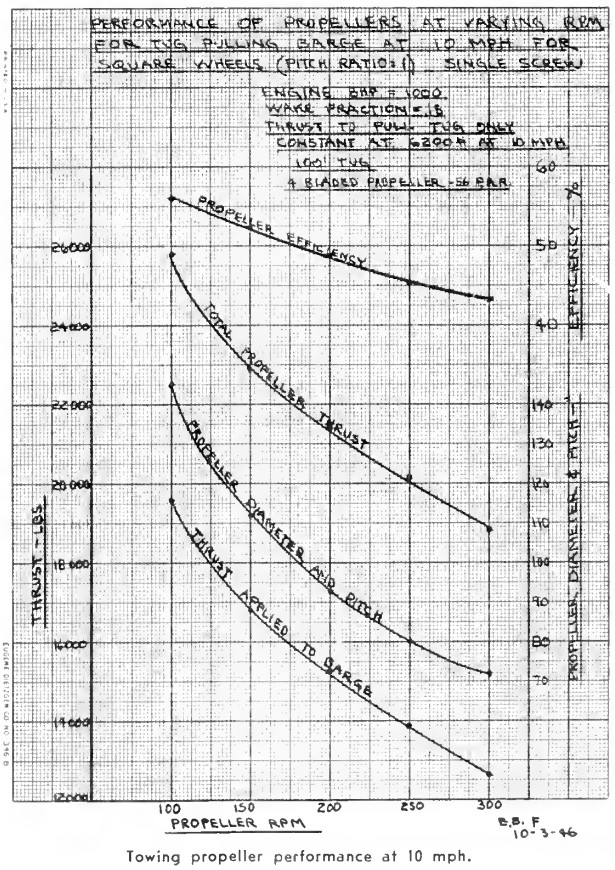
It is usual in the trade to rate gasoline engines at their peak power. Also, the gasoline engine usually operates at a higher piston speed and speed of revolution than the diesel engine. The usual rated brake MEP of the gasoline engine is higher than the diesel. Normally, the maximum gas pressures in the gasoline engine are lower than the diesel in the types of engines we are discussing. All of this adds up to a heavier engine for the corresponding diesel horsepower.

The heavier diesel makes a more costly engine to build than the gasoline engine, and in addition the fuel injec-

(Text is from a talk delivered before the Marine Diesel Meeting of the Northern California Section of the Society of Automotive Engineers, Inc., on October 8, 1946. Mr. Anderson is Executive Engineer, Atlas Imperial Diesel Engine Co.)



Towing propeller performance at 5 mph.



Towing propeller performance at 10 mph.

tion equipment of the diesel is at present more expensive than the corresponding gasoline engine carburetor. Gasoline engines are in general more standardized and are usually built in larger manufacturing quantities, which further tends to a reduction in cost.

On the other hand, the gasoline engine uses about 25 per cent more fuel in gallons than the diesel at full load, and as the load is decreased, this percentage difference increases to the further advantage of the diesel. In fact, at one-quarter load, the difference may be as great as 100 per cent.

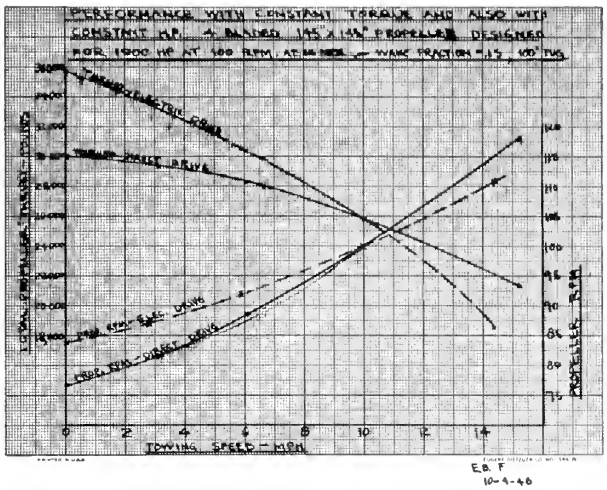
The difference in cost of fuel varies with localities and the amount of sales tax involved in each case, but usually gasoline is far more expensive than fuel oil.

Thus the choice of diesel versus gasoline engine boils down to how much use per year the customer is likely to have for his engine. If the use factor is low, usually the gasoline engine is preferable, but if the engine is to be used many hours per year, the diesel will usually soon pay for itself out of the fuel savings. The owner must decide for himself how soon he would like to liquidate the extra investment for the diesel. According to the time factor for the payout of this extra investment, calculations show that as little as 1000 or 1500 hours of operation per year use is the dividing line in one case, and perhaps up to four or five thousand hours per year in another.

One of the most interesting problems is that of the tugboat, because it operates under such a variety of conditions. When the tugboat is running free, the propulsion problem is very similar to that of the majority of ships, but the tugboat also must tow at widely varying speeds, and this factor alone introduces many problems.

In order to bring out some of the factors involved, take the concrete example of a tug 100 feet long with a 1000-hp diesel engine, and let us assume that the tug runs free at 10 mph and tows at both 5 mph and 10 mph. This is a typical case.

The diagrams herewith have been drawn on the basis of propeller thrust, which is the equivalent of tow rope pull, and for purposes of discussion have been plotted over a range of propeller speeds from 100 to 300 rpm. At 5 mph the chart indicates a propeller efficiency varying from about 23 per cent up to 35 per cent for the range of propeller speeds of from 300 to 100 rpm. The corresponding propeller thrust varies from about 20,400 pounds up to 30,600 pounds, from which must be deducted 1600 pounds for pushing the tug through the water, and thus there is left for towing the barge a thrust varying from 18,800 pounds to 29,000 pounds, according to propeller speeds of 300 to 100 rpm. For these figures square propeller wheels have been used; that is to say, the propeller pitch equals the propeller diameter. The diameter is particularly important, and the chart indicates that at 300 rpm a 69-inch diameter is most suitable and at 100 rpm the diameter increases to 136 inches.



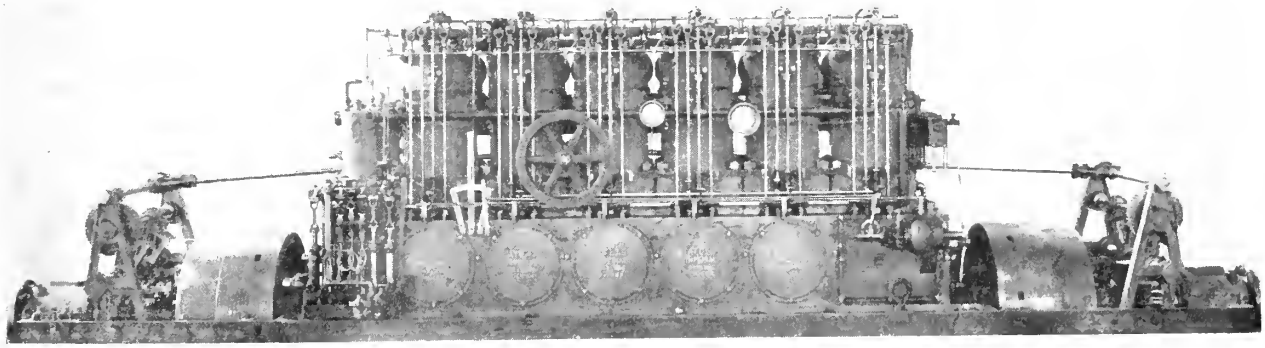
Propeller performance at constant torque and constant hp.

From the standpoint of propeller efficiency, propeller thrust or tow rope pull available for towing the barge, the situation is clearly in favor of the 100-rpm propeller, but for a tug 100 feet long a 136-inch diameter wheel is a sizable affair.

At 10 mph the chart shows a propeller efficiency varying from 43 per cent at 300 rpm to 50 per cent at 100 rpm. This is a marked increase; in fact, very nearly double the figures obtained at 5 mph. The total propeller thrust varies from 18,900 pounds at 300 rpm up to 25,-

(Please turn to page 134)

Here is an Atlas diesel arranged with a clutch at each end for driving a double end screw ferryboat. This engine has given years of economical service.



Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

Shipping Locomotives— A Potent Type of World Trade

Converted to carry 18 locomotives and 18 tenders with a 92-foot hatch big enough to load complete Pullman cars, the motor vessel Gadsden, first of its type built in this country, completed successfully its official trial for heavy lifting beam assembly and heavy lift boom at the Bethlehem Steel Company, Shipbuilding Division, Baltimore Yard, Key Highway. Viewing the trial were officials of the American Eastern Corporation, New York, owner and operator of the vessel which will carry a large part of the 1400 locomotives and tenders purchased by the

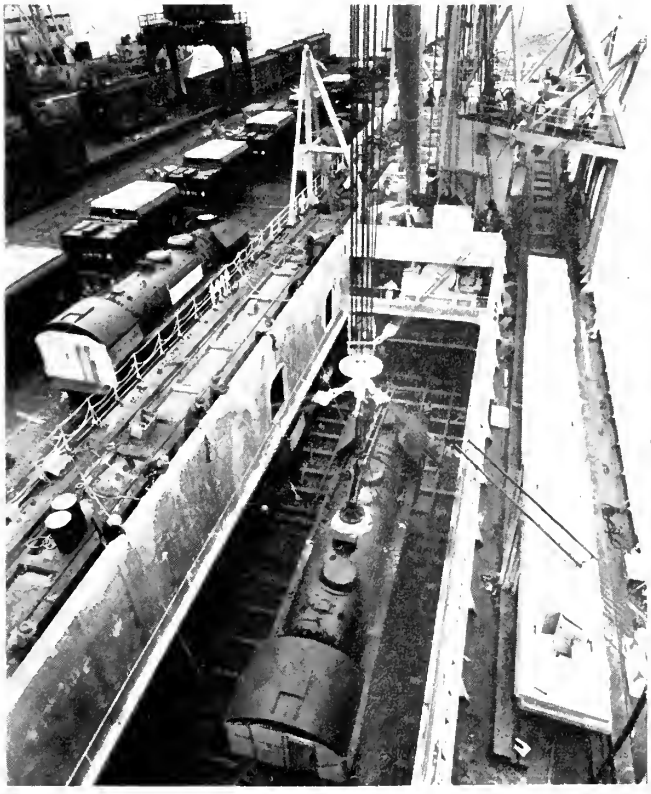
Scenes on pages 72 and 73 show the step-by-step method of loading locomotives on the motor vessel Gadsden, first of its type built in this country, and designed to carry 18 locomotives and 18 tenders. The 72 foot hatch is big enough to load complete Pullman cars.

French Government in the United States and Canada, together with officials and representatives of Bethlehem, Gibbs and Cox, New York, design agents for the ship; the American Bureau of Shipping, the U. S. Coast Guard, Westinghouse Electrical Company, and A. A. Johnson, Inc., New York.

Following the trial, J. M. Willis, general manager, Baltimore District, Bethlehem Steel Company, Shipbuilding Division, stated the equipment met all tests satisfactorily.

Heaviest of three loads lifted was 137½ tons, equivalent to the weight of a complete locomotive and tender. It was loaded so that it would be suspended in equal amounts from each end of the beam. The load was held in position for 20 minutes.

The Gadsden came to Bethlehem's Baltimore Yard



Pacific WORLD TRADE

last August 19 after being purchased by the American Eastern Corp. from the Government. It was used by the Navy as an assault cargo ship (AK) during the war in the Pacific to carry cargo and move troops.

Principal feature of the conversion at Key Highway was the installation of heavy lift handling gear which will enable the vessel to load and discharge its cargo of locomotives and tenders without the assistance of any pier or other facilities.

The main boom, 88 feet long and 33 inches in diameter with the thickness of steel seven-eighths of an inch, is considered the largest of its type built in this country. A novel feature is the method of control of the load by vang tackles attached to a swivel device on the lower hoist block, the boom being free to follow the load moving around. The vessel also is equipped with eight five-ton booms for handling general cargo. The ship has an overall length of 338 feet, width of 50 feet, molded depth of 26 feet, draws 23 feet when loaded and has a displacement of 5425 tons.

New Orleans World Trade Mart

Construction of the International Trade Mart in New Orleans, Louisiana, will begin immediately. Forty-five per cent of the leases for the projected building have already been sold.

With the establishment of the Export-Import Institute, New Orleans will offer practical business training in the foreign trade field, according to International House, in that city. Two two-year course features actual on-the-job training with experts and leaders in shipping, freight forwarding and foreign trade firms conducting lectures and seminars.

HARBOR BLOCKED!

The SS Britain Victory, Pacific Far East Line vessel, blocking Honolulu harbor. The vessel became lodged on a coral reef at the harbor entrance October 29, 1946 at 5:15 p.m. and together with the vessels attempting salvage, blocked all inbound and outbound traffic until she was floated November 8 at 3:15 a.m. Some traffic was able to move but for all purposes Honolulu was without a port for a period of almost eleven full days.

Far East-America Council

Establishment of the first American trade association devoted to promotion of United States trade throughout the Far East and India has been effected by a decision of the China-America Council of Commerce and Industry to expand its scope of activity to other Asiatic areas as well. The name of the organziation has been changed to the Far East-America Council of Commerce and Industry, but the identity of the China-America Council will be maintained as its China division and the China work will continue unimpaired. As rapidly as circumstances permit, however, he said, activities will be extended to other areas.

"Creation of the Far East-America Council," according to Harry D. Collier, Chairman of the Board, Standard Oil Company of California, and Chairman of the Council's California Regional Board, "for the first time puts at the disposal of American business an integrated, specialized trade association operating throughout Southern and Eastern Asia. It has been decided on because of the insistent demand by member firms for the type of services the Council performs as respects trade with China in the other Asiatic areas as well. The reasons for this demand are clear.

As a result of the war, the economic and political status of many of the Eastern countries has been radically changed. These developments, which are only in their infancy, may have the most far-reaching consequences for the future of American foreign trade. All over this vast area, in which live about a billion persons, one-half the population of the world, there is a determination to modernize the economy and to raise the general standard of living. The acquisition by India and the Philippines of a status of independence will create many new adjustments requiring special study. It may be expected that throughout the Orient there will be a gradual evolution from the hitherto colonial or semicolonial status that has existed, and this will bring with it important economic changes. To an increasing extent, these areas will be considered not only as primary sources of some of our basic raw materials but also as potentially great and growing markets for American products. The United States will, of course, play an important role in the reorganization of the Japanese and Korean economies.

"In view of the many highly complex and shifting political, economic and fiscal problems constantly arising in all countries of the Orient, it is essential that American business, for its own protection and for the maximum development of its foreign trade, have at its disposal a strong trade organization in closest touch with developments there. In the past, aside from the type of services provided by government agencies, no reliable and prompt source of detailed commercial information on trade opportunities and conditions throughout these areas, such as the Council has provided on China, has been available to American firms. There has been no unified and authoritative voice pressing the viewpoints and interests of American business in most of these countries. In these respects, American companies have been at a disadvantage as compared with some competitive foreign nations, notably the British, that have strong and concentrated trade groups specially devoted to the study and handling of Eastern problems.

"The Directors of the Council, who represent many of the leading companies of the country engaged in foreign trade, consider the expansion of the Council's sphere of work to India and Southeast Asia a logical outgrowth of its work in China trade. The Council has the active support of a large part of American industry interested in trade with the Pacific areas. In its China operations it has built up considerable prestige in business and governmental circles, both here and abroad, and it has obtained invaluable experience in handling the problems involved. This will make it possible to launch the expanded operations with a minimum of lost motion and with maximum effectiveness."

World Food Group Bars Bilateral Agreements

Twenty-five nations of the International Emergency Food Council have agreed in effect not to carry out bilateral or barter agreement which would interfere with the council's effort to feed hungry areas.

This agreement was contained in a resolution adopted unanimously by the council, with all member countries having representatives present.

The council recently expressed concern lest bilateral and other post-war trade agreements would upset the council's food allocation recommendations for the balance of this year and for 1947.

Pacific WORLD TRADE

New China-U. S. Pact

The representatives of the Chinese and United States governments on the afternoon of November 1 affixed their signatures to the Treaty of Friendship, Commerce and Navigation between the two nations, thus bringing into existence the first treaty of its kind signed with China by a foreign power since the abrogation of the unequal treaties in January, 1943.

In view of the importance of the occasion, Premier T. V. Soong personally attended the ceremony, which was held at the conference hall of the Executive Yuan. China was represented by Dr. Wang Shih-chieh, Minister of Foreign Affairs, and Dr. Wang Hua-chen, chief of the treaty department of the Ministry of Foreign Affairs, and the United States was represented by Dr. John Leighton Stuart, Ambassador to China, and American Consul-General Robert Lacey Smyth of Tientsin.

Negotiations for the new treaty started in the spring of 1945 during the United Nations conference in San Francisco, at which the representatives of the two nations opened consultations, though official negotiation proceedings did not begin until February this year in Chungking at high government levels. The ceremony at the Executive Yuan marked the culmination of one year and a half's efforts.

The treaty is to be ratified by the Legislative Yuan of the Chinese Government and the U. S. Congress and will remain in force for a period of five years from the day of the exchange of ratifications which will take place in Nanking in the very near future. The treaty is in the Chinese and English languages, both of which are equally authentic. The Chinese version of the treaty is estimated to contain 20,000 words and the English version, 10,000 words.

Most-Favored-Nation Treatment Is Keynote

The most-favored-nations treatment is the keynote of the new treaty whose contents opened with the significant statement that "There shall be constant peace and firm and lasting friendship between the Republic of China and the United States of America."

The idea of international equality embodied in the treaty is generally noted. As this is the first major treaty that China has concluded with another country since the end of the war, all the newspapers expressed the belief that it will be a model for all subsequent similar treaties that she may sign with other countries.

Dean Roscoe Pound On Chinese Law

Chinese commercial legislation is in line with good modern standards and should present no greater obstacles to American business than might ordinarily be expected in almost any foreign country. The principal difficulty lies in the interpretation and administration of the laws. China has an insufficient number of lawyers and jurists trained in the application of her codes and legislation. There are a considerable number of lawyers and judges with good foreign training, but the fact that this training has been received in many different countries, particularly the United States, England, France, Germany and Japan, makes it difficult to get a unified approach to the codes and their application. Also, as yet there has not been time to build up a body of well-established modern legal precedents to guide judges and lawyers.

The Chinese Government leaders are eager to get advice from American business on ways and means of improving their commercial law and judicial procedures. In giving such advice, however, American business should be sure to take into account Chinese viewpoints and conditions. Failure to give sufficient heed to Chinese national interests has been a major cause of rejection of some of the suggestions made by other foreign business groups in the past.

—Dean Roscoe Pound,
to the Legislative Committee
of the China-America Council.

Norway Orders Large Cargo Ships

Oslo reports steady progress in the replacement and expansion of Norway's merchant fleet. Contracts to a value of over 1,700,000,000 crowns ($340,000,000) have been placed with foreign and domestic yards since the war's end and modern vessels are steadily replacing Norway's war-lost ships, says the Royal Norwegian Information Service. Although more recent contracts call for delivery as late as 12 years from the present, Norwegian interests have great faith in the future of world shipping.

Norwegian firms have recently placed orders with Swedish shipyards for four 24,000-ton tankers which when completed will be the world's largest cargo vessels. Two of them have been ordered by the Onstad Shipping Corp., and one each by the Herlofsen Co. and the Torgersen firm in Tonsberg. Each of the vessels is estimated to cost approximately 10,000,000 crowns ($2,000,000).

Argentina—

A Vital Factor in World Trade Today

—Los Angeles Begins Series of World Reports

The first of the new series of World Reports, sponsored by the World Trade Department, was delivered Friday, November 8th, in the Chamber of Commerce dining room. Michael Harris, director, Export Sales, Max Factor & Company, furnished an excellent report on current business and economic conditions in Argentina. Unfortunately, we are unable to present his complete report, but following are some of the highlights:

"Any fellow who has $750,000,000 American dollars in his left hand pocket and 150,000,000 British pounds in his right hand pocket is an excellent customer. Argentina is that customer."

"England has no monopoly on Argentine trade. The Argentine is interested in buying almost every conceivable type of goods wherever he can buy them."

"'Britain Delivers the Goods' is a fine slogan, but is only a slogan right now. There are few goods coming in from England at this time."

"Argentina is the easiest country in the world in which to establish a branch plant."

"Business taxes are much easier in Argentina than in the United States, the top bracket being abour 20 per cent. Individual tax rates are negligible.

"There are no governmental restrictions in Argentina on dollar exchange for bona fide foreign transactions."

"There are no credit problems in selling to Argentina. Imports by law must be paid for in full in cash within 30 days after clearance through Argentine customs."

"The Peron Government has none of the aspects of a comic opera. It is a regime with a very cold, hard-fisted and clearly thought out foreign and domestic program."

"Rental costs for offices are very high and compare with upper Fifth Avenue in New York."

"There are no governmental restrictions on the taking of profits out of Argentina."

"Salesmen and governmental missions from many nations are heading for Argentina trying to get their business. We have an immediate chance to get in there and establish American brand names so well that England will never catch up. We can sell every piece of industrial equipment, road machinery, public utilities equipment we can send to Argentina. We can sell practically every kind of Department Store merchandise. We'll get paid for it, it will be sold, and we'll get re-orders."

Elsa Miranda, popular radio star, who first won national recognition by her rendition of "Chiquita Banana," sponsored on November 1st, the SS Sixaola, fifth of a program of nine fully refrigerated ships now building at Bethlehem - Sparrows Point for the United Fruit Company.

Photo courtesy United Fruit Company

Cargo in the Air

The airplane's value to shippers whose products are destined for domestic and world markets is shown by the first 90 days operations of American Airlines' new Contract Air Cargo Division, with six giant four-engine Airfreighters.

Payloads have included: sheet aluminum, carburetors, automobile tires, cholera serum and penicillin, furniture and office equipment, Mexican beer, popcorn, electrical appliances, mahogany logs and plywoods, various kinds of Alaskan fish, Newfoundland lobsters, race horses and cattle, fruits and vegetables, cheese, department store merchandise, women's wearing apparel, Mexican pineapples and bananas, and magazines and newspapers.

A five-ton cumbersome marine turbine flown from the East Coast to a Texas coastal town shares heavyweight honors with nine and one-half tons of structural steel parts to build a 275-foot radio tower for Station WMTW

at Portland, Maine. The steel was flown from Allentown, Pa., in two hours, eliminating construction delay.

Forty tractors, each weighing more than one and one-quarter tons, eight to plane, were flown by Airfreighter to Guatemala City from Detroit.

More than 20 tons of cigarettes, 13½-million smokes, were flown in two flights from Richmond, Virginia, for export to Panama. These two shipments, each weighing 20,587 pounds, were among the largest commercial cargoes ever shipped by air.

Some flights have been emergencies. In eastern Canada, the Stokely-Van Camp Company had a bumper pea crop which matured too quickly because of warm weather and no rain. Canneries around Trenton, Ont., couldn't handle the big crop. For nearly 72 hours freshly shelled peas coming directly from the fields were flown to Windsor 10 tons at a time. The crop was saved.

In Mexico were sugar-rich, plant-ripened pineapples, a dead loss to growers in the past. They had to be eaten within a few hours of picking. They were flown in a few hours from Vera Cruz to a Texas plant for the initial experiment in quick-freezing the mature pineapples. Soon Americans for the first time will be able to enjoy this luscious fruit.

In the news came stories that China was suffering an epidemic of cholera. Working steadily for 48 hours, two planes were made ready to fly 16 tons of life-saving medicines to Shanghai—10,000 miles away. U. S. newspapers also went along for our troops in the Far East. Some weeks later a third ship carried more penicillin and some anti-hog-cholera serum.

When the South's $75,000,000 peanut crop in Georgia, Alabama, and Florida was threatened with destruction within a few hours by a plague of velvet bean beetles, tons of insecticide were flown into strategically located territories and quickly made available to save that crop.

Brig. General R. H. Wylie, new port manager appointed by the Board of State Harbor Commissioners, who will take office January 15, 1947.

Brig. General Wylie Port Manager Of Port of San Francisco

Appointment of Brig. General R. H. Wylie as port manager of the Port of San Fracisco is announced by Thomas Coakely, president of the Board of State Harbor Commissioners. Wylie will take office on January 15, 1947, following his retirement from active service by the War Department.

His appointment as successor to Neil S. Laidlaw, who resigned last July to accept an executive position with the Matson Navigation Company, climaxed a long study of the qualifications of numerous applicants by Coakley and his fellow commissioners, W. G. Welt and N. Loyall McLaren.

General Wylie was chosen because of his long experience in the field of shipping, which includes such assignments as Assistant Chief of Transportation, and Director of Operations with the Army Service Forces. His record shows that of the 28 years Wylie has spent in the military service, 22 have been in transportation, and 14 of those years principally in water transportation. He served on the War Department General Staff in the early months of the war and was afterward stationed in San Francisco as Assistant Superintendent, Army Transport Service.

His duties during his service as Assistant Chief of Transportation and Director of Operations included control of military rail and motor traffic throughout the United States and the operation of Ports of Embarkation at Boston, New York, Charleston, Norfolk, New Orleans, Los Angeles, San Francisco, and Seattle, with sub-ports at Baltimore, Philadelphia, Moblie, Portland, and Prince Rupert. In addition, General Wylie was responsible for military shipping operations in overseas ports in all parts of the world. This background, Coakley said, should prove of great value in the development of world commerce through the port of San Francisco.

General Wylie, having spent altogether eight years in San Francisco, has a wide acquaintance throughout the shipping industry, and a thorough knowledge of the operations of the port of which he is to assume charge.

Shell Man Developed Portable Military Pipe Line

Sydney S. Smith, manager of the products pipe line department of Shell Oil Company, was presented the Medal for Merit, the country's highest civilian award, at a dinner recently in Tulsa, Oklahoma. He was cited "For exceptionally meritorious conduct in the performance of outstanding services to the United States." Col. C. H. Cherpening, Tulsa District Engineer, represented President Truman in making the award, which is the civilian counterpart of the Distinguished Service Medal.

"Mr. Smith," the award stated, "following the outbreak of World War II, foresaw the entry of our country into the conflict and started to promote portable military pipe lines to keep mobile armies supplied with petroleum products. Actuated by high patriotic motives, he unstintingly gave his time and experience in assisting the government in designing, perfecting and proving such equipment."

Considered one of the most important developments in modern warfare, the portable pipe line, perfected by Mr. Smith in cooperation with army engineers, played a major role in speeding allied triumphs during World War II. When American troops broke out of the Normandy beachhead at St. Lo and started on their historic dash across France, the portable line supplied the major portion of the million gallons of gasoline required daily to maintain this breakneck pace.

Pre-fabricated, each section of four-inch, lightweight steel pipe in the line was 20 feet long and weighed only 100 pounds, about half the weight of standard pipe. Sections were joined by a flexible coupling to eliminate the need for welding. Portable pumping stations, operated by fully automatic controls, were located every 5 to 10 miles, and gate valves were also placed every few miles to cut off the flow of oil when necessary. The total weight of the line per mile, including pumping stations, was only 13 tons.

The line was laid above ground at the rate of 10 to 30 miles a day and concealed by brush and trees wherever possible. It was so flexible that it could bend around corners. Usually, it was placed parallel to roads to make it easy for trucks hauling equipment. Even during violent action at the front, portable stations could be moved for repairs or replaced with scant interruption to the flow of the precious fuel.

The Medal for Merit, originated by George Washington in 1782, has been presented to only 140 civilians during World War II. Among the recipients were William A. Harriman, Secretary of Commerce; Charles E. Wilson, president of the General Electric Company; and J. Edgar Hoover.

Mr. Smith has been with Shell Oil Company since 1924, when he became office manager of the company's Natural Gasoline Division at Tulsa, Oklahoma. He became manager of the division in the following year, and in 1935 was transferred to the company's Manufacturing Department in St. Louis. On January 1, 1938, he assumed his present position. He was a Lieutenant in the Balloon Corps during World War I.

Matson's Big Aircraft Facilities At Oakland

Formation of a new subsidiary, the Matson Aviation Maintenance Company, is announced by the Matson Navigation Company. The new company will carry forward on an expanded, permanent basis the aircraft conversion and repair program previously undertaken by Matson's Air Transport Division.

S. G. Walton, vice president of the parent company, is President of the new concern. Executive Vice President will be T. A. Schmidt, director of Matson's Air Transport Division. Paul Naton and A. A. Maisel will be Secretary and Comptroller, respectively.

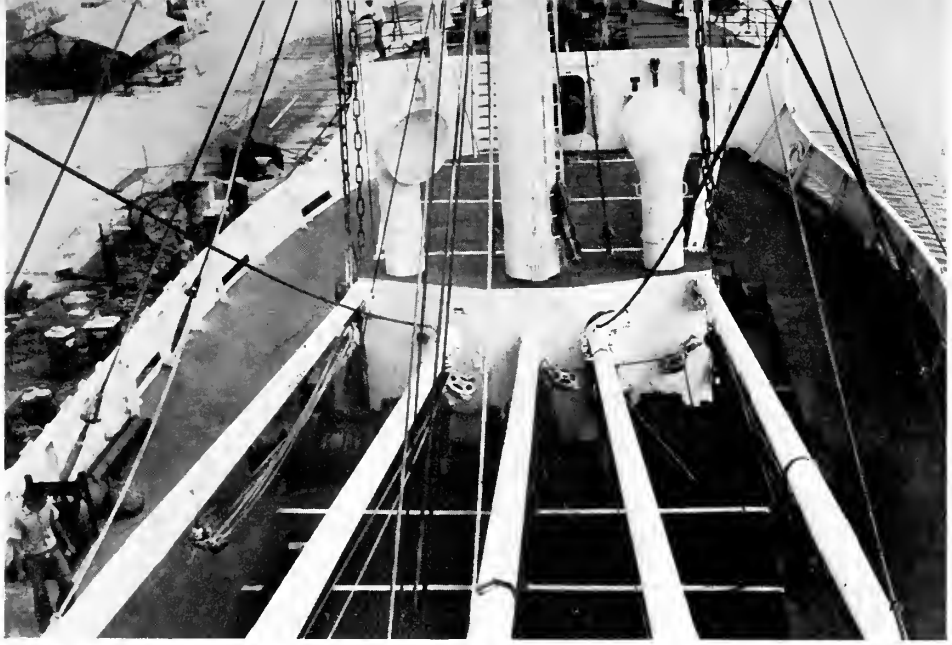
Under the new set-up, Matson's non-scheduled air transport operations will continue to be carried on by the Air Transport Division, while all aviation maintenance, repair and conversion work will be conducted by the new company at Matson's conversion center at Oakland Municipal Airport.

The activities of the new company contemplate establishing facilities at John Rogers Airport in Honolulu, where the same type of work will be done on a commercial basis.

During the war, Matson modified, converted and overhauled aircraft for the Navy. Following V-J Day, this work was carried forward on a commercial basis, specializing in conversion of multi-engined aircraft for foreign and domestic airlines and other customers. Matson's conversion and maintenance facilities are *among the largest in the country*, and are concentrated in two large hangars at Oakland Airport. Employees now number approximately 650, and additional skilled workers and technicians are being employed to meet a growing work load.

New Foreign Commerce Handbook

A revised edition of "Foreign Commerce Handbook" has been released by the United States Chamber of Commerce. The handbook presents a list of the leading organizations, governmental and non-governmental, which are best qualified to furnish foreign trade information and services in connection with all phases of exporting and importing.



The new cargo winch of G.E.'s was installed on the Angele Higgins at left.

◄

Below: General Electric's new and speedy cargo winch.

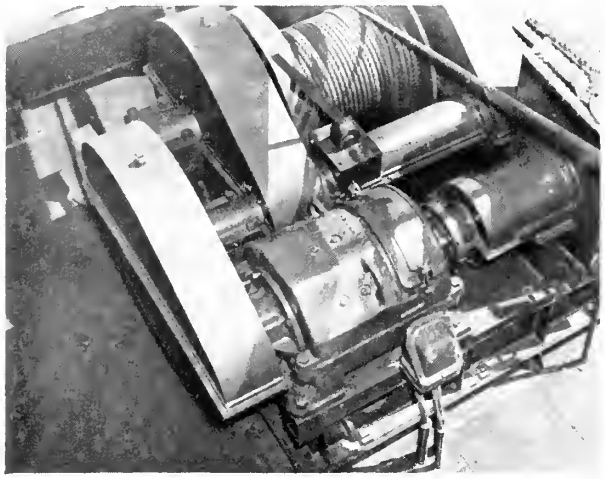
▼

G. E.'s New Winch Control System on Angele Higgins

The pioneer installation of General Electric's new Maxspeed cargo winch control system has been made aboard the Angele Higgins of Higgins, Inc., New Orleans, and subjected to a series of exhaustive tests.

In addition to the tests required by the U. S. Coast Guard and the American Bureau of Shipping, the new winch controls were subjected to gruelling tests devised by Higgins, including, they said, "everything that a stevedore could ever dream of—and then some."

The winch was rared to handle 10,000 pounds, but in one test the boom was loaded with 17,000 pounds. With the load resting on the wharf, the control handle was thrown to full-speed hoist, not gradually, but as fast as the handle would go over. The motor raised this load without a whimper.

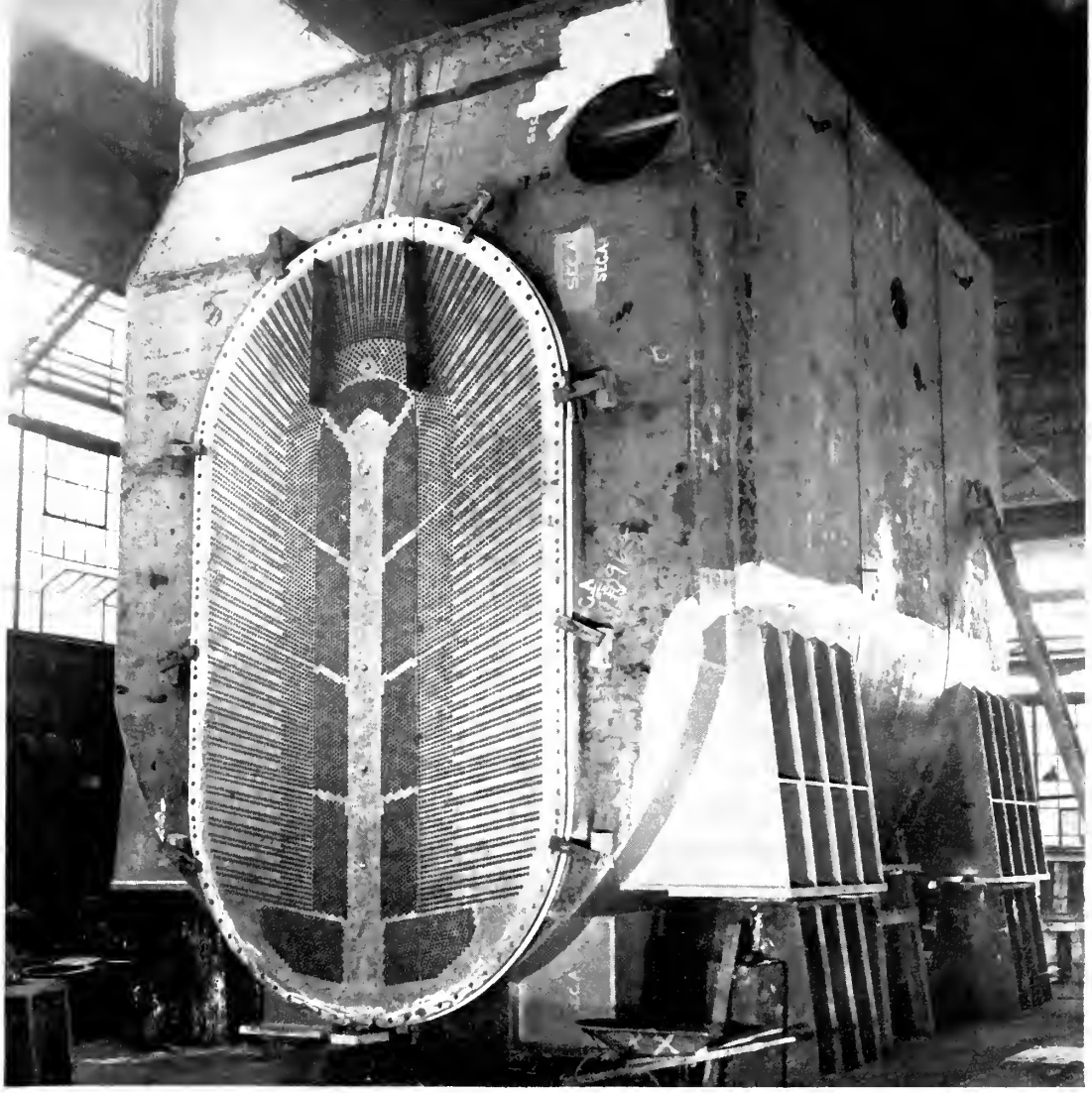


When the load neared the top of the mast, the control handle was thrown, without stopping, directly to full-speed lowering. As the load was commencing down, apparently without control, the handle of the master switch was gradually moved to a slower lowering speed. The speed of the descending load was reduced from 150 feet per minute to 10 feet per minute.

Throughout the various tests, with high-speed hoisting and rapid reversal of morors, there was no sparking on motor or generator commutators. The Maxspeed winch control system does not place any heavy load on the ship's main generators. The hard thrust of sudden heavy loads and quick reversing is smoothed out by the motor-generator sets. The ammeter on the Maxspeed main switchboard showed but minor fluctuations during the entire cargo handling process.

The Maxspeed cargo winch control system automatically "measures" the hook-load handled so that it is hoisted or lowered at the optimum speed consistent with the load, yet prevents dangerous overloading. Speed changes are inherent in the drive and do not depend on the functioning of the control devices.

Operating on ac incoming power, the drive consists of a generator, an unusually constructed cross-flux exciter, an ordinary constant voltage exciter—all driven by an induction motor, and a dc hoist motor with its main field designed for a variable separate excitation. All braking is performed electrically, power returning to the supply system rather than being dissipated by resistors. Loads at rest are held by a solenoid brake.



This Foster Wheeler condenser is equal in size to a full five-room house.

Largest Condensers

The Foster Wheeler Corporation has completed construction of the two largest cross-flow condensers ever built—each unit larger than a complete five-room house.

Each unit, measuring 35 ft. in height, 46½ ft. in length, and 20 ft. in width, will condense exhaust steam from a turbine of 150,000 kilowatt rated capacity.

To condense the steam, it is necessary to circulate 146,000 gallons of water per minute through the condenser tubes—a volume equivalent to the daily domestic water requirements of more than 6,000,000 persons, or the combined populations of the States of Maine, New Hampshire, Massachusetts, and Vermont.

At the higher loads 1,300,000 pounds of steam per hour will be condensed in each unit. The energy absorbed in doing this is equivalent to the total power of a fleet of 70 modern steam locomotives.

When empty, each condenser unit weighs 660,000 pounds, and with water flowing through the tubes it weighs 1,100,000 pounds. The tube sheets at each end of the condenser—which support the tubes—are the largest bronze plates ever rolled. They measure 11′ 7″ x 21′ 1″ and are 1½″ thick. Each plate weighs approximately 14,000 pounds.

There are 12,316 tube holes drilled in each plate for the condenser tubes, in addition to 108 bolt holes. The 86 tons of tubes through which the water circulates are 28′ long each, and should they be placed end to end would reach a distance of more than 65 miles.

The condensers, built at the company's plant in Carteret, N. J., are being installed in the Southwark Station of the Philadelphia Electric Company in Philadelphia, Penna.

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Foreign Currency Exchange for Maritime Commission Ships

Responsibility for converting foreign currencies into dollar exchange must now be assumed by the Maritime Commission and its agents in view of the withdrawal of authorization to disbursing officers of the United States Army and Navy and their agents to accept local currencies from officers and crews of vessels operating for or on behalf of the Commission, the Commission has advised in a joint Operations Regulation Supplement (No. 5 to No. 50) and Auditing and Accounting Instructions (No. 57).

Headed "Foreign Currency Exchange Control," the joint Regulation and Instructions reads as follows:

"Pursuant to War Department Circular 256; dated August 23, 1946, regulating the use of Military Payment Certificates in such areas as the War Department designates, disbursing officers of the U. S. Army and their agents are authorized to disburse military payment certificates for pay and allowance of authorized personnel, and for other authorized payments to individuals in and under the Military Establishment, and set forth in Circular 256.

"Disbursing officers of the U. S. Army and Navy and their agents, wherever stationed, are no longer authorized to accept local currencies from, among others, the officers and crews of vessels operating for or on behalf of the Maritime Commission.

"It, therefore, is necessary that the U. S. Maritime Commission and its agents assume the responsibility for converting foreign currencies into dollar exchange. With respect to all vessels operated for or on behalf of the U. S. Maritime Commission by any agent, and departing from a United States continental port, effective immediately, all agents are directed and all owners of vessels time-chartered to the U. S. Maritime Commission are requested to instruct masters and pursers to act and advance foreign currencies to the crews. All crew members of vessels operated for or on behalf of the U. S. Maritime Commission should be instructed to draw only such foreign curencies as are required for their needs in the areas involved, since the War and Navy Department disbursing officers are no longer authorized to convert any foreign currencies for account of the officers and crews of our vessels, it will henceforth be the responsibility of the individuals to effect conversions on their own behalf.

"Advances of wages at foreign ports to members of the crew shall be made by the Master or Purser from local currencies obtained from the sub-agent of the vessel, and shall be charged to the crew members on the payroll records at the rate of exchange prevailing on the date of such advances. In certain areas the War and Navy Department disbursing officers are authorized to furnish the necessary currencies to the Master or Purser, but without recourse to reconversion. Prior to a permanent departure during a voyage from a country or area in which the currency is in circulation, the Master or Purser may accept unexpended portions of advances to crew members of the local currency advanced through the sub-agent in that area, but under no circumstances, an amount in excess of the amount originally advanced as wages. The unexpended portions of advances so accepted by the Master or Purser must be received sufficiently in advance of the vessels' sailing time to enable the funds to be returned to the sub-agent of the vessel for credit to the account of the Master or Purser, who in turn shall allow credit to the seamen on the payroll at the rate of exchange at which the advance was made.

"Disbursing officers of the War and Navy Departments are not authorized to accept the return of unused portions of funds furnished by them. Accordingly, Masters and Pursers shall not accept the return of funds so obtained from the seamen for conversion.

"A notice to all crew members with respect to the above should be posted in one or more conspicuous places on board all vessels operated for or on behalf of the U. S. Maritime Commission for information of the crew."

Permanent International Shipping Organization Urged

Establishment, through the machinery of the United Nations, of a permanent shipping organization within a defined scope, but excluding matters which are suitable for settlement through the normal processes of inter-

national shipping business, was recommended by the United Maritime Council to the Governments represented in the group.

The following nations were represented by delegations at the meeting: Australia, Brazil, Belgium, Canada, Chile, Denmark, France, Greece, India, Netherlands, New Zealand, Norway, Poland, Sweden, Union of South Africa, United Kingdom, United States. The Government of Yugoslavia was represented at the meeting by an observer.

The meeting was under the chairmanship of Vice Admiral W. W. Smith, chairman of the United States Maritime Commission, with Huntington T. Morse as alternate.

The Council, which was established as a successor to the United Maritime Authority, wartime shipping organization that controlled the activities of over 90 per cent of the world's non-Axis tonnage, reviewed at this session the working of transitional machinery established on the termination of UMA controls to insure the transportation of UNRRA and other relief and rehabilitation cargoes.

Separate Probe of Competitive Rail Rate Asked of I. C. C.

Separation of issues relating to transcontinental railroad rates which are competitive with intercoastal water carriers in any investigation ordered by the Interstate Commerce Commission as a result of the Maritime Commission's petition for probe of water-competitive rail rates was urged upon the ICC by counsel for the Intercoastal Steamship Freight Association on October 30.

Support for the proposition was forthcoming from spokesmen for other intercoastal carriers and from those representing coastwise steamship companies. It was pointed out to the ICC that the intercoastal situation is somewhat different from that of the coastwise water carriers, and that solution of the difficulties with respect to the railroad competition as to the intercoastal carriers would be simpler and, therefore, could be disposed of more expeditiously than the more complex issues involved as to other competitive rates. The thought was expressed that the ICC by handling the intercoastal proposition as a separate proceeding, or an independent part of Ex Parte 164—the petition for investigation of water-competitive rail rates—could reach a conclusion in this phase of the matter before December 31, 1946, when the temporary authority granted to the Maritime Commission to operate ships in the trade is to expire. In any event, it was stressed, the ICC decision could be reached before February 28, 1947, when the statutory authority of the Maritime Commission to carry on War Shipping Administration operating functions will expire.

The plea for separation of the intercoastal issues came after the ICC had heard argument on behalf of the Maritime Commission for approval of its petition for the investigation, and statements for the War and Navy Departments emphasizing the importance from the national defense angle of maintaining and adequate American merchant marine, particularly in the coastwise and intercoastal trades.

Power Trucks Maintain Machine Production Pace

LIGHT-WEIGHT, REAR-DRIVE, LOW-LIFT power trucks which afford full visibility of other equipment, operators, materials and aisles are fulfilling rapid-production requirements in many industries.

Some of the products of the industries are as different as cheese spreads and foundry cores, and conditions under which they are manufactured vary from extreme cleanliness to those of sand, smoke and iron. Yet trucks adapt themselves to environments as though built especially for them.

In some of the country's largest dairy-food processing plants, electric trucks work in kitchens rated as examples of spotless housekeeping. They are of the same type though of lighter capacity as some of those used in foundries. Mobile tools of production, trucks pick up loads 20 to 60 times heavier than the weight one man can lift as a steady occupation, and they carry the loads three times faster than the man walks. Completely mechanized, they are not limited to the speed with which operators walk. Drivers are always in plain view, and they can see where they are going.

Trucks are built for many uses, but only one purpose, speed and economy in getting work done.

New Vice President at United Engineering

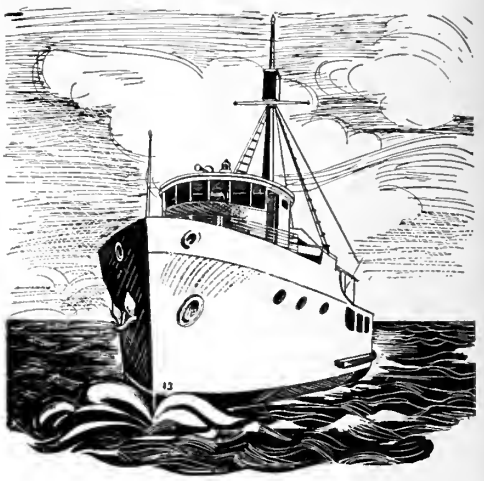
Election of Commodore Lisle F. Small as executive vice president of United Engineering Company is announced by R. P. Hasenauer, president of the company.

Commodore Small has been Commandant of the Norfolk Naval Shipyard since the end of World War II, and during the war served as assistant head of the Shipbuilding Division, U. S. Naval Bureau of Ships, at Washington, D. C.

He is widely known for his work in the development of the high speed diesel engine and the gas turbine for marine use, and throughout his career has been connected with industrial research and development work of the Bureau of Ships. He is a graduate of the U. S. Naval Academy.

As executive vice president of United, Commodore Small will assume general charge of that company's operations.

Coast COMMERCIAL CRAFT



Tuna Clipper American Boy

CONSOLIDATED STEEL CORPORATION, LTD., have recently delivered from their Newport Beach yard to Joaquin Canas of San Diego, a welded steel hull tuna clipper, christened American Boy. This all-steel vessel was built and classed under American Bureau of Shipping Rules. She has a raised deck forward, a clipper bow, a square stern, and follows the standard Consolidated Steel Corporation design. Her principal hull characteristics are:

Length	125 ft.
Breadth	28 ft.
Depth	14 ft. 6 in.
Crew	16 men
Fresh water cap.	5,600 gals.
Fuel oil cap.	49,000 gals.
Lube oil cap.	1,200 gals.
Gasoline	260 gals.
Propulsion power	850 shp

Special features of the Consolidated design are: heavy continuous fore and aft shaft alley bulkheads giving greatly increased strength and rigidity to the hull girder; fully separate inner well tanks having full support by, but insulated from, the containing members of the hull structure; and hollow water-tight steel bulwarks 34 inches high by 8 inches thick.

The bilge pumping system has been improved by the addition of a Hytor vacuum pump that holds a positive priming head on the system at all times.

Crew quarters are completely insulated and have forced air circulation. These quarters are commodious and comfortably furnished. The combined galley, pantry, and messroom is equipped to adequately take care of the crew on long voyages with roomy refrigerated compartments for meat and for vegetables.

Propulsion

American Boy's power plant is located well forward as shown on the drawings herewith. The propulsion power unit is a six cylinder, four cycle, fully reversible, supercharged diesel, rated 850 shp at 300 rpm. This unit is directly connected to a three bladed 86″ x 60″ bronze

Tuna Clipper, American Boy, built by Consolidated Steel Corp. Ltd., at their Newport Beach yard.

propeller through a 7½ inch diameter forged steel shaft carried in marine type pedestal bearings and a "Phenolic" stern tube bearing.

For auxiliary machinery, lighting, and refrigeration, two diesel engine generating sets supply electric power. One is a six cylinder, four cycle, rated 233 shp at 600 rpm, driving a 150 kw 220 volt ac generator; the other is a six cylinder, four cycle diesel rated 120 shp at 600 rpm, driving a 75 kw 220 volt ac generator. All of the diesel engines are fresh water cooled.

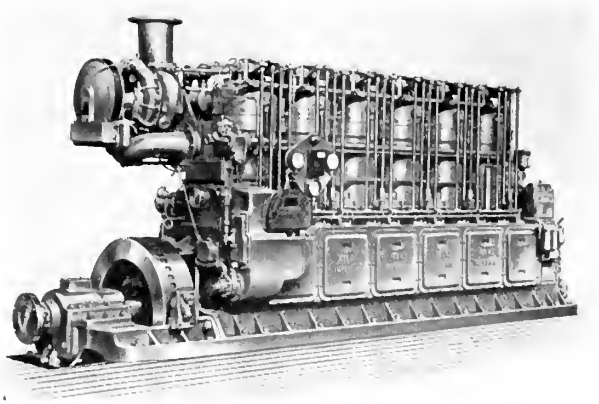
Auxiliary machinery includes: two 12 inch centrifugal bait-pumps, each driven by a 30 hp motor; thirteen 3 inch centrifugal brine pumps, each driven by a 3 hp motor; two 4 inch centrifugal brine transfer pumps, each driven by a 5 hp motor; one 4 inch centrifugal bilge pump driven by a 5 hp motor; one 2 inch centrifugal fire pump driven by a 15 hp motor; one 4 inch refrigeration condenser pump driven by a 5 hp motor; and fuel oil and lubricating oil transfer pumps. Bait boxes can be emptied in 2½ miuntes. Brine suctions are located below the lowest point of fish well bottoms, so that wells can be pumped and drained completely dry.

Four duplicate 5½ inch by 5½ inch 2 cylinder compressors, each driven by a 20 hp motor, take care of the refrigerated fish well load. For the galley cold rooms, a separate 3 hp compressor is provided. A 10 hp cargo winch on deck takes care of any hoisting required and provision is made for emergency steering by this winch. A 15 hp anchor windlass is mounted on the forecastle.

Two air compressors, one driven by a gasoline engine, take care of starting and maneuvering air. A lathe and a 1½ ton hoist are installed in the engine room for emergency repairs.

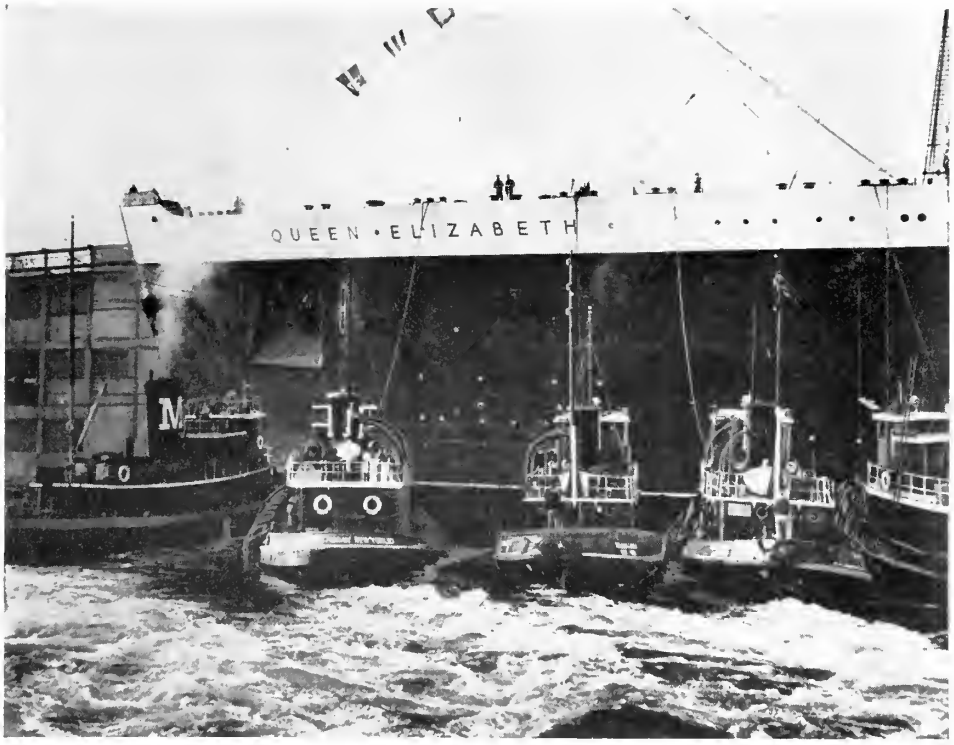
In the building of fishing boats of this character, the purchase of equipment and machinery covers a wide range of industry. American Boy demanded the services of the following vendors:

Deck covering—R-Mir-Deck Miller Marine Decking.
Watertight Doors—Heintz Co., Philadelphia.
Bituminous Coatings—Flintkote Pioneer Paint Co.
Fish wells lining—Amercoat American Pipe and Construction Co.
Cargo winch—Campbell Machine Co., San Diego.
Bait pumps—Campbell Machine Co., San Diego.
Brine pumps—Campbell Machine Co., San Diego.
Brine transfer pumps—Campbell Machine Co., San Diego.
Condenser pumps—Campbell Machine Co., San Diego.
Bait tank lights—Campbell Machine Co., San Diego.
Steering gear—Johnson Machine Co.
Anchor windlass—Johnson Machine Co.
Compass—Ritchie.
Clocks—Seth-Chelsea.
Whistle—Doran Cunningham, Seattle.
Anchors (2)—Columbia Steel Co.
Deep sea anchor—Danforth Co.
Chain—Round California Chain Co.
Wire cable—Pacific Wire Rope Co.



Diesel, by Atlas Imperial Diesel Engine Company, is model 6HMT3358, 850 hp, 6 C 300 rpm turbocharger, direct reversible marine engine, which is the main propulsion unit installed in the American Boy.

Ropes—American Wholesale & Republic Supply Co.
Galley range, Engle—Dohrman Hotel & Supply Co.
Sink—Dohrman Hotel & Supply Co.
Water heater—Bauer Electric Co.
Plumbing fixtures—Crane Co.
Ventilating blower, engine room—Dean & Hoffman.
Ventilating blower, crew quarters—Trade Winds Fan Co.
Exhaust fan, galley—Trade Winds Fan Co.
Insulation—Johns-Manville.
Refrigerator doors—City Refrigerator Co.
Airports—Bushcraft Marine Specialties.
Main engine—Atlas Imperial Diesel Engine Co.
Auxiliary engines—Atlas Imperial Diesel Engine Co.
Silencers—Maxim.
Shafting—E. M. Jorgensen.
Shaft bearings—American Metal Co.
Stern tube bearing—American Brake Shoe Co.
Propeller, Federal Mogul—Atkins Kroll Co.
Oil Filters—Barnes & De Laney.
Bilge pump—Pacific Pump Co.
Fire pump—Pacific Pump Co.
Fuel oil pump—Grandco Grandberg Co.
Lube oil pump—Grandco Grandberg Co.
Fresh water pressure system—Fairbanks-Morse.
Salt water pressure system—Fairbanks-Morse.
Vacuum pump—Nash.
Air compressors—Quincy.
Refrigerating machinery—Baker.
Electric motors—General Electric.
AC electric equipment—General Electric.
Main switchboard—Ets-Hokin & Galvan.
Wiring and installation—Ets-Hokin & Galvan.
Fire extinguishing system, CO_2—Ets-Hokin & Galvan.
Searchlight—Carlisle & Finch.
Radio—McBride.
Fathometer—Submarine Signal Co.
Workboat and skiff—Watson Boat Works.
Motorboat, Chrysler—Kettenberg.
Lathe—South Bend.



Diesel Tugs Berth Queen

The Queen Elizabeth, world's largest passenger liner, is being put into her berth in New York harbor after her first passenger trip to the United States. A battery of tugboats is shown doing this big job in record time. Many of these tugs are powered with General Motors diesel-electric plants.

Socony Lubricants on America and Queen Elizabeth

Two of the world's largest and most famous ships, the SS America of the United States Lines and the Queen Elizabeth of Cunard-White Star, Ltd., both making their peacetime maiden voyages this fall, are lubricated by products manufactured by Socony-Vacuum Oil Company, Inc.

Although the United States Lines luxury ship is making her peacetime maiden voyage this October, she was actually first placed in service in 1940, and as the U. S. Transport West Point carried nearly a half million troops throughout the world, amassing a total of 500,000 miles.

During the ship's entire career, including the years under Navy operation, Socony-Vacuum's Gargoyle DTE Marine Oil Heavy has been in constant use. The oil was analyzed at frequent intervals during the war period and was found to be always in suitable condition. The most recent analysis was made in August of this year and, indicative of the stability and long-lasting qualities of this oil, it was in good condition at that time. All the America's machinery, in fact, from small gyro-compass bearings to mighty turbines, are protected by Socony-Vacuum oils and greases.

During the six years of her wartime service the Queen Elizabeth's giant 200,000 horsepower engines were protected by Socony-Vacuum lubricants also. In that time the Cunard Liner carried 811,234 service men and women for a total of 492,635 miles in submarine infested waters where engine failure of any kind would have been tantamount to destruction.

Nordberg Appoints Export Manager

Nordberg Manufacturing Company announces the appointment of B. T. Eagerton as export manager. He has been associated with exporting since 1928 and came to Nordberg from the Oliver Corporation where he served as assistant manager of the Export Division. Prior to that he was export manager for the Cleveland Tractor Company which was later absorbed by the Oliver Corporation. During his many years in export work he traveled extensively and has wide acquaintance in export markets. His headquarters will be at the main office of Nordberg at Milwaukee.

Reedville Menhaden Vessel, Margaret Converted to Diesel Power

Another member of the Menhaden fishing fleet, the Margaret, owned and operated by the Reedville Oil & Guano Company of Reedville, Virginia, was recently modernized by the installation of a Cooper - Bessemer Model JSDR-8-T turbo-charged diesel engine, and is now bringing its owners greater pay loads at highly increased operating efficiency.

The Margaret is the third member of this fleet to be equipped with a Cooper-Bessemer main propelling engine, the Alden S. Swan and the David K. Phillips having been converted from steam to diesel power in 1938. The Margaret is the first Menhaden vessel to be powered with a four-cycle, four-valve head, turbo-charged diesel engine. This type of power provides maximum horsepower with minimum weight and space, and with increased fuel economy, resulting in more pay cargo and lower operating costs.

Back in 1912, at Weems, Virginia, Captain Jo Bellows laid the keel of the Margaret on the site of the present Humphreys Railway with the intention of building a sturdy ocean-going, steam-powered tug. Observing the possibilities apparent in the Menhaden fishing industry which was then growing rapidly, the vessel was completed as a Menhaden vessel in the sturdy New England style, with a L.O.A. of approximately 128 feet, a beam of 23 feet, and a depth of approximately 11 feet. At that time steam propelled equipment was installed to provide 500 horsepower. Christened the Margaret after Captain Bellows' youngest daughter, this vessel entered the Menhaden industry to eventually find its way into the fleet of the Reedville Oil & Guano Company at Reedville, Virginia.

Growing competition and the necessity for increasing production and reducing operating costs resulted in the establishment of a dieselization program by the Reedville Oil & Guano Company for its entire fleet, which has been carried out over the past few years. As the fleet was dieselized, comparisons with steam operating costs and savings accomplished rapidly became apparent.

In the fall of 1944 the owners of the Margaret ordered a Cooper-Bessemer turbo-charged, Model JSDR-8-T main engine. This 8-cylinder, 13-inch by 16-inch engine is fitted with four valve heads, Elliott-Buchi turbo-charger, and the Cooper-Bessemer patented controlled pressure fuel system. The engine is rated at 730 bhp at 300 rpm at a brake mean effective pressure of 109 pounds.

After delivery and installation of the Cooper-Bessemer turbo-charged engine, the Margaret was overhauled and fitted with an 80-inch by 60-inch three bladed Columbian Bronze Type M.E. wheel, which enables her to clock off approximately 13.8 miles per hour, with the wheel making 300 turns and with engine exhaust temperatures running 600 degrees or less. Space savings permit the Margaret to handle up to 200 tons of cargo.

Other equipment installed in the Margaret at the time of the new power plant installation included a Reiner diesel engine driven auxiliary compressor set, in which is included a 5 kw dc generator. Other equipment installed consisted of a 5 kw tail shaft generator, two Reiner built dc open front switchboards; a Briggs lube oil clarifier; and a Briggs fuel oil clarifier.

Fishing the Margaret are Captain Irving Diehl, master; Captain Jones, pilot; and Joe Davenport, chief engineer. Raymond L. Haynie, Jr., who has returned from active duty as a commissioned officer in the U. S. Coast Guard, is now general manager of the Reedville Oil & Guano Company. All of these men are enthusiastic over the results they are obtaining from diesel propulsion.

This is the recently modernized Menhaden fishing vessel, the Margaret which is the first of its kind to be powered with a four-cycle, four-valve head, turbo charged Diesel engine.

New York's Latest Diesel-Electric Ferry

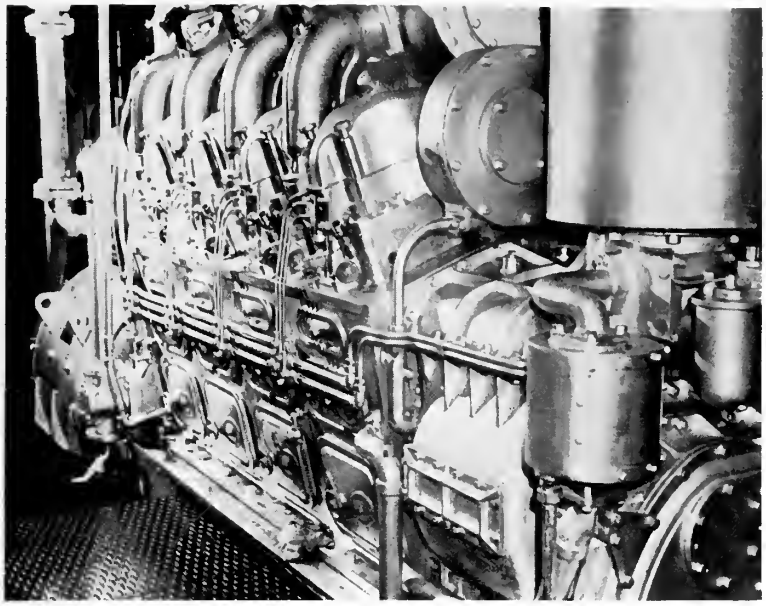
On August 26 an inspection and test run was made by the diesel-electric ferry, The Narrows. This vessel is the first of two craft that will augment the service between Brooklyn and Staten Island, and the neatly arranged engine room and spacious accommodations were praised by about 150 marine, press and business men who were aboard for the demonstration run.

When it is realized that the engine room is only 40 ft. long by 23 ft. between trusses, and has a floor width of but 18½ ft., it obviously was a problem for the designer to pack in 1350 shaft hp in the form of two G. M.-Cleveland 8-cylinder engines, two main generators and two electric propelling motors with one reduction gear—plus all the auxiliary equipment. In fact, a remarkable engineering job has been accomplished in line with the high grade production engineering embodied in the two main diesels.

Each of these two diesels is of 800 bhp and drives a 540 k.w. generator at 750 rpm, top speed. Current from the power units operates two 685 hp motors at 700 to 875 rpm. A single propeller shaft runs the entire length of the hull and is turned through a reduction gear at 160 to 200 rpm. There is a bronze propeller at each end of the shaft, one right handed and the other left handed. With two engines at full load a speed of 12.8 knots can be maintained, or 8 knots with one engine.

The Narrows was built by the Jakobson Shipyards, Inc., Oyster Bay, New York, from designs by Eads Johnson for the Brooklyn and Richmond Ferry Company, affiliate of Electric Ferries, Inc., New York, N. Y., and a sister ferry is under construction at the same yard. E. G. Diefenbach is the president of the owning company. Straight line construction was used throughout, effecting considerable ease and economy in fabricating the hull, at the same

Prow view of The Narrows showing spacious deck accommodations for trucks and automobiles.



Close-up view of the two 800 bhp diesel engines that power The Narrows. These engines operate at 700 to 875 rpm.

Engine room control panel and main switchboard.

time providing maximum stability by increasing the tons-per-inch immersion at the load waterline.

Greater horsepower is installed in The Narrows than in any of the existing diesel-electric ferries operating in the Narrows, and on the North River, and she has greater speed. But, for the most part she follows their general appearance, although she has larger passenger quarters. The big central deckhouse has plenty of comfortable wooden settees and modern toilet facilities. Her capacity is 50 automobiles and 750 passengers. Constructed of welded steel, she is virtually fireproof and meets all Coast Guard regulations for a vessel of her class.

Dimensions of The Narrows are: Length oa, 185 ft.; length wl, 183 ft. 8 in.; width over guards, 54 ft.; depth 15 ft. 6 in.; while her displacement at 9 ft. 6 in. draft is 690 tons. Her G.M. - Cleveland diesel engines are of the V two-cycle type, model 8-278A.

Electric control of the propelling machinery is from whichever of the pilot houses—at the two ends of the passenger deck—happens to be in use. Steering is by means of a small lever, the large hand-powered steering wheel in each pilot house being for emergency use and is not normally required. But one rudder only is operated from each pilot house, the forward rudder driving motion being locked before the start of each run. The ferry, of course, is double ended.

Another feature of the pilot house control is that the propelling machinery control can be shifted, if desired, to local control in the engine room. Only two men per watch are on duty in the machinery compartment—an engineer and an oiler.

On the port side of the engine room are located two lubricating coolers; fresh water cooler and tank; fresh water and salt water sanitary units of 30 gallons capacity each; heating boiler; auxiliary bilge pumps; duplex strainer; fire and bilge pumps of 250 gallons capacity;

lube oil clarifier; sludge tanks and the 10 kw auxiliary diesel-generating set.

On the starboard side are the fuel oil service pump; fuel oil transfer pump; work bench; sea chest; another lube oil clarifier; engineer's log desk; switchboard; storage batteries; a centrifugal lube oil purifier; lube oil cooler and a fresh water cooler.

Two fuel tanks of 3000 gallons capacity each are arranged in the compartments fore and aft of the engine room. In the forward compartment—if a double ended ferry can be said to have a permanent forward end—there also is a 1000 gallon fresh water tank.

Among the guests on board during the demonstration run was Stephen P. O'Regan, director of ferries of the New York City Department of Marine and Aviation, who stated that the City of New York has just purchased four powerful tugs, all equipped with G.M.-Cleveland diesel-electric drive.

Marine Insurance

The Future of Marine Insurance In the United States

By WILLIAM D. WINTER, Chairman of the Board of Trustees,
Atlantic Mutual Insurance Company

HISTORY HAS AN INEVITABLE WAY of repeating itself. Out of the history of the past is sought the probable pattern of what the future holds in store. The progress made by marine insurance in the United States in the past 25 years has been made in the face of intense competition from foreign insurance markets. These markets are under less strict governmental control than is the case in the United States and their overhead costs are therefore materially less. Furthermore, there was a growing tendency in the 1930's for national insurance projects to develop, endeavoring to control within a country—and for the benefit of native companies—the insurance on imports and exports of that country. It was the extension of protective tariff walls around a particular phase of international trade.

The war ended and as we battle for the peace certain old theories of foreign trade are brought out and dressed in new garments to appear more attractive. No uniform approach is made. France nationalizes her insurance while Great Britain even under a socialistic government, sensing that free trade in insurance is desirable, continues insurance as a private enterprise. Far away in Argentina, however, efforts are being made to control to the nth degree the issuance of insurance for the benefit of the local companies and the government exchequer.

Everywhere the cry is "One World," which should lead to a greater and greater trend toward "free trade," yet all over the world the old nationalistic ideas are being brushed up and presented in attractive garb to the people. Which merely proves that the annihilation of time in the field of travel and communication changes neither geography nor human nature.

Gradually the eyes of the United States, which for six years have again been turned toward the sea and the far distant parts of the world, are turning back to our country, and the spirit of nationalism and of isolationism is growing. That this is not good for the world is readily discernible. Unfortunately, through lack of knowledge on questions of foreign trade, many of our citizens do not realize that this growing spirit is not good for the United States.

Once more it would seem that the opportunity of becoming a leader in the commerce of the world is to be passed up as it was 25 years ago.

To those whose lives are spent in the business of overseas commerce, the danger of this backward step is all too apparent. Full prosperity never is possible unless an active overseas commerce is present. The thoughts of the people of the United States must be directed into world-wide channels. This happens overnight when international war comes. But in the era of peace only by education will the people of the United States realize how dependent, more so in the future than in the past, they are upon a strong foreign commerce adequately served by American ships, banks and insurance companies.

When our country was but a strip along the coasts the people unconsciously realized how important shipping was. Any people whose land is maritime realizes this, and so England and Holland and the Scandinavian countries foster the growth of their shipping, banking and insurance facilities.

The problem in the United States inevitably is different. A group of citizens living away from our coasts seem to have little realization of or interest in the part that foreign trade plays in the economy of the nation. Even the farmer, whose grain or cotton or cattle or fruit makes up a considerable part of our export shipments, does not look beyond the local market in which he sells his product. His interest in his product is in what he gets for it and not in where it goes. But what he gets for it is in

large measure dependent on the conditions existing in where it goes or where it might go.

A very definite effort is being made in the marine insurance business to foster a world view. This would appear to be a natural and perhaps a selfish attitude. But many of those concerned are content to continue as a provincial market, insuring American ships and cargoes but not seeking to develop the business into a world market. At the behest of the Maritime Commission the scope of the Hull Syndicate was broadened to include the insurance of foreign flag, foreign owned hulls. A number joined in the program, not through conviction but because of the desire of our Government to foster a world insurance market.

On the other hand, other agencies of the Government have shown little interest in the American marine insurance market. As men come and go in the Government service the attitude toward marine insurance changes or the international aspects of the business are ignored. All this indicates that there does not exist in this country any general policy which is based on a conception that fostering foreign trade is important to the United States. Even less interest is shown by the several States in this question. The government of cities like New York, Boston, Philadelphia, etc., are fully alive to the problem, but cities removed from the coasts show little interest, notwithstading the vital part foreign trade may play in their local economy.

The future of marine insurance in the United States is bound up in this problem. Unless there is a desire and will on the part of the people to use and to encourage the use of American shipping, banking and insurance facilities when available at reasonable competitive prices, there will be be little incentive for venture capital to enter these fields.

The marine insurance business never has and does not now seek governmental financial assistance. It does not seek a closed market. It does believe that in the interest of the ecoonomy of the United States, in times of peace as well as in the stress of war, a strong marine insurance facility is desirable. It does believe that the Government should take the same benevolent attitude toward the business as is shown by foreign governments toward the marine insurance business in their countries. When loans are made or ships are sold the marine insurance business only asks that arrangements be made so that it may compete on fair terms with foreign borrowers and buyers. To accomplish this requires a sympathetic attitude on the part of government officials and an understanding of how marine insurance operates internationally. This is not nationalism in its ordinary sense, but is preparedness from an economic and defensive point of view.

People in the United States more and more are buying trademarked products. This is the result of newspaper, magazine and radio advertising. In other words, it is the result of education. Education in the use of American commercial facilities is not as simple as educating the housewife to use a special brand of soap. But the basic principle is not too different. The American people should be taught to use American shipping, banking and insurance facilities, not solely or primarily because they are American. They should be so instructed that they will realize that in this "One World" each nation making up the group must be individually strong and self-reliant, so that it may do its full part in a free world where enterprise is free. They should realize that nations must be able to be independent if they are to do their full part in an interdependent world.

London Letter

By Our British Marine Insurance Correspondent

"Lloyd's" and "Lloyd's Register"

"Lloyd's" and "Lloyd's Register" are terms regarding which there is much confusion all over the world. Even in old-established shipping and marine insurance circles, there is some uncertainty as to the respective functions of the two organizations. Sir Eustace Pulbrook, chairman of Lloyd's, in one of his rare incursions into print, has just given a lengthy survey of the position in the quarterly publication o fthe Powell Duffryn coal-mining group.

He points out that the history of Lloyd's commences in the 17th century when the underwriting of marine insurance was beginning to be a recognized principle and practice in London commercial life. Bankers, merchants and others who undertook this risk were known as "underwriters" because they wrote their names one under the other as they assumed responsibility for their proportion of an insurance upon a ship or cargo.

Where underwriters foregathered during the years following the Great Fire of London in 1666—when nine-tenths of the City was laid in ruins in a fire of four days and nights—is not known. It is certain, however, says Sir Eustace Pulbrook, that soon after Edward Lloyd, the "Coffee Man," opened his coffee shop in Tower Street in 1686 or 1687, it became the recognized rendezvous for those interested in marine insurance.

We will not follow Edward Lloyd in the subsequent development of the world-famous "Lloyd's." Lloyd's is not a Company, nor do its members operate in partnership, but they are associated in groups or syndicates—to quote the wording of a Lloyd's Policy, they accept risks "each for himself and not one for another."

After undergoing the most searching enquiries into his private and business career, and having been elected to membership, the new member joins a syndicate which is underwritten for by one of its own number or by some

other trained specialist. On his election and before commencing underwriting he must deposit a considerable sum of money which must be retained intact until he has relinquished underwriting, either by death or retirement.

This sum does not represent trading capital, and no part of it may be used for any other purpose, but it must remain untouched as a guarantee that all claims arising under policies underwritten in his name will be paid.

Mention should be made of the vast world-wide system of Lloyd's Agencies which, starting in 1809, now encircles the Globe. There are now 590 Agents (and 980 sub-Agents) who represent Lloyd's interest in all the principal ports and cities throughout the world. They are not servants of the Corporation but are leading firms of shipbrokers, bankers and merchants who act for Lloyd's, especially in respect of the transmission of marine information and the assessment of marine losses. From these Agents come pouring into Lloyd's through all the hours of the day and night (for its doors are never closed) news about vessels all over the world. Every time a ship reaches or leaves a port or is spoken at sea, every wreck and casualty is reported to Leandenhall Street at once.

I come now to "Lloyd's Register." In 1760 the first private Register of Ships was published and issued only to underwriters, but, unlike "Lloyd's List" (the daily shipping publication which is still going strong after 212 years), it was never the property of the Masters of the Coffee House, nor was it officially taken over by the subscribers when they established themselves in the second Royal Exchange (the first Royal Exchange was lost in the 1666 fire). From the beginning it was owned by an independent body with its own Committee and its own officials, but its use was restricted to members of the Register Society, all (or practically all) of whom were subscribers to Lloyd's. Masters of the Coffee House collected subscriptions, meetings of its Committee were held at Lloyd's and leading underwriters took a prominent part in its management.

In 1797, a rival publication called the "Red Book" was started, and for a time there were two Registers, neither possessing the entire confidence of the Marine Insurance Market until 1834, when both Societies became amalgamated and "Lloyd's Register of Shipping" came into being.

Thus, although there has always been the closest association between Lloyd's and the Register, the latter has from the beginning been a separate organization. Lloyd's is represented on its Committee by its Chairman for the time being and by other elected representatives. Marine Insurance Companies, through the Institute of London Underwriters, are also represented.

London Shipowners send 12 members to the Committee, which also includes shipbrokers, shipbuilders and merchants from the various British ports. There are local Committees at Liverpool and Glasgow, of whom a certain number sit on the London Committee and in addition the Committee co-opt practical and technical experts, such as naval architects, marine engineers and other representatives of the British shipbuilding trade. Every

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Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

Warranties in Marine Policies

WHENEVER POSSIBLE I will attempt to explain admiralty decisions that deal with the subject of marine insurance. Undoubtedly, whether you represent the underwriter or the assured, you have had occasion to come face to face with situations where warranties under a marine insurance policy have been violated in part and the difficult decision of whether the violation of those warranties would or should be either a bar or a defense to collection on the one hand or payment on the other of the loss claimed. Of course the courts will always construe an insurance policy, whether it be marine or some other type, more strictly against the underwriter and more favorably insofar as the interests of the assured are concerned. There are logical reasons for such interpretations. I suppose, however, that violations of warranties will always be a subject of court interpretation and review principally because the assured so many times feels that the violation of a warranty should not be construed against him unless it has some causal connection with the accident or loss. It is ordinarily difficult to sell a court on the theory that a recovery should be defeated where a warranty has been breached and at the same time there is a failure to prove that the breach of the warranty caused, or was connected, with the accident. This result does not always follow, which fact is borne out by the recent case of *Dan Levine, Administrator of Lorraine Levine, Deceased, vs. Aetna Insurance Company*, United States Circuit Court of Appeals, Second Circuit, 1944 A.M.C. 62, where the District Court rendered a judgment for the defendant in an action to recover from Aetna Insurance Company on its marine policy. Judgment, however, was affirmed by the Circuit Court. The defendant insured Sandy and LaGrou under its marine

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Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

Bactericidal Efficiency of Low Pressure Double Effect Distilling Plants

By WILLIAM W. PAYNE, Senior Assistant Engineer [R].
U. S. Public Health Service

An interesting discussion of a subject that is becoming increasingly important to Marine Engineers.

STUDIES MADE SOME YEARS BACK by the Public Health Service determined that in distilling water a temperature of at least 165° F. was necessary at some point in the process in order to be sure of killing all pathogenic bacteria and so produce safe potable water. With these studies in mind the Service was concerned about the bactericidal effects of the modern low pressure double effect distilling plants now being installed on passenger and cargo vessels, since these plants operated at maximum temperatures of 115° to 120° F.

To insure that water produced by plants operating at temperatures lower than 165° F. would be safe, it was proposed that either the feed water or the distillate be heated by a supplementary heater to a temperature high enough to kill any pathogenic bacteria that might be present. These provisions are undesirable because they add some complication to the equipment and heating the distillate would entail a loss in economy because the heat supplied does not contribute to the evaporation.

As a result of these developments the U. S. Maritime Commission and the U. S. Public Health Service agreed to make a study of a low pressure distilling plant. The objectives of the study were to determine the efficiency of low pressure distilling plants in producing potable water; the factors responsible for the killing or removal

U. S. Public Health Service mobile laboratory in front of test shed.

of bacteria; and the suitability of various automatic controls. Also included in the study was a determination of the dependability of preheating the feed water in such a plant to 165° F. should the application of this method be necessary.

The study was conducted under the supervision of the Vessel Engineering Section, Sanitary Engineering Division, U. S. Public Health Service, and was directed by the author, a sanitary engineer of this Section. Technical assistance, laboratory facilities, a bacteriologist, and a sanitary chemist were furnished by the Water and Sanitation Investigations Station of the same Division. All laboratory work was performed in a fully equipped mobile laboratory brought to the shipyard for this purpose.

Engineers of the Technical Division, U. S. Maritime Commission, gave advisory assistance in planning and conducting the study. The Central Technical Department, Shipbuilding Division, Bethlehem Steel Company, in cooperation with the Commission, made available the plant and other facilities, as well as the personnel to operate the plant. The engineers from this department aided in planning the work and suggested changes in the agenda as the work progressed.

The plant used for the study was a 40,000 gallon per day Navy type low pressure double effect plant with some additional automatic controls. The air ejector condenser was enlarged and supplied with auxiliary steam to preheat the feed water to any desired temperature. Circulating and feed water was obtained from a salt water harbor which was not heavily polluted. Because the feed water was not heavily polluted, raw sewage from a nearby building was injected into the feed line just ahead of the feed pump.

All bacteriological examinations and chemical analyses were made in accordance with Standard Methods for the Examination of Water and Sewage, eighth edition (1936) published jointly by the American Public Health Association and the American Water Works Association. The plant was placed in operation under the conditions desired for the particular test and allowed to become stabilized before any data were recorded or samples collected. In general the duration of each run was one hour. Operating data and samples were taken at intervals of fifteen minutes. Sampling points were located on the feed pump discharge (before the distiller condenser); on the feed water line entering the first effect shell; on the brine pump discharge; on the distillate pump discharge between the distillate cooler and the fresh water meter; and on the sewage pump discharge. Samples were transferred from the points of collection to the laboratory within five minutes after collection and examined within two or three hours.

Plant Operating Under Normal Conditions

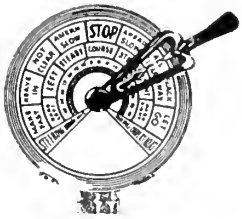
In this series of runs no auxiliary steam was supplied to the special combined feed heater and air ejector condenser; consequently this heat exchanger operated in the same manner as the usual air ejector condenser. Runs were made under various conditions of temperature and pressure corresponding to possible operating conditions aboard ship such as on auxiliary exhaust and on low pres-

(Please turn to page 128)

Interior of U. S. Public Health Service mobile laboratory.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

Sudden Emergencies

One of the peculiar factors that characterize many of the most tragic marine disasters is the rapidity with which the whole event takes place, and the extreme simplicity of the causes leading to the tragedy.

For instance, in 1914 the Canadian Pacific liner Empress of Ireland was steaming along the lower St. Lawrence River when a small, very dense fog bank rolled down onto the water from the land, enveloped the ship, stayed just long enough to bring the vessel and over 1000 persons to an untimely end, through collision, and then, in a matter of seconds, disappeared.

Another example was the British naval vessel Eurydice off the Isle of Wight in 1878. In very rough seas, a sudden easterly squall, lasting only 3½ minutes, put this vessel ashore with a loss of nearly 400 lives.

Perhaps the most famous sudden disaster was that of the North German Lloyd liner Elbe in the North Sea. The winter of 1894-95 was bitterly cold, and the surface waters of the North Sea were near freezing temperature for many weeks. On January 28, 1895, the Elbe left Bremen bound for New York with a total of 354 persons on board. At 5:30 the next morning, she was suddenly enveloped by a dense snow squall that gave practically zero vision in all directions. A few moments later she was rammed amidships by a small freighter, the Craithie of Aberdeen, bound from Hull to Rotterdam. The lookout saw the Craithie only 15 seconds before the crash. This freighter had been designed to cut through Baltic ice, and she certainly cut a large gash in the side of the Elbe, and then backed off and disappeared in the murk. Immediately, the Elbe took a tremendous list as the water poured into the engine and boiler rooms. Practically all of her passengers, and most of her crew, were in bed. Within 12 minutes she went down. Only one boat, with 20 persons, got away, and they undoubtedly would have been frozen had they not been speedily picked up by a trawler. The snow squall cleared immediately after the sinking.

Instances of this type of disaster could be multiplied. They would all be similar and all would serve to emphasize the necessity for vigilance. One development of the war, if properly used, would eliminate the risk in all such situations. We refer to radar which penetrates practically all atmospheric barriers to vision. However in each of the cases mentioned vigilance would be necessary even when carrying full radar equipment.

Stepping in Cracks

One of the chief responsibilities of deck officers is maintaining safe working conditions on deck and in the holds. In this connection, all deck officers should consider with great care, the simple matter which is treated in the following excerpt from The Preventer, published by the Accident Prevention Bureau of the Waterfront Employers Association of the Pacific Coast.

"Stepping into holes and cracks in stowed cargo and dunnage is the cause of between six and nine per cent of all longshore injuries year after year. Undoubtedly the necessity of men's watching to avoid these pitfalls contributes to many accidents of other types which seemingly are not related to the condition of the working surface.

"While it is impracticable to provide a smooth surface over all types of cargo, it is reasonable to provide dunnaged runways for men under the same conditions that they are provided for hand trucks and four-wheelers.

"In many cases conditions can be greatly improved by merely using greater care in laying necessary dunnage to see that ends and weak spots do not fall over holes and that all holes are covered."

While it is true that, so far as longshore labor is concerned, the responsibility of covering holes and maintaining dunnaged runways in unloading operations lies with the stevedore, it is also true that a little attention to loading at foreign ports, and to condition of working

surface of cargo after partial unloading, will help greatly in eliminating accidents due to this cause.

This attention can and should be given by any experienced deck officer in charge of stowage. Such attention will not only help in safe working conditions, but will undoubtedly help greatly in minimizing claims for cargo damage.

Office of Marine Safety

The Office of Merchant Marine Safety was established by the Coast Guard in September, 1945, with its primary function of coordinating the three principal divisions having cognizance over Merchant Marine matters. At the same time, the Merchant Marine Inspection Division was renamed the Merchant Vessel Inspection Division (MVI). This division, plus the Merchant Marine Technical Division (MMT) and the Merchant Marine Personnel Division (MMP), was then coordinated under the Office of MMS.

An Assistant Chief, Office of Merchant Marine Safety, has also been designated by Commandant Farley. This post is filled by Captain R. L. Raney, who was for more than two years the Commanding Officer of the USS Wakefield, the former peacetime luxury liner SS Manhattan.

The three divisions under Commodore Shepheard and Captain Raney perform essentially those same functions that were performed under the former BMIN. The MVI Division, now headed by Captain R. E. Coombs, has jurisdiction over all merchant vessel inspection and manning standards, including casualty reviews, review of inspectional developments, reports of law violations, motorboat registration and hazard prevention. The MMT Division, with Captain R. A. Smyth as chief, handles matters pertaining to marine engineering, electrical engineering, marine architecture and equipment approvals and records. The MMP Division, chiefed by Captain H. T. Jewell, manages licensing and certificating, complaints, review of hearing cases, documents, statistics and welfare records.

Thus, the evolutionary trend of integrating and consolidating within one agency the coordinated administration of those statutory responsibilities to the Merchant Marine is virtually complete.

In its endeavors to perpetuate its policy of adjustment to the public welfare, the Coast Guard encourages the promotion of a close association between its organization and all affected interests of the maritime industry. In this respect, personnel will be selected on a basis to assure the highest degree of intelligent, efficient and forward looking administration so as to guarantee all components of the Merchant Marine against sudden or unwarranted changes in government attitude.

Book Review

SCIENTIFIC INSTRUMENTS is the title of a very neat volume of 305 pages copiously illustrated and very competently edited and indexed; covers thoroughly the field of modern scientific instruments. The author is Herbert J. Cooper, dean of the Engineering Department, South-West Essex Technical College and School of Art. He treats his subject matter in clear, concise, easily understood English, and divides it into five sections.

These are:

Section I	Optical	Nine Chapters
Section II	Measuring	Nine Chapters
Section III	Navigational	Six Chapters
Section IV	Liquid Testing	One Chapter
Section V	Miscellaneous	Four Chapters

Maritime officers should add this book to their personal libraries. They will be surprised to learn how many of the gadgets they use every day on modern ships are scientific instruments and possibly may get an added feeling of pride in their profession.

This book in neat grey cloth cover with gold stampings is published by Chemical Publishing Co. Inc., Brooklyn, N. Y., $6.00 net.

"The Safety Credo"

"In the field of human relations, nothing is so important as safety. Safety applies with equal force to the individual, to the family, to the employer, to the state, the nation, and to international affairs.

"Safety, in its widest sense, concerns the happiness, contentment and freedom of mankind.

"Safety must come from the top. The work must begin with the chief executive, who must have an abiding faith in the integrity and loyalty of the organization.

"There is no mystery in safety. The important thing is to think a situation through and then apply common sense. Nothing can ever be gained by attempting to develop theories in the handling of safety matters.

"There must always be enthusiasm in safety work. Safety is, and always will be, a day-to-day, hour-by-hour job.

"The success or failure of a steamship line can be laid, in a large measure, to its safety program. That is just how important safety is to good ship operation.

"Safety practices—good safety practices—are a good habit for every individual and for every company."

Slightly paraphrased from
WILLIAM M. JEFFERS,
Former President
Union Pacific Railroad Co.

On the Ways — SHIPS IN THE MAKING

Steam Yacht to be Luxury Cruise Ship

In 1930 the late J. P. Morgan built at the Bath Iron Works his fourth Corsair, a 2181 gross ton steam yacht with an overall length of 343 feet, a beam of 42 feet and a draft of 18 feet. Powered with twin screw turbo-electric propulsion she had a speed of 18 knots. In May 1940 he turned her over to the British Admiralty who fitted her as a convoy escort and used her throughout the war. After the war she was sold by the British in Bermuda to private parties who transferred her to Panama registry. She was later acquired by the Skinner and Eddy Corporation, who plan to convert her into a de luxe passenger cruise liner.

Preliminary repairs and overhaul are now nearing completion at the Todd Shipyards Corporation, Brooklyn plant. This work includes: opening and cleaning out boilers, armature rewinding, renewal of boiler tubes, removal and overhaul of pump motors, installation of new shafting and couplings in one of the turbines, repairs and replacements in the hand-steering mechanism, repairs and refitting of wood panels in the pilothouse, and numerous other items of repair and overhaul.

Conversion of the yacht to a commercial cruise ship, which will be completed on the West Coast, entails splitting up the large guest rooms into smaller cabin units; extending the passenger quarters on the boat and main decks, and the addition of a lounge on the aftersection of the boat deck. These alterations will increase the number of passenger cabins to 45, with two beds in each. The dining room will not be enlarged, but refitted and rearranged to accommodate about 50 persons at one sitting.

When her conversion is completed, she will have accommodations for between 85 and 90 passengers, and a crew of 80.

Before the Corsair left New York for war duty in 1940, the fine teakwood paneling and railings were removed, at the Todd Brooklyn yard, from the dining room, bridge deck, "living room" and alleys. This wood —which Mr. Morgan never permitted to be varnished—the new owners are seeking to purchase and replace, to match the teak decking which still is intact.

Evidently the new owners intend to use the reconverted Corsair as a special de luxe cruise liner for passenger cruises anywhere on the Pacific.

Reconversion Bids

Recent bids submitted to the U. S. Maritime Commission by ten shipyards cover the reconversion work on five troopships and show a very healthy spread between high and low bidder.

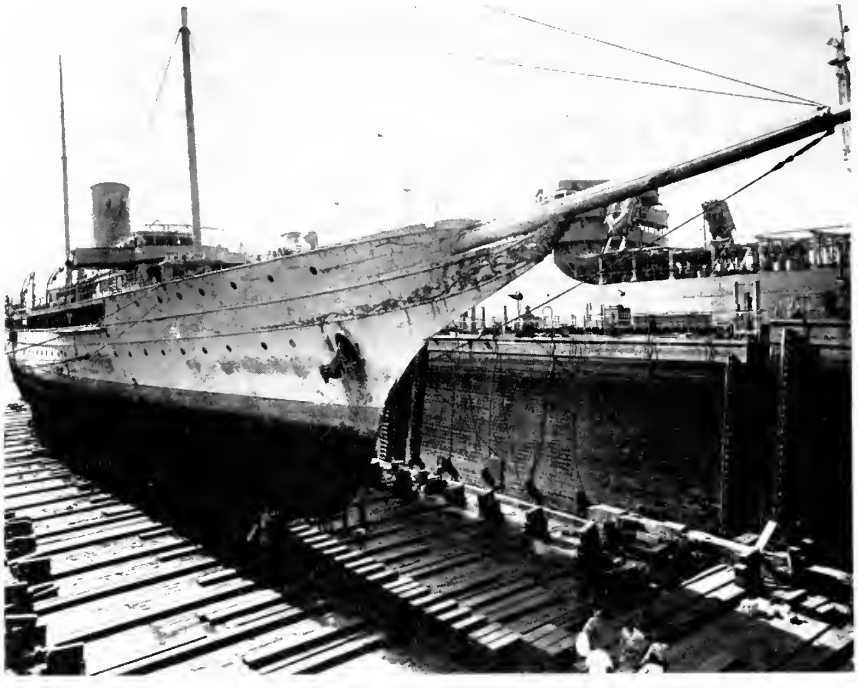
For SS Sea Owl, the high bid was $425,000 and 75 days; the low bid was $398,408 and 55 days.

For USS Griggs, high was $623,000 and 85 days; low was $544,424 and 80 days.

USS Guilford brought a high bid of $610,000 and 90 days; a low bid of $520,174 and 80 days.

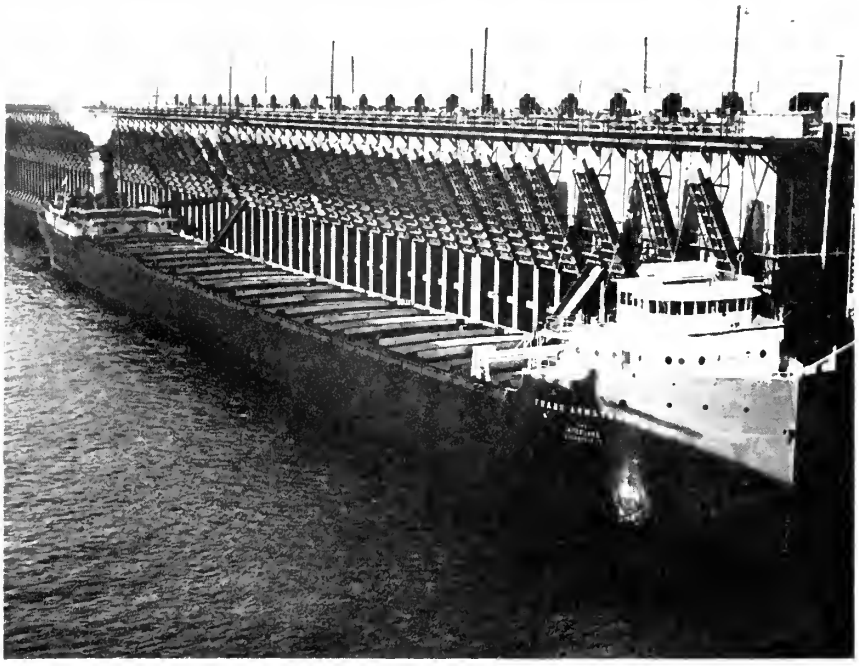
For SS Sea Ray, high was $370,000 and 70 days; low was $280,982 and 55 days.

For USS Hansford, high was



Yacht Corsair, turned over to British Admiralty by the late J. P. Morgan in 1940 for convoy patrol service, in dry dock at Todd Shipyards Corporation's Brooklyn division. The $2,000,000 vessel, fourth Morgan yacht to bear the name, will be operated as de luxe cruise ship by new owners, the Skinner and Eddy Corporation of Seattle.

GREAT LAKES CARGOES WORLD'S HEAVIEST



U. S. Maritime Photo

Maintaining a miracle of modern trnasportation, the huge bulk carriers on the Great Lakes ply their routes with cargoes of bulk ore, grain and coal. Above is the Frank Armstrong, one of the fine carriers built during the war by the Maritime Commission for this vital service. She is shown taking on bulk ore at one of the great "tips" at Superior, Wisconsin. The ship's capacity of nearly 16,000 tons can be loaded thus in eight hours or less.

Last published annual figures (1944) for the overall movement of bulk cargo in lake traffic, including Canadian, were: iron ore, 90 million tons; bituminous coal, 17½ million tons; wheat, 7½ million tons.

$590,000 and 90 days; low was $490,694 and 80 days.

Lapsed time estimates shown here are all calendar days.

Spread in amount of bids runs as high as 42 per cent of the low bid. Spread in time runs as high as 50 per cent of the lesser number of days (lowest time estimates are not shown in the figures above).

Three New Good Neighbor Liners

Our illustration shows the combination passenger-cargo liners SS Del Mar and SS Del Norte, berthed at outfitting piers of the Ingalls Shipbuilding Corporation at Pascagoula, Mississippi. A third sistership, the Del Sud, is also under construction and will be finished a little later. Each will accommodate about 100 passengers.

The Del Mar, Del Norte and Del Sud are of Maritime Commission design C3-S1-BR1, 495 feet long with a beam of 70 feet. Their deadweight tonnage has not yet been calculated, but they displace 16,700 tons. Propelled by 8500-hp double reduction geared turbines, they will make 16½ knots.

The ships present a pleasing profile with raked stem and cruiser stern. All quarters are air conditioned and will be finished in the latest designs. Of special interest to passengers are such features as a social hall, club and bar, dining salon, deck cafe, circular promenade, and swimming pool. All passenger staterooms have outside exposure, toilet and shower.

These vessels are expected to be operated by the Mississippi Shipping Company (Delta Line) between the United States and the east coast of South America.

SS Del Mar at outfitting dock at Ingalls Shipbuilding Corp.

Federal Launches Cargo Liner

The fast freighter African Moon, of 17,980 tons displacement, was launched November 2 from U. S. Steel's Federal shipyard.

Mrs. Joseph Bradley Murray, of 11 East 90th Street, New York, smashed the christening bottle of South African champagne on the bow of the ship in the simple ceremony. She is the wife of the vice president of the Metropolitan Engineering Company, Brooklyn, and a sister of John J. and James A. Farrel, Jr., Chairman and President, respectively, of the American South African Line, Inc., for which the ship is being built.

This is the fifth ship in a fleet of six being constructed for the line at Kearny. African Star, African Planet, African Rainbow, and African Crescent, already are engaged in commerce between their home port of

New York and ten ports of south and east Africa.

These vessels are modified C-3's, with accommodations for 12 pasengers, a comfortable lounge and a spacious dining room. Design speed of 16½ knots has been exceeded in operation. Length is 429 feet, beam 69½ feet, and draft 29 feet 1 inch. Commercial radar is in use on the African Star and African Crescent, and will be installed in the other ships.

Each ship has five cargo holds, three cargo oil deep tanks, four fuel oil deep tanks and 27,000 cubic feet of refrigerated cargo space. Cargo dead weight capacity is 10,000 tons, grain capacity is 706,350 cubic feet and bale capacity 642,415 cubic feet. Holds are ventilated by 104,000 cubic feet of fresh air a minute.

Shipbuilding Veterans Retire

Four men whose years of service total 179 have just retired from Bethlehem Steel Company's San Francisco Yard. They are Richard F. G. Fletcher, 65, 1829 37th Avenue, San Francisco; Peter Logan, 65, 214 Peninsula Avenue, San Mateo; Joseph Oribin, 66 Montecito Avenue, San Francisco; and S. P. Phillips, 61, 316 Utah Street, San Francisco.

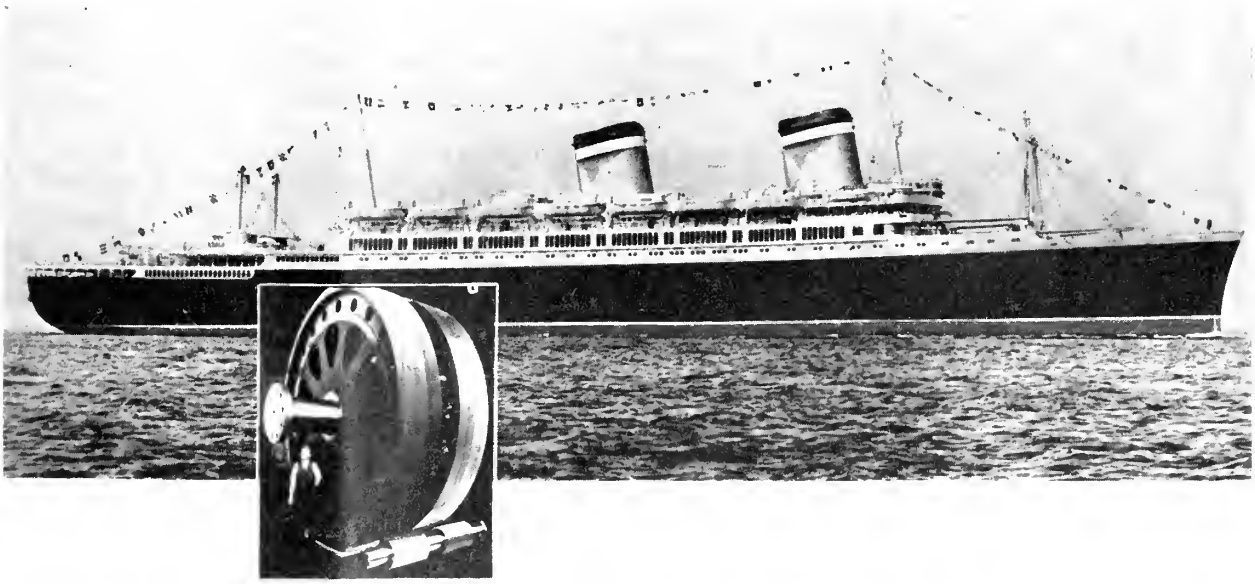
Joy and sadness marked the end of 179 years of service at Bethlehem's San Francisco Yard for 4 foremen, retired. Left to right: Joseph Oribin, Shipwright foreman, 40 years service; S. P. Phillips, Sheet Metal Dept. foreman, 41 years service; W. M. Laughton, general manager of the yard; Peter Logan, Riveting Dept. assistant foreman, 50 years service; Richard Fletcher, Riveting Dept. foreman, 48 years service.

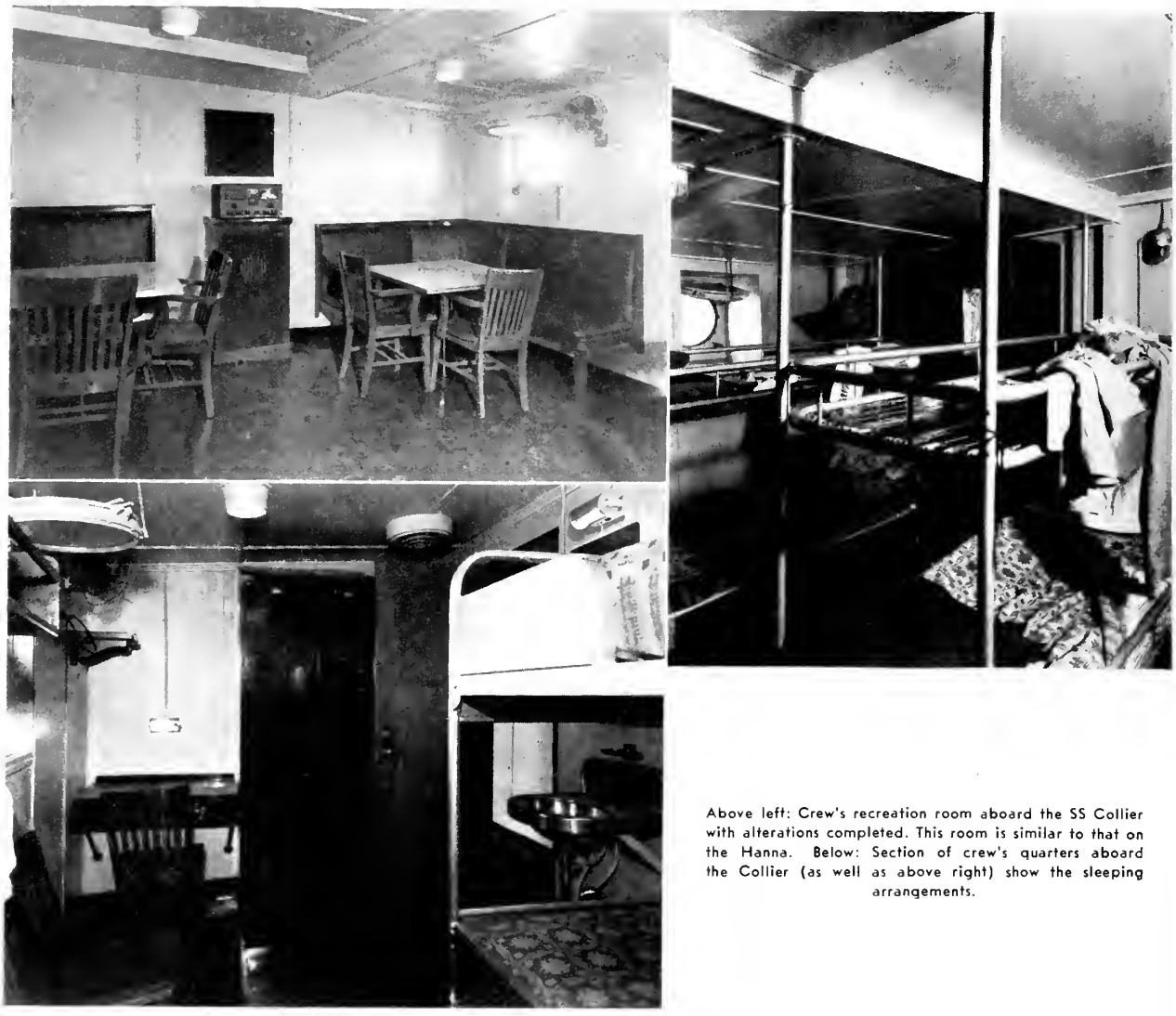
The first two veterans are native Californians Mr. Fletcher was born in Deer Valley, Contra Costa County and started shipbuilding September 11, 1898, as a chipper apprentice. At that time the present San Francisco Yard of Bethlehem was the Union Iron Works. In 1921 Fletcher was made foreman of the riveting department. He plans now to catch up on golf and gardening.

Mr. Logan, born in San Francisco, started at the Union Iron Works in 1897 as a rivet heating boy. He ends his career as assistant foreman in the riveting department and intends to travel and improve his golfing score.

Mr. Oribin, a native of Greenock-on-Clyde, Scotland, came to work on

The largest marine gears eevr built in the United States will propel the SS America when the country's largest liner leaves New York November 14 on its maiden postwar voyage to Europe. These enormous gears, 14½ feet in diameter, cut to hairbreadth precision by the De Laval Steam Turbine Company in Trenton, New Jersey, were installed in 1939 when the America was built by the Newport News Shipbuilding and Dry Dock Company.





Above left: Crew's recreation room aboard the SS Collier with alterations completed. This room is similar to that on the Hanna. Below: Section of crew's quarters aboard the Collier (as well as above right) show the sleeping arrangements.

November 27, 1906, as a shipwright and was made a foreman on January 1, 1923. He will return to Scotland for a visit. He has two children, a son and a daughter.

Mr. Phillips is a native of Sparta, Greece. He came to work November 13, 1905, as an apprentice in the Sheet Metal Department and was made foreman on February 1, 1944. Mr. Phillips plans to see the United States before settling down in San Francisco.

Luxury on Tankers

Bethlehem Steel Company's San Francisco Yard has just completed alterations and improvements to crew's quarters on two Standard Oil tankers which, from a seaman's point of view, give them the most modern and comfortable tanker quarters afloat. The two vessels involved are the J. L. Hanna and H. D. Collier recently purchased from the Maritime Commission.

New berths and other furniture of owner's standard design have been installed in all of the crew's staterooms. Furthermore, additional crew quarters, washing facilities and a crew's recreation room have been built in the spaces originally intended for gun crew sleeping and messing accommodations.

Existing crew's wash rooms have been rearranged and otherwise modified to provide additional toilet and bathing facilities in order to bring these compartments up to the standards existing on other Standard of California vessels. A new laundry with commercial type electric washing machine, drying racks, and complete equipment has been provided for the use of the vessel's personnel.

The new crew's recreation room on the port forward corner of the poop deckhouse has been furnished with card tables, standard as well as shortwave broadcast reception radio, fans, bookcase, settees, chairs, etc., and in order to make this a cheerful, well-lighted and livable space, it has been provided with mechanical, as well as natural ventilation, heating system, additional air ports, and ample artificial lighting.

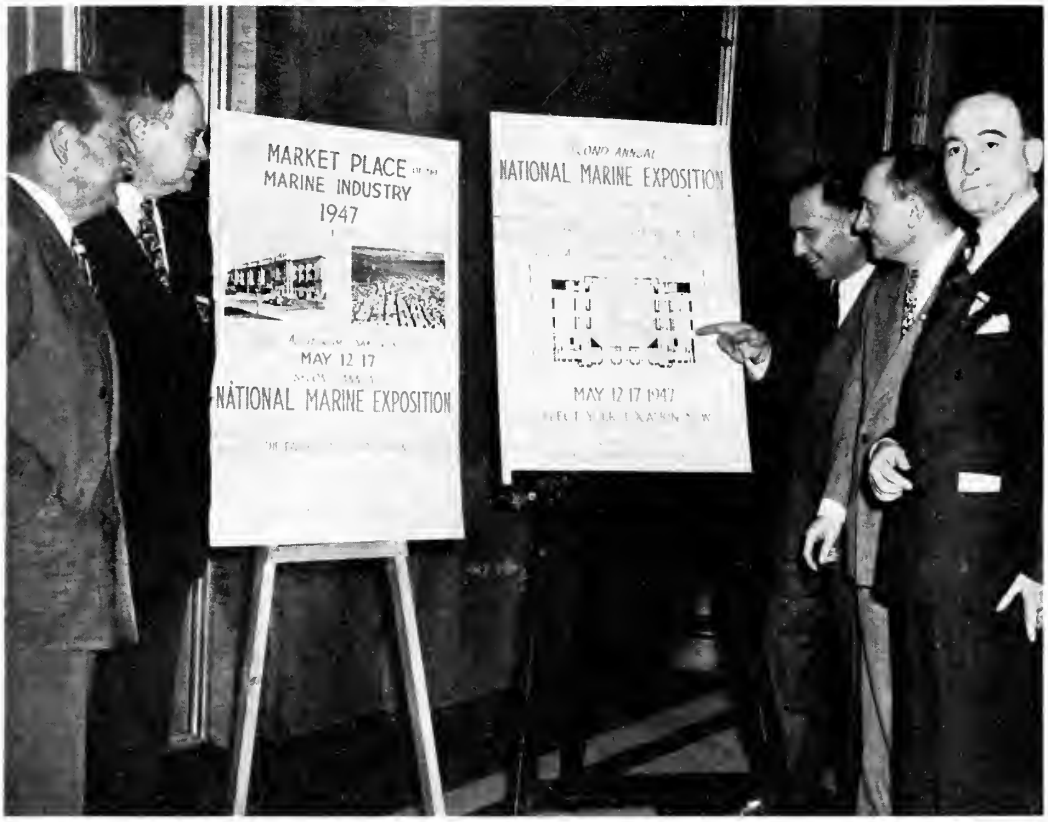
Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

Society of Naval Architects and Marine Engineers Meets at New York

This picture was taken at the recent meeting in New York of the Society of Naval Architects and Marine Engineers. Left to right: J. H. King, vice president of the Society, who was elected treasurer for a one-year term; Vice Admiral Edward L. Cochrane, USN, elected president of the Society; and William S. Newell, president of the Society for the past two years, who was elected honorary president for life.



Seen at the American Merchant Marine Conference and Propeller Club of the United States Annual Convention: Robert E. Friend, president, Nordberg Mfg. Company of Milwaukee, smilingly points to large main floor space his company has contracted for in which to display small craft and pleasure boat engines as well as heavy duty equipment, in the forthcoming Second Annual National Marine Exposition. Looking on are, left to right: Roger E. Montgomery, pres. and gen. mgr., National Marine Expositions, Inc., under whose management this annual exposition is held; I. W. Jackman, manager Marine Division, Worthington Pump & Machinery Corp., who again this year have taken over 800 sq. ft. in which to display engines of all sizes. Next to Mr. Friend is Arthur M. Tode, honorary president, Propeller Club of the United States, sponsors of the Second Annual National Marine Exposition, and R. W. Bayerlein, manager of Heavy Machine Division, Nordberg Mfg. Company.

The East is Coming West

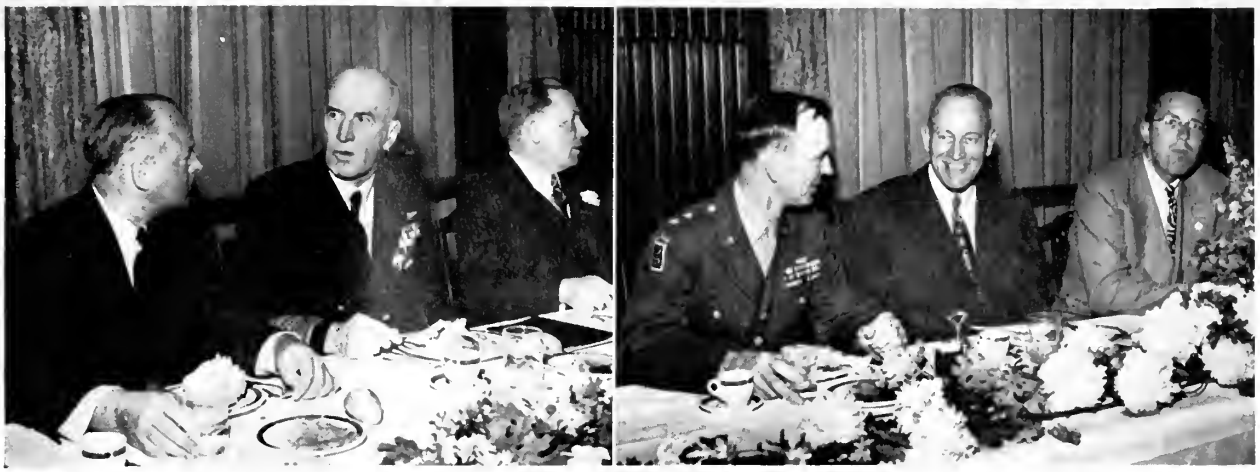
Big Demand for Space in the Second Annual National Marine Exposition

Sponsored by the Propeller Club of the United States, the National Marine Exposition which will be held in the San Francisco, California, Civic Auditorium, May 12-17, 1947, inclusive, is an assured sell-out according to Roger E. Montgomery, president and general manager, National Marine Expositions, Inc., under whose management this annual event is held alternately between the East and West coasts.

To date, with six months still to go, 50 leading concerns in the marine industry have contracted for more than half of the available exhibit space. A veritable "who's who" of the marine industry will again—as they did in New York last May—display to the thousands of buyers and the general public the latest developments and improvements in marine equipment, design, machinery, furnishings, products and services.

Following is a partial list of exhibitors to date:

Adel Precision Instruments
Alcoa Steamship Co.
Aluminum Company of America
Amercoat Division, American Pipe & Const. Co.
Cargocaire Corp.
J. S. Coffin, Jr. Co.
Dearborn Chemical Company
Flexitallic Gasket Co.
General Electric Co.
General Petroleum Co.
Globe Wireless Ltd.
Frank Groves Co.
Hooper Valve Co.
International Paint Co., Inc.
Johns-Manville Corp.
Liquidometer Corp.
The Log
Mackay Radio & Telegraph Co., Inc.
Marine Catalogue & Buyers Guide
Marine Engineering & Shipping Review
Marine News
Metalock Castings Repair Service
Nordberg Manufacturing Co.
The Texas Company
E. J. Bartells Co.
Owens-Corning Fiberglas Corp.
Pacific Marine Review
Propeller Club of the United States
Radiomarine Corp. of America
Sausalito Shipbuilding Co.
Sperry Gyroscope Co., Inc.
Submarine Signal Co.
Todd Shipyards Corp.
Tubbs Cordage Co.
United Fruit Co.
Vickers, Inc.
Western Electric Co.
Western Gear Works
Thomas C. Wilson Co.
Worthington Pump & Machinery Co.
H. G. W. Young Co.
American Export Lines
Federal Electric Co.
Gamlen Chemical Co.
Triangle Boat Co.
Atlas Imperial Diesel Engine Co.
Ets-Hokin & Galvin
Standard Oil Co., of California
Hercules Equipment & Rubber Co.
C. J. Hendry Co.
George G. Sharp



Head table at the Navy Day luncheon held October 24 in the Commercial Club in San Francisco. Left to right: Louis A. Benoist, chairman, Navy Day Committee; Fleet Admiral Ernest J. King, guest of honor; Brayton Wilbur, presiding at the luncheon, president, San Francisco Chamber of Commerce; Major General George P. Hays, Commanding General, Sixth Army, The Presidio of San Francisco; Charles E. Moore, State President for Northern California, Navy League of the United States, and Joseph A. Moore, Jr., regional national vice president of the Propeller Club of the United States.

Resurgence of Navy League in West

With the war-time wraps removed, the Navy League of the United States is reorganizing its Councils in numerous localities. The League is determined to keep before the public the needs of the Navy in ways which the Navy itself is not permitted to do.

At the call of Charles E. Moore, president for Northern California, and Richard D. Brigham, chairman of the Chamber of Commerce Naval Affairs Committee, a Navy-minded group met on October 31 to form the San Francisco Council. Dan London was named president; George M. Lowry, vice president; T. Douglas MacMullen, secretary; Richard D. Brigham, treasurer; Walter J. Walsh, judge advocate. These five, with Charles T. Langlais, Robert Christy, G. E. Reed and Dudley Harkleroad, were elected directors.

Memberships in the National organization are being transferred to the local council and interested citizens are invited to apply for membership. Address the secretary—T. Douglas MacMullen, c/o Pacific Marine Review, 500 Sansome Street, San Francisco.

Facts About The Navy League

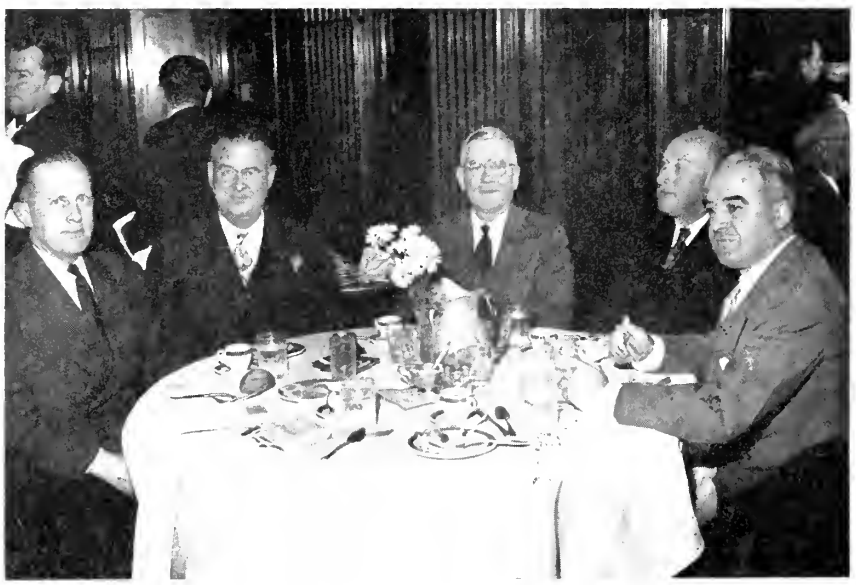
The Navy League of the United States is a patriotic civilian organization, incorporated in 1903, under the laws of New York State.

It is non-profit, non-partisan, non-commercial, and non-sectional in character.

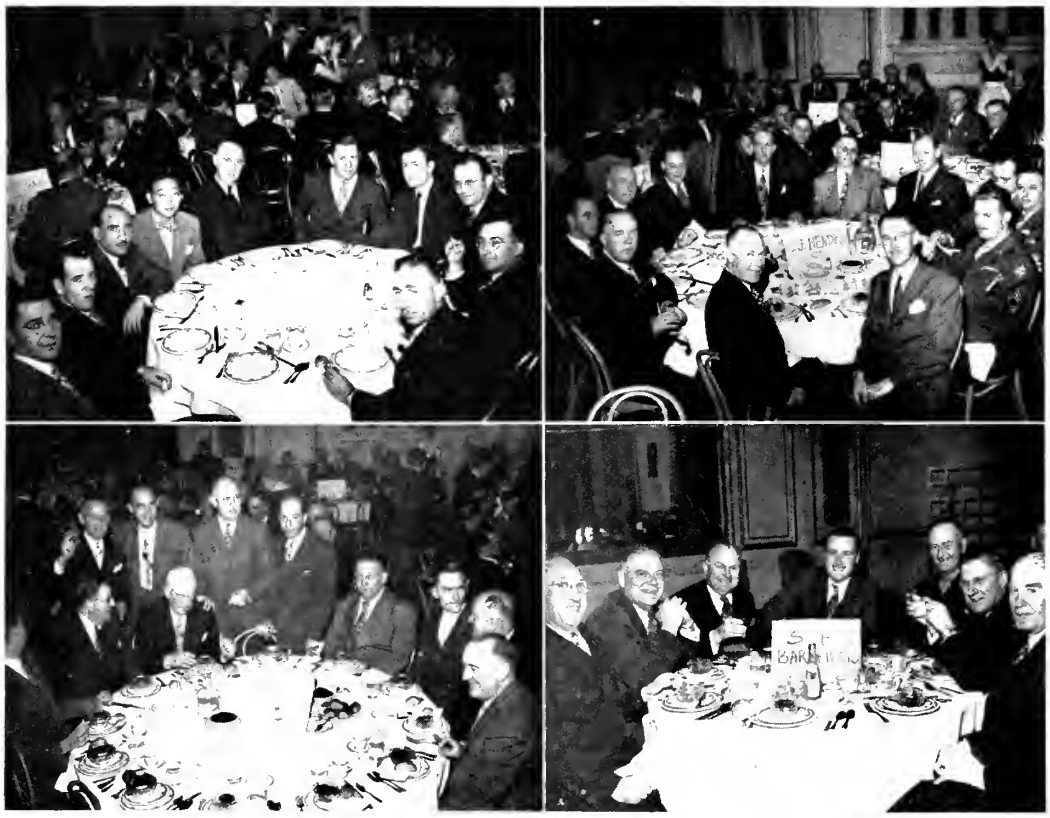
Every civilian who is an American citizen in good standing and all officers and enlisted personnel of the armed services released or discharged from such service under honorable conditions, are eligible for membership.

The basic purpose of the Navy League is to keep the citizens of this country properly informed as to the needs of our Navy in order that it may be constantly and efficiently maintained as the greatest sea-air power in the world, which position it now occupies. The citizens of the United States looking ahead will be satisfied with nothing less, and the Navy League undertakes to keep this objective constantly alive and before the people of our country.

"The Civilian Arm of the Navy"



Seen at the Navy Day luncheon were: D. N. Lillevand, operating manager of Grace Lines; Harry Thompson, freight traffic manager for Grace Line; Fred L. Doelker, vice president of Grace Line; William A. Geary, chief wharfinger, Board of State Harbor Commissioners, and William E. Rodgers, assistant manager, W. R. Grace & Co.



Many firms of the maritime industry played host at the Mariners Club Fall Banquet. Tables represented here include Harbor Supply, San Francisco Bar Pilots, C. J. Hendry Co., General Engineering and Dry Dock Co., Thos. A. Short, Ets-Hokin & Galvan, Graham Industries, and Haviside Company.

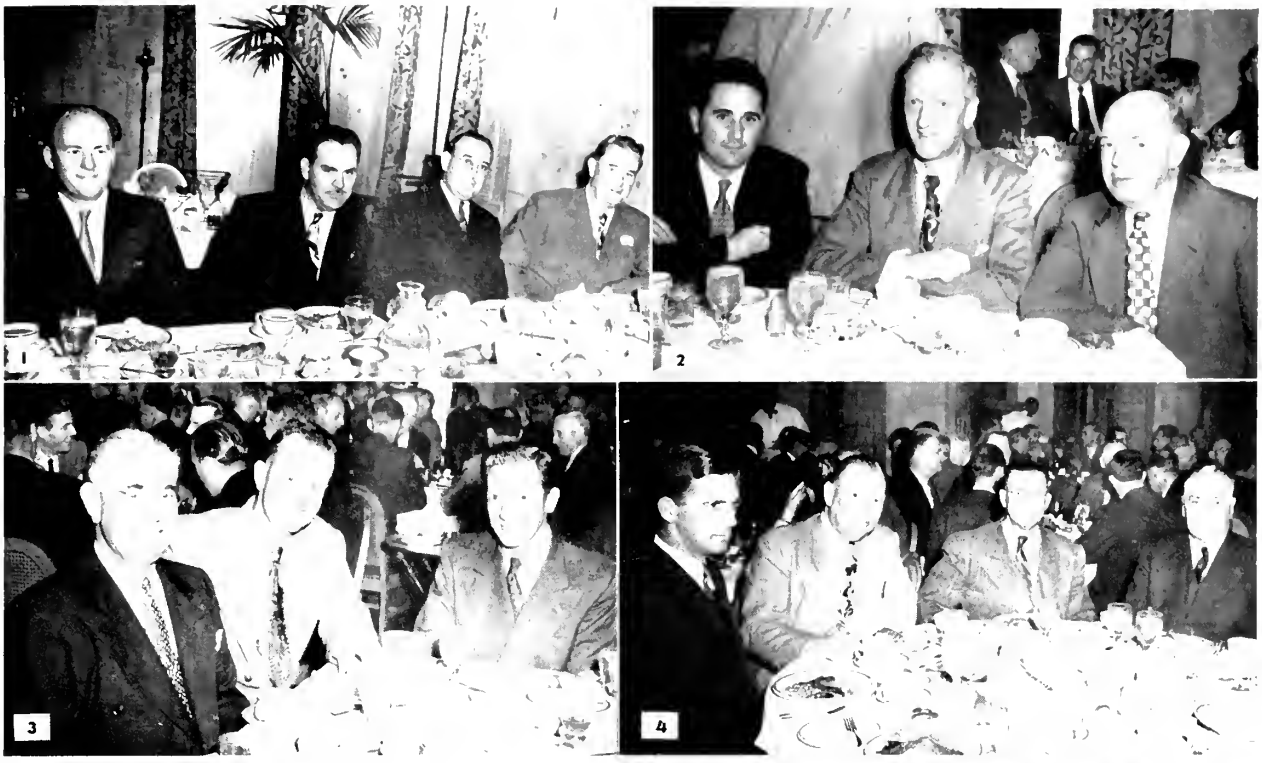
Mariners Fall Frolic

"Never a dull moment!" was the promise of President Tom Short's efficient committee in charge of banqueting and entertaining the Mariners Club of California at its 18th Annual Fall Frolic. The big event actually topped the advance billing.

First of all, the event set a new record for attendance. Secondly, all hands seemed to agree that the cuisine, the victuals, the refreshments and the show hit a new HIGH!

The data for the record: Wednesday, October 30, in and around the Gold Ballroom of the Palace Hotel in the city by the Golden Gate.

Dick Glissman was in rare form and introduced some swell acts to keep up his rep as an impresario extraordinaire. His committee mates were: F. G. Archbold, A. T. Berry, Frank De Pue, Joe Benoit, Bern De Rochie, William Fisher, N. O. Gunderson, A. T. Hunter, Ross Marble, Edward McCarthy, Joe Gisler, George E. Swett, Louis Ets-Hokin, and William Leahy.



Bilge Club Annual Fall Banquet

Held at Pacific Coast Club, Long Beach, Calif.

Above: Rolf Monsen, Todd Shipyards.

At left: J. C. McKnight, American Bureau of Shipping; R. J. "Dusty" Dussler, Inner Harbor Terminals; Bill Eigle, Pope & Talbot Lines.

1. Stan Franklin, Diesel Control Corp.; W. F. McNeil, Joshua Hendy Iron Works; Roy Campbell, American Pacific Steamship Co.; and Joe Hare, U. S. Maritime Commission.
2. J. T. Gilbride, Todd Shipyards; Karl French, naval architect; H. E. McEwing, General Steamship Corp.
3. Ray Sullivan, Bill Foster and Joe Shafer, representing the Hagan Corporation.
4. Hal Bowen, Llewellyn Supply Co.; Bob Snodgrass, secretary, Bilge Club; Winn Rash, California Bank; and Walter Richards, Wilmington Iron Works. These men are all Bilge Club officers.

Instructor Louis Lopez of the Sperry Marine School indicates to student mariners how the Loran receiver establishes a fix at sea electronically in a matter of minutes.

Loran Added to Sperry School

Classes in Loran, the new, electronic navigational device, have been added to the curriculum of the Sperry Gyroscope Company's Marine School, which recently moved to new enlarged quarters at 81 Willoughby Street, Brooklyn, New York. Additional classes in Sperry marine radar operation will soon supplement the traditional gyro course taught at the school.

Over 2700 men from all the merchant marines of the world have been graduated from the school in the past 32 years.

Mackey Radio's Marine Division Offers New Service

The Mackay Radio and Telegraph Company, susidiary of the American Cable & Radio Corporation, announces that its Marine Division has inaugurated a new radio maintenance service for steamship companies. The service is offered in the form of a maintenance contract under which Mackay Radio, for a flat monthly fee, becomes responsible for repairs, adjustments and replacements of all electronic equipment, such as radiotelegraph, radiotelephone, radio direction finder and radar units, which are the property of the steamship lines. In this way it relieves the shipowner or ship operator of the problems of arranging for the materials and the licensing of equipment, and this new service is performed by Mackay's Marine Division with the issurance of individual repair requisitions and purchase orders.

The service facilities of Mackay Radio are located on the Pacific Coast as follows: Seattle, at 1008 Western Avenue; Portland, at 214 S. W. Stark Street; San Francisco, at 350 Mission Street; Wilmington, at 311 Norrh Avalon Blvd.; Honolulu, T. H., Pier 7; and also in Manila, P. I.

The new maintenance contracts are in addition to Mackay's rental, deferred purchase, and service contracts which the company has been offering for many years.

Scene at a recent San Francisco Port Propeller Club meeting. Left to right: Fred L. Doelker, past president of the Club; J. J. Geary, presiding president; and Andrew L. Kerr, War Assets Administration, guest speaker at October meeting

Ets-Hokin & Galvan's Monterey Store Holds Open House

Over 500 well-wishers gave Ets-Hokin & Galvan's newest store an enthusiastic "send off" Saturday afternoon, October 12. The new store is located at 484 Washington Street in Monterey, and includes a very modern and well-equipped electrical shop.

The new organization offers an unusual amount of electrical experience in the marine field, the commercial and industrial fields, and in motor repair. Ad Edel and Stan Segali have been spark plugs in the organization for many years. Gordon Howe and Pearson Wilmot, who operated the Monterey Motor Shop, have also come into the new company. Mahlon Fales will be shop foreman.

The new store is also the Monterey headquarters for General Electric Home Appliances of all kinds.

California Representatives For Sterling Engines

Left to right: A. P. Hahn, and H. Bohuslav, of Sterling Engine Co.

The Sterling Engine Company announces the appointment of additional dealers in California to properly service the Viking Diesel, Petrel gasoline, and newly acquired Model "A" and Model "D" diesel engines. The sales and service of these outstanding marine and stationary engines will be handled by Nuttall-Styris Company, marine dealers for the San Diego territory, and Fellows & Stewart, marine dealers for the balance of Southern California.

Having represented the Sterling Engine Company for the past 20 years in California, the King-Knight Company of San Francisco is continuing sales and service for Northern California. Industrial sales and service in Southern California are handled by PAKCO of Los Angeles.

The Northwest Marine Distributors and the Petrich Machine Works of Seattle will handle marine service and sales for Washington and the Territory of Alaska. In the Lower Columbia River Basin and the Portland area the Beebe Company of Portland, Oregon, will represent the Sterling Engine Company for marine applications. Industrial sales in the State of Washington and the Territory of Alaska will be handled by the Nelson Equipment Company.

To assist these dealers and to maintain close contact between the factory and the user, the Sterling Engine Company has recently established a factory branch office in the Russ Building, San Francisco, with Hans Bohuslav, vice president, and Al Hahn, assistant manager.

Galbraith with A. A. Pedersen of S. F.

ROBERT E. GALBRAITH is now associated with A. A. Pedersen of the Transmission Engineering Company, whose offices are located at 259 Second Street, San Francisco.

Galbraith, who is an engineering graduate of the University in 1930, was sales engineer for the Allis Chalmers Company for 12 years. During the recent war he served four years in the U. S. Navy in charge of the Electrical Department for the office of the Supervisor of Shipbuilding, Twelfth Naval District in San Francisco.

Robert E. Galbraith, associated with A. A. Pedersen.

The Transmission Engineering Company is manufacturers agent for the following companies: Falk Corporation, Milwaukee, makers of marine propulsion gears; United Iron Works, Oakland, makers of centtifugal pumps; Stearns Magnetic Mfg. Co., Milwaukee, makers of magnetic cluches and brakes; Galland Hening Co., Milwaukee, makers of hydraulic cylinders and valves; Crane Packing Co., Chicago, makers of packing for marine and industrial use; Henry Vogt Machine Co., Louisville, Ky., makers of heat exchangers, condensers and boilers; and Chicago Train Rail Co., Chicago, makers of cranes and hoists.

General Petroleum Appoints Public Relations Director

President S. J. Dickey of General Petroleum Corporation, the Pacific Coast affiliate of Socony Vacuum Oil Company, announces the appointment of *Wallace B. Curtis* to the newly created position of Public Relations Director, with headquarters in the General Petroleum executive offices at Los Angeles.

Promoted from the post of advertising manager which he has held for the past 14 years, Mr. Curtis has a previous background of other marketing activities for the same company, preceded by several years of promotion, advertising and public relations work in the commercial aviation and resort fields.

ALAN SCURFIELD

Scurfield Manager of Charles E. Lowe Co.

Alan Scurfield is now manager of the Charles E. Lowe Co., 185 Steuart Street, San Francisco, distributors for Celeron pump rings and pump valves; Sur-Tite condenser packing and Bestolife lead seal compound.

Scurfield is well known in marine circles and sailed as engineer for a number of years with the Union Oil Company, Associated Oil Company, Matson Navigation Company, and the United Fruit Company.

In 1936, he became associated with the engineering department of Swett and Crawford and in 1941 he entered the U. S. Navy as Lieutenant Commander. After serving more than three years overseas, he was released from the service in December, 1945. He resigned from the engineering department of the Fireman's Fund Indemnity Company to take his present position.

New Engineering Partnership

Captain Thomas H. Urdahl, US NR, and Commander John Everetts, Jr., USNR, recently released to inactive duty by the Navy, have joined forces as Consulting Engineers, specializing in problems associated with air conditioning, industrial drying and dehumidification.

Offices have been established at 212 Mission Street, San Francisco, under the resident direction of John Everetts, Jr., and a temporary office at 726 Jackson Place, N. W., Washington 6, D. C., under resident direction of T. H. Urdahl.

Captain Urdahl, in private practice of engineering since 1926, was commissioned a Lieutenant Commander in the Naval Reserve in November, 1939, and was on active duty in the Bureau of Ships from February, 1941, until August, 1946, serving as Head of the Air Conditioning Section, with responsibility of air conditioning, ventilation and heating of all vessels in the United States fleet.

Commander Everetts was commissioned a Lieutenant in the Naval Reserve in July 1942, and was assigned to duty in Bureau of Ships, where he served as West Coast Representative of the Air Conditioning Section, making his headquarters in San Francisco, and handling all technical problems, as well as the procurement and distribution of equipment for heating, ventilating and air conditioning of naval vessels at all West Coast activities.

Gogin Sales Engineer for United Engineering Co.

Lee F. Gogin is now industrial sales engineer for United Engineering Company, with office at 500 Beale Street, San Francisco.

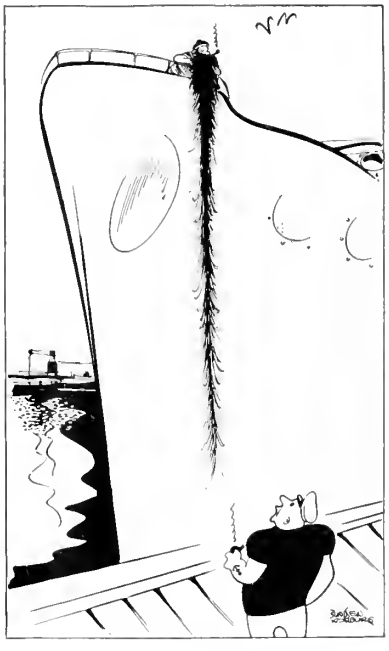
Gogin is well known in marine circles, having served his apprenticeship and worked for 12 years at the Union Iron Works.

He was superintendent at Pelton Water Wheel Company before joining the Matson Navigation Company's Maintenance Division in 1943 as superintendent of the Machine Shop, Tool Room, and Blacksmith Shop.

H. M. DASCHBACH

Daschbach Traffic Manager Of Columbia Steel

Howard M. Daschbach, traffic manager of Geneva Steel Company, has been appointed Traffic Manager of Columbia Steel Company, San Francisco, West Coast subsidiary of the United States Steel Corporation. In his new position, Daschbach will fill a dual capacity as traffic manager of both steel companies.



"HI, MAC. HAVE A LONG TRIP THIS TIME?"

Extreme left: Rigging Loft—riggers at work, Broderick and Bascomb rope. Above left: W. C. Johnson, marine engineer, The Republic Supply Co., of California. At right: Roy W. Johnson, vice president and director in charge of Oakland Division, Republic Supply Co., of California.

The Republic Supply Company of California

The new offices, warehouses, and wire rope fabricating department of the Republic Supply Company of California, industrial division, Oakland branch, are located at 1401 Park Avenue, Emeryville. The offices are housed in a modern brick building, and adjacent are the warehouses and shipping departments.

The company keeps an adequate supply of the products of the following companies on hand at all times: The Clayton Mark & Co., Dresser Manufacturing Co., Malleable Iron Fitting Co., W. C. Norris, Inc., Jones & Laughlin Co., Hills-McCanna Co., Watson - Stillman Co., Nordstrom Valve Co., Clayton Manufacturing Co., Pittsburg Pipe and Coupling Co., M-B Skinner Co., H. O. Trerice Co., Lube-Gum Co., Western Nipple Manufacturing Co., Broderick and Bascom Wire Rope Co., and The Lunkenheimer Company.

The Oakland branch is in charge of Roy W. Johnson, vice president of the company. W. C. Johnson, marine engineer, is manager of marine sales.

The headquarters of the company in Southern California are located at 2122 East 7th Street, Los Angeles, California.

The products of The Lunkenheimer Company include a complete line of bronze, iron, steel, and special alloy valves, ranging in size from the smallest bronze types to massive steel valves for the highest prevailing pressures and temperatures; also boiler mountings, lubricating devices, air devices, whistles, cocks, and numerous other specialties, used on naval and merchant marine vessels throughout the world.

Below, left: Corner of warehouse showing valves for marine and industrial use. Right: Portion of warehouse, showing Lunkenheimer valves—all sizes—for marine and industrial use.

Tuna Clipper Chicken of the Sea shown in new Amercoat dress. New Amercoat antifouling was recently applied below the water line and Amercoat plastic topside finish above. Amercoat anticorrosive primer was used as the base, overall.

Amercoat's New Antifouling Coating

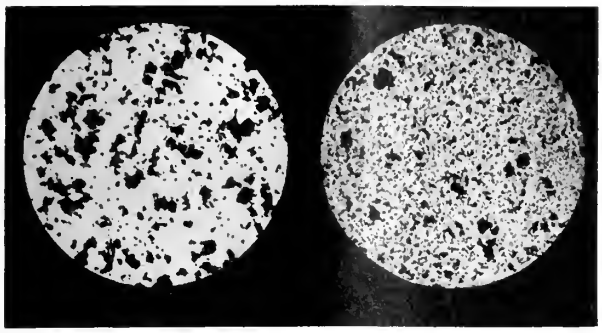
IMMEDIATE AVAILABILITY of the new Amercoat Antifouling, an improved type of coating to protect underwater surfaces against the age-old problem of barnacles and other animal and vegetable growths, is announced by the Amercoat Division of the American Pipe and Construction Company. Longer life, ease of application and fast drying are demonstrated by records made during a four-year development period.

The problem of hull fouling is probably older than the Ark. The familiar story relates specifically that every living thing *on and in the earth* was destroyed except those that came into the Ark "two-by-two." But the fishes of the sea were apparently left undisturbed in the waters. No doubt barnacles and similar pests were undisturbed also, and allowed to multiply and increase . . . to become a discomfort and annoyance for new generations of boat operators. Be that as it may, the persistence of such formations has been a major factor in ship operation since the first craft was launched, and probably will remain a threat to the end of time.

The best defense lies in prevention and the most popular method is to treat underwater surfaces with compositions containing substances which act as toxics or poisons for animal and vegetable organisms.

But ordinarily such protection has been short-lived, necessitating frequent applications with consequent expense and idle time while in drydock. Also, deterioration in effectiveness has been rapid, beginning soon after application, and resulting in quickly developing accumulations and correspondingly diminishing operating efficiency between overhauls.

This new antifouling incorporates certain important



Photomicrographs showing: (left) particle size of standard high quality copper powder as compared to (right) copper particles used in Amercoat antifouling. (Magnification 75X.)

advancements in materials and formulation to meet these problems. Basic is the use of a new type of more finely divided metallic copper toxic, developed through an extended research program carried on by the Battelle Memorial Institute, nationally-known research organization, in cooperation with the major copper companies. This work produced a metallic copper flake with particles but a fraction the size of those in copper powders that previously were available commercially. It is oxygen-free and of an extremely high degree of purity. Poisoning efficiency is greatly increased because of more efficient distribution of the smaller particles in the vehicle, and greater availability of toxic action to combat fouling organisms.

Another reason for the superior performance of Amercoat is proper vehicle formulation. The material is designed so that it allows controlled leaching at the surface. This permits the liberation of toxic at the optimum rate to keep the hull clean for the maximum length of time.

Experience has shown that the coating is remarkably long-lived. It has proved effective in preventing barnacle infestation in fouling water for as long as two years. This is about four times the service life of ship-hull paints meeting ordinary specifications. It has been applied to pleasure craft, sail boats, tugs, and tuna clippers, and subjected to service tests in various sections of the Atlantic and Pacific, as well as in the Caribbean Sea. In all tests, it has effectively prevented fouling under extreme service conditions, including tropical waters.

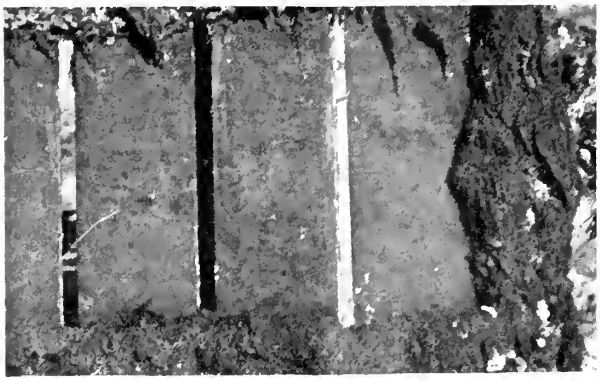
Apart from performance features, Amercoat antifouling offers other important advantages to users. It can be easily applied to either wood or steel hulls with brush or spray. No special equipment of any kind is necessary and no training in application is required.

It is quick drying. One hour should be allowed between coats and before launching. However, it is unaffected by exposure to the air, so that immediate launching after application is not necessary.

The new antifouling is the latest addition to the Amercoat line of plastic marine coatings. They are designed for positive protection against corrosion and include anticorrosive primer, boottopping and topside finishes. They represent an outstanding contribution to greater efficiency and economy in ship operation.

The line will be sold through marine supply houses and dealers throughout the country, and backed by an extensive national advertising campaign scheduled to appear in leading marine publications reaching both commercial and pleasure craft operators.

Photograph shows steel panels coated with antifouling, completely free of all marine growth after two years immersion. This is typical of the many tests conducted at Kure Beach, North Carolina. Note fouling on the unprotected surfaces.



In this photograph of wooden panels under test at Kure Beach, North Carolina, the three panels at right were treated with Amercoat antifouling, while the remainder were treated with other products. Note devastating effects of teredos and other fouling organisms on panels at left.

Case Construction Changes Name to Johnson Western Co.

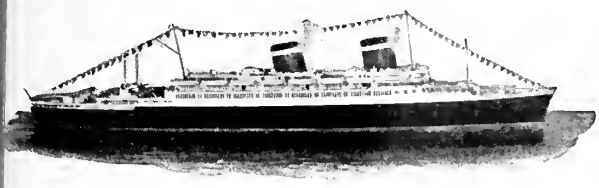
William A. Johnson, prominent West Coast contractor, has acquired the interest of his former associate, Vern D. Case, in Case Construction Co., it was announced recently. The firm will henceforth be known as the Johnson Western Company. Mr. Case is withdrawing to devote his entire time to other interests.

Management of Johnson Western Company will be in the hands of Elden Smith, president, and Harry Gast, vice president and general manager. Mr. Smith has joined Johnson Western Company following his recent resignation as vice president at the Head Office of the Security-First National Bank of Los Angeles. He brings to Johnson Western Company a broad background in the financing and management of Southern California business. Harry Gast is well known in the construction industry, having been with Case Construction Co. since its inception in 1932 and its general manager since 1938.

The key personnel and operating plant of the organization remain unchanged. Eldred Northup, who has served Case for 14 years, continues as operations manager. L. J. Sullivan, D. W. Shupp and E. E. Jackson will, as heretofore, manage the Los Angeles, San Francisco and San Diego divisions, respectively. This organization will, under its new name, continue and expand the activities in which Case Construction Company has long been active, in general and marine contracting, Gunite construction, hydraulic and clamshell dredging, deep sea diving and salvage, tugboat, derrick barge and lightering service.

At top left: Elden Smith, president of Johnson Western; center, Harry Gast, vice president; at top right, Eldred Northrup, operations manager. Lower, left: D. W. Shupp, manager, San Francisco; E. E. Jackson, manager, San Diego; and L. J. Sullivan, manager, Los Angeles Division. Below: Johnson Western Company main office at San Pedro, California.

Again ★ ★ for the America



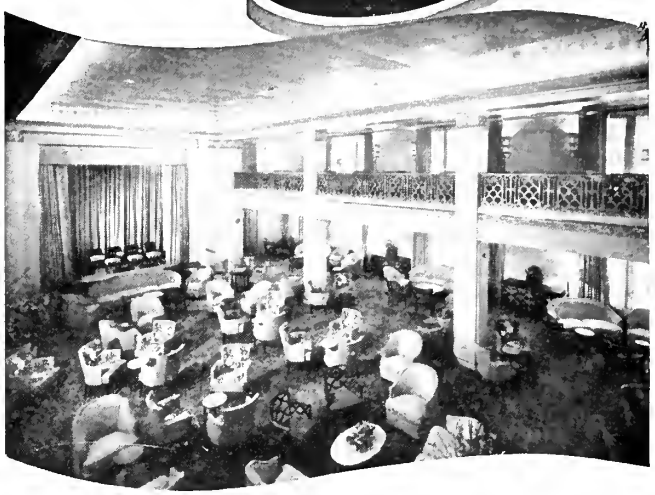
Johns-Manville MARINITE

ONCE AGAIN THE S. S. AMERICA is sailing as "America's Queen of the Merchant Marine" . . . the largest, fastest, and finest liner ever built in this country.

And once again . . . just as for her original outfitting . . . the Maritime Commission and the owners specified J-M Marinite and Marine Sheathing for the alterations in reconverting the America from battle dress to her prewar luxury.

Marinite and its companion materials, Marine Sheathing and Marine Veneer, meet every requirement for strong, corrosion-resistant bulkheads, linings, and ceilings. From luxurious public spaces to modern comfortable staterooms and crew's quarters . . . Marinite provides attractive, soundproof interiors. Made in decorative wood veneer or plain finishes, as well as in pre-surfaced "standard base" ready for waxing . . . Marinite resists scuffing . . . costs little to maintain. And, most important of all in Marine service, Marinite is incombustible . . . forms a fireproof barrier against the spread of fire.

For detailed information, write for your free copy of the J-M Marinite Booklet. Address: Johns-Manville, Box 290, N. Y. 16, N. Y.



First Class Lounges . . . such as this offer proof of the beautiful interior effects that can be obtained with adaptable J-M Marinite bulkheads. Note the spacious ceiling of J-M Marine Acoustical material . . . a "noise-quieting" unit that adds greatly to passenger comfort.

Modern Cabins . . . are as attractive and relaxing as your bedroom at home. See the attractively finished J-M Marinite bulkheads . . . the ceiling of J-M Marine Sheathing that resists heat and sound transmission . . . assures quiet comfort.

Johns-Manville MARINITE & MARINE SHEATHING

COPPER ALLOY BULLETIN

MARINE AND POWER EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared by Bridgeport Brass Company "Bridgeport" BRASS CO. *Headquarters for BRASS, BRONZE, and COPPER*

Corrosion-Resisting Condenser and Heat Exchanger Tubing for More Severe Conditions

With power plant schedules becoming heavier, approaching almost continuous operation in some cases; with water conditions growing worse through increasing pollution by sewage, chemicals and industrial wastes; and with higher cooling water velocities for faster steam condensation, condenser tubing is taking more and more punishment. Because of these conditions more care must be taken to select the most suitable alloy which will give maximum efficiency and greatest economy with minimum tubing failure.

Changing conditions may make it hazardous to retube with the same alloy which may have given satisfactory service in the past. Long before the condenser is ready for retubing, many operators insert test lots of tubing made from various alloys in order to obtain an indication of tube life under existing operating conditions. From a practical standpoint, greatest economy is obtained by using the most suitable alloy available, regardless of price. In other words, operators should consider tube alloys in terms of cost per thousand service hours. Also, a better alloy often permits higher water velocities with correspondingly higher vacuum and greater efficiency.

Bridgeport's Laboratory recognizes the complexity of corrosion problems and maintains a consistent program of corrosion research in order to be in a position to serve customers more effectively.

We hope that this concise presentation of information regarding outstanding condenser tube alloys, together with specifications and composition, may be helpful to operators.

Duronze IV* (Aluminum Bronze)

This is considered to be one of the finest condenser tube alloys made and has exceptional resistance to corrosion under severe conditions such as rapidly flowing fresh or salt water polluted by sewage and industrial wastes, acids, cinders and other foreign matter. It has been used successfully in plants located on tidal estuaries where salt water is mixed with polluted fresh water and withstands impingement corrosion attack better than most alloys. Made to the following specifications: A.S.T.M. B111-45; A.S.M.E. SB111.

Copper	94.25%
Aluminum	5.5 %
Arsenic	.25%

Cupro-Nickel (70-30)

The U. S. Navy specifies Cupro Nickel for warships and other vessels because it has fine resistance to corrosion from sea water flowing at high velocity. The corrosion film formed on Cupro Nickel is thinner than the corresponding film found on brass so that its heat transfer properties remain quite constant. However, since 70-30 Cupro Nickel has a lower thermal conductivity than brass some designers provide 10% additional condensing surface as compared to brass. Made to the following specifications: A.S.T.M. B111-45; A.S.M.E. SB111; Navy 44T39A.

Copper	68.85%
Nickel	30.00%
Iron	.40%
Manganese	.75%

Cuzinal (Aluminum Brass)

This alloy has good resistance to air impingement corrosion resulting from high sea water velocities and trapped air bubbles. It contains arsenic as a dezincification inhibitor. Cuzinal is less scale forming than some other alloys and maintains better heat transfer properties since a thinner corrosion film forms on its surface.

Made to the following specifications: A.S.T.M. B111-45 Type B; A.S.M.E. SB111.

Type B	
Copper	77.0 %
Aluminum	2.0 %
Arsenic	.02%
Zinc Remainder	

Arsenical Admiralty

Bridgeport Brass Company was one of the first in this country to make Admiralty. In the interests of longer service life Bridgeport has for a number of years added arsenic as a dezincification inhibitor. This alloy has excellent general corrosion resistance to sea water and is recommended where velocities are not too high. Arsenical Admiralty is supplied as a standard alloy although Admiralty without arsenic is available upon specific request.

Made to the following specifications: A.S.T.M., B111-45 Types "A" and "B"; Navy 44T7g; Federal WWT756a; A.S.M.E. SB111 Types "A" and "B".

Type A	Type B (Arsenical)
Copper....71.0%	Copper....71.0 %
Tin..... 1.0%	Tin..... 1.0 %
Zinc Remainder	Arsenic.... .03%
	Zinc Remainder

Arsenical Muntz

This alloy has good corrosion resistance when used in clean fresh waters and contains arsenic as a dezincification inhibitor. Made to the following specifications: A.S.T.M. B111-45; A.S.M.E. SB111.

Copper	62.0%
Arsenic	0.1%
Zinc Remainder	

Red Brass

This alloy withstands dezincification better than yellow brass and is used where circulating water is very corrosive. However, it is not recommended for applications involving high sea water velocities and trapped air bubbles resulting in impingement corrosion. Excellent to good corrosion resistance for most inland fresh waters. Made to the following specifications: A.S.T.M. B111-45; A.S.M.E. SB111.

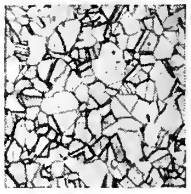
Copper	85.0%
Zinc Remainder	

Arsenical Copper

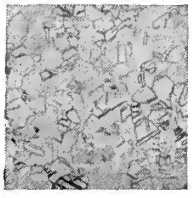
Pure copper alloyed with a small amount of arsenic for greater corrosion resistance than ordinary tubing. Very satisfactory for most inland fresh waters. Made to the following specifications: A.S.T.M. B111-45; A.S.M.E. SB111.

Arsenic	0.15% to 0.50%
Copper Remainder	

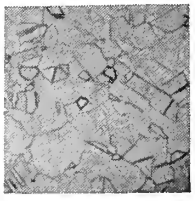
*Reg. U. S. Pat. No. 2093380



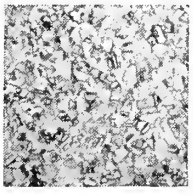
Under the microscope Cupro Nickel may show either a "cored" (left) or homogeneous (right) structure, neither of which influences corrosion resistance.



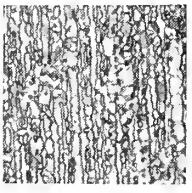
Microstructure Duronze IV Condenser Tube. Mag. 75X.



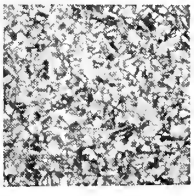
Microstructure Cuzinal Condenser Tube. Mag. 75X.



Microstructure Admiralty Condenser Tube. Mag. 75X.



Microstructure Muntz Metal Condenser Tube. Mag. 75X.



Microstructure Red Brass Condenser Tube. Mag. 75X.

Microstructure Hard Drawn Copper. Mag. 75X.

MATSON CONVERTING ON PACIFIC COAST

The Matson Navigation Company has taken title to the C-3 vessels Sea Hare, Sea Skimmer, Sea Blenny, Sea Centaur, Sea Pegasus, Sea Falcon, and Margaret LeHand; also the Libertys Laura Drake Gill, George E. Waldo, and Alex Hrdlicka. The C-3's are for bulk sugar and molasses trade, and the Libertys are for lumber. Alterations will include cargo gears on the forward end of Libertys, and deep tanks for oil. C-3's for operation to the Atlantic will have deep tanks for oil. C-3's for Pacific service will have deep tanks for molasses, and cargo refrigeration.

All of the above vessels will be converted on the Pacific Coast, and an additional nine ships, yet to be acquired, will be converted in the area most convenient when the particular ships are selected.

* * * * *

FIFTY TANKERS NEEDED

The Maritime Commission is moving to meet a demand from the petroleum industry for fifty tankers to serve the world with oil. Laying-up of tankers has left a shortage in this type of vessel, and thirty-five ships have been removed from reserve fleets and put back into service. It is expected that the demands of the Navy, British and French Governments, and the emergency created by the coal strike, will result in still more ships being recalled.

* * * * *

BENDIX ACQUIRES WAR PLANT FACILITIES

The Freeze Instrument Division of Bendix has assumed full ownership of the properties at its Towson, Maryland plant. The price was approximately one and a half million dollars.

* * * * *

NEW STEAMSHIP AGENCY IN SAN FRANCISCO

A new company, to be known as Ocean Agencies, Inc., 537 Merchants Exchange Building, San Francisco, is announced by H. E. Pickering and L. J. Pepperell. W. H. Wickersham & Co. will represent Ocean Agencies in the Los Angeles area.

* * * * *

CALIFORNIA TERMINAL HEARINGS SET

The Maritime Commission will hold hearings in San Francisco, December 5, and in Los Angeles shortly thereafter, on the question of Terminal costs.

* * * * *

APL HAS WAITING LIST OF FIVE THOUSAND

During the first three weeks of December, more than five thousand passengers will sail from San Francisco on the American President Lines' vessels, General Meigs, President Monroe, General Gordon, Marine Lynx, and Marine Falcon. Additional sailings of passenger-freighters, within this period, will increase the total.

* * * * *

MOORE DRY DOCK WILL BREAK UP OKLAHOMA

The Moore Dry Dock Company, Oakland, California, was best bidder for breaking up the seventy-two million dollar battleship, Oklahoma.

MORE ITEMS CAN BE MADE ON PACIFIC COAST

The industrial department of the Los Angeles Chamber of Commerce is making a survey of industrial opportunities in its area, and finds there are at least five hundred items regularly purchased, but not produced, in the territory, and proceeds to list many for which the demand would seem to justify production in the West.

* * * * *

FERRYBOAT FOR SALE

The old San Francisco ferryboat, "Tamalpais," now moored at the Mare Island Navy shipyard, is for sale. Bids will be received by the Director of Large Vessel Sales, Maritime Commmission, Washington, D.C., until 2:15 p.m., January 13.

* * * * *

YALE FOR SALE

The Maritime Commission will receive bids until 2:30 p.m., December 13, for the purchase of the USS Wassuc (Ex-Yale). The Yale was the coastal passenger-cargo vessel built in 1923. She is a steel, twin-screw type of 1670 gross tons--length 230' 5¾", beam 42' 1", draft 10' 7¾", oil-fired, with a speed of 12 knots.

* * * * *

YACHT ORION FOR SALE

The Maritime Commission will receive bids until December 13, 2:30 p.m., for the USS Vixon (Ex-yacht Orion). The Vixon is a steel, twin-screw, motor vessel, built in Germany in 1929; 3015 gross tons, and propelled by 2 Fried-Kruk Diesel engines.

* * * * *

FERRYBOAT CALISTOGA FOR SALE

The auto-passenger ferryboat, Calistoga, built in 1907, is offered for sale by the Maritime Commission, and bids will be opened at 2:30 p.m., December 18. The Calistoga is now at Suisun Bay, California.

* * * * *

GIANT CONDENSER ORDERED FROM CONDENSER SERVICE.

The Condenser Service and Engineering Company has been awarded a contract for constructing and installing three 70,000 square foot condensers for the Wilmington Harbor Plant of the City of Los Angeles. This is thought to be one of the biggest single condenser jobs for a public utility that has ever been awarded.

* * * * *

MANY LINES USE CARGOCAIRE

The Cargocaire Engineering Corporation has prepared a list of one hundred vessels, operated by nineteen steamship companies, which have installed Cargocaire. Many of the leading steamship companies in the United States appear in the list.

* * * * *

ARMY TRANSPORT CHIEF PLANS TO SHIP IN PRIVATE VESSELS

Pacific operations of the Army Transportation Corps include maintenance of permanent fleet bases in San Francisco and Seattle. Thirty-nine Army-owned and operated ships constitute the present fleet for Pacific operations. These vessels will carry about ten per cent of the Army's cargo movement; the remaining ninety per cent will be carried on commercial ships, according to announcement by Major General Edmund H. Leavy, Chief, Army Transportation Corps.

PRESIDENT WILSON LAUNCHED

The President Wilson, second of American President Lines' big P-2 postwar passenger carriers, was launched Sunday, November 24, at the Bethlehem-Alameda yard. The first of the two, President Cleveland, was launched this summer, and will be completed about April 1.

* * * * *

CONVERSION TO C-TYPES

Contracts for the reconversion to C-type of seven vessels which served as troop transports have been approved by the Maritime Commission. Names of the ships, successful bidders, and cost quoted follow:

USS FAYETTE (APA 43), to be C3-S-A2, Brown Shipbuilding Company, Houston, Texas, $483,848, 119 calendar days. There were five other bidders.

USS SITKA (APA 113), to be C3-S-A2, Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia, $524,000, 90 calendar days. Five other bidders.

USS ELMORE (APA 42), to be C3-S-A2, Brown Shipbuilding Company, Houston, Texas, $481,715, 119 calendar days. Six other bidders.

USS GRUNDY (APA 111), to be C3-S-A2, J. K. Welding Company, Inc., Yonkers, New York, $496,000, 90 calendar days. Four other bidders.

SS CORPORAL, to be C3-S-A2, Maryland Drydock Company, Baltimore, Maryland, $246,799, 50 calendar days. Five other bidders.

SS SEA PARTRIDGE, to be C3-S-A2, Maryland Drydock Company, Baltimore, Maryland, $260,087, 50 calendar days. Four other bidders.

SS KENDALL FISH, to be C2-S-AJ1, Central Maritime Contracting Company, Brooklyn, New York, $86,585, 23 calendar days. Fourteen other bidders.

* * * * *

SHIPS IN RESERVE FLEET NUMBERED 1,717 NOVEMBER 15, M.C. ANNOUNCES

Merchant vessels moored in its nine Reserve Fleet anchorages reached a total of 1,717 in the month ending November 15. the Maritime Commission disclosed. Ninety-nine ships were added to the fleet during that period but 77 were withdrawn.

Reflecting operation of the Merchant Ship Sales Act of 1946, 23 ships were withdrawn from the James River Fleet, Lee Hall, Virginia, while only three entered, making the total moored there 700.

The status of the other fleet sites November 15 was:

Suisun Bay Fleet, Martinez, California, 18 entered, one withdrawn, total 391; Mobile Fleet, Mobile, Alabama, 25 entered, 19 withdrawn, total 235; Astoria Fleet, Astoria, Oregon, 21 entered, one withdrawn, total 59; Olympia Fleet, Olympia, Washington, two entered, none withdrawn, total 96; Beaumont Fleet, Beaumont, Texas, three entered, seven withdrawn, total 43; Hudson River Fleet, Tarrytown, New York, five entered, two withdrawn, total 151; Wilmington Fleet, Wilmington, North Carolina, 14 entered, two withdrawn, total 34; and Brunswick Fleet, Brunswick, Georgia, eight entered, none withdrawn, total eight.

* * * * *

RCA TO PUT RADIO ON 31 TURKISH SHIPS

The Radio Corp. of America announces the signing of a contract with the Turkish Government to install modern radio communications equipment aboard thirty-one ships of the Turkish merchant marine. The agreement also called for erecting a coastal radio station in Turkey and equipping a Turkish maritime radio training school.

* * * * *

BIG U.S.-FOREIGN TRAVEL FIGURES

A survey reports that shipping officials estimate that the United States will continue to furnish about 75 per cent of all transatlantic travelers, and quotes a report of the State Dept. that Americans will be spending $1,500,000,000 annually for foreign travel within the next few years.

NO BIDS RECEIVED ON KAISER COAST YARD

The Maritime Commission announces that, after three postponements, it had received no bids for the Richmond, Calif., No. 3 Shipyard, operated during the war by Henry J. Kaiser. In advertising the yard the commission announced that its minimum terms were for a lease for 10 years at $600,000 a year. One of the reasons given by Mr. Kaiser's spokesmen for their lack of interest was the commission's insistence that the yard be used exclusively for shipbuilding purposes.

* * * * *

ITALY SIGNS CONTRACT TO BUY 30 LIBERTY SHIPS

The Maritime Commission says the Italian government has signed a contract to buy thirty of fifty of the Liberty ships it plans to purchase. Italy made a 10 per cent down payment of $1,917,000. Another 15 per cent must be paid prior to delivery. A commission official declared the deal is the largest single sale of Liberty ships to date.

* * * * *

BIDS OPENED BY M.C. FOR PURCHASE OF TWO TANKERS

Bids for the purchase of two tankers were opened by the Maritime Commission, with Boston Metals Company, Baltimore, Md., submitting the high offer of $15,500 for the twin screw Brazos and Richmond Exploration Co., San Francisco, Calif., submitting the high bid of $52,000 for purchase of the tanker Rheem. The Brazos was offered for sale without restriction, and the Rheem was offered for scrapping or for use as a floating storage tank. It is understood that the hull will continue in use.

The only other bid received for the Brazos was of $5,750 by The Lerner Co., Oakland, Calif., while Pacific Coast Wrecking & Salvage Co., Oakland, offered $18,180, and Edward M. Ricker & Co., San Francisco, $10,200 for the Rheem.

* * * * *

WORLD-WIDE JOINT SERVICE PROPOSED IN AGREEMENT BY FIVE NORWEGIAN COMPANIES

Establishment of a joint cargo and passenger service to be known as the "Hoegh Lines," having a wide trading range from this country to the Far East, Africa, Asia, South America, and various other destinations, has been proposed by five Norwegian companies in an aggreement (No. 7593) filed for approval with the Maritime Commission. The proposed joint service may become party to conferences or other agreements, such participation to be as a single party, with Kerr Steamship Company acting as representative.

The agreement covers establishment of the joint service in the trade between ports of the United States, Hawaiian Islands and Philippine Islands, ports in British North America, Uruguay, Argentina, Paraguay and Brazil, the Continent of Europe, including the Scandinavian Peninsula, China, Union of Soviet Socialist Republics, the Continent of Asia, Java, Ceylon, Japan, Korea, Formosa, Panama Canal Zone, Colony of Singapore, Malayan Union, Netherland India, Central America, British Malaya and the Continent of Africa. The joint service will be under the management and control of the firm of Leif Hoegh & Co. AXTIESELSKAP, of Oslo, Norway.

* * * * *

DUTCH LINES AND SILVER LINE PROPOSE JOINT TRANSPACIFIC SERVICE PACT

Establishment of a transpacific joint cargo and passenger service by two Dutch steamship lines, constituting the Java Pacific Line, and Silver Line, Ltd., providing for equal participation by the parties, including equality in number of ships employed by each, has been proposed in an agreement (No. 7594) filed for approval with the Maritime Commission. Signatories to the pact are N. V. Stoomvaart Maatschappij "Nederland," N. V. Rotterdamsche Lloyd and Silver Line, Ltd.

Keep Posted

New Equipment and Literature for Yard, Ship and Dock

New 12 Watt Marine Radio Telephone

The Harvey-Wells Marine Radio Telephone Model 1206, shown in our illustration, is a new and distinctly modern unit offering a number of highly desirable features not ordinarily available in this class of equipment.

The latest addition to the successful Series MTR-12 Radio Telephones, it incorporates such notable advantages as: bulkhead mounting; compact, streamlined cabinet styling; 12 watt power output with high level modulation at any four crystal control frequencies in the Marine Telephone band of 2 to 3 megacycles with "press to talk" operation (other frequencies can be supplied as required); a receiver of advanced design, using the latest series of miniature tubes, provides tunable coverage of standard broadcast band of 540 to 1550 kilocycles as well as four crystal frequencies in the marine band. Other important advantages include the use of inverse feedback in the audio circuits, a sensitive and stable squelch circuit, a high gain R.F. amplifier stage on both broadcast and marine bands, a loudspeaker output of 2 watts, and built-in loading coils matching any vertical antenna longer than 17 feet or shorter than 60 feet.

Installation and maintenance difficulties are minimized by convenient accessability of all adjustments and components. Releasing two quick fasteners permits removal of cabinet, exposes all tuning adjustments and allows crystal and tube replacement without removing equipment from its mounting plate or disconnecting power leads. For under chassis inspection, a simple release button is depressed permitting the chassis, which is hinged at the bottom, to be lowered to a horizontal position while still secured to the mounting plate.

New 12 watt marine telephone by Harvey Wells Electronics.

The new Artweld steel utility boat.

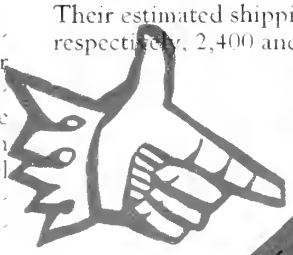
All-Steel Utility Boat

Pioneering in all-steel, open runabout craft designed expressly for utility purposes, Engineering Specialties Co., Inc., of New York, now are introducing their new Artweld, an easily driven hull built of sheet steel—not "tin"—transverse and longitudinally framed, all certified welding.

The Artweld's modern design steel construction gives it the obvious seaworthy advantages of being leakproof, rot-proof, worm-proof and absorption-free. According to its builders, no expense has been spared to make it the most rugged of performers—a boat that is, in their own words, "a glutton for punishment."

These husky little work boats are powered with standard makes of gasoline engines, all fresh water-cooled. Modern internal heat exchangers and liberal-sized, raw water pumps are used, assuring complete and economical control of engine temperatures. It is a recognized fact that this type of cooling not only prolongs the useful life of the engine, but it also cuts normal maintenance expenses to little or nothing.

The Artweld comes in two models—18′ and 23′ in length. Both are capable of speeds of 13-15 m.p.h. Fuel capacity is 20 gallons for the smaller model, 25 for the larger boat. Their estimated shipping weights are, respectively, 2,400 and 3,500 pounds.



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PACIFIC MARINE REVIEW

500 Sansome Street - San Francisco

Send me descriptive data of the following new equipment or literature as reviewed in

issue Page No.

(Identify by name of manufacturer and catalog)

NAME

BUSINESS

ADDRESS

Firemaster Refractory Coating

The Gamlen Chemical Company has just introduced Firemaster Refractory Coating which, after being brushed or sprayed on to furnace refractory walls, dries into a seamless monolithic lining that is practically impervious to the effects of slag and other products of combustion.

Firemaster fuses, in the presence of heat at the regular furnace operating temperatures, into a continuous, glass-like substance of high strength and heat-reflecting properties. This seamless lining prevents infiltration of gases into refractory walls, reduces spalling, and minimizes accumulation of slag, therefore greatly reducing brick work maintenance.

The coating improves combustion in two ways—by sealing air leaks, thus preventing heat loss through the walls, and by reflecting a better percentage of the heat back into the furnace.

Firemaster is made in a variety of grades, vitrifying as low as 1000° F., or as high as 3000° F., for all types of furnaces, burning any type of fuel. Its use requires no shutdown other than the time taken to apply the coating. The furnace is fired immediately after application, and operated at once at normal temperatures.

Marine Radar Protects Great Lakes Shipping

Westinghouse marine radar, in regular passenger service on Chesapeake Bay since early March, now is providing protection for essential freight shipments on the Great Lakes. The new installation—one of six to be made by leading manufacturers on as many lakes' fleets for comparative performance studies during the current shipping season—is on the William G. Mather, flagship of the fleet of the 96-year-old Cleveland-Cliffs Iron Company, plying to ports along the 1000 miles between Buffalo and Duluth.

Tests are being conducted by the Lakes Carriers Association with the cooperation of the U. S. Coast Guard and a committee representing the various manufacturers. Out of the season-long study will come recommended standards for future lakes radar equipment, according to C. M. Jansky, Jr., member of the firm of radio engineering and consultants which is in charge of the test for the Association.

Captain C. O. Rydholm, marine superintendent of Cleveland Cliffs, explained that the narrow channels which connect the several lakes constitute some of the busiest waterways in the world and poses a particular problem of close-in navigation. In addition, radar's long-range information should be most helpful in expediting ship movement under the rapidly changing weather conditions encountered on the lakes.

The installation is of the plan position indicator type and thus provides a continuous picture of ship traffic and shoreline conditions throughout a range of from 100 yards to 32 inches of the vessel at all times. Operating frequency of the unit is in the 9320-9430 megacycle band.

Maritime Commission Purchases RCA Radar

Purchase by the United States Maritime Commission of the first commercial three-centimeter radar units for installation aboard ships slated for service in international trade is announced by Charles J. Pannill, president of the Radiomarine Corporation of America.

The installations will be made on three ships nearing completion for the Maritime Commission at the yards of the Newport News Ship Building & Dry Dock Co., Newport News, Va. The vessels are the Heredia, Parismina and Metapan.

In addition to the three-centimeter wave band which provides a narrow beam resulting in a higher resolution in range and bearing, the RCA radar units are equipped with a 12-inch viewing scope designed especially for commercial shipboard use. The equipment has a range of from 100 yards to 50 miles, in darkness or any kind of weather.

A Miniature Hydraulic Control

An almost miniature hydraulic remote control, the smallest of its type and weight yet offered to the marine market, has been developed by Sperry Products, Inc., Hoboken, N. J., long the manufacturers of larger units in

this same field. Numerous applications are possible, but those most frequent are throttle, mixture, governor, and all sorts of position indicator controls.

This new Sperry product retains all the advantages of the previous larger units in that only a single flexible copper tube is used, the system is completely enclosed, and the installation is easily accomplished with but three small bolts for each of the two pieces which make up the complete unit.

Transmitter and receiver are made of bronze and together weigh only 3.7 pounds. Any motion of the transmitter arm will be duplicated by the receiver arm. Either arm will move through an arc of 60 degrees, and the receiver arm may be drilled at any location to obtain the desired linear travel of that actuating rod.

The complete system is dust-proof and water-proof. Transmitter and receiver may be joined by as much as 35 feet of connecting tubing without experiencing any difficulty, and lengths even longer than that may be used where conditions of temperature and load will warrant it.

Fonda carbide set.

Fonda Carbide Set Devised to Eliminate Gage Block Wear

Fonda tungsten-carbide gage blocks are reported to be the first complete set of gage blocks meeting the Bureau of Standards requirements manufactured from tungsten-carbide and offered for general use. They are manufactured in sets of 35 pieces ranging in size from .1001" to 4.000".

These blocks are said to have a wear resistance at least 100 times greater than that of steel gage blocks, or 98 times greater than chrome-plated. Fonda engineers predict that the users of the company's carbide sets will have no occasion whatever to replace a carbide gage block.

Moreover, due to the Fonda Ultra-Finish, .2 to .4 micro-inch r.m.s, the wringing qualities of Fonda carbide gage blocks are said to be far superior to those of either steel or chrome gage blocks, and carbide blocks are corrosion-proof against moisture or fingermarks.

WESTINGHOUSE GEARED-TURBINE MARINE PROPULSION is the title of the latest booklet put out of Westinghouse Electric Corp.'s Steam Division, Philadelphia. After covering the historical background of the first practical steam turbine, the booklet covers the marine geared-turbine unit, turbine construction, auxiliaries, gearing, and the lubrication and governing and said unit. This booklet is beautifully illustrated with diagrams, charts, and pictures.

Jack Knife Gravity Conveyor

To meet the needs for a complete light duty gravity assembled unit, which can be instantly rolled to any

Jack Knife gravity conveyor.

job and adjusted to any desired height from floor area, the Island Equipment Corp. of New York City, have placed on the market what they claim as "the Island jack knife gravity conveyor."

It is a handy piece of equipment; it is light, portable, almost instantaneously adjustable and has about everything that can be desired in a light duty roller gravity conveyor. The legs, as can be noted from the illustrations can, like a jack knife, be raised or lowered from 6 inches to 52 inches in height by the mere loosening of two wing bolts. In fact, if desired, one end can be made lower than the other, giving greater or less

Jack Knife gravity conveyor.

pitch to the table top. This is often found very convenient and this feature also permits the entire unit to be stored away in the minimum of space.

Bob-Cat Model Electric Hoist

The new Bob-Cat model of electric hoists has been recently introduced by the Lisbon Hoist & Crane Co., Lisbon, Ohio, the successors to The Wright File Co.

The unique engineering employed in the internal mechanism of this hoist makes possible the light weight and small size of the hoist, which makes it most convenient for erecting and removing where desired. The hoist is made in three sections, permitting complete and easy access to any part by the removal of four bolts. Made of steel forgings and castings, plus the cable, the hoist's motor is entirely enclosed in a drum, with proper heat dissipation construction. The unit is entirely ball bearing and the gears are all heat treated alloy steel.

ELECTRIC CONTROL DEVICES: Ward Leonard Electric Co., Mount Vernon, N. Y., has recently issued an eight-page bulletin, No. 100,000, on the company's line of electric control devices. The bulletin contains descriptive information and illustrations on a.c. and d.c. motor starters, speed and voltage regulators, resistors, ring and plate rheostats, switches, magnetic contactor, and relays and dimmers.

COCHRANE ATOMIZING DEAERATORS is the title of publication 1160, recently published by the Cochrane Corporation of Philadelphia, explaining the technical details and application of this new process of removal of dissolved oxygen, particularly from boiler feedwater, by atomization.

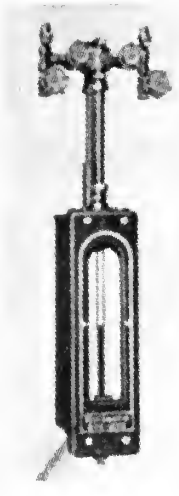
Navy Special Cargo Handling Hook

A new special safety cargo hook designed for the U. S. Navy for transferring supplies and ammunition at sea underway, is reported to be applicable to many difficult hoist and loading problems. This hook designed by the American Chain Ladder Company, of New York, was developed especially to handle simultaneously three cargo nets with a total load of 3500 pounds.

Since in loads of this kind it is necessary for the hook to carry twelve parts of 3¾" Manila in the grab, the American Chain Ladder Company's U. S. Navy special hook is made with a grab opening of $3\frac{7}{16}$", while the diameter of the bail opening is $4\frac{1}{16}$".

In constructing this new hook the company made ample provision for overloads. Tests show that the new hook will tolerate loads exceeding 25,000 pounds. Stemming from ACLC's original safety hoist hook, the Navy's new hook features the exclusive patented self-mousing action which prevents hook straightening and load slippage.

Recently the American Chain Ladder Company added to their ACLC safety hoist hook line new shank and shackle models. The new shackle (or clevis) hoist hook includes its own shackle, making an initial shackle unnecessary in threading the thimble.



Eye-Hye remote reading liquid level indicator by Reliance Gauge Column Co.

The Eye-Hye Level Indicator

The Reliance Gauge Column Company, Cleveland, announces a newly styled, newly engineered model of the EYE-HYE remote reading liquid level indicator which they have marketed for 10 years. Besides giving the device a new, modern face plate, the construction has been altered to achieve greater compactness and certain structural advantages. Use of a plastic diffusing screen improves the distribution of the interior illumination. The case has been made drip-proof and the arrangement of the interior more accessible for cleaning and renewing of illuminating lamp. The new EYE-HYE Model E-32 is the first of several which will replace the original series. It is described in Bulletin 452.

WESTINGHOUSE ANNOUNCES A NEW 20-PAGE DATA BOOK, B-3534, for the marine industry to facilitate the selection, ordering and application of stern tube bearings, pintle bushings and other Marine Micarta products. It also contains a discussion of the characteristics of this heavy-duty, thermosetting plastic.

L. M. RAKESTRAW

Foster Wheeler Promotions

The Foster Wheeler Corporation of New York, announces that L. M. Rakestraw has become manager of the Marine Davision following the retirement of J. J. Nelis, vice president.

Mr. Rakestraw, formerly assistant manager of the Marine Division, has been with Foster Wheeler for almost 20 years and has had long and valuable experience in the operating, engineering and sales fields which gives him an unusually strong background from which to direct his new duties and responsibilities.

R. W. Haase is office manager of the Marine Division, and Frank Andres is manager of the Service Department of the Marine Division, succeeding George Tidd, who has been promoted to the Research Department.

S. F. Sales Office of M. C. Moved

The San Francisco Office of the U. S. Maritime Commission's Sales Branch has been moved to 65 Sutter Street.

This office handles the sale of surplus materials which are declared to the Maritime Commission for disposal on both a bid and fixed price basis.

The materials offered are of a varied nature, consisting of metals, tools, general hardware and marine hardware, plumbing and pipe fittings, marine engines—both diesel and gas, winches, electrical supplies and scores of other items.

Fleming Named New Pacific Coast Director of Maritime Commission

Lloyd C. Fleming, widely known in West Coast shipping, is the new Pacific Coast Director of the United States Maritime Commission. He succeeds W. Creighton Peet, Jr., who resigned after serving with the Commission since its inauguration.

Fleming, who has held the post of Chief Administrative Officer for the Commission until his latest promotion as head of the Commission's West Coast maritime operations, has been identified with Government shipping since 1921 with headquarters in San Francisco.

One of the best known and popular steamship men in this region, announcement of Fleming's appointment was received with approval by Pacific Coast shipping leaders. Fleming brings to his new position a long and varied experience and is well equipped to handle problems of the industry. Steamship executives said Fleming's knowledge of Pacific shipping is of particular importance during this period of transition from Government to private operations of the steamship business, as well as re-allocation and reconversion of tonnage.

B. J. BAHORICH, port engineer for Pacific Far East Lines in San Francisco.

LLOYD C. FLEMING

Phelps Dodge Pacific Coast Changes

Homer L. Hussey, who was formerly manager of the Seattle sales office of Phelps Dodge Copper Products Corporation, has recently been placed in charge of their San Francisco office handling sales of the complete line of both tubing and electrical wire and cable made by the various divisions of Phelps Dodge. Hussey is replacing D. L. Geisett, following the latter's resignation. He graduated from the University of Minnesota in 1928, and was formerly with the Puget Sound Power & Light Co., in Seattle, for ten years prior to joining Phelps

Harry W. Finnell Jr., who was formerly production manager of the Los Angeles Tube Division of the Phelps Dodge Copper Products Corporation, has recently been transferred to their San Francisco sales office. Finnell was a member of the Class of 1939 at the University of Virginia. Since being employed by Phelps Dodge in 1939, he has had considerable experience in several of the Divisions of the Company, namely, the Tube Mill at Bayway, New Jersey, Habirshaw Cable and Wire Division in Yonkers, New York, the Inca Magnet Wire Plant at Fort Wayne, Indiana, and the Cleveland, Ohio, sales office.

Shoreside Personalities

TERRY-ALVANEY AND ASSOCIATES, industrial designers, have been appointed San Diego representatives for Karl French, naval architect and marine engineer of San Pedro. This appointment is to bring about better service to the maritime industries of San Diego. They are located at 4818 El Cajon Blvd., San Diego.

CARGOCAIRE ENGINEERING CORP., along with Carswell Marine Associates, a division of Cargocaire, announce the opening of an office in Washington, D. C., at 726 Jackson Place, N. W. under the direction of James W. Speer. Carswell Marine Associates represent American Ventilating Hose Co., Colby Steel and Engineering Co., Derbyshire Machine and Tool Co., Gifford-Wood Co., Lake Shore Engineering Co., The Landley Co., Products Research Co., and Ulster Foundry Co.

HUGH MIDDLETON, second vice president of the Port of Los Angeles-Long Beach Propeller Club, was tendered a farewell luncheon on October 25 at the Jonathan Club by the Los Angeles Steamship Association and the Waterfront Employers Association. He has been transferred to San Francisco as Pacific Coast manager for The De La Rama Steamship Co., with whom he was asscociated in Southern California.

JOHN H. MARSH is now available for consultation on marine refrigeration and air conditioning at the firm of George E. Swett & Co., Engineers, according to George E. Swett, manager. Marsh has specialized for 24 years in designing and the installation of refrigeration and air conditioning equipment, both for the industrial and marine applications.

CAPTAIN GUSTAF A. JOHNSON, master of the Standard of California's tanker W. H. Berg, has been cited by the War Shipping Administration for meritorious conduct for saving his vessel after it was torpedoed during the war.

He was master of the W. S. Rheem when the vessel was attacked by a submarine in the South Pacific. Dodging two, a third torpedo hit, leaving a gaping hole in the bow. Captain Johnson shifted his gasoline cargo to an after-tank and effected temporary repairs. He reached his destination and delivered his precious cargo, the citation revealed.

ASSISTANT SECRETARY OF STANDARD OIL: *Harold L. Severance* was recently elected as an assistant secretary of the Standard Oil Company of California. After graduating from Stanford University in 1932 he went to work for Standard in the Richmond refinery. Subsequently he served on the accounting staff of the Manufacturing Department. He was attached to the secretary's office in 1940.

JOINS PACIFIC FAR EAST SS CO.: *Ray J. Pries,* in charge of Operations for the U.S. Maritime Commission in San Francisco, resigned in September, to become associated with the newly-formed Pacific Far East Steamship Company.

NEW PRESIDENT OF INTER-CONTINENTAL ENGINEERING: *Captain T. C. McDowell, USN retired,* well known both in Bay Area naval and merchant marine circles, is now president of the Inter-Continental Engineering Company with headquarters in San Francisco in the Rialto Building. During the war, Captain McDowell was head of the Arma Company of New York, a concern that turned out much specialized machinery for the Government.

Chemical Cleaning Speeds Cargo Ship Repairs

By CARL MORABITO, General Manager,
Martin Ship Service Company, Wilmington, California

Carl Morabito, general manager, Martin Ship Service Company, Wilmington, California.

ALTHOUGH WORLD WAR II IS RAPIDLY MOVING BACKWARD into history, the problems of maritime maintenance are as urgent and important today as they were when men, guns, war supplies traveled at top speed. While mainly devoted to the pursuits of peace, these problems are divided into two enormous fields (1) the great government program of deactivation and repair and (2) maintenance and reconversion of vitally needed passenger and cargo vessels. Warships are being put away to allow the resumption of traffic in food, clothing, and supplies for war-spoiled areas without delay. Vital raw materials must be shipped and received to meet the demands of expanded industry and product-hungry markets everywhere.

Martin Ship Service Company, Wilmington, California, is both interested and active in the various phases of today's maritime problems. It is their job to clean and recondition vessels of all types between voyages and during periodic lay-ups when engines, boilers, deep tanks, hulls, and holds are completely serviced to remove all forms of obdurate dirt, rust, cargo residues, water-scale, sludge, and other unwelcome parasites of industry.

Maritime cleaning work, especially on cargo vessels, must be accomplished immediately. Time is short—the usual between voyages lay-over varies from one to several days. This work must be done completely, thoroughly, safely for the shipyard worker, and *it must be done on time*. Many years of experience on the waterfront have given this firm full opportunity to discover and choose the best methods of supplying shipowners with satisfac-

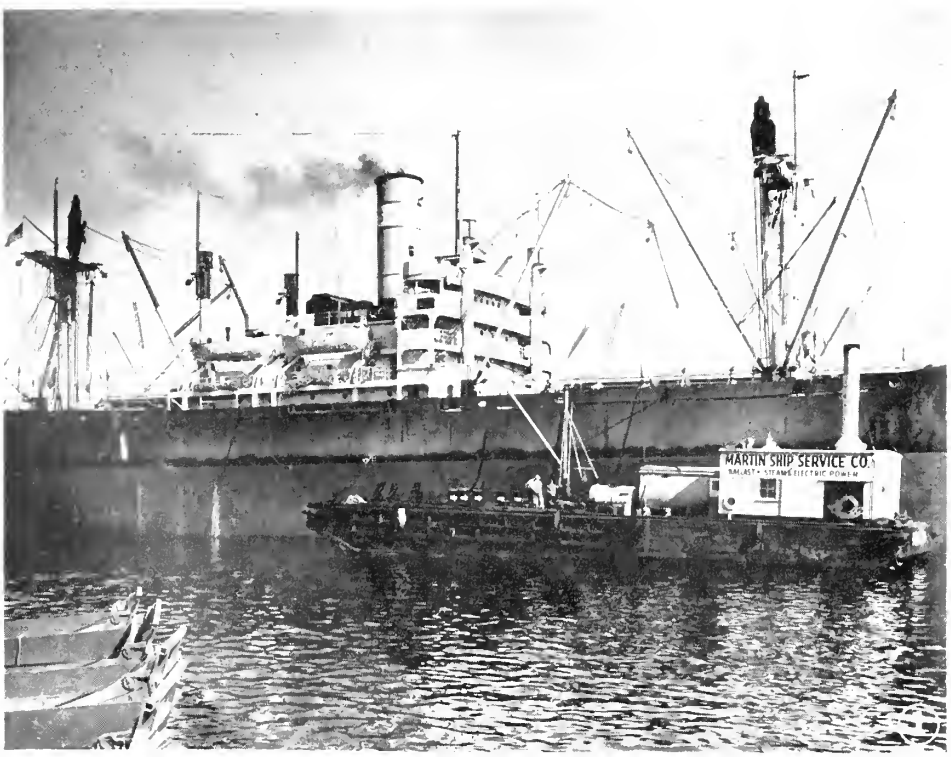


Fig. 1. A cargo ship loaded with copra. En route home fire broke out and process of extinguishing fire rotted the copra and made ship useless for perishable goods. Martin Ship Service inspected the ship and sent in one of its fleet of barges and went to work.

Fig. 2. Hot solution of Turco Steamfas.
Fig. 3. All holds were washed down with hot Steamfas solution and followed by a clear water rinse
Fig. 4. Another type cleaning aboard a cargo ship. This shows one of the tanks in untouched badly rusted condition.

tory reconditioning work. It is Martin's firm conviction that the only way to meet deadline demands is through intelligent use of scientifically formulated, well-balanced, tested, sure-acting chemical compounds. Manual methods —scraping, chipping, wiping—formerly utilized in ship cleaning are out of the question today. They are too slow, too dangerous, and in many instances incapable of producing a satisfactory result. Use of the proper chemical compounds, on the other hand, not only insures a completely finished job, on time schedules, and a reduction in accident percentages, but is a factor in the reduction of overhead costs both in materials outlay and man-hours consumed during the particular operation.

Unusual assignments are not new to Martin Ship Service. There is hardly a working day when some out-of-the-ordinary problem does not come up. The accompanying pictures show how two of these jobs were handled recently in record time through the application of scientific methods and Martin ingenuity.

Figure 1 shows a cargo ship home from the South Pacific with a load of copra. En route a fire was believed to have started in the holds whereupon water and steam were injected. Soon afterward the copra began to rot and ferment, giving rise to an almost intolerable stench. The ship was desperately needed to carry a cargo of flour, but the copra residues and fermentation gases had rendered her almost useless for further transportation of sentitive, perishable goods. Martin Ship Service looked the holds

(Please turn to page 126)

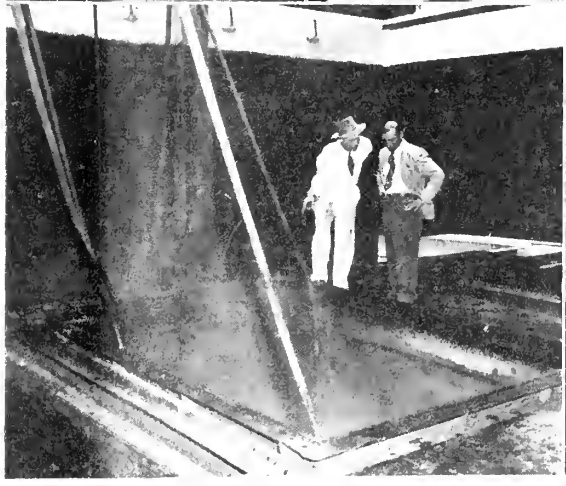


Fig. 5. Washing the rusty deep tanks down with clear water followed by a strong solution (shown in Fig. 6 and Fig. 7) of hot Turco Steamfas to remove the rust, cargo refuse and obdurate base coatings of paint. The whole surface is rinsed off thoroughly with a stream of clear water.

At right: Joe Celentano, general superintendent, Martin Ship Service Company, and F. W. Nicholaysen, field service engineer of Turco Products, Inc., inspect a cargo ship-cleaning operation at Martin's Wilmington yard.

Chemical Cleaning

(Continued from page 125)

over, then sent in one of its fleet of five service barges loaded with men and cleaning compounds.

On the barge (Figure 2) a hot solution of Turco Steamfas, an extra heavy alkaline cleaning compound, was first dissolved in the tank shown, diluted to proper consistency in a large tank and pumped aboard ship.

Aboard ship (Figure 3) all holds were thoroughly washed down with the hot Steamfas solution (170° Fahrenheit) and followed by a clear water rinse. The whole job was completed in one and one-half days' working time, the ship being completely cleaned, degassed, and ready for her cargo of flour.

A second example of an unusual Martin cleaning operation is shown in Figure 4. This cargo ship had been carrying dry cargo. After the dry materials had been unloaded, the deep tanks were filled with water ballast. Later the water was drained off and the deep tanks left to the forces of corrosion and dirt. The illustration shows one of the tanks in untouched, badly rusred condition.

Using practically the same procedure as in the copra cleaning job, Martin workers first washed the rusty deep tanks down with clear water to remove loose, flaky rust and grime deposits (Figure 5). Then they applied a strong solution of hot Turco Steamfas (Figures 5 and 7) to remove the more obdurate base coatings of paint, rust, and cargo refuse. The hole surface was rinsed off thoroughly with a stream of clear water.

As soon as the water rinse had been completed, the deep tanks were given an all-over spray application of Turco Paintite, a powerful corrosion inhibiting, surface passivating material, to remove final traces of rust from the pitted metal and protect it from further corrosive action permitting the ship to sail away for its next cargo just three days after she had docked for repairs.

Numbered and Undocumented Vessels

The table below gives the cumulative total of numbered but undocumented vessels in each Coast Guard district on the Pacific Coast by customs ports to June, 1946. Generally speaking, undocumented vessels are those of less than 5 net tons engaged in trade and those of less than 16 gross tons used exclusively as pleasure vessels. These vessels are required to be numbered under the provisions of the Act of June 7, 1918, as amended (46 U. S. C. 288).

Coast Guard District		*Customs Port*	*Total*
11 (Long Beach)	(27)	Los Angeles	6,335
	(25)	San Diego	1,297
	(26)	Nogales	51
			7,683
12 (San Francisco)	(28)	San Francisco	18,481
	(47)	Denver	.....
			18,481
13 (Seattle)	(30)	Seattle	28,635
	(29)	Portland, Oregon	9,197
	(33)	Great Falls	920
	(46)	Omaha (part)	2
			38,754
14 (Honolulu)	(32)	Honolulu	2,112
			2,112
17 (Ketchikan)	(31)	Juneau	6,034
			6,034
Grand total for the U. S.			411,310

Sacramento Deep Water Channel

(Continued from page 54)

location—and two miles of automobile road will have to budge over."

Up in the Planning Branch, A. C. Showman of the Engineering Division had this to say: "Briefly, the salinity problem results from the intrusion of salt water into tidal channels, such as we have in the Delta area. When we build something like this ship channel we, in theory at least, move the ocean a little farther inland by increasing the channel volume lying below high tide level.

"This at once becomes the concern of established municipalities, industries, and agricultural interests if there is any chance that the salt content of their present water supply is apt to be increased. For irrigation purposes, as an example, salinity of 100 parts of chlorine to each 100,000 parts of water is the maximum for a usable supply. Even now, without any ship channel, the water supply is too salty in dry years. Therefore salinity encroachment counter measures must be available to be used if necessary with any such development as the proposed ship channel.

"One way to hold back the salt water is to increase the flow of fresh water into the tidal channels. Shasta Dam is just beginning to improve river flows, and additional tributary reservoirs, some of them already authorized for construction under flood control acts—such as Folsom, Black Butte and Iron Canyon—will further help.

"However, if additional preventive measures are required, a number of possible courses are available, the one favored by the Engineers being the reduction of the tidal prism to compensate for the increase caused by excavation of the ship channel.

"When the tide is coming in, salt water enters the Delta in direct proportion to the volume of space, in channels and other low areas, which lie below high tide level. If you increase this space, such as would be the case in digging a ship channel, the volume of salt water inflow theoretically would increase. One way to arrest this movement then is to force a similar volume of water off land that is already under water. That can be done in this case, and we propose to reclaim if necessary certain land that is now under water by means of suitable levees, dykes, and pumping arrangements. Thus the effect of the proposed channel is compensated for, as no more water will move inland than did before construction. The tidal prism remains unchanged."

One other solution suggests itself, and that would be a lock structure at the lower end of the ship channel to act as a mechanical barrier against tidal inflows. Engineer studies look on this as a last resort, since it would be relatively expensive, and certainly no aid to navigation. Further, the method that takes land out from under high tide has the added advantage of eventually creating useful land. It is apparent at any event, that the salinity problem has not been overlooked, and it does appear that practical and economic solutions do exist for whatever may develop.

Finally, under the heading of local interests, comes the proposals for "adequate terminal facilities." These are expected to include a wharf, transit sheds, storage warehouses with platform space, together with appurtenant paving, railroad trackage, water supply, sewerage, and fire protection equipment.

Costs were expected to hit close to $14,000,000 when the report was written, with the government taking about $10,750,000 of it. These will have to be revised to meet conditions at the time construction is contemplated. The feeling is they will certainly go up, but since the major item is dredging, in quantities that appeal to contractors with especially heavy equipment, it is not expected that the increase will be proportionate to construction generally.

This, then, is the status and a summary of the thinking on the ground as of now with respect to the Sacramento Deep Water Ship Channel.

Bactericidal Efficiency of Low Pressure Double Distilling Plants

(Continued from page 94)

sure bleeder steam under full power and ¾ power. The temperature in the first effect shell was varied from 175 F. to 110° F. The extremely low temperatures are abnormal for this plant, but they may be encountered in other plants. A total of 29 runs, each of about one hour's duration, were made with the plant in this condition.

In some of the runs the plant was operating purposely with high brine levels so that the salinity of the distillate would be higher than the usual limit of 0.25 grain per gallon, but salinities higher than 0.50 grain per gallon could not be obtained.

In all 29 runs, sufficient sewage was introduced into the feed water to produce an average most probable number of coliform bacteria of 605,000 per 100 ml. and an average bacterial content of 41,000 per ml., as determined by the plate count at 37° C. Coliform bacteria are an index of sewage pollution and 37° C. bacteria are an index of general contamination. In all 54 samples of distillate collected during the above tests, no coliforms were found, and the bacterial counts on agar plates were 0 except for 16 samples. Of these, 12 samples had counts of 1 per ml., 2 counts of 2, 1 a count of 3, and 1 a count of 6.

In all runs regardless of temperature there was a gradual decrease in the number of bacteria in the various stages of the process. That is, the most porabable number of coliforms and the total bacteria as determined by the plate count were lower in the feed water after preheating than before, lower in the brine than in the feed water entering the first effect shell and then zero in the distillate. This was most noticeable in the higher temperature runs, especially at 140° F. or above, in the first effect shell. This is illustrated by the tabulation of part of the results of runs wherein the first effect shell temperature was approximately 140° F. shown in Table 1.

The chlorides in the harbor water, which was used for circulating water, varied from about 16,000 to 18,000 parts per million (ppm). The chlorides in the feed water were 14,000 to 18,000 ppm, which was less than in the harbor water because a considerable amount of fresh water was added with the sewage. The chlorides in the sawage were only 20 to 30 ppm. The salinity of the feed water was about 60 per cent of that of normal sea water. The chlorides in the brine varied from about 20,000 to 29,000 ppm, which is 0.72 and 1.05, respectively, times the amount of chlorides in normal sea water. The salinity of the brine as determined by the salinometer pot method varied from 5/8 to 1¼ 32nds, which is less than normal. It is usual practice to operate the plant so that the salnity of the brine is 1½ times that of normal sea water.

The distillate contained from 0.2 to 2.0 ppm ammonia, while the feed water contained from 0.1 to 0.2 ppm, and the brine contained only a trace. This indicates that practically all amounts present in the feed water is vaporized and then distilled with the distillate. Because practically no ammonia was present in the brine, the distillate contained a higher percentage than did the feed water.

The amount of oxygen consumed is a partial measure of the organic matter present in the sample of water. The oxygen consumed by the feed water was from 30 to 40 ppm, while it was from 0.5 to 1.5 ppm for the distillate. This indicates that the process was effective in reducing the organic matter in the water.

The hydrogen ion concentration (pH) is an expression of the intensity factor of acid or alkaline properties as opposed to the quantity factors "acidity" and "alkalinity." A solution having a pH of 7.0 is neutral. A pH value greater than 7.0 denotes alkalinity, while a value less than 7.0 denotes acidity. Hence pure distilled water has a pH of 7.0. When the plant was being operated properly, the pH of the distillate was from 6.9 to 7.1. Thus the distillate was practically neutral, as it should have been. The pH of the feed water was from 8.0 to 8.5.

(To be continued January)

TABLE 1

Bacterial Content

	Coliforms Most Probable Number (M.P.N.) Per 100 ml.				Plate Count per ml. at 37° C.			
Sample No.	*Feed Before Heating*	*Feed After Heating*	*Brine*	*Distillate*	*Feed Before Heating*	*Feed After Heating*	*Brine*	*Distillate*
179-182	430,000	1,500	91	1.1*	6,700	170	6	0
183-194	91,000	4,600	36*	1.1*	4,000	240	9	0
219-222	2,400,000	21,000	430	1.1*	25,000	260	110	1
223-234	230,000	24,000	430	1.1*	24,500	1,750	675	0
259-264	390,000	2,300	360*	1.1*	15,500	475	150	0
265-274	230,000	110,000†	910	1.1*	23,500	3,200	200	1

*Indicates less than †Indicates more than.

It should be pointed out that the designation "less than" does not, necessarily, mean that coliforms were present in the distillate. It does mean that none of the samples examined disclosed coliforms. If a larger portion of the sample had been used, coliform may or may not have been found to be present, but in any case the most probable number would have been smaller than that indicated. The designation "more than" means that all of the tubes planted were positive, and consequently the most probable number is indeterminate and is larger than that indicated.

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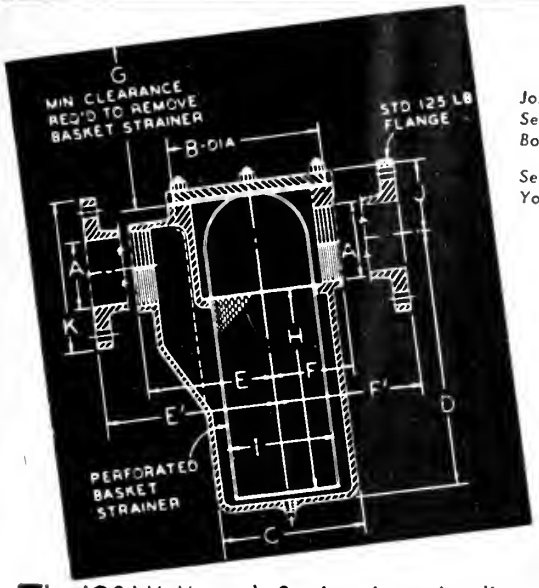

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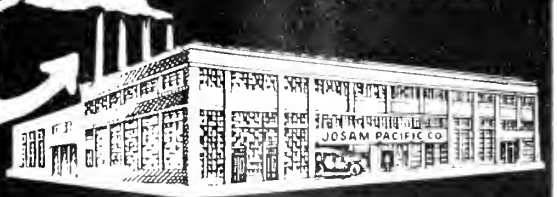

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Admiralty Decisions

(Continued from page 92)

policy covering protection and indemnity risks on a motorboat on which the plaintiff's intestate was a passenger for hire at the time of an accident which occurred on Lake Owasco, New York, and resulted in decedent's death from drowning. The plaintiff, as administrator, recovered a judgment against Sandy and LaGrou in the sum of $7,735.70, and upon being unable to satisfy it, brought this action against the insurance company, which the defendant resisted on the ground that the assured, who owned the motorboat, were guilty of breaches of the following express warranties contained in the policy:

> "Warranted all vessels be equipped with searchlights."
> "Warranted in charge of a competent operator at all times when operated."
> "Warranted that the assured has complied with all Federal Regulations pertaining to the carrying of passengers for hire."

The trial judge submitted to the jury the following two questions as to which it was to render a special verdict:

(1) Do you find from the evidence that the operator of this boat was competent?

(2) Did the fact that the motorboat was not equipped with a searchlight or spotlight at the time of the accident in any way conribute to the accident?

The jury answered the first question in the affirmative and the second in the negative. Thereupon the defendant's counsel moved to set aside the verdict and for a direction of a general verdict in its favor. The court set aside the special verdict in answer to the second question because the motor boat, in violation of the covenant of warranty, was allowed to proceed without a searchlight on the trip during which the accident occurred, and directed a general verdict for the defendant, on which judgment for the latter was entered. The Circuit Court said that the judgment was proper and should be affirmed.

The motorboat You're Right started on her last voyage without the searchlight, which had been on board on the prior trip. This was because it had been knocked loose and was thereafter disconnected by the pilot and given to one of the owners who placed it in a buiiding on shore. To proceed on the trip without a searchlight, the court said, was a breach of warranty and in itself discharged the Aetna Insurance Company from liability *irrespective of whether any causal relation existed between the absence of the light and the happening of the particular accident.* The court also said that it was no excuse for neglecting to comply with the condition under which liability upon the policy would arise that the owners of the motorboat had originally equipped the vessel with a searchlight; and to comply with the condition they should have had the searchlight on board and available at the time when they undertook the night trip on which the accident occurred. It was decided that, under the circumstances, it would make no difference whether the failure to comply with the warranty contributed to the accident or not. *Compliance with the warranty was a condition precedent to liability and afforded a complete defense irrespective of any question of causation.*

The provisions of Section 150, Subdivision 2, of the New York Insurance Law that: "No breach of warranty shall avoid an insurance contract or defeat recovery thereunder unless such breach materially increased the risk of loss, damage or injury within the coverage of the contract," in no way affected the liability of the appellant. The policy upon which this action was brought was a marine policy and for that reason was excepted from the provision of Section 150, Subdivision 2, by Subsection 3, which reads as follows:

> "3. Nothing contained in this section shall affect the express or implied warranties under a contract of marine insurance in respect to, appertaining to or in connection with any and all risks or perils of navigation, transit, or transportation, including war risks, on, over or under any seas or inland waters, nor shall it affect any provision in an insurance contract requiring notice, proof or other conduct of the insured after the occurrence of the loss, damage or injury."

The court was of the opinion that inasmuch as the warranty that the vessel was equipped with a searchlight was a condition of liability under the marine policy, the action must fail. But there would be no liability on the part of the insurance company under Subdivision 2 of Section 150 even if the policy had not been marine; for, while the obstruction in Lake Owasco, which caused the sinking of the motorboat and the drowning, was under water and hence would not have been seen by a searchlight, yet even though the absence of a searchlight might not have contributed to the particular accident there can be no doubt that a searchlight would have been a safeguard against running aground and an aid to the navigator of the vessel in ascertaining his bearings, and its absence materially increased the risks of the insurer.

Open Policy

The courts have had before them on many occasions the question of whether or not a particular shipment of goods comes within the terms of a policy of marine insurance. It can almost be said that each case rests upon its own facts and very few rules of law are available for a ready solution of such claims. However, through the years certain rules have been formulated in this connection which are graphically illustrated in the case of *Forster vs. Insurance Company of North America,* United States Circuit Court of Appeals, Second Circuit, 1944 A.M.C. 131. This is an appeal from a judgment of the District Court in favor of defendant Insurance Company of North America in an action to recover for money had and received.

The policy read: "On merchandise consisting principally of Fur Cuttings," which was almost immediately followed by the phrase: "To cover all shipments made by E. Forster doing business as Parker Fur Co." Being an "open policy," concededly the insured was obliged to advise the insurer of any shipment, as he did in every case.

The argument is that because the merchandise insured was to consist "principally of Fur Cuttings," such "declarations" as were for goods not consisting "principally of Fur Cuttings" were never insured, although the insurer accepted the "declaration" and kept the premium.

As stated by the court, there are two sufficient answers to this. Like every other policy, the language would be interpreted most favorably to the insured; and there cannot be much doubt that, merely as language, it would

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Admiralty Decisions

(Continued from page 130)

cover " all shipments made" by the insured. Be that as it may, when the insured delivered a "declaration," which stated the character of the goods, and the insurer accepted it and kept the premium, there could be no doubt that the parties meant that shipment to be covered, whether it conformed to the policy or not. The meaning of such a transaction is obvious; the insured expected coverage and paid for it, and if the insurer did not assent, the plainest dictates of common honesty required him to say so. If the goods did not fall within the description in the policy, a new contract was made. Indeed, a new contract was always made in any event, for the policy did not cover a shipment before it was "declared." No question can arise as to the authority of the insurer's agent to vary the terms of the policy; the retention of the premium was a ratification in each case.

The "declaration" preceded actual shipment of the goods in most cases, but those are no different in which the "declaration" followed shipment. The policy covered, "vessel lost or not lost," and the risk attached retroactively; the insurer would have been liable, had the goods been lost before the "declaration" was made. *Insurance Company. vs. Folsom.* 85 U. S. 237, 251; *James Pendergast vs. Globe & Rutgers Fire Ins. Co. of the City of New York.* 246 N. Y. 396.

London Letter

(Continued from page 92)

type of expert associated with the construction, maintenance and navigation of vessels is available for the essential work which is undertaken by the Register.

When a new ship is projected and built "under survery," plans must be submitted to, and approved by, surveyors employed by the Register. This is not a stereotyped or perfunctory measure. Elaborate rules have been laid down and these have been modified through years of experience. In the complexity of modern life, many ships may be designed to carry unusual cargoes, and here the experience and expert advice of the surveyor is of inestimable use in ensuring their safety.

When a vessel is ready for sea, the final survey is made and it is submitted to the appropriate Committee of classification. If it reaches in all respects the high standard demanded by the surveyors and the Committee, it receives the highest distinction—"100 A.1." This is a survival (although it has now a different meaning) of the old system under which a ship and its equipment were classified by letters and number respectively—A.1 being the highest possible class.

After this final survey, the ship is ready for inclusion in the Register Book, the unique volume which contains the names of practically every vessel in the world over 100 tons burden. It has been called, a little irreverently, the "Underwriters' Bible," and no marine underwriter could transact his business without its assistance. Subscribers in London have their copies brought to-to-date weekly, and a staff of posters are continually engaged in making additions and corrections with hand stamps. This system has been in use since 1775, and the Register Book is believed to be the only book in the world which is corrected in this way. Subscribers away from London periodically receive a printed supplement containing this information.

But the work of the Register does not end with the launching of a vessel. If she has met with no accident in the meantime she will be "free from survey" for four years when she will undergo her first periodical survey. (Boilers, if of certain type, must be examined annually.) Full reports are made as to her condition, and state of repair, and then the question arises as to whether her classification shall be continued. The great tragedy in the life of a ship occurs when her classification is removed and a red or black line appears in her place in the Register Book.

"It will be seen, then," states Sir Eustace Pulbrook, in conclusion, "how vital is the work of Lloyd's and of Lloyd's Register in the overseas trade of the nation. Without insurance, ships could not put to sea, and without the Register the work of the marine underwriter would be impossible."

Sir Eustace Pulbrook's survey is illustrated, with some interesting pictures of Lloyd's "Then and Now," and there is also reproduced part of a page from the original log of H.M.S. Euryalus, which records Nelson's famous signal "England expects that every man will do his duty," in the possession of the Corporation of Lloyd's.

As a footnote to the foregoing, it is of interest to note that, in October of this year 1946, C. H. Leach, in the course of his presidential address to the Insurance Institute of London, held at the Institute's offices in London, asserted that insurance was one of the most highly practical and individualistic of industries. Like most of the trade of this country it had been built up by private enterprise, and by people who knew the risks they were taking and were willing to accept them. He was convinced that free private enterprise was vital to the needs of a prosperous world society. Industry could not run smoothly without a reasonable prospect of security, and unlike some other industries the insurance profession at least knew where they stood at home. They, with their world-wide operations, had a definite assurance that they were not to be nationalized. What use were they going to make of that assurance? They must take into account changes in the value of money internally, and what perhaps was more obscure in these days of controlled exchange, its value in relation to that of other countries.

It was well to bear in mind that £1,000 earned 50 years ago represented much more real value than a similar amount today. Moreover, generally speaking, their liabilities accrued after the receipt of their income; in the case of abnormal strains such as catastrophe risks, perhaps long afterwards, perhaps never. As a result, an age of rising prices must operate against them from a profit angle, and indeed in a period of a single account might turn a profit into a loss. Over a longer period it could play havoc with the ratio of actual resources to potential liability, which was the real test of sound development.

Reference in the foregoing to insurance being an "individualistic" industry serves to remind that the Gov-

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London Letter

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ernment has stated that it has no intention of nationalizing insurance—or shipping, either, for that matter. This is because both of these are of an international character. Spokesmen for the Socialist Government at present in power in Britain have paid the shipping and insurance industries the compliment of stating that they are well-conducted although they are private enterprises. These eulogistic references are regarded as highly significant, coming as they do from members of a Socialist Government with a strong majority and a bias toward nationalization. On the other hand, there is, of course, no promise that the Government may not eventually take full charge of either or both of these industries. It all depends to what extent it is able to get through its very long program of nationalizing all kinds of other industries. The success of its policy (*if* it succeeds) *may* whet its appetite and induce it to take over shipping and insurance, even at the risk of experimenting dangerously in such international fields. Time only will show.

Some Marine Diesel Installation Problems

(Continued from page 71)

800 pounds at 100 rpm. However, the thrust required to propel the tug at this higher speed amounts to 6200 pounds, and this figure subtracted from the total propeller thrust available leaves only 12,700 pounds at 300 rpm up to 19,600 pounds at 100 rpm. Again a square propeller has been used, and the diameter varies from 72 inches at 300 rpm to 145 inches at 100 rpm.

As in the case of towing at 5 mph, the beneficial effect of lower propeller speeds is quite obvious. However, a 12-foot diameter propeller is too large a wheel for the size of tug involved, especially since it is usual to allow for a 20 per cent of the diameter immersion of the propeller tips. This means that the tug would require 15 feet draft, which is entirely out of proportion.

At 5 mph the thrust available for the barge is practically 19,000 pounds at 300 rpm, which is very nearly the thrust available at 100 rpm at 10 mph. It must be remembered that in both cases there is 1000 engine horsepower available in the tug. The explanation of this situation is of course that at 10 mph only half the propeller thrust is available for the same horsepower because the speed is twice as great, assuming all other factors constant. Actually two other factors are important. One is the greatly increased thrust required to propel the tug at the higher speed, and the other factor is the difference in propeller efficiency.

From the standpoint of tow rope pull only, it is preferable to tow at 5 mph. If it is desired to tow at 10 mph, it is possible to obtain a propeller thrust available for towing of 19,000 pounds at 300 rpm of the propeller, provided the engine horsepower is increased sufficiently to give the additional power required to propel the tug. A 1350-hp engine at 300 rpm will give 25,000 pounds propeller thrust for propelling the tug at 10 mph and leave a full 1000 hp, or about 19,000 pounds propeller thrust available for the barge. Such tugs have been built and have shown the benefits of this additional horsepower where it was important to tow at relatively high speeds.

Obviously, if a barge is to be towed at 10 mph, it should be designed accordingly. Certainly nobody would expect to tow log rafts and coal barges at any such speeds. On the other hand, speed is not essential with such cargoes and thus such tows are made up in size and shape to tow at very moderate speeds.

The owner of the tug must make up his mind in every case what the best answer is for his particular conditions. The overhead, including the interest and maintenance of his tug, plus the wages, plus food, are constant and are chargeable against the total time. Cost of fuel is based upon horsepower developed and time, but the owner's income from towing is on a ton-mile basis with the important factor of value of cargo and scheduled speed of delivery at the terminal involved.

Looking over the two curve sheets, it is important to note that the slope of the curves is such that there is relatively less variation between the conditions at 300 and 250 rpm than there is between 150 and 100 rpm. The point is that there is nothing sacred about a speed of 300 rpm. In some cases it might be possible to use a propeller suitable for 250 rpm instead of 300 rpm and gain the measurable benefits due to this moderately lower speed without going to such lower speeds as 100 to 150 rpm.

Choice of Power Plant

In order to make some comparisons and develop pertinent points of discussion, take a series of naturally aspirated, six-cylinder, four-cycle engines all operating at 1000 feet per minute piston speed and with a normal rating of 80 pounds brake MEP.

Such an engine directly connecting to the 100-rpm propeller would have cylinders 18.7 inches diameter with a stroke of 60 inches and would weigh in the neighborhood of 350,000 pounds. An engine of these proportions is out of the question for the tug we are discussing. It has too long a stroke and too much weight. Thus from the engine standpoint as well as from the propeller diameter standpoint, we cannot accept 100 rpm speed.

An engine at 300 rpm would have cylinder diameters as before of 18.7 inches but with a 20-inch stroke, and the weight would be in the vicinity of 120,000 pounds. Such an installation is entirely feasible.

A 300-rpm engine connected to the propeller through a reduction gear so that the propeller would be turning at 100 rpm or even 150 rpm would be a very large and heavy combination.

Two six-cylinder engines of 500 horsepower each, with cylinder diameters of 13¼ inches by 17-inch stroke, running at 350 rpm and connected through a reduction gear to a single propeller, would weigh approximately 120,000 pounds, depending upon what propeller speed was chosen.

A better roposition would be two six-cylinder engines with 13¼-inch diameter by 15-inch stroke operating at

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Some Marine Diesel Installation Problems

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400 rpm and such engines and reduction gear would weigh in the vicinity of 100,000 pounds. This is a worthwhile reduction in weight over the direct connected engine at 300 rpm, and shows that there is a weight advantage in choosing multiple engines operating at higher rpm connected through a common reduction gear.

An electric drive might be used, but in order to take care of the double electrical loss of generators and motors we must provide 15 per cent more horsepower; thus we need two 575-hp engines. Sticking to our standard piston speed of 1000 feet per minute, we will take two eight-cylinder Buchi turbocharged engines with a rated brake MEP of 120 pounds per square inch. Such engines would have cylinders 10 inches in diameter by 12-inch stroke; run at 500 rpm; weigh about 27,000 pounds each; which with the weight of two 400-kw generators at 500 rpm plus a 1000-horsepower motor at 300 rpm totals approximately 120,000 pounds. Two higher speed motors connected through a common reduction gear to the propeller would lower this total weight appreciably.

Provided the engines are all operated at the same piston speed and comparable rating, it is difficult to obtain any marked advantage on the comparative basis of weight and space between a direct connected engine, a reduction gear engine installation, and an electrical drive combination. Each of these three types offers its best advantages according to circumstances surrounding the installation. Maneuverability, type of towing or variety of towing jobs are likely to be the deciding factors.

Engines of higher piston speed or higher brake MEP used in connection with reduction gears or electric drive show relative weight and space advantages over the direct drive jobs. However, many owners object to higher speed engines and prefer direct connected jobs with "heavy duty slow speed" engines.

The third chart shown compares the performance with constant torque and constant horsepower. The total propeller thrust and the propeller rpm are plotted against towing speed in miles per hour. The standard speed is taken as 10 mph and the chart shows that for the direct drive job the speed of revolutions drops as the towing speed decreases until at 5 mph, for instance, the propeller speed is only a little over 85 per cent of that obtained at full speed. This means that if this tug is towing at 5 mph, then the 1000-hp engine at 100 rpm and 10 mph becomes only an 850-hp engine at 5 mph. Thrust increases from about 26,000 pounds to about 29,000 pounds at 5 mph in spite of the reduction in horsepower. For these two curves drawn in solid lines, the torque is constant and of course the horsepower varies directly with the speed of revolution. Even so, the propeller thrust increases moderately as the towing speed and the propeller speed are reduced.

With the electric drive a full 1000 horsepower is available regardless of speed of the propeller because the electrical controls can be so adjusted. The two curves applying in this case are shown in broken lines. If the propeller turns at 100 rpm at 10 mph, it will turn at 90 rpm at 5 mph. Also, the thrust from the propeller increases from about 26,000 pounds at 10 mph up to about 31,500 pounds at 5 mph. There is more horsepower available and more thrust with the electric drive under such conditions than in the case of the direct connected job.

As the curves are plotted, the direct drive job above 10 mph still holds to constant torque and thus increased horsepower is indicated as being applied to the curves. If the engine is capable of carrying an overload for the time being at the higher speed, then it can turn the propeller up to these higher revolutions, and give greater speed to the tug and its tow.

In practice, the electric drive controls are flexible enough so that these electric drive curves can be modified, but attention must be paid to possible overloads thrown upon the engine.

For instance, in fishing and cargo vessel installations requiring a great deal of auxiliary electric power at times when the propulsion load is low the electric drive shows marked over-all economy. Examples of this are tuna fishing boats with large quick-freezing refrigeration load and coasters with frequent cargo handling loads.

Where the space available in the ship is such that it is more convenient to place the engines and generators away from the propulsion motor, electric drive is about the only transmission that is suitable.

However, whether the installation is in a tug, a fishing boat, a tanker, or a cargo vessel, the owner must decide what the important factors are in his individual case and assess their relative importance. There is no simple formula in which values can be inserted and the answer result automatically. On the contrary, it requires good judgment to make sure that all of the factors involved are known and are properly evaluared. But in general it can be said that the lower the speed of revolution of the propeller, the better the propulsive efficiency under all circumstances.

Correspondence Training For Mariners

Correspondence courses in the U. S. Maritime Service Institute are now available to members of the U. S. Merchant Marine. A few of the basic subjects covered in the correspondence courses include: Elementary and Advanced Navigation, Principles of Mechanics, Elements of Physics, Preparatory Mathematics for Engineering, Maritime Law for Seamen, Bookkeeping and Accounting, Radio, Plane Geometry, First Year High School Algebra and History of the United States.

Interested applicants should apply to the Director, U. S. Maritime Service Institute, 30 West 44th Street, New York, 18, or Enrolling Officer, U. S. Maritime Service Center, 1000 Geary Street, San Francisco.

Gas Turbine Alloys

(Continued from page 50)

are reported to have given far greater trouble than wheels and buckets combined.

5. Stresses due to thermal expansion, such as are produced by contacts between dissimilar materials or thermal gradients in the same piece, are among the most critical to be considered in high-temperature design. It can be demonstrated that rotating discs which are cooler at the center than at the rim have compression stresses in the rim, which act in a favorable direction, and greatly aggravated tensile stresses at the center, which may be disastrous. In wheels of this type, the writer knows of no failures at the rim, although loosening of the blades is common.

6. Blading failures tend to be from fatigue. The writer's opinion of the order of causes for fatigue failures is listed below:
   a. Imperfect manufacturing (casting defects, improper finish, nicks, etc.).
   b. Improper design (introduction of nodes, sympathetic vibrations, stress raisers).
   c. Lack of adequate fatigue strength in the alloys.
   d. Lack of adequate damping capacity (inherent inability to absorb vibrations) in the alloys. Little can be done about this since none of the better super alloys have any appreciable damping capacity at operating temperatures.

This listing would seem to let the metallurgist off easily. Actually, the metallurgist originally neglected to develop the basic information on this problem because of an improper assumption that steady rupture stress was more of a limiting factor. He is now scrambling to correct this error, at least as applied to certain designs.

7. It is the writer's belief that heat resisting alloy castings require several more years of "production research" before they will be acceptable for the rotating parts of plants for long-time service (other than aircraft). Reference 1 is worth noting in this regard since the extreme complexities of the problems involved in castings are treated in some detail. Theoretically, however, castings hold out more promise than any other class or form of material yet investigated, with the exception of ceramics. Here again a long program of experiment must be carried out before we know whether or not ceramics offer anything of value for long-time units (except as castings for metallic parts, which appears to be of immediate utility).

The recent award of a 2750-hp locomotive gas turbine contract to Elliott Company by Bituminous Coal Research, Incorporated, presents a new challenge. Temperatures may be somewhat lower, but stresses will surely be higher, and the handling of the coal combustion and the products of this combustion is a problem heretofore considered only in the laboratory. The metallurgist, however, is ever helpful, and perhaps for once he will predict performance from test data and not vice versa—a real triumph!

References:

1. Grant, N. J., "High Temperature Alloys," *The Iron Age*, May 23, May 30, June 6, June 20, 1946.
2. Evans, C. T., Jr., "Wrought Heat Resisting Alloys for Gas Turbine Service," *Metal Progress*, November, 1945.
3. Knight, H. A., "Super Alloys for High Temperature Service," *Materials and Methods*, June, 1946.
4. Badger, E. S.; Cross, H. C.; Evans, C. T., Jr., Franks, Russell; Johnson, R. B.; Mochel, N. L.; Mothling, Gunther, "Super Alloys for High Temperature Service in Gas Turbines and Jet Engines," A.S.M. Symposium in Cleveland, Ohio, February 5, 1946, published in *Metal Progress*, July, 1946.
5. Badger, W. L., "Metallurgical Development of Materials for Turbosuperchargers and Aircraft Gas Turbines," *The Iron Age*, July 25, August 1, 1946.

Thirsty Ship

During her recent visit to New York City, the giant Queen Elizabeth took on nearly two million gallons of bunker fuel oil. The big load, equivalent of ever 200 tank cars, was pumped into her at the average rate of 55,000 gallons per hour from Esso Marketers oil barges.

Book Review

STARS AND ATOMS HAVE NO SIZE by A. M. Sullivan, 160 pages bound in blue buckram with gold stampings, published by E. P. Dutton & Company, New York, price $2.75 net.

A. M. Sullivan is an associate editor of Dun's Review, published by Dun and Bradstreet's, a former president of the Poetry Society of America, and the author of several notable books of poetry.

"Measurement" a poem which gives the title to this volume begins:

"Stars and atoms have no size
They only vary in men's eyes.

"Men and instruments will blunder
Calculating things of Wonder.

"A seed is just as huge a world
As any ball the sun has hurled."

Other samples are:

THE OIL CAN

"The oil drops shaping to a pear
Iridescent in the sun
Pause a moment in high air
And tumble one by one.

"On the bearings of the wheel
In answer to the metal's cry
And change the plaintive squeaks and squeal
To a lullaby."

THE HARBOR TUG

"The tug is a terrier who worries the bull
And the beast with a throaty blast complains
But moves to his stall with a push and a pull
Till his nose is caught in a link of chains."

The general theme is an exploration in science and engineering. Ships' officers who are fond of poetry will find herein much of special interest to their profession.

Ore Carrier Converted to Diesel

(Continued from page 44)

diesel generator sets of 100 kw each, as well as one 100 kw motor generator set. The clean cut layout of the engineroom can be seen from the accompanying photographs, as can the comparatively small space needed by the main engines, generators, main motors and reduction gear. Right aft of the fuel tank in the forward end of the machinery compartment, is the ballast valve manifold. To its port are the main and auxiliary ballast pumps, and a fuel oil centrifugal separator; while on the starboard side is another main and another auxiliary ballast pump, respectively. To the starboard of the main diesel generator units are located the three auxiliary diesel generator sets; also the fresh water and lube oil coolers for the auxiliary units. The bilge pump and the lube oil transfer pumps are aft of the main motor reduction gears, and next to the transfer pump is a lube oil centrifuge. To the port of the main diesels is an oil-fired boiler for accommodation heating purposes. (In the forward part of the ship there is a duplicate boiler to heat the navigating officers' and deck crews' quarters, and this dual arrangement saves running lengthy steam piping along the decks or through the holds.) A fire pump and a general service pump are located just forward of the small boiler.

On the engineroom upper flat over the propelling motors is the electrical control room to starboard, and a lamp, oil and paint room to port, with the new hydro-electric steering gear between, the latter having a telemotor and hydro-electric control. Forward again on this flat is a machine shop and mechanical storage on the port side, and a laundry and locker room to the starboard. (A second laundry has been installed in the forward part of the ship.) On the 'tween flat in the engineroom is located the various electrical equipment, such as storage batteries for starting the main engines; battery charger, main and auxiliary switchboards, exciter control and lighting panels; fresh water tank, as well as the chief engineer's office.

This machinery is taken care of by 11 men—chief and three assistant engineers, three oilers, three wipers and one electrician. The total complement of the E. J. Block consists of 32 officers and men, and their accommodations are arranged at the forward and after ends of the hull. There also are accommodations for six guest passengers. The old deck housing forward was lifted off and the forecastle raised to increase space, and then the housing was placed back and welded into position. The old after-deckhouse was cut away, and an entire new deck housing erected, with the result that this vessel now has the longest after deckhouse of any cargo vessel on the Great Lakes.

The Captain has excellent and spacious quarters under the pilothouse forward. His cabin—fitted with a double bed and its own bathroom—is to port, while his office is on the starboard side. Forward of the Captain's quarters is the lounging room for the passengers. On the next deck down, or the spar deck, are the cabins of the three mates. Just forward are cabins for three wheelsmen and one watchman, these all being on the port side. To the starboard are three guest staterooms, each with two beds. One of these cabins has a private bath. Between these accommodations is a cabin for two watchmen, as well as separate bathrooms and toilets for the passengers and the crew. On the deck below, known as the dunnage deck, is a cabin for three of the crew; a laundry, bathroom, lamp room, paint room, heating boiler, and the master gyro compass.

There is a considerable amount of accommodation in the after-deckhouse. On the spar deck forward is the chief engineer's quarters with private bathroom, the cabin having a large bed as well as a desk. Next is a two-berthed cabin shared by the third engineer and electrician, and next is a bathroom which they share with the second assistant engineer who has a cabin to himself. The first assistant engineer has a private bathroom. These four cabins, collectively, run the width of the deckhouse.

Next aft on the port side is a spare room with a private bath, and this probably would be occupied by the engine guarantee engineer if he went on a trip. Then comes a cabin for three deck watchmen with a bathroom between them. Aft again on the port side is the crew's mess, and then the galley and pantry, respectively. At the extreme aft is the officers' dining room to the port, and the guest-passengers' dining saloon to starboard. Also to starboard are five cabins for two stewards, two porters, one night watchman, one porter, three wipers and three oilers, and these accommodations have three bathrooms and private toilets. In a central space there is a lounging room for the crew.

In rebuilding the cargo hatch combings and covers, the number was cut in half. The lifting and replacing of hatch covers when loading and discharging cargo is carried out by a 6-ton electric crane running on tracks laid on the deck. New electrically operated windlasses have been installed to handle the 5,000-pound anchors, as well as a number of new electric mooring winches.

The E. J. Block is commanded by Captain H. H. Kizer, and her chief engineer is Alan Seelye. The marine manager of the owning company is L. B. Hunter, and the vessel will be operated by Hutchinson & Company, Cleveland, Ohio. We were able to inspect her from stem to stern prior to the trials through the courtesy of Edward C. Lee, general manager of the Lorain yard, and to describe her with the kind assistance of Kent C. Thornton, naval architect, American Shipbuilding Company.

Doubtless the operation of this re-built ship will be watched with very great interest by Great Lakes shipping men, although traffic probably will be closed for the winter season in early December. Perhaps the E. J. Block will make economic history next year, and pave the way for a new era in ore transportation.

Netherlands to Spend $90,000,000 in U. S.

The Netherlands government plans to import $90,000,000 worth of agricultural products from the United States this year. About 25 millions will be spent on bread grain, 20 millions for other grains, 11 millions for sugar, 14 millions for fats and oils, and 20 millions for fertilizers, feedstuffs, and miscellaneous items.

Diesel Power vs. Steam Power

(Continued from page 64)

fuel economy of the diesel, but also its record as a more consistent performer than the steam plant.

"The motorship is reliable, breakdowns at sea are an extreme rarity, and special qualities of fuel and lubricating oil are no longer needed. The trend toward smaller cylinder dimensions and toward multi-engine installations has reduced the maintenance factor to where it now compares favorably with steam. Availability is increased by the use of diesels, particularly in multi-engine installations, as the failure of a single engine does not cripple the ship.

"The question is raised regarding the increased cost of the diesel powered vessel as compared with the steam ship. In Europe there seems to be little difference in costs. We believe that the difference, if any, in this country is because the average builder has had more experience in building steam powered vessels, and quotes as a result a higher price because of his lack of experience in installing diesel machinery. This is a condition to be corrected by cooperation between diesel manufacturers, naval architects, marine engineers and shipbuilders.

"Many marine diesel installations have suffered because of lack of coordination in the machinery layout, and because of the unsatisfactory operation of auxiliary equipment. These faults can be eliminated if the architect, the engine builder and the shipbuilder work together. The Diesel Industry stands ready and eager to do its part.

"We hear that the big cost of operating a ship in coastal service is dock labor, and that the fuel bill is only about 10 per cent of the operating cost. It would seem that if labor is expensive, the incentive should be very strong to grasp any other possible economy. The savings of diesel power as compared with steam may at the year's end represent the difference between an operating profit and a loss."

Gordon Lefevbre, president of The Cooper-Bessemer Corporation.

Gordon Lefebvre, president of Cooper-Bessemer Corporation, conducted the question and answer period that followed the scheduled addresses. Many interesting points were brought to light in this period, as follows:

American-made diesel engines are the best available in the world today.

As a result of the war, thousands of young men who have been trained in the armed forces to operate and maintain these engines are ready and eager to go to work—preferably in the diesel industry.

Foreign competition that is taking business away from us in the marine field is doing it by means of diesel engines. To recapture and hold this business, the merchant marine industry of America needs diesels, too.

While the diesel engine is the most efficient type of prime mover known today, "None of us," in the words of Mr. Lefebvre, "can close our minds to the possibility of improvements."

Why Diesel Power in Our Merchant Ships

(Continued from page 69)

maintenance cost for diesel vessels for material and labor of as low as 50 cents per horsepower per year of installed capacity for both main and auxiliary engines, and others showed about $2.50 per hp per year. There are many established records for reliability, dependability, and ability to take punishment. The foreign shipowners are not playing with a loser.

With respect to first cost of vessels, I believe many shipyards will offer the diesel-propelled vessel at the same price as for steam-propelled, at least there were a number of shipyards which made their offerings on an even basis in the past, or with no great increase for diesel over steam. The savings in fuel cost, extra cargo carrying capacity, smaller engine room crews required, instant availability of full power without stand-by loss, and maintenance of the highest economy throughout the life of the ship, are points ship operators and marine architects cannot afford to overlook if we are to attain and maintain our goal of leadership in shipping.

General Electric Purchases Steel Mill

The General Electric Company has purchased the Mahoning Valley Steel Company of Niles, Ohio, it was announced by G-E President Charles E. Wilson.

The purchase of this hand steel mill for the manufacture of hot-rolled sheets was necessary, according to Mr. Wilson, because "under current OPA pricing policies in the steel industry, General Electric could find no other way to obtain adequate supplies of hot-rolled steel sheets to make consumer products which are so urgently needed in the nation's reconversion and housing programs."

He said further, "General Electric has no intention of going into the steel or other basic materials industries. At least 90 per cent of our requirements for steel of all kinds will continue to come from other steel producers."

John P. Hosack, vice president and treasurer of Mahoning, has been named president and treasurer of the new G-E affiliate. Other officers of the mill will continue in their same capacities. Plans are to increase the present employment of 450.