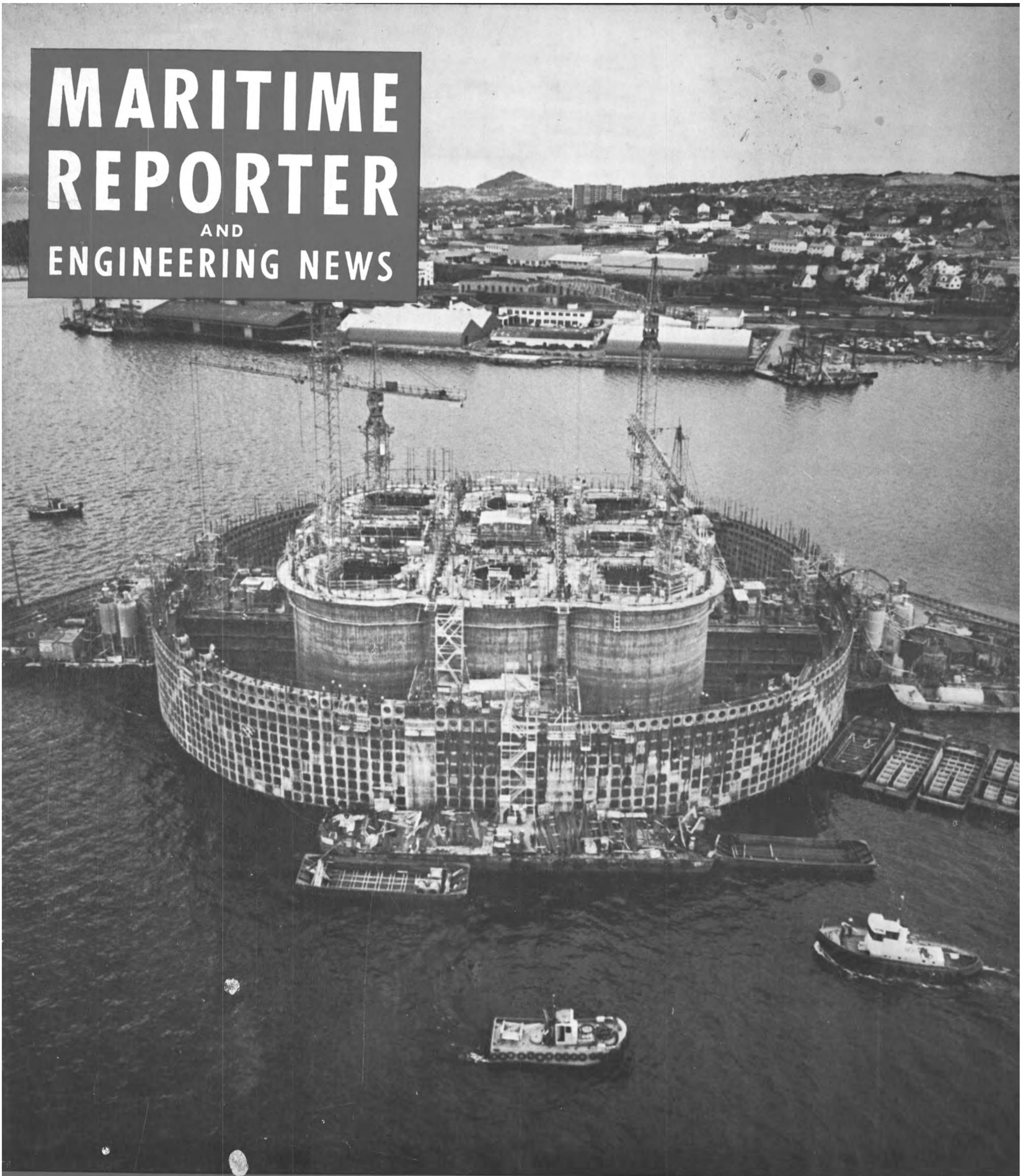


MARITIME REPORTER AND ENGINEERING NEWS



**World's Largest Ocean "Vessel" Will Be Towed
250 Miles Out Into The North Sea To Function
As One-Million-Barrel Oil Storage Tank**

(SEE PAGE 11)

FEBRUARY 15, 1973



Paul Revere did more than wake people in the middle of the night

He was a printer, engraver, music publisher, dentist and gunpowder manufacturer. He cast bullets and cannons during the war, drew political cartoons and invented a process for rolling sheet copper. He made the state seal which is still used by Massachusetts, was a renowned silversmith of course, and even a shipbuilder.

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Arctic Liquid Gas Asks Title XI Aid To Build Tug And Barge Unit

Arctic Liquid Gas Co. of Houston, Texas, has applied to the Maritime Administration for Title XI mortgage and loan guarantees to aid in financing the construction of an integrated tug-barge unit, the Government agency announced.

The vessels to be built include a cryogenic vessel which would be used in the carriage of liquefied gases from Alaska to the West Coast. Estimated cost of the 7,500-horsepower tug and the 8,500-dwt barge is \$7.8 million.

Arctic Liquid Gas is a wholly owned subsidiary of Arctic Tanker Group, Inc.

Bulk Cargo Shipments On Great Lakes Rise 4.21% During 1972

Vice Adm. Paul E. Trimble, president of Lake Carriers Association, has reported that movement of major bulk commodities on the Great Lakes last year amounted to 198,151,828 tons. This is 8-million tons, or 4.21 percent, over 1971, and the fourth highest on record for a Great Lakes season. Shipments of grain scored another high, exceeding the previous year by 5.75 percent, while stone shipments topped 1971 by 9.85 percent for the second highest figure on record.

A relatively restricted demand for iron ore during the first half of the year put ore shipments during that interval to the lowest in 10 years, a trend carried over from 1971. During the latter part of the year, ore shipments increased considerably, but not sufficiently to counter the results of the first half. Coal movements held at about 1971 levels, and were again the lowest since 1949.

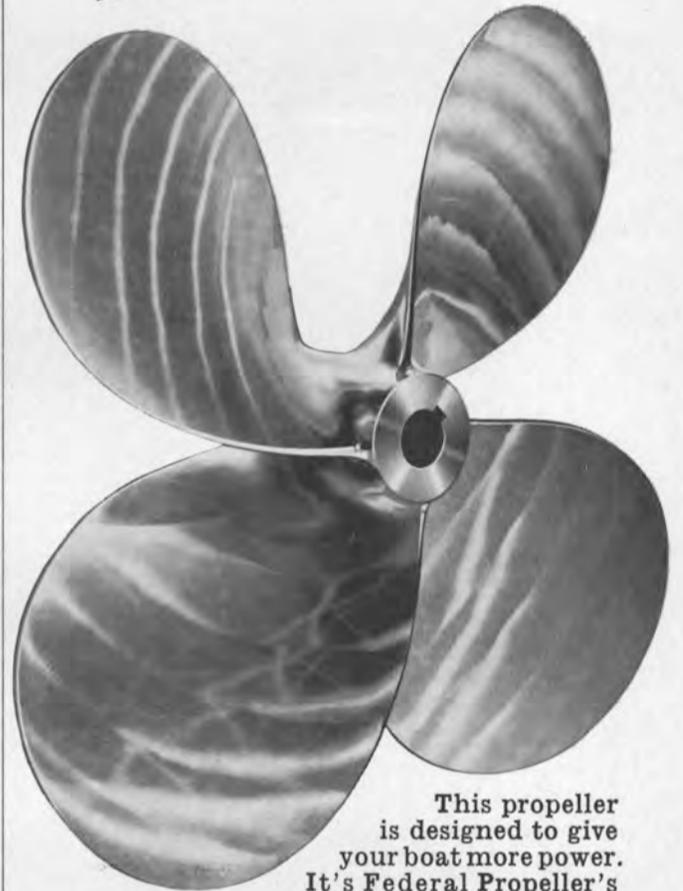
Total grain shipments on the Lakes last year came to 26,692,466 tons, compared to 25,239,080 tons in 1971.

Ore tonnage amounted to 90,-877,977 tons, compared to 87,447,-875 tons the year before.

Bituminous shipments came to 43,196,307 tons in contrast to 43,-290,445 tons, while anthracite accounted for 39,177 tons as opposed to 51,402 tons in 1971.

Limestone accounted for 37,345,-901 tons, while a year previously the figure was 33,998,558 tons.

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3-4

**MARITIME
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No. 4

Volume 35

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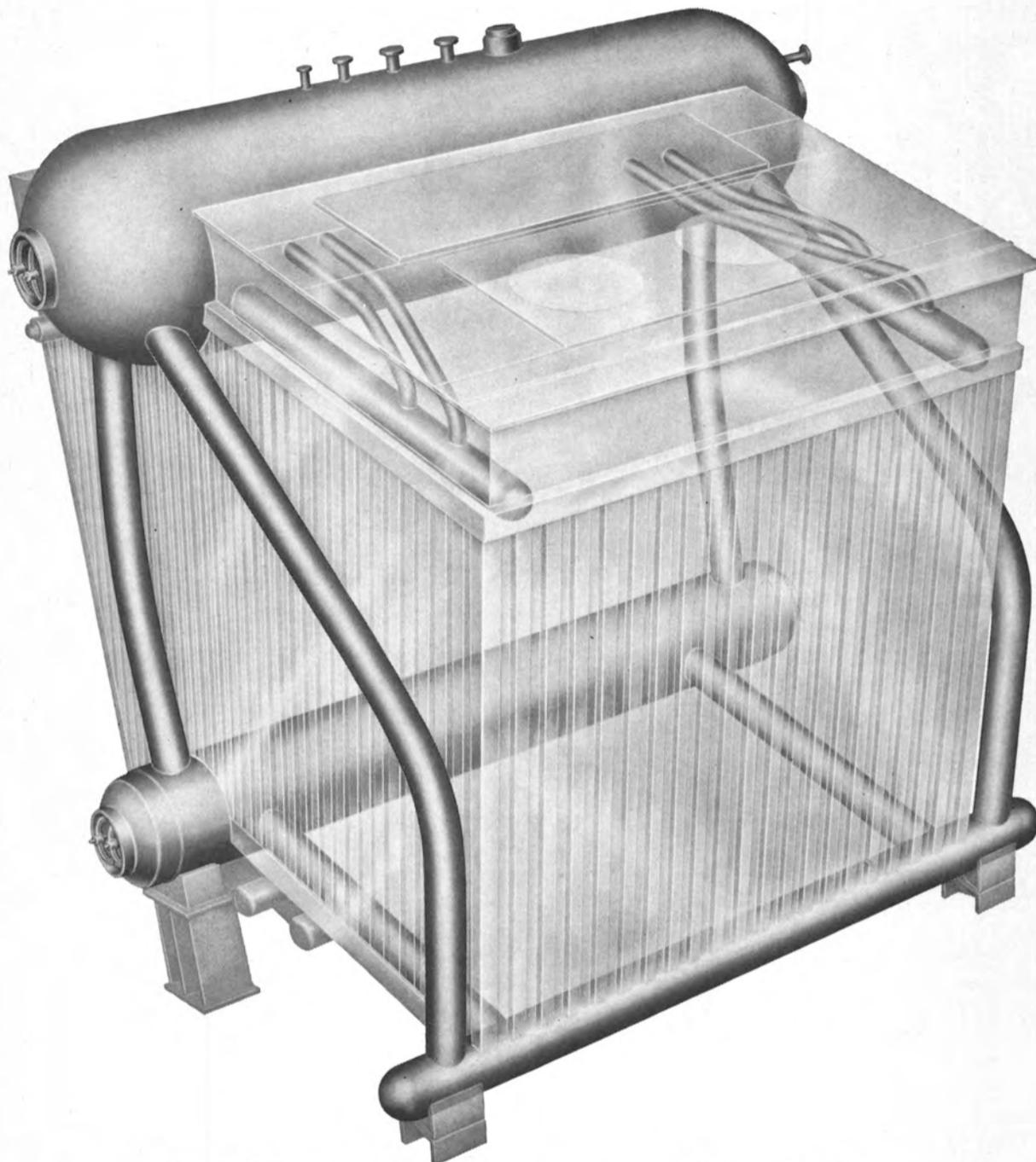
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Barge Operator Carries Diversified Cargo From California To Hawaii

Northland Marine Lines is now operating the only regularly scheduled barge service from California to Hawaii from the Port of Oakland's Seventh Street Terminal.

Why a barge service? "Our versatility is unlimited," Fred Christie, Northland Marine Lines dis-

trict manager said. "For diversity in what we can carry, nobody can touch us."

Northland's most recent sailing from the Port of Oakland substantiated that point. Aboard the 278-foot-long barge were scores of 20 and 40-foot containers and substantial breakbulk cargo, telephone poles, structural steel, a large power sailboat, and a mobile home. In the 200-foot-long hold were six

buses, 12 trucks, and additional breakbulk cargo.

The freight was loaded via a 40-ton capacity shipboard crane or was driven aboard, using 26-ton lift trucks.

Utilizing a 150-foot-long twin-screw tugboat, the barge has a nine-day sailing time to Honolulu.

"One of the other aspects of our versatility," Mr. Christie said, "is that we can schedule the right size

barge for the cargo we'll be carrying on a particular sailing. And we can always add a second barge."

Northland Marine Lines, a Seattle, Wash.-based firm, has served Alaska from the Northwest for 10 years, and has served Hawaii from California since 1970.

The company based its California-Hawaii service at the Port of Oakland in November 1972.

John V. Banks Named NASSCO President



John V. Banks

The appointment of John V. Banks as president and chief executive officer of National Steel and Shipbuilding Company was announced by Edgar F. Kaiser, chairman.

National Steel and Shipbuilding Company, owned jointly by Kaiser Industries Corporation and Morrison-Knudsen Company, Inc., engages primarily in shipbuilding and repair at its facilities in San Diego, Calif. At year-end, its backlog totaled \$223 million.

Mr. Banks had been executive vice president of National Steel and Shipbuilding since 1962. Born in Boise, Idaho, and a civil engineering graduate of the University of Idaho, he joined the Kaiser organization in 1935 on the construction of Boulder Dam (now called Hoover Dam).

Following World War II, Mr. Banks held management positions of increasing responsibilities with Kaiser's automotive operations. In 1956, he joined Kaiser Steel Corporation as production manager at its Montebello, Calif., fabricating plant. He later became assistant general manager of Kaiser Steel's Fabricating Division before joining National Steel and Shipbuilding in 1962.

Mississippi Marine Gets Additional Order To Construct Towboat

Mississippi Marine Corporation, Greenville, Miss., recently received an order from Magnolia Marine Transport Company, Jackson, Miss., for the construction of a 4,300-hp towboat.

The 140-foot by 38-foot by 11-foot vessel will be powered by General Motors 12-567-E5 engines.

A 5,600-hp towboat for Cox Towing Corporation is also currently under construction at Mississippi Marine.

Delivery of this second boat is scheduled for October or November of this year.

The leading builder of tugs and offshore support vessels is Halter Marine.

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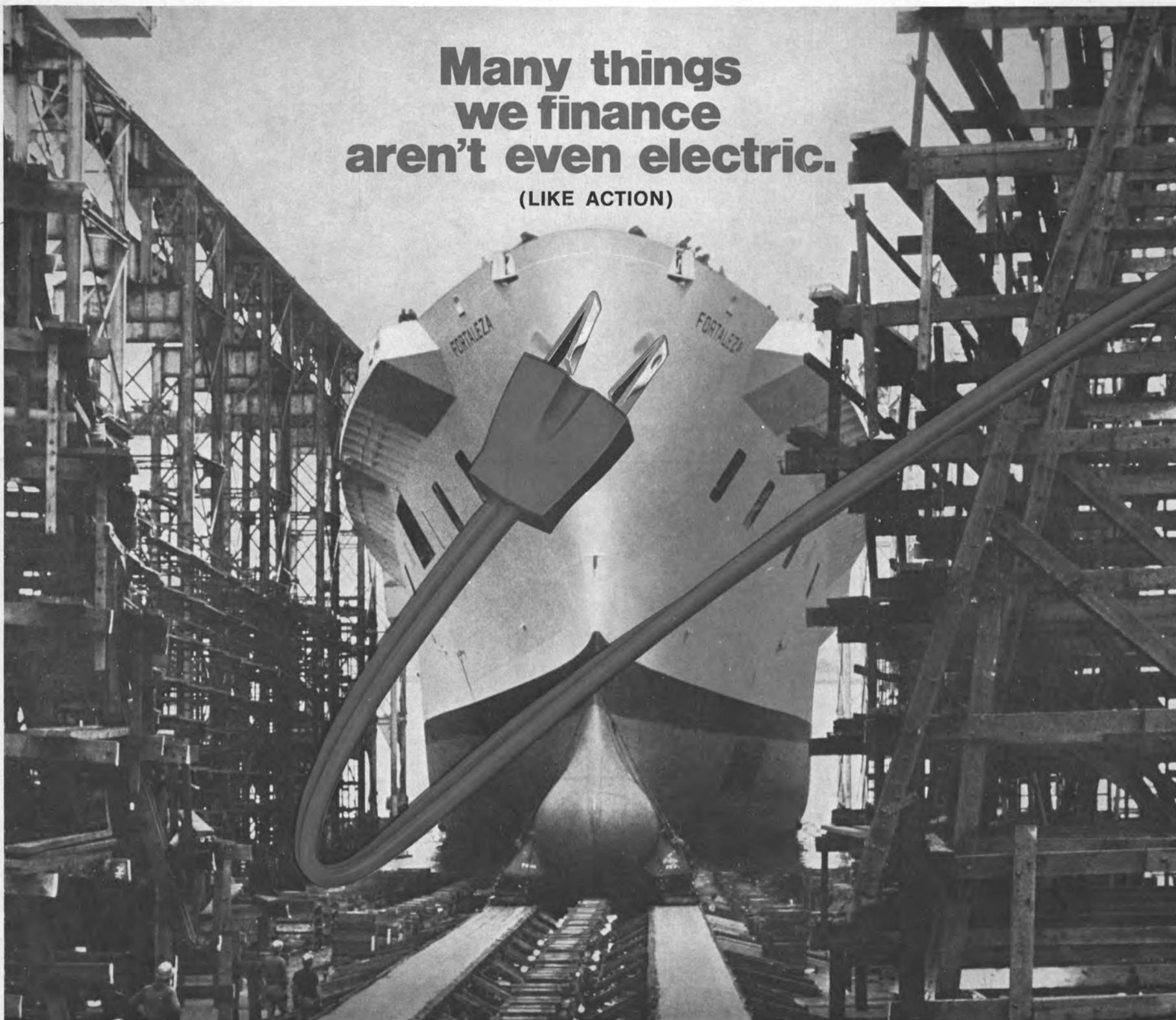


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Todd Shipyards Corp. Los Angeles Division Appoints Schaeffner



C. Richard Schaeffner

C. Richard Schaeffner has been appointed manager of engineering, Los Angeles Division, Todd Shipyards Corporation, it was announced by Carl M. Lippincott, division general manager.

Mr. Schaeffner has been added to Todd's management group as part of a continuing overall program to strengthen Todd's capabilities for the active decade ahead.

He is a graduate naval architect with more than 30 years of experience in the fields of naval design and shipbuilding. He has served as a design agent for leading naval architectural firms and in executive engineering positions with other shipbuilding concerns.

Mr. Schaeffner is a member of The Society of Naval Architects and Marine Engineers (past chairman, Gulf Coast Section), and the American Welding Society.

Jacksonville Port Auth. Names J.J. Scott Jr. New Managing Director



James J. Scott Jr.

James J. Scott Jr. was recently appointed as the new managing director of the Jacksonville Port Authority. He came to Jacksonville from the South Carolina State Ports Authority in Charleston, where he held the position of director of engineering. He assumed his new duties on February 5, 1973.

Mr. Scott, a native of Charleston, received a B.S. degree in civil engineering from the Citadel, and an M.S. degree in engineering from Cornell University.

He has held management positions with the South Carolina State Ports Authority since 1955, and is credited with being largely responsible for the progressive planning and development of its marine facilities.

Kaiser Steel To Build Two Container Barges For Foss Launch & Tug

Kaiser Steel Corporation has received an order from Foss Launch & Tug Company, affiliate of Dillingham, to build two seagoing flat deck container barges for service between Seattle, Wash., and Alaska.

To be completed in the spring of

1973, these million-dollar American Bureau of Shipping Class A-1 barges will each be 76 feet wide, 286 feet long and 17 feet deep. Each barge will weigh 1,400 tons and have a 6,500-ton cargo capacity. Twenty-ton containers will be rolled on and rolled off via bow and stern ramps.

The Foss barges are to be constructed in two longitudinal sections at the company's Napa, Calif., plant, and from there the sections will be

towed to the San Francisco Bay area, where they will be joined together. This unique construction procedure was necessitated by the 70-foot maximum passage widths of the Brazos Bridge and the Mare Island Causeway.

The Napa plant has constructed a number of barges and containership components, and more than a dozen offshore platform structures in recent years.

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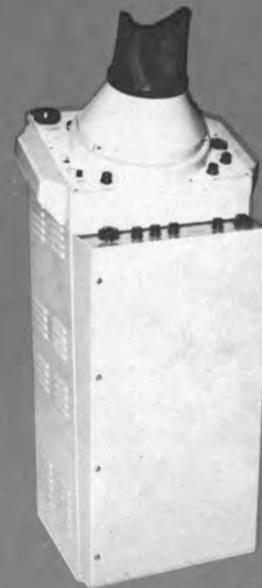
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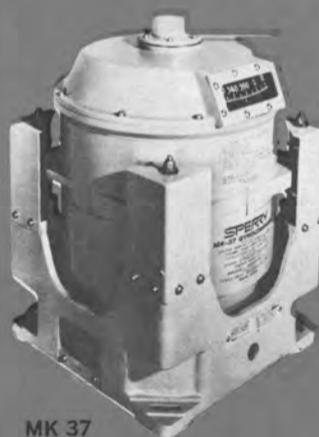
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MK 227



MK 37



SR-130

Hong Kong Operator Buys 250-Passenger Jetfoil From Boeing

The keel-laying of Boeing's first Jetfoil scheduled for customer delivery was held January 19, at the company's Renton, Wash., facility. The 50-mile-an-hour Jetfoil has been sold to Far East Hydrofoil, Hong Kong, one of the free world's largest hydrofoil operators.

Far East Hydrofoil will operate the 250-passenger 106-ton Jetfoil on its Hong Kong to Portuguese-Macao route, beginning in the summer of 1974.

"This unique ship is the first of a fleet of high-speed advance-design hydrofoils destined for service in the world's markets," said **William M. Shultz**, Boeing commercial hydrofoil manager. "With the Jetfoil, it is finally possible to offer

passengers a comfortable, safe, rapid ride on a dependable schedule, even in high winds and heavy seas. Furthermore, we can do this at a cost that is not only competitive, but downright attractive to the operator.

The Jetfoil is based on more than 14 years of Boeing hydrofoil experience, including three hydrofoils built for the U.S. Navy. The most modern hydrofoil ever designed,

Jetfoil, features fully submerged foils which are automatically stabilized to produce its superior ride quality. Propulsion will be by waterjet, a system pioneered for hydrofoils by Boeing, and proved on two of their previous models.

Savannah Machine Elects W.J. Foran VP



William J. Foran

William J. Foran, general superintendent of Savannah Machine and Shipyard, has been elected an officer of the company, according to an announcement by **Robert F. Sherman**, president of Savannah Machine.

In his new role as vice president-general superintendent, Mr. Foran will have expanded responsibility for yard operations.

He joined the company as an apprentice in 1935, after graduation from Benedictine Military School. He has been general superintendent for the past 12 years.

2,000-Ton Craneship Will Be Constructed By Boele's Shipyard

Boele's Scheepswerven en Machinefabriek B.V. at Bolnes, Holland recently received a contract from Intrepid Shipping Company for the conversion of the supertanker Veedol into what will be the world's largest craneship. This is the third craneship to be constructed by this shipyard.

This conversion will provide a craneship with a lifting capacity of 2,000 tons. Only the forepart and the cargo section of the tanker Veedol will be used for the new vessel. Thus, the conversion requires widening the ship's hull by 28 feet 6 inches, building the crane foundation, erecting the crane, providing accommodations for a crew of 180 people, building a helicopter deck, installing the propulsion machinery and providing a new ballast system. This extensive conversion will require about 3,500 tons of new steel.

The shipyard is having model tests made at the Dutch Shipbuilding Research Laboratory at Wageningen to aid in the selection of the propulsion machinery.

When completed, the vessel will have a length of 557 feet 7 inches, a breadth of 128 feet 5 inches and a depth of 49 feet 10 inches.

The previous craneships built by Boele's Shipyard are the Challenger, with a lifting capacity of 800 tons, for Heerema's Engineering Service; and the Orca, with a lifting capacity of 900 tons, for the Panama Europe Offshore Shipping Company.

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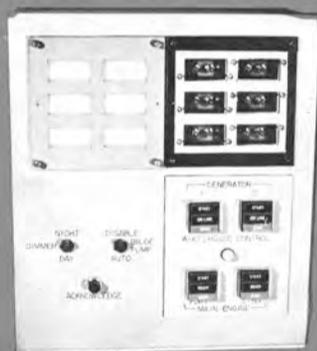
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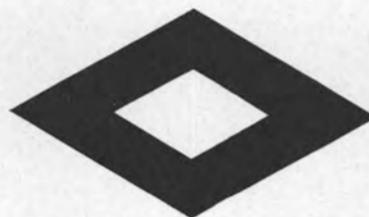
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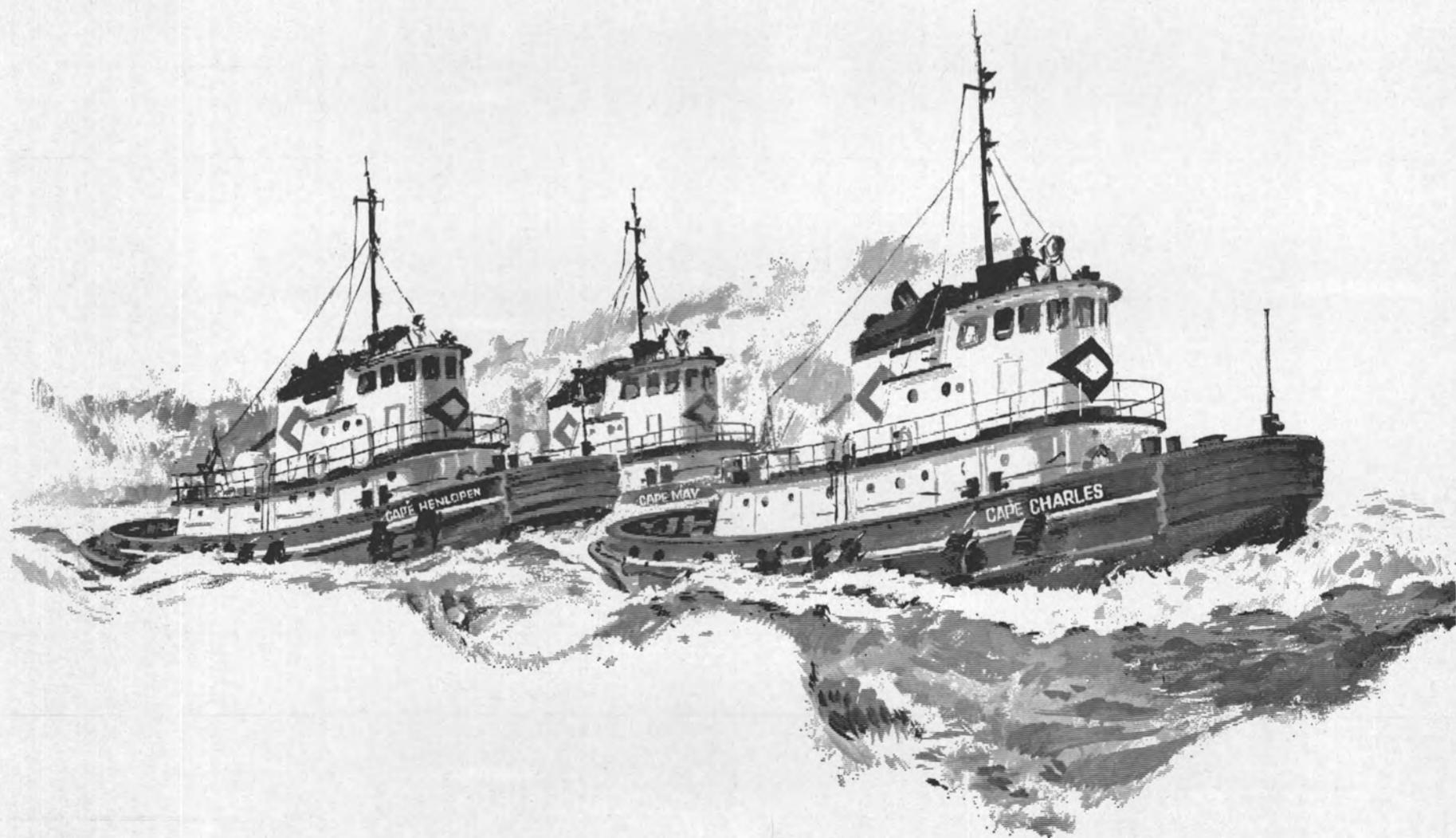
The Blue Diamond Fleet pulls ahead again with three new 3,300 horsepower twin screw tugs. The Cape Charles, Cape Henlopen, Cape May. Three of the most modern, best equipped tugs afloat, designed to offer extra power, maneuverability, efficiency.

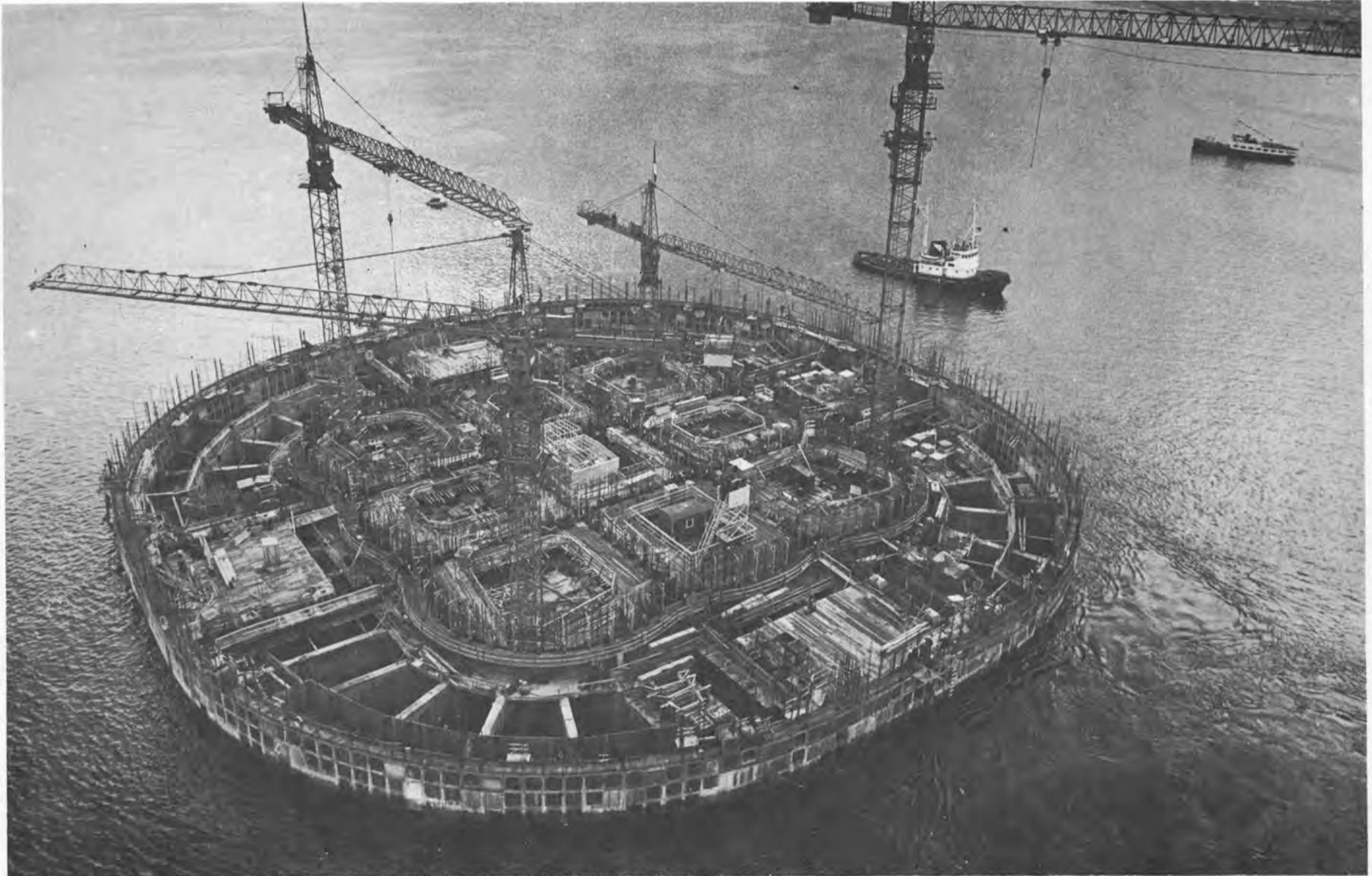


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When the one-and-only sea voyage takes place under tow of four tugs, the tank "vessel" will break all maritime records for weight moved, draft below the waterline, beam of vessel and sheer volume of a man-made object in controlled sailing. The photo above shows the tank just prior to being anchored in Hillevagen Bay at Stavanger.

Norwegians Build Unique Storage Vessel Designed To Rest On North Sea Floor

Referred To Affectionately As "The Thing," The Largest Man-Made Object Ever To Float In Any Ocean Will Become The Centerpiece Of An Oil Drilling City Hundreds Of Miles Offshore In The Ekofisk Field

A unique ocean "vessel" that will set records in beam, bulk, floated weight, and draft depth when it sails, is rapidly nearing completion in Norway for its scheduled one-and-only voyage into the North Sea sometime this summer.

Built in massive form of concrete and reinforced by thousands of miles of high quality tensile steel cable to enable it to resist buffeting by ocean storms, this special "vessel" will ultimately function as a stationary petroleum storage tank in the midst of the turbulent North Sea. However, before it rests on the bottom of the ocean for its fu-

ture role, it will make a record-breaking maritime voyage from the Port of Stavanger as the largest, the most cumbersome, and the deepest draft man-made object ever floated on a specific course in world history.

A concept of an international oil consortium headed by Phillips Petroleum Company, of Bartlesville, Okla., the concert tank is designed to become the centerpiece of an emerging oil-drilling city hundreds of miles offshore from Norway and Great Britain at a North Sea site known as Ekofisk.

When finally in place later this

year in some 235 feet of water, the tank will be capable of holding one million barrels of oil—an estimated three days of petroleum production at the Ekofisk site. As noted by the Phillips Norway Group, an affiliate of Phillips Petroleum, it will have the holding equivalent of a tanker of from 132,000 to 145,000 deadweight tons depending on whether long or short ton terms are used. Still only about 20 per cent of its height of 300 feet will be seen above water.

To dramatize the massive proportions of the project, its builders say it is equal to building a 19-

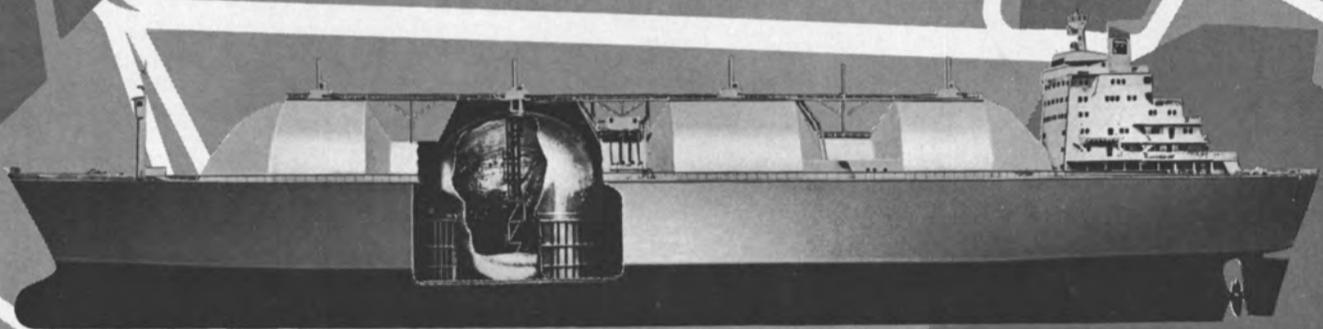
story structure on the surface of the sea and gradually sinking the bottom 17 floors underwater. Standing at exactly 295 feet from top to bottom, the tank will show only 65 feet above the waves of the rough North Sea.

However, in the process of getting to that position at Ekofisk, the tank "vessel" will float under tow of four tugs from Norway's key harbor on its southwest coast some 250 miles to the southwest. When the voyage takes place—it is now expected in late summer—all maritime records concerning

(Continued on page 13)



SULZER



This fast LNG/LPG carrier will be powered by a Sulzer cross-head two-stroke cycle dual-fuel engine delivering 20000 BHP. Direct-drive engines of this type are capable of producing up to 35000 BHP in one unit (full diesel output) while running on the boil-off gas and have thermal efficiencies comparable to their straight diesel counterparts. They accept bunker-C oil as pilot fuel which may run as low as 5 % of the total heat input. This type of prime mover provides the highest degree of safety for any kind of dual-fuel installation.

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Unique Storage Tank—

(Continued from page 11)

weight moved, draft below the waterline, beam of vessel, and the sheer volume of a manufactured item in controlled sailing will be eclipsed.

The completed project, which will include a huge platform over the entire tank for helicopters, storage space and other elements for a man-made island, will encompass between 480,000 and 500,000 tons of construction materials. With a horizontal dimension of 302 feet, which includes a specially-designed outer breakwater and the nine holding tanks inside, the concrete tank under tow will far exceed the largest oceangoing tankers now built or contemplated in width of beam.

In its short ocean voyage to Ekofisk from Stavanger fjord, it will also set an unheard of draft record of 197 feet. Truly, the only floating objects that are larger, wider, and with greater draft depths are icebergs.

To put the tank "vessel" into proper perspective with other man-made sailing objects—oil tankers—the facility to be moved to Ekofisk is by far the largest in all of its dimensions with the exception of tank capacity. The latter total, however, represents a calculated business estimate of oil storage needed to maintain a smooth and steady flow of petroleum from the offshore site to terminals on land to offset possible production interference from ocean storms.

As a comparison of the concrete tank with seagoing tanker giants, the biggest ship now afloat is a 477,000 deadweight ton tanker being readied for service in Japan. The ship—the Globtik Tokyo—is one of three of similar size being built in Japan. Contracts, meanwhile, have been awarded for construction of even larger oil tankers—530,000 dwt—for the Shell Oil Corp.

The Globtik Tokyo is slated to go into operation very shortly. When it begins operating it will be the all-time giant carrier, topping the current record holding ship in terms of size by some 110,000 tons of cargo capacity. However, even fully laden with oil, which it moves regularly from the Persian Gulf to Japan, the present record size ship would not equal the floated weight of the Ekofisk tank. Moreover, the beam of the biggest tankers at some 240 feet and their draft of between 90 and 100 feet fully loaded are only about half that of the concrete tank when it makes its memorable voyage this year.

Referred to with affection as "The Thing" by the American, Norwegian, French and other workers involved in the construction, the tank will be installed in Ekofisk, where exploration for oil is continuing.

Phillips reports that the oil consortium is now completing four exploratory wells and plans to begin

EKOFISK CRUDE OIL STORAGE TANK ONE-MILLION BARRELS

1. Water depth at Ekofisk location; 230 ft.
2. Tank structure will rest on seabed. (Weight of the tank will cause it to penetrate the firm sand bottom 1.0' to 1.5')
3. Perforated outer wall (breakwater) will extend above sea level 39'-4".
4. Inner wall (tank) will extend above sea level 65'-8".
5. Total tank height: 295'-8".
6. When completed in Stavanger Fjord and ready for tow to site, the tank will have 197' draft.
7. There are 8,000 circular holes in the outer breakwater wall. Diameter of the holes range from 2'-8" in the lower portion of the wall to 3'-7" midway up the wall to 4'-3" in the upper portions of the wall.
8. Horizontal dimension of the structure is 302' outside to outside of breakwater wall.
9. The breakwater wall is 6'-6" thick for the upper 105' of its height, and 4'-5" thick for the lower 164' of its height.
10. The horizontal dimension of the inner tank is 175' outside to outside of walls.
11. Thickness of the inner tank walls is 20".
12. Approximately 100,000 cubic yards of concrete are required for the completed tank.

work soon on three new drilling platforms. Sitting on the sea bottom and connected to the production pipelines in the nearby wells, the concrete tank will permit uninterrupted oil flow even during typical violent, stormy North Sea weather conditions, when tankers are unable to dock at the terminal for loading.

Designed by a French company, the tank uses a patented energy-absorbing breakwater and an inner section to hold the crude oil. The breakwater, a perforated wall measuring 302 feet in diameter, is linked to the inner tanks by a series of perforated walls, all of which are made rigid and secure by high strength steel cables that encircle the tank in all directions.

The perforations in the breakwater are designed to help absorb energy against the structure by allowing sea water to flow into the water-filled space between the inner and outer walls.

Two Norwegian engineering firms are building the structure at a point in Stavanger fjord where the water depth is greater than that at the site at Ekofisk. However, this is not where it all began. Initially a sheet pile cofferdam was built across a small inlet to form a dry-dock for construction of the tank bottom.

When the self-floating 20-foot thick concrete cell that forms the tank bottom was completed, it was moved into deeper water where the vertical walls are being constructed by the slip-form method. Perforations in the outer wall are formed by inserting precast units into the wall as slip forming proceeds. As the tank grows, it is moved farther out of the inlet into deeper water, so that only the uppermost section is above water.

The oil storage section will be divided into nine compartments, for maximum structural strength. Inner walls and partitions are being formed from 20-inch thick reinforced concrete. The outer walls are six feet thick from the top down through the surf zone, and taper down to four and a half feet at the bottom.

The top of the tank will be decked to provide 30,000 square feet of

usable platform space. Eventually a 750-foot bridge will connect the deck to a field terminal complex to be built nearby.

When completed, the million barrel tank will sail under tow to its final destination. Towing time is estimated at five days. Once the tank is on site and anchored in position, sea water pumps will flood the storage compartments and cause the tank to submerge to its final position on the seabed. The lowering operation is calculated to take 24 hours. However, the process is reversible at any time in the event of an unexpected storm.

With the Norwegian government insisting on anti-pollution standards in every possible aspect of the North Sea exploration program, the tank will include a variety of sensors and pollution control devices and pumps.

Phillips reports that special consideration has been given to pollution control and several safety features have been included in the storage tank design to protect against harmful spills. As an example, a water tank is being built into the roof of the tank to provide a means of oil/water separation and to assure that no oil will be discharged into the surrounding sea.

Additionally, the oil storage section of the tank is completely isolated from the sea, and, in the event of a ship-storage tank collision, the thick outer breakwater affords maximum protection for the storage compartments.

However, beyond even such eventualities the construction is geared to safety and strength. Built in the form of a network of thousands of multi-strand steel cables tensioned by tremendous pressure, the tank is covered by the thick concrete walls. In fact it is a single, unitized structure, whose circular form is capable of offering the greatest possible resistance to outside forces that may come against it.

Once in the water, it will always function with either oil or sea water within its compartments to provide equal weight pressure on the walls, according to a structural engineer at the site.

Donald J. Main Joins ConAgra's Ocean Shipping Staff



Donald J. Main

Donald J. Main, former planning and development coordinator for Ingram Ocean Systems, has joined ConAgra, diversified international foods company headquartered in Omaha, Neb. He will work in the company's ocean shipping program and report to the office of the president.

Mr. Main, whose experience includes both naval and mercantile vessel service, also served as a marine engineer with Shell Oil. Prior to that, he was a test engineer in the naval nuclear department of the New York Shipbuilding Corp. While in the U.S. Navy, Mr. Main served as a lieutenant aboard diesel-electric submarines.

He earned a bachelor of science degree in 1959 from the Maine Maritime Academy. He also received special training in marine capital expenditure and operating management in London.

ConAgra, with 66 plants in 20 states, also has extensive operations in Puerto Rico, Spain and Portugal.

Drew Chemical's Ameroid Marine Div. Names John P. Kay



John P. Kay

John P. Kay has been appointed Regional Manager for the Ameroid Marine Division of Drew Chemical Corporation in the United States. Drew Chemical is a subsidiary of United States Filter Corporation.

A graduate of the United States Merchant Marine Academy at Kings Point, Long Island, N.Y., Mr. Kay joined Drew in 1964, and has served as industrial national accounts manager, and as assistant marine sales manager.

He will be headquartered at Drew Chemical's New York City location at 522 Fifth Avenue.

The World's Largest Tuna Purse Seiner

The Margaret L

The world's largest tuna purse seiner, the Margaret L, recently joined the American tuna fleet. The Margaret L was designed by Rados Western Corporation and built by Peterson Builders, Inc. of Sturgeon Bay, Wis. This fishing vessel was launched last summer, at which time she was christened by the owner's wife, Mrs. Andrew J. Lococo.

The construction schedule and delivery date were planned so that the vessel would leave the Great Lakes just before the close of the navigation season. It also allowed the Margaret L to sail to the South Pacific in time for the opening of the tuna-fishing season in that area. The owner plans to deliver the probable 2,000-ton catch to Puerto Rico, where the vessel is registered. After the Pacific season closes, the ship will fish in Puerto Rican waters and African waters.

The Margaret L is the raised-deck type of purse seiner with a steel hull and an aluminum superstructure. The hull below the main deck is subdivided by six structural, watertight bulkheads. The hull above the waterline is painted a brilliant red, whereas the superstructure is painted white. There is a helicopter platform on the forward deck. An array of boat and brailing booms are appendaged from the kingpost. On top of the superstructure stands an air-foil-shaped lookout mast, topped with a crow's nest.

The main-propulsion machinery consists of two Fairbanks-Morse turbocharged, non-reversing, 12-cylinder diesel engines. Each engine drives an Avondale Ship-



WORLD'S LARGEST tuna purse seiner on trials off Sturgeon Bay where the ship was built. This U.S. designed and built fishing vessel will have an influence on all future vessels of this type because of the advanced design features incorporated for efficiency.

yards' four-bladed propeller, each having a diameter of 122 inches, through a 3.97:1 Western Gear Model 360 PCMR reduction gear. The engines are air started and freshwater cooled by external type skin coolers. Engine speed and direction are controlled from three stations by a Westinghouse Air Brake Company control system. This system is designed to apply compressed air to the respective

shaft brakes when the single lever for either engine is placed in the neutral position. The engines are fitted with Wichita pneumatic clutches.

The ship's electric power is provided by two 400-kw Caterpillar D379 diesel-generator sets. These also are air started and freshwater cooled. Auxiliary power is provided by a 250-kw Caterpillar D343-TA diesel-generator set, which is

hydraulic started and freshwater cooled. These units were supplied by Shepard Marine.

Other engine room equipment includes Riley-Beard, Inc. evaporators, DeLaval Separator Company fuel and lubricating oil purifiers, Federal Pacific Electric Company switchboards, and Vilters Manufacturing Corp.'s refrigeration and air-conditioning equipment. The

(Continued on page 17)

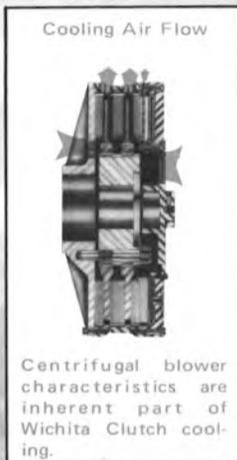


The wheelhouse of the Margaret L is outfitted with the most modern equipment. The decor, while simple, provides a pleasant work area, together with easy maintenance.



The owner's stateroom is one of the most luxurious accommodations provided on any ship. The furniture and paneling are black walnut with appropriate matching colors.

Off to a 2,000 ton catch . . . with WICHITA CLUTCHES!



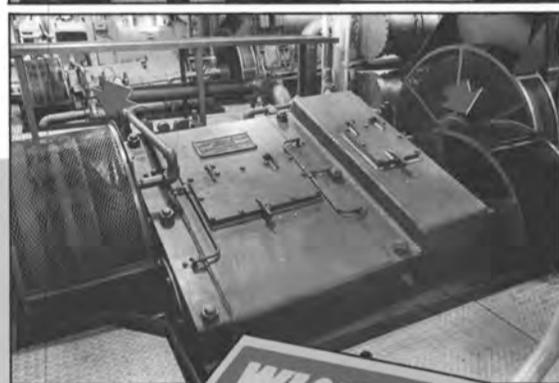
THE MARGARET L – world's largest tuna seiner – adds more world-ranging efficiency to the U. S. fishing fleet. Built by Peterson Builders, Inc. of Sturgeon Bay, Wisconsin, the "Margaret L" is powered by two Fairbanks Morse diesel engines, each developing 3,000 hp at 750 rpm. To deliver and control this power, the Rados Western Corp. of San Pedro, California, the designers, chose Western Gear Model 360 PCMR 3.97 to 1 reverse-reduction gear driving through Wichita ATD-230H Marine Clutches.

- ★ Smooth, positive performance.
- ★ Quick response for excellent maneuverability.
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- ★ Low maintenance.
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THE MARGARET L ENGINE ROOM

Top Right: Looking forward between the two Fairbanks Morse opposed piston, turbocharged, diesel engines. Western Gear propulsion gears shown in right and left foreground.

Bottom Right: Each Western Gear reverse-reduction gear is equipped with Wichita ATD-230H Marine Disc Clutches, one to apply forward power, the other to apply reverse power to one of the two propellers on this beautifully equipped twin screw workboat.



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Marine Bulletin No. 119



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Looking forward in the engine room between the two Fairbanks-Morse diesel engines indicates ample work areas. These engines are remotely controlled from the bridge.

World's Largest Tuna Purse Seiner

(Continued from page 14)

propeller shafting was supplied by Kahlenberg Bros. Company.

The excellent maneuverability of the Margaret L is enhanced through the use of a Brunvoll Model SPO-200 fixed-pitch bow thruster rated at 220 hp and delivering 5,100 pounds of thrust. This unit was supplied by Propulsion Systems, Inc.

All deck machinery, supplied by Marco, is powered by an electrohydraulic power unit consisting of three 125-hp double-ended electric motors directly connected to double fixed-vane hydraulic pumps. Any two of the three electric motors will provide full power for the hydraulic system. Control of the deck machinery is accomplished through one master and one auxiliary console, located on the upper

CHARACTERISTICS

Length overall	262 ft. 0 in.
Breadth	45 ft. 0 in.
Draft	18 ft. 9 in.
Displacement, long tons	3,230
Shaft horsepower	7,200
Speed, knots	17
Operating range, miles	4,000
Complement	18
Fuel capacity, gallons	159,000
Lube-oil capacity, gallons	3,900
Potable water, gallons	26,250

deck and main deck, respectively.

Because of the complex machinery, the vessel is equipped with an extensive monitoring system, supplied by ITT Decca Marine Inc., which covers some 76 points throughout the ship. Some of the alarm points covered are the fish-well temperatures, ammonia compressors, main engines, and diesel generators. The alarms can be routed to the chief engineer's cabin as well as the bridge.



The ITT Decca Marine monitoring panel covers 76 points throughout the vessel. This system assures efficient and trouble-free operation during critical fishing.

On the navigation side, the vessel is fitted with the latest electronic equipment, such as dual Decca solid-state RM 916 radars with 60-mile range. The autopilot and steering-control system is a dual gyro/magnetic type Decca DP 752 GM working in conjunction with a Decca/Microtecnica gyro. The vessel is equipped with such necessities as Omega, single-sideband radios with 1,000-watt linear amplifier, and Konel depth recorder and direction finder.

This purse seiner has one of the most luxurious staterooms afloat. Exotic furniture and paneling are of black walnut by Samson West Corporation of California, who supplied most of the furniture for the Margaret L.

The vessel, in addition to having a one-mile-long purse seine, is outfitted with a 34-foot purse boat, powered by a Caterpillar D-343 turbocharged diesel engine, and five 15-foot chase boats powered by single 80-hp Mercury outboards. A

Husky Hydraulics' crane is used to handle these boats.

The hull of the Margaret L is protected by an Engelhard Industries cathodic protection system. A flume stabilization system designed by Flume Stabilization provides for an easy riding vessel under all operating conditions. The fire-extinguishing system was designed and provided by Walter Kidde Company. All the windows on the ship were supplied by Kearfott and the life-saving outfit was furnished by the Revere Supply Company. Fans for the machinery spaces and elsewhere on the ship were furnished by Buffalo Forge Company.

The removal of the 2,000-ton fish load is accomplished by means of a flotation system. The fish are floated from the wells to the upper deck by means of increased "flow and pressure" using a heavy brine solution. The fish are dumped into a chute which is extended from either side of the ship to the beach for cannery handling.

Port Of Stockton Appoints Andersen

Richard A. Andersen, with 26 years of experience in the maritime distribution and transportation field, was appointed as port director by the commissioners of the Stockton Port District. He assumes his new responsibilities on February 15, 1973.

Mr. Andersen comes to the Port of Stockton from the Port of Everett, Wash., where, since June 16, 1969, he has served as general manager, during which time the Port of Everett has enjoyed a substantial increase in cargo tonnage and profits developed under his direction. Prior to his service at Everett, he served as sales manager for the Port of San Diego and was involved in terminal operations, cargo development programs, advertising and port promotion. In this capacity he traveled extensively to

all major port cities in the United States, Japan, Taiwan and Korea.

Mr. Andersen joined the Port of San Diego in 1967, and is a native to that area. He has twice been elected to a directorship of the American Association of Port Authorities during the last three years. He is an active member of the Everett Area Chamber of Commerce; a member of the executive board of the Snohomish River Basin Committee; an active working member of the Pacific Coast Association of Port Authorities and Washington Public Ports Association, and a member of the executive board of the Northwest Marine Terminal Association, a tariff group serving the ports of Washington and Oregon. He served as an active sponsor of the North Puget Sound Ports group, who are working mutually to aid and develop the economic independence of these three northwest Washington counties.



HITACHI DELIVERS ORE/OIL CARRIER: The 175,935-dwt ore/oil carrier Larina, which had been under construction at Hitachi Zosen's Innoshima Shipyard, was recently delivered to her owner, Larina Shipping Inc. The vessel, equipped with a cargo oil-heating system to improve discharging efficiency, has a cargo hold capacity (ore) of about 3,544,655 cubic feet and (oil) 7,527,888 cubic feet. She is powered by a Hitachi B&W 7K98FF type main engine with a maximum output of 26,600 hp delivering a maximum trial speed of 16.072 knots. The Larina measures approximately 948 feet in length (bp), 158 feet in breadth, and has a depth of 80 feet.

Getty Oil's Worldwide Operations To Expend \$205.2 Million In 1973

Capital expenditures of \$205.2 million in 1973 have been approved for the worldwide operations of Getty Oil Company and its wholly owned subsidiaries.

Recently, in a separate action, the board of directors of Skelly Oil Company approved a capital appropriations budget which will re-

sult in expenditures of \$117.3 million for 1973. As of December 31, 1972, Getty Oil Company owned an 87.16 percent interest in Mission Corporation, and a 1.42 percent interest in Skelly Oil Company. Mission owned a 72.53 percent interest in Skelly Oil. Directly and indirectly through Mission, Getty Oil held a 64.64 percent interest in Skelly Oil.

George F. Getty II, executive vice president and chief operating

officer, said that of the \$205.2 million for Getty Oil capital expenditures, \$146.9 million or 71 percent of the planned 1973 budget will be invested in the company's petroleum and hard minerals exploration and production programs.

Mr. Getty noted that \$139.7 million, or 95 percent of the \$146.9 million, will be invested in petroleum and hard minerals exploration and production activities on the North American continent, and the

remainder will be invested in overseas projects.

The company's principal petroleum exploratory areas in North America are in the mid-continent southern states, the Gulf of Mexico, Canada, and Alaska. Its principal domestic petroleum production activities are located in the mid-continent southern states, in the Gulf of Mexico offshore Louisiana and Texas, and in California.

Getty Oil will invest \$7.2 million in overseas exploration and production. Getty Oil's principal overseas petroleum exploration areas of interest are the Oriente Basin of Peru, the United Kingdom sector of the North Sea and offshore Indonesia. Its foreign petroleum production interests are in the Saudi Arabia-Kuwait Partitioned Neutral Zone, in Iran, and in Algeria.

For its marketing, manufacturing and transportation operations, Getty Oil has designated \$51.4 million, or 25 percent of the planned 1973 capital expenditures. The sum includes \$19.6 million for marketing operations, \$10.5 million for manufacturing operations, an \$11.8-million payment toward construction of a new 222,000-deadweight-ton international tanker, and \$9.5 million for various smaller projects.

The remaining \$6.9 million of the 1973 capital expenditures program is designated for miscellaneous operations. In 1972, Getty Oil capital expenditures were \$181 million.

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Freddie L. Jordan Named To New Post At TMT Shipping



Freddie L. Jordan

Freddie L. Jordan has been named manager of the operations/agency department of Houston, Texas-based TMT Shipping & Chartering, Inc.

Mr. Jordan has 20 years of experience in the shipping business and will supervise all operations, agency, and consignment vessel activities in his new post.

TMT Shipping & Chartering is a worldwide marine transportation consultant, shipbroker/chartering agent and steamship agent. Its subsidiary, TMT Marine Equipment Sales, Inc., specializes in the sale and purchase of all types of commercial marine equipment ranging from inland/offshore tugs, barges and floating contractors' equipment to dry cargo vessels and tankers of both American and foreign flags. Mowbray Marine Enterprises in New York represents both firms on the East Coast.

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Fork lift discharges LASH barge load of beer in palletized Shrink-Paks.



Electrical machinery heavy lift (142 L.T.) is secured in LASH barge for export.



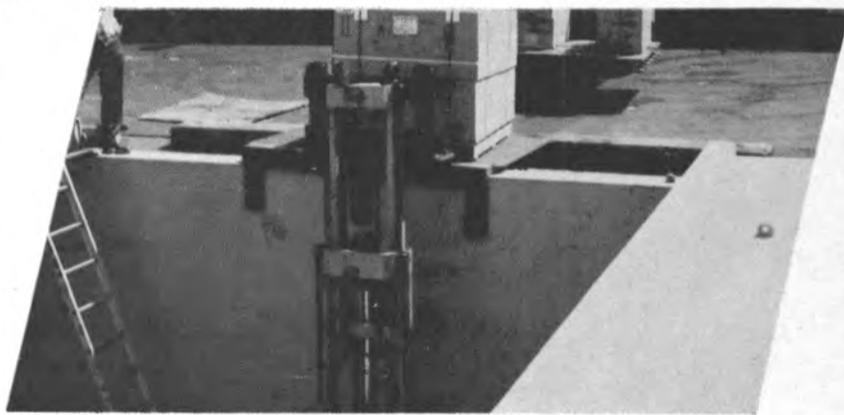
Bulk rice is loaded into LASH barge at Helena, Ark. for direct shipment to Rotterdam.



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Standard container occupies portion of LASH barge loaded with farm vehicles, steel rods and miscellaneous general cargo.



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NKK Lays Keel For World's Largest Ore/Oil Carrier

The keel for the world's largest ore/oil ship, a 269,000-deadweight-ton carrier, has been laid at the Tsu yard of Nippon Kokan (NKK), Japan's only integrated shipbuilder-steelmaker-fabricator.

NKK's New York shipbuilding department said the vessel is scheduled for completion in mid-1973 and de-

signed to bring Brazilian ore to Japan, and Persian Gulf oil to Brazil.

The owner will be Seamar Shipping Corp. of Liberia, a subsidiary of Vale Do Rio Doce Navegacao S.A. of Brazil. The vessel is being built to a standard design for 270,000-dwt-class ore/oil carriers developed by NKK's Shipbuilding Division.

Five central tanks and 20 wing tanks will give the ship eight more cargo compartments than in other

vessels of this size. This will conform to Inter-Governmental Maritime Consultative Organization recommendations to lessen oil spillage in case of accident.

Other features include a fully automated, unmanned engine room; inert gas system for protection against explosion in tanks; special cargo control room for oil loading and unloading, and fixed cleaning equipment in each tank.

Overall length is 1,115.5 feet,

length between perpendiculars 1,056.4 feet, breadth molded 180.4 feet, depth molded 92.8 feet, and draft 70.2 feet. A turbine main engine developing 34,000 shp at 83.5 rpm will give the 169,500-gross-ton ship a service speed of about 15.5 knots.

Pacific Far East Line Elects George Gmelch Exec. Vice President



George J. Gmelch

George J. Gmelch, who was recently elected to the board of directors, has been elected executive vice president of Pacific Far East Line, Inc., San Francisco, Calif., it was announced by president Leo C. Ross. Leif M. Harris, previously operating manager, was elected vice president-operations to succeed Mr. Gmelch. Mr. Gmelch came to PFEL in 1954 from The East Asiatic Company. He previously served as Director of Transportation for the U.S. Public Roads Administration, assistant chief of operations for the U.S. Army Transportation Corps-Los Angeles Port of Embarkation, and freight traffic manager for Transmarine Navigation Corporation in Los Angeles. He recently completed the Advanced Management Program at Harvard Business School.

Among his many association activities, Mr. Gmelch is past president, San Francisco Marine Exchange; past president, The Propeller Club-Port of San Francisco; currently second national vice president, The Propeller Club; member of the national panel, American Arbitration Association; director of Napa Valley Savings & Loan Association, and past president, Foreign Trade Association of Southern California. He is a member of the Commonwealth Club, World Trade Club, Commercial Club, and The Family Club.

National Boat Corp. Applies For Title XI To Build Six Vessels

The Maritime Administration has announced that National Boat Corp. of Houston, Texas, has applied for a Title XI guarantee to aid in financing the construction of four ocean-going towing supply vessels, and two oil field supply vessels. The estimated cost of the project will be \$10,600,000.

The first two towing supply vessels, to be constructed by American Marine Corp. of New Orleans, La., will cost \$2,100,000 each. Contracts have not as yet been awarded on the four other vessels.

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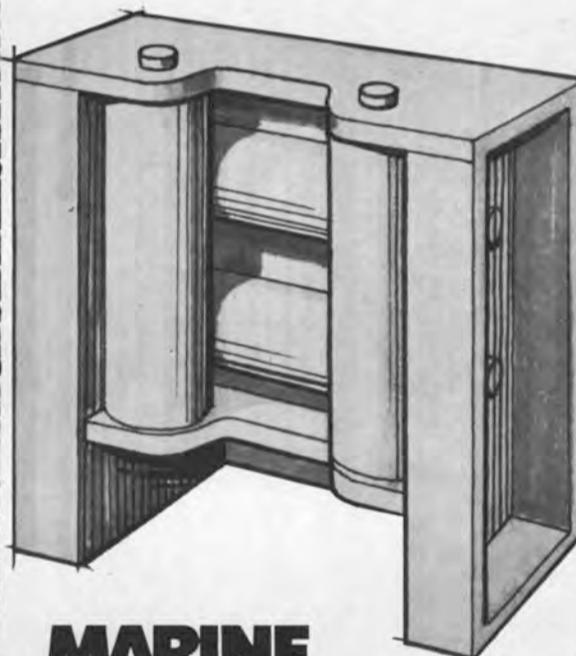
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As all Buck's fans know, expanding your business into new areas means exposure to new, unforeseen hazards. When the day comes that your firm starts doing business on Venus we hope this map will have been of help.

But all kidding aside — successfully operating a business today has hazards enough. Between direct physical hazards and liability exposures that are constantly changing, things just can't be done the same way that worked so well yesterday.

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- (A) All planetside shipments leave from here. Make sure they're protected!
- (B) First stop if you're planning to do business on Venus.
- (C) Make sure of your Fire Insurance if you're sailing this way.
- (D) Stevedore Liability Claim about to happen. Are you covered?

- (E) General Liability Coverage a good idea if you're stopping here.
- (F) Crew of Midland claims adjusters on way to inspect damage at (G).
- (G) Scene of extensive damage because of Venusian Dinosaur stampede. (Covered, of course!)

- (H) We TOLD you about that fire insurance! No worries here. Complete protection's been provided by Midland.
- (I) Back in operation after roof damage claim from falling dragon was settled overnight by Midland.
- (J) Offices of old-fashioned insurance company still using Stone Age methods.

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Edwin M. Hood Urges Greater Coordination Of Shipping Policies

Speaking at a luncheon of The Propeller Club of San Francisco recently, Edwin M. Hood, president, Shipbuilders Council of America, called for greater high-level coordination in the implementation of policies affecting U.S. shipping capabilities to generate

maximum impact in the national interest.

He asserted that actions of Federal agencies in recent years have tended to treat problem areas "in almost complete isolation" of one another:

"... there is not now, and has never been, any high-level coordination to ensure that an expansion of trade will equate to an expansion of shipbuilding. There is not now, and never has been, a pro-

gram correlation between these two elements with specific milestones to be reached in an orderly fashion. Except for the National Maritime Council, established following enactment of the 1970 Act . . . there has never been, to my knowledge, an intensive, broadly structured campaign to encourage the movement of an expanding proportionate share of U.S. cargoes in American-flag ships."

Citing national goals of Japan to

assure that "the Japanese-flag merchant marine should carry 60 percent of all Japanese exports and 70 percent of all Japanese imports by 1975," Mr. Hood noted that "the volume of U.S. export and import cargoes carried by U.S.-flag shipping has steadily declined and, over the past several years, has hovered near 6 percent. Obviously," he said, "we are a long way from emulating the Japanese in their 'national interest' approach."



Edwin M. Hood

The spokesman for the private shipbuilding industry further suggested that "changing times demand that shipping and shipbuilding capabilities need to be justified in the broad spectrum of the national interest and not as a fragment of national defense requirements.

"The 'national interest' equation in which shipbuilding is a factor," he observed, "has these inseparable constituent elements: trade and commerce, sealift capacity, accessibility and availability of sea lanes, marketing competence, and shipbuilding capabilities. Each factor is a function of the other; the parts are not independent variables. The sum of the parts equates to a positive contribution to the balance of international payments. The extent to which sovereign jurisdiction or control over any one of these elements is diminished affects the whole of the equation and equates to a negative drain on the balance of payments."

Santa Fe Receives Letter Of Intent For \$2.3-Million Rig

E.L. Shannon Jr., president of Santa Fe International Corp., Orange, Calif., has announced that his company has received a letter of intent from Arabian American Oil Co. for a new \$2.3-million drilling rig to operate in Saudi Arabia under a long-term contract.

Mr. Shannon said the rig is scheduled to begin drilling August 1. It will be similar to the rig which Santa Fe is currently assembling in Houston, Texas, for shipment to Saudi Arabia under a previously announced contract.

With the arrival of these two units in 1973, Santa Fe will have eight rigs in Saudi Arabia, including three new rigs which arrived from the United States in 1972 and three used rigs shipped in from other Middle East countries. The initial contract term for each rig will be a minimum of two years, Mr. Shannon said.

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Equitable Equipment Honored As Louisiana Offshore Pioneer



Equitable Equipment president **Cecil M. Keeney** stands beside plaque commemorating his company's pioneering contributions to Louisiana's offshore drilling industry.

Equitable Equipment Company, Inc., a New Orleans, La., shipbuilder, was recently honored for its pioneering contributions to the development of Louisiana's offshore oil and gas industry.

Equitable's president, **Cecil M. Keeney**, was presented with a plaque commemorating his company's work for the industry 25 years ago, at ceremonies in Morgan City by 25th Offshore Anniversary Inc., an agency of the Chamber of Commerce of the Morgan City, Berwick, and Patterson (La.) area, organized to pay tribute to those companies instrumental in the initial development of Louisiana's oil and gas industry in the Gulf of Mexico and the state's tidelands.

Equitable Equipment Company converted a Navy vessel into the drilling tender *Frank Phillips*, used by Kerr-McGee to bring in the first Louisiana offshore oil well in 1947. The vessel was 260 feet long by 48 feet in beam by 15 feet, with a draft of 8 feet 6 inches loaded. It was equipped with stiff-leg derricks, hoisting winches, diesel generators, pumps for water and fuel transfer, bilge system, mud pumps, warping winches for holding the barge to the drilling platform in rough weather and a modern Halliburton oil well cementing skid unit. It had living and working accommodations for a crew of 38.

The well drilled from this tender was 12 miles off the Louisiana coast at a water depth of 30 feet at low tide. Production was from a Miocene sand with pipe perforated at 1,734-50 feet on block 32 of 20,000 acres of Louisiana state-owned land. It was Kerr-McGee No. 1 well.

Equitable Equipment also built the world's first self-propelled drill ships, the 76-man quarters unit for Humble's first twin-tower offshore rig—the first of its kind in the world—and the largest offshore quarters unit in the world.

Representing Equitable Equipment Company at the presentation and recognition ceremonies were Mr. and Mrs. **Cecil M. Keeney**, **J. Frank Williams**, vice president, sales, and Mrs. Williams.

Personnel Changes At Columbus Line

Dr. John Henry de La Trobe, chairman of the board, has announced that for personal reasons **Richard T. Soper**, president of Columbus Line, Inc., has resigned. Mr. Soper will continue as a director and a consultant, and will remain as a director of the other corporations in which Hamburg-Sud,

the parent company of Columbus Line, has an interest.

Erwin M. Ludewig, a director of Columbus Line, Inc., and a managing director of Hamburg-Sud, will act as president of Columbus Line, Inc.

Dr. de La Trobe also announced the election of Dr. **Michael Schwarz** as senior vice president, and the election of Capt. **Konrad Wedekind** as vice president-Pacific Coast.

Columbus Line operates between the East Coast of the United States and Canada, and Australia-New Zealand, and was the first shipping company to introduce a fully containerized service in that trade.

On the Pacific Coast, Columbus Line will be the first to operate a fully containerized service to and from Australia and New Zealand with the introduction this spring of new containerships in that service.

Here's what happens with the new Raytheon Watchstander System for remote monitoring of engineering, cargo and bridge parameters — as well as spares inventory, fuel consumption, cargo control, dockside maneuvering, satellite navigation, or just about anything else you might need a computer to do:

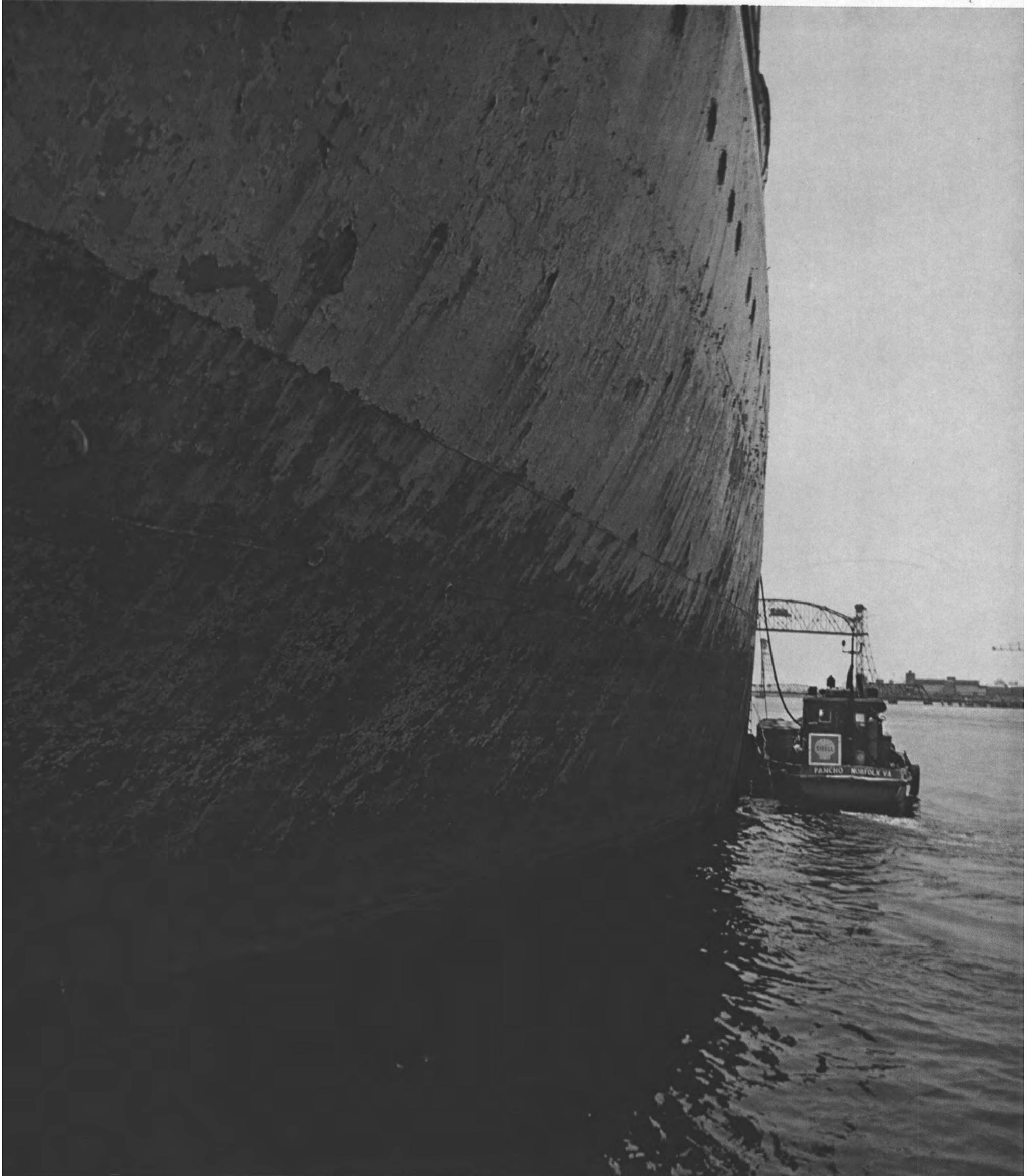
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—or 4,800 gals./hr. at Portland, Maine, or 4,400 gals./hr. at New York City. Altogether, Shell offers speedy, cost-saving bulk lube delivery at 13 major ports on the East, West and Gulf Coasts.

Motorships are saving time and costs with bulk oil delivery service offered by Shell's Agent, Marine Oil Services, Inc., Anders Williams Company, Norfolk, Virginia.

This firm uses two tank boats—one holds 13,500 gallons, the other 19,500 gallons, to service ships in Hampton Roads. Each boat is divided into two compartments and can deliver up to 4,000 gallons of Shell Lubricants per hour to ships' tanks.

Advantages to ship owners

With this speedy tank-to-tank delivery system, there is less chance of product contamination, and only minimum assistance is needed from ship crews. In addition, there is no interference with cargo operations. Delivery is faster and less hazardous than with drums. Still, both of the tank boats frequently carry drums on deck, in addition to full tanks below, to fill smaller orders.

Use of Shell MELINA® Oil increasing

Demand for multi-purpose MELINA Oil is increasing for both slow speed crosshead-type diesels—including Sulzer, MAN, B & W, Gotaverken, Fiat, Stork—and medium and high speed trunk piston engines. MELINA Oil protects engine parts against wear and corrosion, and resists oxidation over a long service life. MELINA also satisfies the requirements of other shipboard equipment such as gear transmissions, variable pitch propellers, steering gear, turbochargers and air compressors.



Shell Representative, John Barnett, discusses some of the advantages of MELINA Oil with Chief Engineer, Demetrios Kalisporis. MELINA Oil neutralizes acids that straight mineral oils cannot.

◀ Marine Oil Services' tank boat, Pancho, pumps Shell MELINA Oil into the Greek tanker, Captain Xilas. Pancho's pumps can deliver 4,000 gals./hr. from her 19,500-gallon tanks. This fast, clean delivery speeds ship turnaround time.



E. J. Wheeler, Manager of Marine Oil Services, Inc., opens an outlet valve so that ALEXIA Oil can be pumped at 55 gals./minute into a waiting tank boat. Four insulated 10,000 gallon storage tanks hold Shell lubricants at a constant 120°F., permitting fast flow in any season.

Marine Oil Services also offers TALPA® Oil, a specially refined straight mineral oil, for engines not requiring additive type lubricants. And Shell ALEXIA® Oil is in demand for engines with separate cylinder lubrication because of its anti-wear and acid-neutralizing properties.

Start saving with the speed and economy of bulk delivery of Shell lubricants at Seattle, Portland, Oregon; San Francisco, Oakland, Los Angeles, Houston, Galveston, Texas City, New Orleans, Hampton Roads, Philadelphia, New York and Portland, Maine. Call your nearest Shell Transportation Sales Office listed below:

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Star Straddle Carriers To Be Installed At APL Terminal In San Pedro

Star Iron & Steel Co., Tacoma, Wash., has been awarded a contract for the construction, delivery and assembly of six large Star Karrison straddle carriers for American President Lines' Los Angeles Harbor Terminal at San Pedro, Calif., it was announced by **Thomas Lenahan**, president of Star. The

straddle carriers will be working in conjunction with a 40-ton capacity Starporter container crane, which is already operating at dockside in APL's new facility, specifically renovated for container handling. The Starporter was also supplied by Star Iron & Steel (a wholly owned subsidiary of Breeze Corporation, Inc.).

Star Karrison carriers have a number of unique operating features, including their capability to stack

containers three-high. Most straddle carriers will only stack such containers two-high. They will travel at speeds up to 15 mph, and can hoist at speeds up to 32 fpm.

The Star Karrison carriers also feature a fully automatic telescopic spreader, which extends to appropriate lengths of different size containers and locks mechanically by push-button control, even while the machine is traveling. The spreader can also be side shifted and slewed

to pickup irregularly positioned containers.

Twin diesel-hydraulic power units drive hydrostatic motors on all four wheels and on the independently controlled front and rear hoists. Fail-safe disc brakes are coupled to each drive and hoist motor.

Star Karrison carriers are manufactured by Star Iron & Steel Co. under license from Rubery Owen & Co., Ltd., England. The first three Star Karrison carriers will be in operation this month. The second three are scheduled for delivery in mid-1973.

\$2,000,000 helper for Antigua Pit Stop

New tanker refueler helps reduce cost, bunkering time.

The strategic location of Antigua in the Northeast Caribbean and our extensive marine facilities have always been good reasons for you to Bunker Antigua.

But now, with the addition of the modern M.T. BUNKER ANTIGUA, we're making it even more worthwhile. Some important particulars on the M.T. BUNKER ANTIGUA include: capacity approximately 42,000 barrels, pumping rate in excess of 5,000 barrels per hour, carries all grades of marine fuels as well as potable water.

M.T. BUNKER ANTIGUA ensures prompt delivery and quick turnaround to ocean-going vessels of all types and sizes including mammoth tankers, OBO's, container ships and cruise liners.

To find out all the advantages of bunkering Antigua or to place orders, contact our agent nearest you.



U.S. Freight Elects Julio Del Valle VP Marine Activities



Julio Del Valle

Julio Del Valle has been elected vice president of United States Freight, it was announced by **G. Russell Moir**, chairman and president. Mr. Del Valle is responsible for all marine activities of the diversified domestic and international transportation holding company.

Mr. Del Valle, who had been assistant vice president of USF prior to his new appointment, has spent his entire business career in the marine transportation industry. He joined USF in 1966 as vice president and general manager of Coordinated Caribbean Transport, Inc., a wholly owned subsidiary which operates a roll-on/roll-off service between Miami and Central America. One of his first assignments was to design and supervise construction of the trailership Mar Caribe, which entered Central American service in December 1968. He was named assistant to the president of USF at New York headquarters in 1969, and assistant vice president in 1971.

Born and educated in Havana, Cuba, Mr. Del Valle was employed as manager of agency traffic in New York by Garcia & Diaz, Inc., steamship agents, from 1951 until joining C.C.T.

Barges To Be Built From C-4 Midbodies For Coastwise Trade

Plans to convert four C-4 midbodies into eight deck cargo barges for the U.S. coastwise trade has been approved for Government construction and mortgage insurance by the Maritime Administration.

The applicant is World Service Inc. of New Orleans, La. Slocum Iron Works Inc., Mobile, Ala., will do the conversion.

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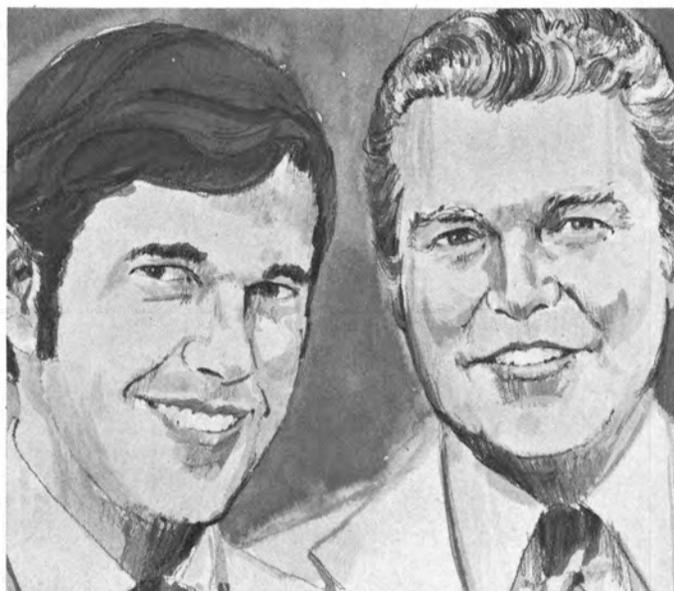
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In considering a yard for the design and construction of their 7000 HP M/V Jean Gladders, Warren and Tom Gladders knew what they wanted and where to get it. To quote them further:

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“As a small but growing company, getting into the heavy power market was a big step, and we couldn’t afford *not* to select the best, so we could offer *the best*. Maximum operating efficiency and quality



of workmanship were our main criteria.

“Thirty southbound loads out of Cairo on her maiden trip, with exceptional handling and excellent shove and speed northbound, proved to us

that Hydrodyne and St. Louis Ship had once again fulfilled our every expectation. We’re glad we again selected Hydrodyne.”

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Harland And Wolff To Build Six Maritime Fruit Tankers At Total Cost Of \$330 Million

Maritime Fruit Carriers Company Limited has announced that Island Fruit Reefers Shipping Company Limited, its English subsidiary, has ordered, subject to fulfillment of certain financing conditions, on behalf of Maritime's wholly owned U.S. subsidiary, General Maritime Corporation, six 333,000-deadweight-ton Very Large Crude Carriers from Harland and Wolff Limited, Belfast, Northern Ireland.

The vessels will be built at Harland and Wolff's Belfast Works, where additional new facilities are to be constructed. Each vessel is expected to cost between \$53 and \$56 million, giving the total transaction a value of up to \$330 million. Though not yet approved, financing for this order of tanker tonnage is intended to be arranged through an 80 percent

U.K. Government guaranteed mortgage and the balance by the company, probably through a lease transaction.

Delivery of the first vessel is expected in late 1975, with the other five coming during 1976 and 1977.

This supertanker order marks the third since mid-1972 by and for General Maritime Corporation, involving up to 12 such vessels. On January 8, 1973, it was announced that Maritime Fruit Carriers had signed a letter of intent for General Maritime with Todd Shipyards Corporation for the construction by Todd of three 380,000-deadweight-ton supertankers, with an option for three additional such vessels.

On June 30, 1972, it was announced that General Maritime Corporation would time-charter three 265,000-deadweight-ton supertankers to be built by Bethlehem Steel Corporation.

Maritime Fruit Carriers Company Limited

is a multinational organization, specializing in refrigerated shipping and oil transportation. It is intended that Maritime Fruit will concentrate its future VLCC activities in its U.S. subsidiary, General Maritime Corporation.

Astilleros Launches Largest Tanker Built At Sestao Yard



The 110,000-dwt tanker Orduna just after sliding into the water at the Sestao Shipyard of Astilleros Espanoles.

The Sestao Shipyard of Astilleros Espanoles, S.A., recently launched the largest tanker to be built at their Biscayan yards—the 110,000-dwt Orduna. This vessel is being constructed for Naviera Vizcaina S.A.

The Orduna has a length overall of 906 feet 11 inches, a length between perpendiculars of 861 feet, a beam of 127 feet 11 inches, a depth of 62 feet 4 inches, a draft of 49 feet 9 inches and a cargo-tank capacity of 4,766,850 cubic feet. The ship has four center and 10 wing tanks. It was designed for the carriage of three different grades of crude oils at one time.

The main propulsion plant consists of an AESA-Burmeister & Wain 9K84EF diesel engine, developing 24,750 bhp at 121 rpm. This engine was built at the Bilbao Works of Astilleros Espanoles. The anticipated speed in ballast conditions is 17½ knots. The machinery plant is automated sufficiently to obtain the U.M.S. Class from Lloyd's Register of Shipping.

The building berth left free by the Orduna has been occupied by the construction of an 80,000-dwt bulk carrier being built for the King Line, Ltd. On another berth, the 35,000-dwt tanker Khanaquin, being built for the Iraqi Maritime Transport Company, is nearing the launching stage.

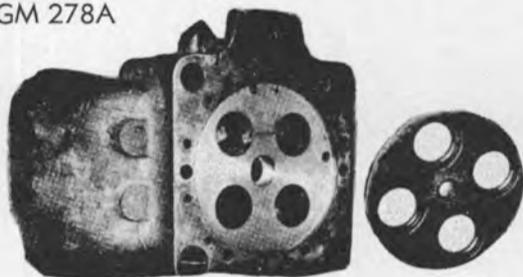


MITSUI-BUILT ORE/OIL CARRIER: The 183,526-dwt ore/oil carrier Arafura Maru was recently delivered to her co-owners, Mitsui O.S.K. Lines and Sawayama Steamship Co., by Mitsui Shipbuilding & Engineering Co., Ltd. As a significant feature, the vessel is designed to give better visibility from the wheelhouse located aft, although she measures 1,024 feet long. Driven by a B&W 8K98FF diesel engine with a maximum continuous output of 30,400 bhp at 103 rpm, she marked a maximum trial speed of 16.71 knots. Approximate general dimensions are 1,024 feet in overall length, 984 feet in bp length, 79 feet in depth, and a full-load draft of 59 feet. The Arafura Maru is to transport ore from Australia to Japan, and crude oil and ore from the Persian Gulf, Europe and South America to Japan.

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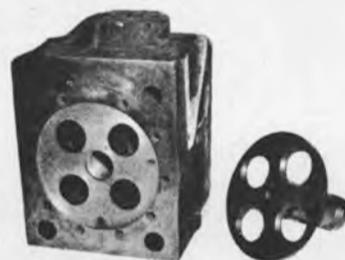
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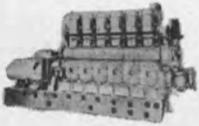
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DIESEL GENERATOR SETS

250 KW DIESEL GENERATOR SET

1



ENGINE: Enterprise 12 x 15 DSG-6—6 cyl.—450 RPM crank No. 50J. GENERATOR: Westinghouse 250 KW—120/240 DC—1040 amps—450 RPM. Typical serial No. 35-10P-913. Complete with switch gear.

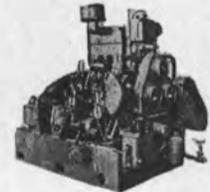
EMERGENCY GENERATOR SUPERIOR 75KW 120/240 VOLT D.C. DIESEL GENERATOR SET

2

With switchgear. ENGINE: Radiator cooled Superior GBD-8—6 cylinder—1200 RPM GENERATOR: Electric Machinery Co.—120/240 volts DC—316 amps—1200 RPM—stab. shunt.

UNUSED 10 KW SUPERIOR DIESEL GENERATOR SET

3



GENERATOR: Delco 10 KW—120 VDC—83.3 amps—1200 RPM. ENGINE: Superior diesel—2 cyl.—4 1/2 x 5 3/4—15 HP—heat exchanger cooled.

500 KW—120/240 VOLT DC DIESEL GENERATOR SET

4



GENERATOR: Allis Chalmers—Compound wound. Has Class "A" insulation. Output 500 KW—120/240 volts DC—2080 amperes—720 RPM—drip-proof—self-cooling. Ambient 50°C—temperature rise 40°C. ENGINE: Model GM 8-278—2-cycle—Vee type—8 1/2 x 10 1/2—air starting—720 RPM. Complete with switchgear. Condition very good. Still aboard naval vessel.

TURBO GENERATOR SETS

300 KW DIESEL GENERATOR SET

5



ENGINE: G.M. 6-278—6-cylinder—2 cycle—8 3/4 x 10 1/2—750 RPM—with oil and water Ross Shell and Tube Heat Exchangers, instrument panel, pyrometer, etc. Vibro Isolators. GENERATOR: G.E. 300 KW—120/240 volts DC—1250 amps—shunt wound—continuous overload rating 375 KW—2 hours—55° Weight of unit approximately 26,000 pounds. Complete with shock mounts. Unit 13' 2" long, 64" wide, 8' high.

UNUSED 300 KW—240 VOLT DC WESTINGHOUSE LOW-PRESSURE TURBO-GENERATOR SET

6

GENERATOR: 300 KW—240 VDC—1250 amps—1200 RPM. GEAR: 5286/1200—frame 6x15—serial 10A-2612-4. TURBINE: Frame C-325—225 PSI—397° TT—5286 RPM—Serial 10-A-2611-4. Wt. 16,700 lbs.—complete in original factory crate.

WESTINGHOUSE 440/3/60 200 KW UNIT

7



GENERATOR: Westinghouse 200 KW—250 KVA—450/3/60—1200 RPM—80% PF—with 40 KW—120 VDC on same shaft. GEAR: 9989/1200 RPM—double helical. TURBINE: Westinghouse—540 PSI—super-heat 322°F. Test 930 PSI 800°TT. Also operates 615 PSI—850°TT.

6 EQUAL-TO-NEW LATE TYPE 500 KW SHIPS SERVICE TURBO GENERATORS

8



1962—DeLaval. Very little use. Completely preserved with rotors and diaphragms crated separately. TURBINE: DeLaval—585 PSI—840°TT—6-stage—6391 RPM—class CD—Also suitable 440 lbs.—740°TT—25" vac. GEAR: 6391/1200 RPM. GENERATOR: Allis-Chalmers—450/3/60. Totally enclosed, with static exciter and voltage regulator system. Weight 17,665 lbs. Complete with latest dead front switch gear. Also available are the condensers, circulating and condenser pumps. All very up-to-date, compact construction. Turbines will easily handle 600 KW if up-grading is desired.

UNUSED 300 KW—120/240 VOLT DC G.E. TURBO-GENERATOR SET

9

GENERATOR: 300 KW—120/240 VDC—1250 amps—1200 RPM. REDUCTION GEAR: 8.344:1—10012/1200 RPM—type S-182. TURBINE: DOR418N—449 H.P.—10012 RPM—working pressure 180/220 PSIG.

10



1250 KW G.E. 10-STAGE TURBO GENERATOR SET

TURBINE: 525—615 PSI—850°TT—7938 RPM—10-stage—type FSN. GEAR: Single helix—7938/1200. GENERATOR: 1250 KW—450/3/60/3600—80 PF—type ATB with surface air cooler. Overload 25%—2 hours—1563 KW.

11



AP2 VICTORY WORTHINGTON-MOORE CROCKER-WHEELER 300 KW UNIT

TURBINE: 440 PSI—740°TT—28 1/2" vacuum—type S4—5-stage—6097 RPM—serial 7547 & 7548. GEAR: 6097/1200. GENERATOR: 300 KW—120/240 volts DC—1250 amps—compound wound—973643-999759. Armature flange 8 1/2"; B.C. 7"—12 holes. ALSO NEW ARMATURES IN STOCK & 300 KW SHUNT ARMATURES.

12



VICTORY 300 KW WESTINGHOUSE TURBO GENERATOR SET

440#—740°F—5930 RPM—2A-9794-15-16-17—coupling non-recessed on steam end of pinion—5 3/4". GENERATOR: Westinghouse 300 KW—120/240 DC—1250 amps—1200 RPM—C.B. 208.4.

UNUSED CROCKER-WHEELER 500 KW GENERATOR ENDS ONLY 120/240 VOLTS D.C.—1200 R.P.M.

13

FORMERLY USED WITH WORTHINGTON-MOORE TURBINES & GEARS

Upgraded by U.S. Navy—rewound in glass. Generator Frame and Armature—Marine 500 KW type 3-1200—dripproof enclosure—base mount. Modified from Crocker-Wheeler generator frame 152HD—240/120 volts DC—2083/521 amps—1200 RPM. Ambient temperature 50°C. APPLICATION: For C-4-SA1; C-4-SA-3; T-AP-134 vessels, using Worthington-Moore Turbine—Form S-6 and generator Form 14 x 10.

TURBINES & ROTORS

MAIN PROPULSION

14



19 STAGE WESTINGHOUSE H.P. ROTOR FOR AP2 VICTORY

Reconditioned—balanced—with ABS. Serial 4A-2079—type B—19 stage reaction blades. Excellent—just out of shop. 13" Flange diameter with 14 bolts.

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1 WESTINGHOUSE COMPLETE T-2 MAIN TURBINE

15

PROFILE (UNSHROUDED) 6600 HP—435 PSI—750°F 28" VAC.—3720 RPM

Instruction Book 6893—Serial #2A-9361-21. The turbine rotor blades, stationary blading, diaphragms and nozzles are all in unusually good condition.

IMMEDIATE DELIVERY—WITH ABS

8500 H.P. G.E. TURBINE

16

G.E. instruction book GEI16263—from ex-Navy Victory. L.P.—8-stage—3509 RPM—77943 H.P.—8-stage—6159 RPM—77942.

WILL INTERCHANGE WITH INGALLS C3 HULL—442 CLASS AND SUN-BUILT C4 VESSELS

NEW L.P. BLADE RINGS

17

for large 8500 H.P. Victory Joshua Hendy Westinghouse

NEW 8500 H.P. G.E. TURBINES

18

Large Victory or Ingalls C3

L.P.—8-stage—3509 RPM—#72271 H.P.—8-stage—6159 RPM—#72272

ALSO AVAILABLE

U.S.M.C. RECONDITIONED SET H.P. & L.P.

L.P.—8-stage—#77987—3509 RPM H.P.—8-stage—#77994—6159 RPM Interchange Ingalls C3

19



T2-SE-A1 MAIN PROPULSION ROTOR — G.E.

Large Schenectady — serial 77418—reconditioned Bethlehem Steel 1970—all stages magnafluxed.

2 COMPLETE G.E. TURBINES

20

#61818 and #61834—large Lynn—all stages magnafluxed.

WILL INTERCHANGE WITH ELLIOTT MAIN TURBINE

21

8500 H.P. G.E. — C-3 OR VICTORY

H.P.—8-stage—6159 RPM—serial 62043 L.P.—8-stage—3509 RPM—serial 62042 G.E.I. 16263

22

6000 H.P. G.E. — NORTH CAROLINA C-2

H.P.—8-stage—serial 78040 L.P.—7-stage—serial 78043 G.E.I. 16262

VICTORY SHIP AP2 H.P. & L.P. TURBINES

23 NEW — UNUSED — 6000 HP SETS
G.E.—H.P. & L.P.—with throttle valve
Westinghouse—L.P.—with throttle valve
Allis-Chalmers—H.P. & L.P.—with throttle valve

AUX. GEN. ROTORS AND ARMATURES

250 KW & 300 KW ALLIS-CHALMERS ROTORS



24 Typical serial No. 3067—will interchange with most 250 KW & 300 KW Allis-Chalmers as installed on Victory's and Moore C2-C3 vessels.

300 KW 5965 RPM JOSHUA HENDY

25 Turbine—3H-69 Gear—52269
Turbine—3H-52 Gear—52252
Turbine—3H-62 Gear—52262

AUX TURBINE ROTORS AND ARMATURES

UNUSED—4 UNITS AVAILABLE T2 AUX. T2 TURBO GEN. ROTORS



26 DORV — 325M — 5645 RPM—for 525 KW G.E.

ARMATURE

27 Allis-Chalmers 300 KW armature—120/240 volts DC—type MCW-213 (#138511-13819J generators).



28 G.E. 8500 H.P. REDUCTION GEAR FOR LARGE AP3 VICTORY & C3

MD-48A—8500 HP—6159/3509/763/85 RPM.

29 ALSO 6000 H.P. VICTORY AP2 REDUCTION GEAR

Westinghouse 4A-1640.

PUMPS



30 WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP

1400 GPM @ 110 PSI—suction lift 11.5 ft.—steam back pressure 15 lbs. 14" Suction—10" Discharge—2 1/2" Steam—4" Exhaust—Overall width 6'8"—Overall height 9'1 1/2"—depth 3'9 1/2"—wt. approx. 10,000 lbs.



31 NEW BLACKMER FUEL OIL TRANSFER PUMP

Rotary—50 GPM—50 lbs.—2"—5 HP—440/3/60—with starter & spares.



32 UNUSED BLACKMER VERTICAL ROTARY PUMP

4"—100 GPM—100 PSI—15 HP—440/3/60—gear head.



33 UNUSED AURORA PUMP

300 GPM—37' head—5 HP—120 volts DC Centrifugal Pump. Bronze—size 5x4—flanged. MOTOR: Reliance—super T.D.C. Electric Motor—5 HP—120 VDC—36.8 amps—1750 RPM—Frame L216A—with control by Cutler-Hammer. Excellent condition. Latest USN surplus.

34 NEW TURBINE DRIVEN FIRE AND GENERAL SERVICE PUMP



Allis-Chalmers 6x5 pump, type SKH—1200 GPM—125 PSI—3500 RPM. Coppus turbine type TF-22-2 1/2 — 3500 RPM. 273#—50° superheat.

NAVAL VESSEL SECTION FOR FLETCHER CLASS DESTROYERS



35 UNUSED DELAVAL 24.5 H.P. LUBE OIL PUMP

Turbine-driven main lubricating oil pumps—vertical rotary with horizontal worm geared turbine drive. 575# Steam pressure—5000 RPM—15# back pressure. GEAR: 5000/1035 RPM. PUMP: 550 GPM at 50 PSI—suction lift 10.0". Suitable for Fletcher Class Destroyer.



36 UNUSED SIZE 4 BUFFALO FEED PUMPS

Terry Turbine—BM—273 HP—550 RPM—exhaust 15 lbs—590 PSI—superheat 0°—425 GPM Buffalo Pump—discharge pressure 750 lbs—5" x 4"—built for USN DD destroyers.



37 UNUSED STEERING GEAR FOR ALL TYPES OF DIESEL & STEAM DESTROYER ESCORTS

Mfg by Hyde Windlass Co. Two 10 HP 440/3/60 1750 RPM gear motors driving 1500 PSI hydraulic pumps. TORQUE: 1,005,000 lbs.—7 1/2" diameter plungers—two power units with hand gear attachments—replenishing tank—6-way valve—differential control, etc.

ENGINE ROOM COMPONENTS

SUITABLE FOR BETHLEHEM SPARROWS POINT HULLS SERIES 4400/4500

38 COMPLETE TURBINE OR ROTORS ONLY

For Sparrows Point Hull 4518—29,000 GTDW—13,600 HP @ 109 RPM; 15,000 HP @ 112 RPM—585 lb. 840°TT—28 1/2" vacuum H.P. TURBINE—4688 RPM—Mfg Bethlehem—1630-H-9—L.P. TURBINE 2625 RPM—Mfg Bethlehem—#1630-L-9.

WESTINGHOUSE 400 K.W. SHIPS SERVICE GENERATORS

400 KW (500 KVA)—80% PF—1200 RPM—450/3/60. TURBINE: 585 lbs—840°TT—28 1/2" vacuum—9018 RPM—serial 10A4462-3 & 10A4462-4. GEAR: 9018/1200 RPM. A.C. GENERATOR: 500 KVA—400 KW—450 volts—641 amps—80%PF—3 phase 60 cycle—1200 RPM—CR 40°—excitation amps 41—excitation voltage 120. Instruction book 5442. Switch-gear available.



40 2 TURBINE DRIVEN CARGO PUMPS

WESTINGHOUSE C-25 TURBINE—Ingersoll-Rand 10GT pumps—500 HP—single-stage impulse turbine—455 lbs—590°TT—4 PSI exhaust pressure—frame C-25—Westinghouse 4540 RPM. Rotation CC when viewed from governor end. GEAR: 4540/1750 RPM: 4500 GPM at 125 PSI head—type 10 GTM—bronze 2-stage—14" suction—12" discharge.

COFFIN CG-4A FEED PUMPS

41 Max. 325 GPM—1760' head or 750 lbs. Steam Inlet 575 lbs.—540°TT—exhaust 20 lbs.—speed 760 RPM.

FIRE & BUTTERWORTH PUMPS

42 Warren Pump—450 gallons Per Minute—449 ft—71 HP—type 3-TL-2. TURBINE: 71 HP—545 PSI—540°TT—15 lbs G exhaust—3500 RPM.

SHARPLESS LUBE OIL PURIFIERS

43 350 GPM—75 ft discharge head—20 ft suction lift—type AE 15 V. 1 1/2 HP—440/3/60—3450 RPM—40°C temperature rise.

ANCHOR WINDLASS

44 Hyde 2-11/16"—12x14—100 PSI—steam—54,100 lbs.

INQUIRE FOR ALL OTHER ITEMS

Forced draft blowers, reduction gear parts, bilge and ballast pumps, main circulators, general service pumps, F.O. transfer pumps, lube oil service, standby feed pumps, condensate pumps, aux. circulating pumps, feed water heaters, wash water pumps, etc.



46 ALLIS-CHALMERS WINCH CONTROL PANEL

50 HP—230 VDC. Consists of motor control, magnetic breakers and resistor bank.

MISCELLANEOUS



47 3-TON CLYDE DOUBLE DRUM WINCH

3-ton double drum winch—10 HP—115 VDC—de-clutchable drums—with controls.



48 UNUSED 1135 SQ. FT. C.H. WHEELER CONDENSER

20" Ex. inlet—5/8" Cu-Ni tubes—with or without air ejector.



49 UNUSED 70 HP McKIERNAN-TERRY WINDLASSES

23 1/2" Chain and two 10640 lb anchor & 30 fathoms chain @ 30 FPM. 70 HP—230 volts—shunt DC motors—233 amps—550 RPM—55°C rise. Wildcat centers 47 1/2". Base 9'5" wide x 11' long. Weight 36,000 lbs.



50 NEW—UNUSED LINK BELT WINDLASS

1 5/8" and 7000 lb. anchors. 56" Centers—50 HP—230 VDC—spares.



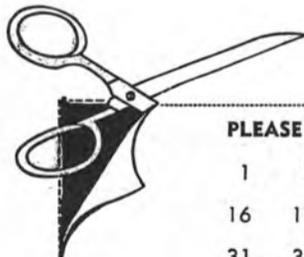
51 IDEAL WINDLASS—UNUSED

1-5/16" Chain—36" Centers—15 HP—115 VDC—1750 RPM—6000 lb. line pull.



52 DOUBLE INPUT—SINGLE OUTPUT DIESEL REDUCTION GEARS

Farrell-Birmingham — 3200 SHP. Reduction gear: 1.81:1—handles two 1600 HP diesels @ 720 RPM. With hydraulic couplings & Fawick clutch. Port and starboard. Gear output 400 RPM. Suitable for Dredge Pumps.



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46	47	48	49	50	51	52								

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World's Largest Methane Tanker Featuring Stainless Steel Tanks Delivers Full Cargo Of LNG

The world's largest methane tanker, *Gadunia*, 75,000-cubic-meter capacity, has delivered a full cargo of liquefied natural gas (LNG) to the new terminal facilities of Osaka Gas Co., Osaka, Japan.

Owned by Shell Tankers (U.K.) Ltd., the vessel was built by Les Chantier de L'Atlantique of France. *Gadunia's* five integrated membrane-type cargo tanks are based on designs of Gazocean/Technigaz of France. The tanks feature corrugated stainless steel bulkheads and balsa wood insulation to carry LNG at a temperature of minus 160 degrees centigrade.

According to Gazocean/Technigaz, measurements were taken of pressures and temperatures in insulated spaces and cargo tanks dur-

ing cryogenic trials to supplement data obtained during gas burning trials. High tightness properties of the primary barrier were attributed to an improved welding process developed for construction of the cargo tanks. At the end of the five-day cryogenic trials, it is reported that gas concentration in the inner barrier spaces remained below the sensitivity level indicated by monitoring devices.



The *Gadunia*, 75,000-cubic-meter capacity, is the first in a series of five LNG tankers of the same design. All five vessels will be used to transport LNG from Brunei to Japan.

The *Gadunia* is registered with Lloyd's Register of Shipping. She is the first of a series of five sister ships to be chartered to Coldgas Trading Ltd., a joint venture firm established by Shell, and Mitsubishi Corporation.

In addition to the five *Gadunia*-class vessels, the last of which is scheduled for delivery in 1974, Coldgas Trading is also to charter two other LNG vessels to be built incorporating the Gaz Transport membrane system for cargo tanks.

In Japan, three shipbuilders have contracted for rights to Technigaz technology—Nippon Kokan, Mitsubishi Heavy Industries, and Sumitomo Shipbuilding and Machinery.

Approximate measurements and main particulars of the *Gadunia* are: length overall, 845 feet; length between perpendiculars, 759 feet; extreme breadth, 114 feet; molded depth, 68 feet; loaded draft, 31 feet; maximum power, 20,000 hp, and speed, 18.2 knots.

Combustion Engineering Names Louis D. Scott New Corporate Vice President

Louis D. Scott has joined Combustion Engineering, Inc., Windsor, Conn., as a corporate vice president. In his newly formed post, Mr. Scott will be responsible for commercialization of selected major processes and systems developed within C-E, according to Arthur J. Santry Jr., president.

Formerly a corporate vice president for Polaroid Corporation, Mr. Scott was also general manager of that company's Film Division. Prior to that, he had spent 15 years with Monsanto, last as director of manufacturing. Earlier, he worked for seven years with Standard Oil of Indiana in a variety of executive posts.

"In his new corporate assignment, Mr. Scott will coordinate our efforts to bring major new products and systems to their fullest potential in the marketplace, and thus enhance our internal growth," Mr. Santry said.

A science graduate of the University of Illinois, Mr. Scott also has an M.Sc. degree in chemistry from Ohio State University and completed advanced work in organic chemistry at the University of Illinois.

Combustion Engineering's 1971 sales totaled \$1,066,000,000. The company provides a broad range of energy equipment, including fossil fueled and nuclear steam generating systems, petroleum and gas production processing equipment, refractories, minerals, pollution control systems, screening equipment, building products, tempered safety glass, nuclear components, and designs petroleum, chemical and petrochemical process facilities.

North American Tug Convention To Be Held April 30-May 3

The first North American Tug Convention will be held in the Hotel Vancouver, Vancouver, British Columbia, April 30-May 3, 1973.

Tug owners, tug designers, tug builders, tug captains, research organizations, Government bodies, and equipment manufacturers will gather under one roof to discuss all that is best and up-to-date in tugs. This will be the first time this has ever happened on the North American Continent.

At the end of the convention, the papers read and the discussions which follow, will be bound into a book that will undoubtedly become a standard book of reference for the whole industry.

The convention is being organized by Ship & Boat International, a British technical journal which deals exclusively with the smaller commercial craft, and is recognized as an authority on tugs and towage. Ship & Boat International, owned by Thomas Reed Publications, organized the successful 1st and 2nd International Tug Conferences in London, both of which attracted delegates from North America and 31 other countries.

In London, the discussions were lively and informed, with the delegates creamed from the top of an industry which stretches across the seven seas, and many more rivers. The North American Tug Convention promises to be every bit as lively and well informed.

The official reception for all delegates and their wives will be held on Monday evening, April 30, at the Vancouver Public Aquarium in Stanley Park, by kind permission of Dr. Murray Newman, director of the Aquarium, who has arranged for Skana, a magnificent killer whale, to show his paces.

Other receptions are planned by Vancouverites for out-of-town delegates and their wives.

On Thursday evening, May 3, a "no-host" banquet will be held in the Pacific Ballroom of the Hotel Vancouver, at which a strolling trio will regale the diners. There will be dancing later.

In conjunction with the convention, a small exhibition will be run in an adjoining room, and booths will be available for companies to exhibit equipment or models or display their literature, etc.

Secretaries will be available for delegates who have business letters to dictate. Canadian Pacific will have a flight desk, and local tours will be available.

A number of films have been promised, and to enable all the delegates and ladies to see these, a separate room has been hired in the hotel, where there will be a film show every afternoon.

On Friday, a log-dumping demonstration in Howe Sound is being arranged by some members of the British Columbia Towboat Owners Association, and possibly a visit to the booming grounds or a pulp mill.

For further information, contact Kenneth D. Troup, Marine Editorial Director, Thomas Reed Publications, Saracen's Head Buildings, 36/37 Cock Lane, London, EC1A 9BY.

Boise-Griffin Steamship Moves To New Offices

Boise-Griffin Steamship Co., Inc., announced that it has moved and that its offices are now located at One World Trade Center, Suite 3811, New York, N.Y.

Boise-Griffin acts as agents for Concordia Line, Norwegian America Line, Atlantic Gulf Service, Finnlines, Atlantrafic Express Service, and Nedlakes Services.

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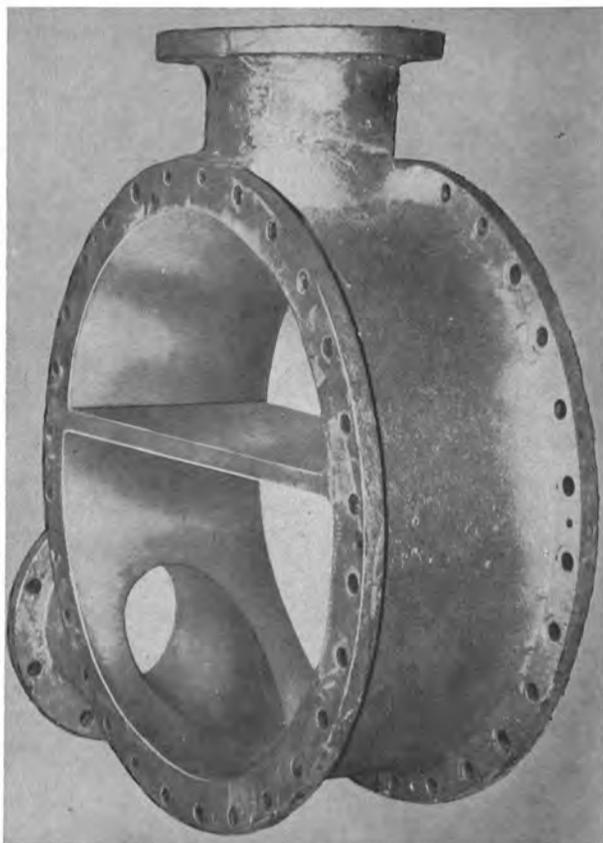
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Farrell Lines Inc. Reassigns R.H. Ballard And T.R. Tarbox



Capt. Raymond H. Ballard



Thomas R. Tarbox

Thomas J. Smith, president of Farrell Lines Incorporated of New York, N.Y., has announced the appointment of Capt. Raymond H. Ballard as manager of its Washington, D.C., office. He has replaced Capt. Paul F. Duffy, who was transferred from Washington to New York to assume special new responsibilities in that area.

A graduate of the U.S. Merchant Marine Academy at Kings Point, N.Y., Captain Ballard joined Farrell Lines as a third mate in April 1945, and became a master in August 1956. In 1962, he had six months of shore duty in Cape Town, South Africa, and in 1963, four months in Johannesburg. In February 1964, he was appointed resident manager for West Africa, and in May 1967, he was made resident manager for South and East Africa. He was appointed managing director of Farrell Lines International Corporation in October 1967.

At the same time, Mr. Smith stated that Thomas R. Tarbox would be sent to Johannesburg to assume the duties of resident manager for South and East Africa.

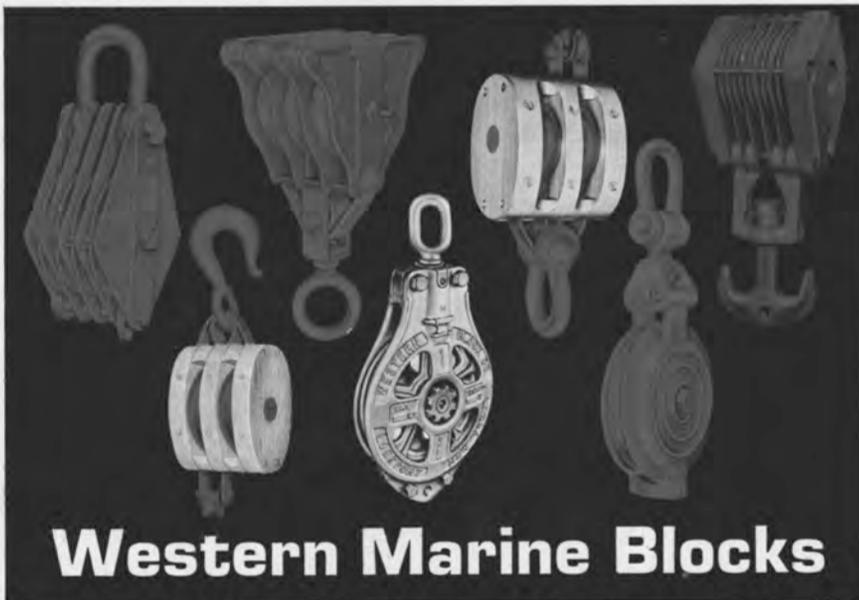
Born in Buenos Aires, Argentina, Mr. Tarbox attended Choate School in Wallingford, Conn., and received a bachelor of arts degree from Williams College. He joined Farrell Lines in 1965 and began a two-year assignment in Liberia. Returning to the United States in 1967, he was assigned to the Philadelphia office, and in 1968, he joined the New York sales department. In February 1971, Mr. Tarbox was appointed resident representative for East and Central Africa, with headquarters in Nairobi, Kenya. He returned to the United States early in 1972 and took up duties in the sales department until his present assignment.

American Tunaboat Association Announces Officers For 1973

The annual meeting of the American Tunaboat Association was held in San Diego, Calif., to review the year's activities and to elect executive officers for the new year.

Lou Brito, the Association's 1972 president, was honored for his contributions and was presented with a memento of appreciation. The 1973 slate of officers was announced as follows: president, Joe Medina Jr.; vice president, Julius Zolezzi; secretary, Daniel Marks; and treasurer, George Alameda.

Special concern was expressed by tuna boat owners with regard to increasing vessel construction and closed season allocations for small purse seiners. As a result, A.T.A. adopted the following Resolutions for 1973: (a) to request Federal suspension of the construction tax reserve program regarding tuna vessel construction for new vessels entering the fleet in 1974; (b) to request suspension of the Puerto Rican income tax exemption for new tuna vessels operating out of Puerto Rican ports, commencing in 1974, and (c) to request consolidation of all purse seiners of 400-tons carrying capacity or less into a single small-boat allotment for the Eastern Pacific yellowfin tuna closed season, commencing in 1973.



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Globe Engineering Demonstrates Ingenuity In Performing Modifications To SEDCO 135



SEDCO 135 resting on the bottom of the Duncan Dock at Capetown, South Africa, while Globe Engineering Works performed modifications to the mooring arrangements.

Ingenuity and know-how were displayed recently by Globe Engineering Works, Ltd., of Capetown, South Africa in the performance of modifications to SEDCO 135, one of the world's largest column-stabilized semi-submersible offshore drilling rigs. The owners of the rig, SEDCO, Inc. of Dallas, Texas, had chartered the unit to the oil-exploration combine of Chevron/Caltex/Soekor to operate in their concession in the Mossel Bay area off the east coast of Africa. Due to the weather conditions in this area, the owners felt that certain modifications would be necessary prior to going into operation. Globe Engineering, through its New York representative **James R. Porter**, received the modification contract.

Basically these modifications centered around the mooring arrangement of the triangular-shaped rig where it was necessary to modify the platform at the top of each of the three corner columns to accept larger and heavier mooring winches. The immediate problem was the fact that even with the rig submerged to rest on the bottom of Duncan Dock, the height of the main deck (166 feet) was such that the floating crane could not be utilized to lift the new components into position. It was therefore de-

termined that a special "A" frame derrick be manufactured and mounted on the top of each corner caisson in turn to make the heavy lifts.

After the removal of the anchors, old mooring chains, wire rope and existing fairleads, the rig was submerged to rest on the bottom in the Duncan Dock. The 60-ton capacity floating crane was used to remove the existing three anchor winches and to install the heavy-lift "A" frame derrick. After cutting away and lowering the existing platforms, new platforms which had been manufactured ashore, were lifted and welded in position. Each platform weighed over 30 tons.

Thereafter, the nine new winches which had been shipped from the United States were lifted into position and the new mooring ropes spooled onto the winch drums. Each winch weighed in excess of 52 tons and holds 4,800 feet of three-inch diameter wire rope. On completion of the heavy-lift program, the rig was raised and the new fairleads installed on the lower part of each column.

In addition to these essential modifications, other work was performed on the drilling rig, such as modifications to the diving platform and living accommodations.

could, therefore, radically alter the viability of using gas turbines in merchant ships.

KHI concluded a license agreement with Rolls-Royce (1971) for the manufacture in Japan of industrial and marine versions of the Olympus gas turbine.

KHI, in addition to its gas turbine activities, is engaged in merchant shipbuilding and operation, and thus brings to the study of new marine gas turbine applications a wide experience in the mercantile field.

At present, Rolls-Royce supply over 90 percent of the world's gas turbine horsepower for naval ship propulsion, and brings to this study nearly 20 years of experience with gas turbines at sea.

N.Y. Metropolitan Section Hears Paper Describing The Pilot Vessel New York



Principals shown above at the meeting in Fraunces Tavern are, left to right: **Robert G. Mende**, national secretary, SNAME; authors **Feridun K. Serim**, vice president and Washington branch manager, **Lester Rosenblatt**, president and naval architect, **Stuart H. Grossman**, chief electrical engineer, all of M. Rosenblatt & Son, Inc.; **Charles W. Wilson**, chairman, N.Y. Metropolitan Section, SNAME; **Donald B. Carpenter**, vice chairman, N.Y. Metropolitan Section; **Monroe D. Macpherson**, chairman, Committees on Sections, SNAME, and **Norman R. Farmer**, executive committee, N.Y. Section.

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers met on January 16, 1973, at Fraunces Tavern in New York City.

A social hour and dinner preceded the technical session, at which a paper was presented entitled "An Unusual Little Ship—Pilot Vessel New York," by **Lester Rosenblatt**, **Feridun K. Serim**, and **Stuart H. Grossman** of M. Rosenblatt & Son, Inc.

The pilot boat New York must maintain her station off Ambrose Light Tower in weather of every intensity for periods exceeding 30 days at a time. Her function is to provide pilot transfer capability and comfortable living facilities for the pilots who handle all inbound and outbound shipping for the Port of New York. This was to be done at minimum cost; consequently, the P/B New York is a work boat whose austerity is apparent in all

spaces except those used for pilots' messing and recreation.

The P/B New York is a 182-foot 6-inch length overall twin-screw twin-rudder diesel ship of 1,700 bhp, with a design displacement of 840 tons and a full load displacement of 914 tons.

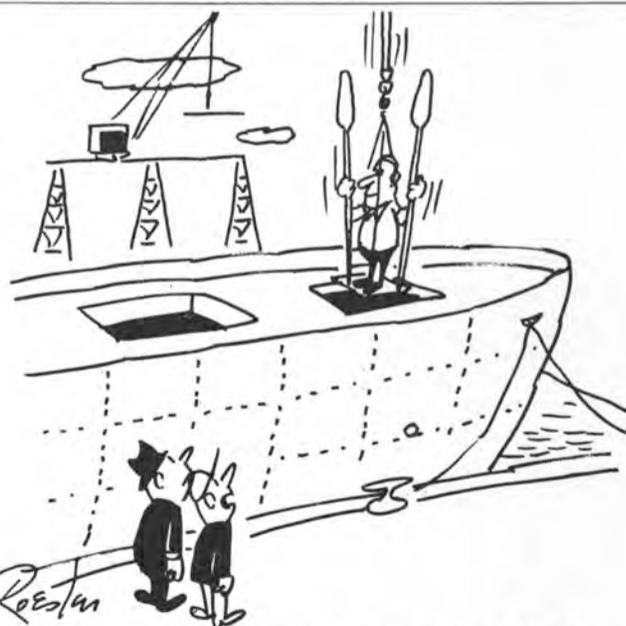
Although her design sustained speed is 14 knots, she has a maximum speed of more than 15 knots. The P/B New York was designed and constructed to meet the latest standards of the U.S. Coast Guard; U.S. Department of Health, Education and Welfare, and the requirements of the American Bureau of Shipping for classification + A-1 (E) Pilot Service + AMS.

The paper describes some of the major features of the pilot boat New York and presents the design approaches that were utilized in the development of a ship to meet the special requirements of pilot boat service for the Port of New York.

Rolls-Royce; Kawasaki Study Marine Uses For RB.211 Engine

Rolls-Royce (1971) Limited have agreed with Kawasaki Heavy Industries of Japan to carry out a feasibility study with the use of gas turbine engines in merchant vessels such as containerships, LNG tankers, and car ferries. The study will include the possibility of using a marinized version of the Rolls-Royce RB.211 engine, power plant of the Lockheed Tristar airliner.

A marine version of the RB.211 would have a specific fuel consumption significantly lower than the existing gas turbine, and approaching that of the diesel engine. The RB.211



"IT'S THE TREND. LESS ENGINE SPACE, MORE CARGO SPACE."

Atlantic Container Line Forms Air Charter Brokerage Firm

AOL Air Cargo Ltd., a new air charter brokerage firm, has been formed as a subsidiary of Atlantic Container Line, Ltd., New York, to meet the shipper's increasing demand for a total transport service.

O.I.M. Porton, president, Atlantic Container Line, U.S., described the

subsidiary as "a natural development of ACL's transportation philosophy and an extension of the company's operations on the North Atlantic, where thorough knowledge of cargo flow patterns, shippers' requirements and commodity characteristics has been gained."

Mr. Porton pointed out that ACL is not entering the freight forwarding business with the new venture. "We aim to provide an additional service for shippers and forward-

ers who normally use sea carriers but require air transportation from time to time," he said.

The new company will act as a broker between airlines and ACL general agents, who will have the responsibility for marketing and customer contact, according to Mr. Porton.

It is expected that the bulk of traffic will be trans-Atlantic, although charters will not be limited to that market. ACL general agents

have been actively engaged in the development of air charter services. Key sales and other personnel have been specially trained in air freight operations, and charter flights have been negotiated for operation between Stanstead, England, and Teheran, Iran. This facet of ACL's developing interests will now be directed by the new subsidiary.

In the fall of 1972, ACL and American Airlines introduced a through-service called Sea Jet One, providing an in-transit time of less than 10 days for cargo shipped from Europe to the western United States. The largest carrier on the North Atlantic, ACL operates 10 containerships with roll-on/roll-off capability in maintaining direct service between five North American and eight European ports.

B&W Names O'Brien Regional Manager General Industry Sales

Dudley A. O'Brien has been named regional manager of general industry sales for The Babcock & Wilcox Company's group marketing department in Chicago, Ill.

Mr. O'Brien, a sales engineer with the Charlotte, N.C., office since 1957, joined B&W in 1949 as a student engineer in the New York office, after receiving a B.S. degree in mechanical engineering from the Rensselaer Polytechnic Institute.

In 1950, he was made a service engineer in the Chicago office. In 1952, he was transferred to the power generation group headquarters in Barberton, Ohio, on special assignment and in 1953, was made a results engineer in the New York office.

Mr. O'Brien is a member of the American Society of Mechanical Engineers.

Carboline Coatings Forms Affiliates In Greece; New Zealand

Stanley L. Lopata, president of Carboline Company of St. Louis, Mo., announces the formation of new affiliates in New Zealand and Greece, as a part of the company's International Division.

Carboline Coatings Limited, a joint venture with Tapes and Coatings Limited of Auckland, New Zealand, will be responsible for sales, servicing and warehousing of Carboline products in New Zealand, Cook Islands, Fiji, and Samoa. The new company is located in Auckland, where the products will be manufactured.

Carboline Hellas Company, through Karcon General Agency Limited, Piraeus, will market Carboline products, principally to the marine industry in Greece.

Carboline Company manufactures a wide range of corrosion resistant protective coatings, tank linings, floor coatings and speciality products to all industries throughout the world. Company headquarters are located at 328 Hanley Industrial Court, St. Louis, Mo. 63144.



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But that's just a drop in Tioga's sea of marine capabilities. Our technical personnel will work with marine engineers and naval architects to show them what is available for a touchy application. They can help resolve problems in corrosion, temperature, pressure . . . or show how to reduce installation costs. And test results or pedigrees are available on almost every product. Tioga offers complete quality assurance procedures to meet all naval and industrial requirements.

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7, 9, 11, 22)

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A-312 A-358 A-376
MIL-P-1144B

Low Temp
A-333 A-334
(GR 1, 3, 6, 9)

Navy Specs
MIL-P-1144
MIL-T-6736
MIL-T-16286 (Ships)
MIL-T-16343
MIL-T-18165
MIL-T-20155
MIL-T-20157
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A-500-A & B
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A-234 A-350 A-403

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If you miss the North American Tug Convention, you could miss the boat.

The 30 April to the 3 May 1973 are dates that should definitely be in your diary. Because the North American Tug Convention is the one place you need to be if you're in the pulling and pushing business. Tug men from all over the world will be there. From America, Australia, Bahamas, Brazil, Canada, Fiji, Germany, Holland, Japan, Kuwait, Philippines, Portugal, Singapore, Sweden, UK and Venezuela. That's an awful lot of knowledgeable talk to listen to. A list of the papers for discussion is shown below. Take a close look at it and you'll realise what you'll miss if you're not there.

1 B.C. Towboat Owners Assoc, Canada, Inaugural Paper. 2 Cove, Hatfield & Company, Canada, Bulk petroleum barges. 3 German & Milne, Canada, An integrated tug/barge combination with particular reference to rough water. 4 United States Salvage Association, USA, North West Section. 5 Interstate Oil Transport Company, USA, The role of the tug in coastal trade. 6 Nickum & Spaulding Associates Inc, USA, Ocean Tug boat design. 7 A legal paper, USA. 8 Jackson-Talbot & Associates Ltd, Canada, Stability and trim of tugs at large angles of heel. 9 Allied Shipbuilders Ltd, Canada, A shipbuilder looks at tug design. 10 National, Physical Laboratories, UK, A rotating cylinder rudder. 11 Puget Sound Tug & Barge Co, USA, Instrumentation of modern tugs, and the effects on manning and servicing. 12 Acoustical Engineering Company, Canada, Noise control on British Columbian tugs. 13 Jones, Bardelmeier & Co Ltd, Bahamas, Large tug barge systems—an overview. 14 Marine Exploration Ltd, UK. 15 Robert C. McHaffie Ltd, Canada, A new type of vessel. 16 Voith Schneider, Germany, Safety in towing. 17 Hamburgische Schiffbau-Versuchsanstalt, Germany, Lateral thrusters with 'anti-suction' tunnels. 18 British Columbia Research Council, Canada, Motion compensation and towing in rough seas. 19 Anglo Saxon Construction, UK, Design of seagoing barges. 20 Lips NV, Holland, Nozzle Rings. 21 L. R. Glosten & Assoc's Inc, USA, Updating London paper. 22 K. T. Routley, Canada, Salvage award. 23 Adelaide Ship Construction, Australia, Stability of tugs with long fo'c's'le and low main deck at large angles of heel. 24 Barge Train, Inc, USA, Tug/barge linkage. 25 Pollution Control Systems (International) Ltd, Canada, Pollution control. 26 Department of Transport, Ottawa, Canada, The Impact of Canadian Towboat regulations. 27 Offshore Marine Ltd, Canada.

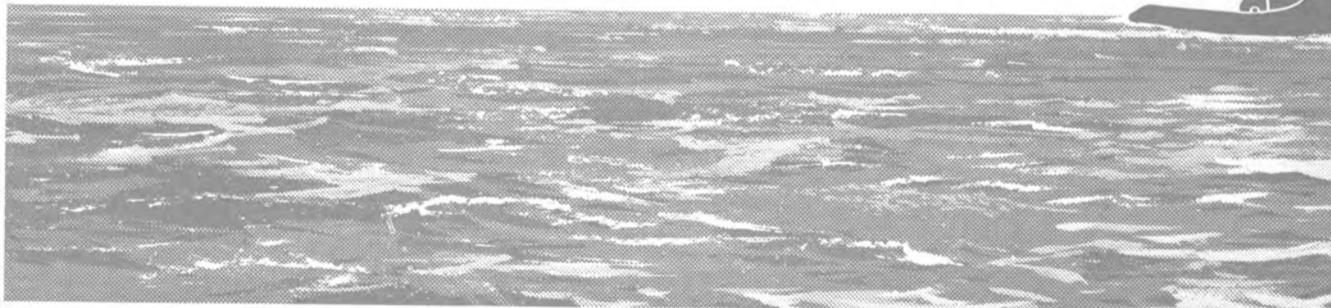
Hotel Vancouver, Vancouver, British Columbia, Canada
on April 30th, May 1st, 2nd & 3rd, 1973.

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Sea Containers Inc. Appoints Tatham VP

James B. Sherwood, president of Sea Containers Inc., has announced the appointment of **Nigel J. Tatham** as vice president-leasing. This is a newly created position at Sea Containers, which is one of the leading international companies supplying marine cargo equipment including containers, containerhips and container cranes.

Mr. Tatham is presently a main board director of Furness, Withy & Co. Ltd. which he joined in 1955, where he was responsible for the company's development and planning department and for new projects. At one point, he was general manager of Furness, Withy ship operations organization, and before that, as a director of the company's Prince Line, was responsible for group liner services to the Mediterranean.

Mr. Sherwood said: "This new appointment, which will strengthen our management, reflects the very rapid expansion of Sea Containers' shipping interests in recent years.

"We now own 17 containerhips and have another seven due for delivery during the current year, including some which are of completely new design. This growth in our shipping activities has been achieved in only three and a half years, and considerable further ex-

pansion in the future is planned."

Most of Sea Containers' fleet involves their Tarros concept of containerhip, a vessel which carries its own craneage aboard and so can operate independently of port-handling facilities. The company also owns a fleet of over 36,000 containers.

Dixie Carriers Names A.L. Wilson President



Archie L. Wilson

George A. Peterkin Jr., president of Kirby Industries, Inc., has announced that **Archie L. Wilson** has been elected president of Dixie Carriers, Inc., Houston, Texas, based operator of inland and offshore barges. Prior to the assumption of his new position, Mr. Wilson was president of Beaumont-based Dixie Transport Co. of Texas, and Western Lines, Inc.

Mr. Peterkin, who served as president of Dixie Carriers, Inc. for 20 years prior to being elected president of Kirby Industries, Inc., was named chairman of Dixie Carriers' board of directors.

Atlantic Steamers Named Distributor For Philadelphia Resins

Philadelphia Resins Corp., Montgomeryville, Pa., has appointed Atlantic Steamers Supply Co., Inc., as the exclusive distributor for their line of marine repair kits in the United States and Canada.

Kits and replacement parts are carried in stock at the general offices of Atlantic Steamers, 1100 Adams Street, Hoboken, N.J., and at branches in New York, Baltimore, Miami, New Orleans, and Houston. Preparations are being made to stock the equipment in Los Angeles, San Francisco, San Pedro, Seattle, Vancouver.

Ocean Shipping Supply Co., Montreal, a wholly owned subsidiary of Atlantic Steamers Supply Co., Inc., is the Canadian representative.

The repair kits are used for quick patching of piping, steam lines, and marine equipment at sea or in port using glass-tape reinforced epoxy laminate. Patched areas have exceptional strength, resist impact and abrasion, and are unaffected by water, hydrocarbons, most acids and alkalis.

Repair kit #1 has its own metal tool chest and is easily carried by one man. Mini-repair kit #2, and steam line repair kit #3 are packaged in sturdy reusable plastic pails.

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never runs hot and cold.

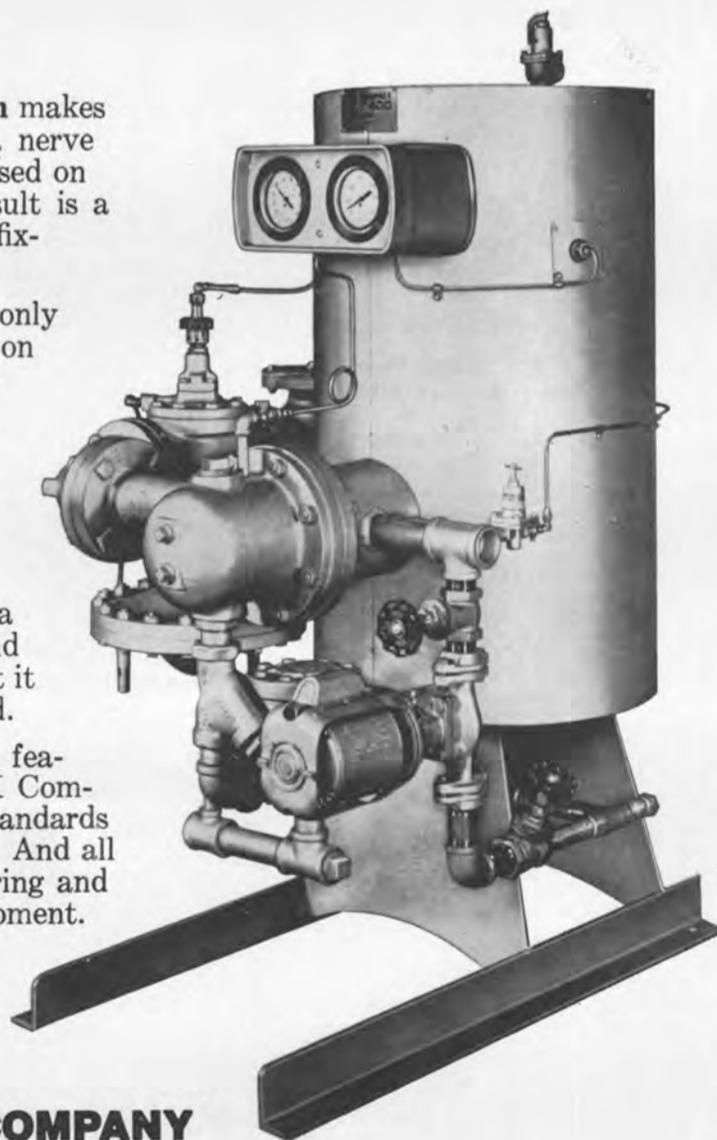
Its Unique Anticipator[®] Control System makes sure of that. The Anticipator, acting as a nerve center, continuously senses heat demand based on inlet water flow and temperature. The result is a constant supply of hot water to shipboard fixtures, with temperature controlled to $\pm 5^\circ$.

Packaged for quick installation — only five connections — the Compact 400 saves on labor costs. Routine inspection just means pulling out the tube bundle. And servicing is easy because the gaskets are all independent.

Compact but powerful, the marine 400 does the work of a conventional unit four times its size, delivering up to 660 gpm. For maintenance access, it requires a maximum of only 36" frontal clearance and no overhead clearance. You can even mount it on a bulkhead or hang it from the overhead.

Nonferrous Materials of construction feature an SB-96 copper-silicon shell. All P-K Compact 400s are built to ASME and ABS standards as well as to U.S. Coast Guard regulations. And all reflect our 93 years' experience in engineering and manufacturing reliable heat transfer equipment.

Send for Bulletin 400.



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Nabrico Appoints David D. Styers



David D. Styers

David D. Styers has been appointed controller and assistant secretary for the Nashville Bridge Company, Nashville, Tenn. The announcement of his promotion was made by William H. Barton Jr., president of the company. Prior to his advancement, Mr. Styers was in the accounting office and served as assistant to the treasurer. He has been with Nabrico slightly more than a year.

Mr. Styers attended Mississippi State University and Murray State University where he pursued a double major, accounting and business administration, and received his bachelor of science degree in August 1968. He is a certified public accountant, a member of the American Institute of C.P.A.'s, and the Tennessee Society of C.P.A.'s.

After graduation, Mr. Styers was employed by Genesco, Inc., and served in their internal auditing department. He was controller of Berland Shoe Company, a division of Genesco, Inc.

ASEA Introduces New Power Meter For Propeller Shafts

ASEA recently introduced a new generation of power meters for propeller shafts. This equipment is based on the TORDUCTOR® torque transducer, which up to now has been installed on board over 300 ships.

This transducer utilizes the phenomenon that the magnetic properties of a propeller shaft change when subjected to torque. No mechanical contact with the propeller shaft is necessary, the TORDUCTOR ring is mounted in two halves around the propeller shaft with a small air-gap between the shaft and the ring. There are no rotating elements or slip rings.

The magnetic field is generated by a series of primary coils, and a voltage proportional to the torque is induced in the secondary coils. Particular attention has been paid to the protection of the coils from water and moisture through the use of special insulation.

The propeller shaft speed is recorded by an electronic pickup mounted on the TORDUCTOR ring. This pickup operates with a metal band with punched holes, which is fastened around the propeller shaft.

The signals from the torque transducer and speed transducer are transmitted to the electronic control unit for signal processing. This control unit is based on ASEA's COMBI-FLEX modular system for the assem-

bly and wiring of electrical and electronic units, and is built up from plug-in modules specially designed to withstand the severe environmental conditions on board ship. The TORDUCTOR torque transducer, speed pickup and control unit all meet the requirements of regulatory bodies as concerns temperature, vibrations, moisture, etc. No costly calibration is required.

The standard version of the new ASEA power meter has outputs for

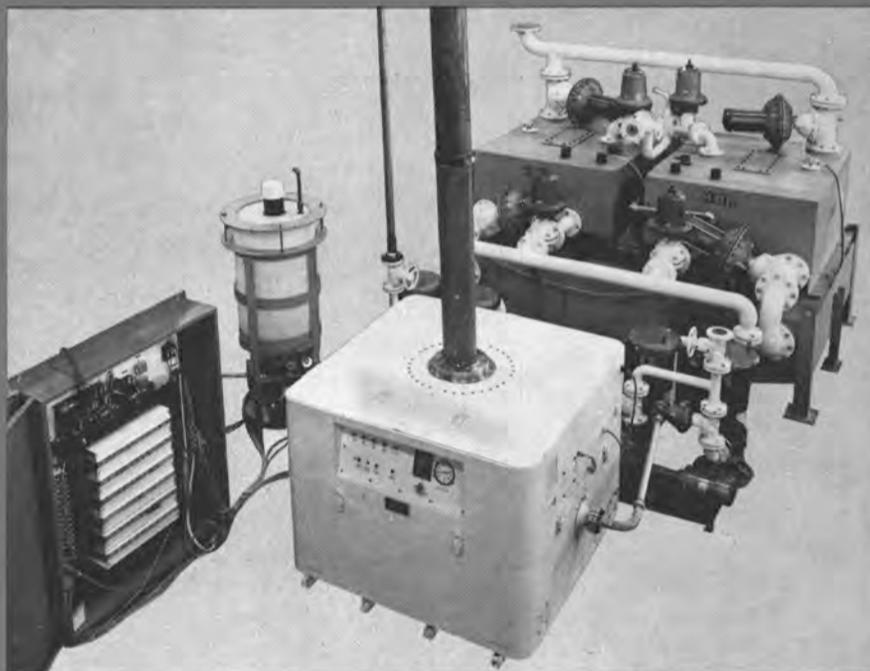
instruments and recorders for torque, rpm, and power. In addition, it is available with energy outputs for shp/hr, kw/hr, etc. ASEA can also supply complete installations with outputs for torque, rpm, power, energy, total fuel consumption, and fuel rate.

ASEA power and fuel-rate meters are manufactured and serviced in the United States by Stal-Laval, Inc., 400 Executive Boulevard, Elmsford, N.Y. 10523.

James R. Porter Relocates Offices

James R. Porter, U.S.A. representative for O.A.R.N. Shipyard, Genoa, Italy; Globe Engineering Works Ltd., Capetown, South Africa; James Brown & Hamer Ltd., Durban, S.A., and Coastal Marine Service, Port Arthur, Texas, has announced the relocation of its offices to 250 Park Avenue, Suite 322, New York, N.Y. 10017.

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Koehler-Dayton's MSTs System incorporates the principals of recirculation, separation, containment, and reduction into one of the most technologically advanced marine waste management systems on the market today. The process meets every current legislative requirement and most certainly every future legislative requirement due to the fact that the end result of MSTs process is "O" discharge.

The MSTs System shown above was designed for a 3,500 passenger New York Ferry. Unique in design and simple in operation, the system uses treated liquid wastes for flushing purposes and reduces solids to ash in a highly efficient thermal chamber. For more information call or write: Koehler-Dayton, Inc. Department MSTs, P.O. Box 309, New Britain, Connecticut.

Koehler-Dayton

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AG 'Weser' To Build Two 'Europa-Tankers' For Niarchos Group

Two companies of the Niarchos Group have each ordered one of the 380,000-dwt turbine tankers known as the "Europa-Tanker," developed by AG "Weser," Bremen, Germany.

The largest ship ever to be built at a German shipyard, the "Europa-Tanker" has the following approx-

imate measurements and principal particulars: length overall, 1,214 feet; beam, 210 feet; depth, 94 feet, and draft, 72 feet. The ship is propelled by an AG "Weser"/General Electric geared steam turbine with an output of 45,000 shp, giving the ship a trial speed of about 16 knots. The ships will be built to ABS class and include IMCO requirements of October 1971.

The ships are scheduled for delivery in 1975 and 1976.

APL Names Porter Manager Military And Government Sales

American President Lines, San Francisco, Calif., has announced the appointment of M.E. Porter as manager, military and Government sales.

Mr. Porter, who previously served 18 years with the company's Passenger Division, will be responsible for APL's military, Govern-

ment and household goods sales. He will report to R.J. Degan, general sales manager, U.S.

He steps into a position previously held by Patrick Roche, who took on a new assignment last fall as manager of rates and conferences.

In 1955, Mr. Porter joined the large steamship company as assistant to the vice president, passenger traffic. In 1965, he was named manager of military and Government passenger traffic, and manager of passenger services, positions he held until his transfer.

After 33 years of military service, Mr. Porter retired in 1969 from the U.S. Army Reserve as Brigadier General and Assistant Division Commander, 91st Division.

Hapag-Lloyd Enters Supertanker Business

The board of directors of the Hapag-Lloyd AG have ordered two supertankers to be built at the "Weser" Shipyard in Bremen. This order by the largest German shipping company is for a type of tanker which has come to be known as the "Europa-Tanker." The vessels will be 386,000 dwt each, with a draft of approximately 72 feet, length of 1,214 feet, and breadth of 210 feet. Their service speed is to be 16 knots. The ships will be propelled by 45,000-shp GE-AGW-turbines. Delivery of the tankers is due for summer and late autumn 1976. When commissioned, they will be the largest merchant ships flying the German flag.

Hapag-Lloyd AG had chartered a German 150,000-ton OBO. As this proved to be successful undertaking, Hapag-Lloyd has arranged for two additional tankers with a capacity of 150,000 dwt each to be chartered on a long-term basis from 1975-76. Thus, Hapag-Lloyd AG will have a tanker tonnage of more than one million dwt at their disposal by the end of 1976, when the two supertankers now ordered will have been commissioned.

John R. Vidmar Elected President Hydraulic Institute

John R. Vidmar has been elected president of the Hydraulic Institute, it was announced at the organization's annual meeting in Boca Raton, Fla.

Mr. Vidmar is senior vice president of the Byron Pump Division of Borg-Warner Corporation in Los Angeles, Calif.

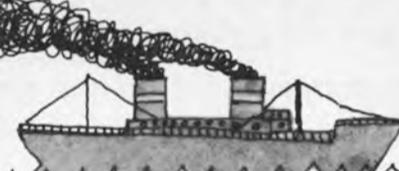
The Hydraulic Institute is composed of over 300 members from 56 companies in the pump industry. Organized in 1917, the Institute serves the pump industry through exchange of information and by establishing standards.

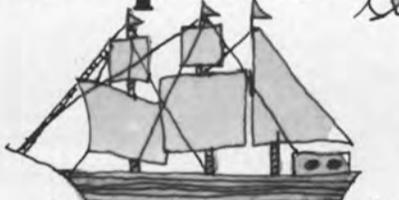
Mr. Vidmar joined the Institute in 1951, and since then has held several positions, including serving as a director for six years, and as a member of the executive committee.

He joined Byron Jackson in 1947, and has held various key management positions.

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B&W Names Taylor General Manager Washington Office



James Taylor Jr.

James Taylor Jr. has been named general manager of Babcock & Wilcox's Washington office with responsibility for the company's Government relations in the nation's capital.

Mr. Taylor succeeds R.H. Harrison, corporate vice president, who retired January 1.

Mr. Taylor joined B&W in 1969 as assistant manager of the Washington office. Previously, he had been a consultant on information systems to the department of transportation. A retired Army colonel, he holds a B.S. degree in engineering from the U.S. Military Academy and an M.B.A. degree from George Washington University.

Mr. Harrison had been head of the Washington office since 1969, when he reorganized and staffed the Government affairs function. A retired Army brigadier general, he had previously been general manager, and later vice president, of B&W's former Atomic Energy Division.

Wurtz And Gosling Promotions Announced By Matson Terminals

Matson Terminals Inc., has promoted Robert D. Wurtz to general manager of container equipment maintenance at the Matson container yard in Oakland, Calif.

John C. Gosling has been named assistant general manager of container maintenance, the post formerly held by Mr. Wurtz. Mr. Gosling was formerly container equipment maintenance superintendent.

H.P. Drewry Appoints Dennis Stonebridge

H.P. Drewry (Shipping Consultants) Limited, London, England, has announced the appointment of Dennis Stonebridge as another senior shipping economist, effective January 1, 1973. Mr. Stonebridge's appointment will strengthen the company's dry cargo, shipbuilding, liner and containerization research and consultancy division.

Mr. Stonebridge, who has gained valuable experience with another firm of shipping consultants, has also had experience as a senior lecturer in transportation economics at a London college. He has already contributed to H.P. Drewry's series of in-depth studies on shipping, namely, "The Cost of Ships."

British Group Forms Offshore Division

Trafalgar House Investments (THI), whose property, construction and shipping interests include the Cunard Line, has announced the formation of a new offshore oil supply and servicing division, which may eventually lead to the largest single investment ever made by the group—perhaps as high as £100 million (\$235 million at \$2.35 to £1).

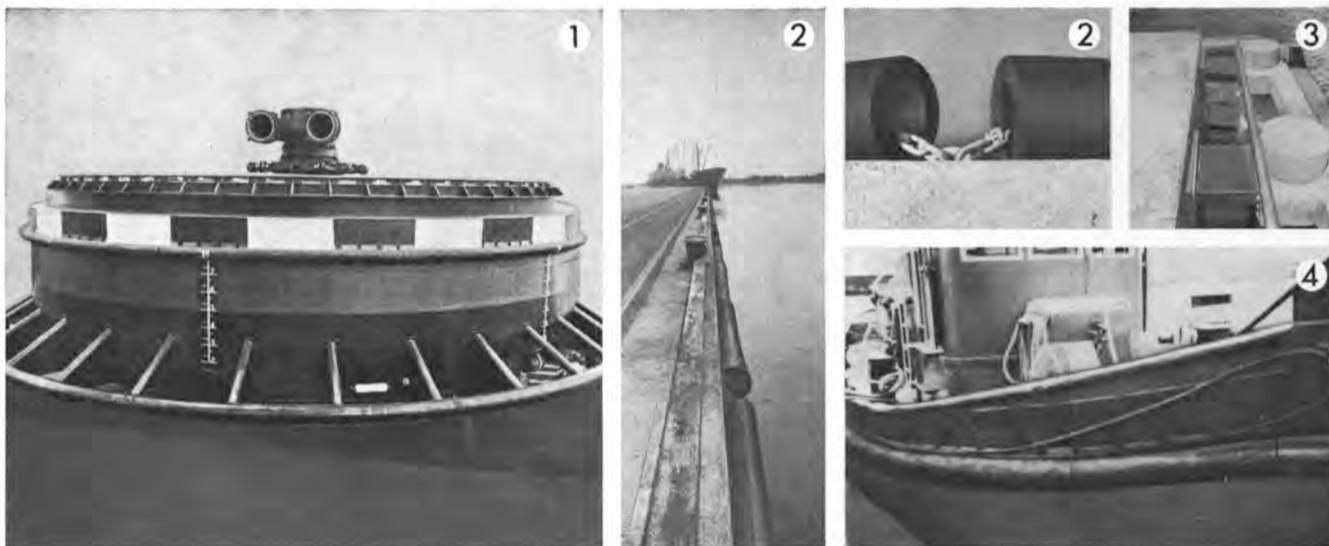
The new division, according to managing director Victor Matthews, is intended to coordinate and expand THI's interests in servicing the offshore industry around the world. It also involves regrouping the company's present interests in these fields.

While no exact estimates of investment have been given, Trafalgar will be seeking to expand as many areas as seem profitable. Total investment will depend on the opportunities presented, but could

reach "as high as £100 million (\$235 million)," over the next five years, commented Mr. Matthews.

To help direct the new division, THI has appointed George Williams, the retiring general manager of Shell U.K. Exploration and Production, one of the North Sea's best known and knowledgeable explorers and pioneers in North Sea oil activity, as managing director. He will take up his new post when he retires from Shell in May.

FENDERING SYSTEMS: ONCE YOU'VE LEARNED HOW TO MAKE THEM PROTECTIVE, YOU HAVE TO LEARN HOW TO MAKE THEM VERSATILE



In our first ad in this series we told you about the basic fendering systems and bumpers which Byron Jackson makes available for marine service. We emphasized the different ways in which they're able to absorb energy since, of course, protection is the first requirement in a fendering system.

FITTED TO YOUR NEED

Next to protection in importance is a fender's ease of installation and its adaptability to your own facilities and fendering needs. That's why Byron Jackson manufactures five completely different systems in a wide range of sizes, shapes and configurations. It's also why these systems are part of some of the newest advancements in marine technology, like single buoy mooring systems for super tankers, as shown in photo #1.

A LITTLE HELP FROM OUR FRIENDS

And customers consistently discover ways to use our fendering systems that surprise even us. Photo #4 for example shows our "D" shape Heavy Duty Modular Fenders

installed on the hull of a tugboat—an application we hadn't considered because of our large line of Pushnee Bumpers for vessels involved in contact operations. Our Modular Fenders are secured by welded mounting plates permanently bonded to the rubber. Byron Jackson's rubber-to-metal bonding process has been perfected over many years of producing marine bearings and rugged oilwell drilling products.

The two photos in #2 of "O" bore Extruded Fenders chain hung at dockside, illustrate how easily our systems can be installed.

ENERGY ABSORBING BUCKLING

Also quickly and easily installed with mounting plates are the Controlled Buckling Fenders shown in photo #3. These low-reaction fenders absorb energy as a load is applied, then buckle in a controlled manner to absorb additional energy without building further reaction forces. Byron Jackson's patented end plate design, which features both a chemical and mechanical bond between rubber and metal,

permits precise control of the direction and amount of buckling.

HOW CAN WE HELP YOU?

We'll continue to keep you informed of ways in which BJ fendering systems are being used throughout the world. In the meantime, for more information mail the coupon below.

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BJ® Marine Products **BORG-WARNER**

ABS Signs Agreement With Iranian Society



Mohsen Zahedi (seated at left), chairman and president of the Radeh Bandi Company, classification organization in Iran, and **Robert T. Young** (seated at right), chairman and president of the American Bureau of Shipping, sign the documents establishing a dual class agreement between the societies. Officers attending the ceremony are (standing left to right) **William J. Zwick**, secretary, ABS Worldwide Technical Services, Inc.; **William N. Johnston**, assistant to chairman, ABS; **Charles J.L. Schoefer**, senior vice president, ABS; **Walter D. Vandegriff**, vice president, ABS Worldwide Technical Services, Inc., and **John R. Blackeby**, secretary, ABS.

The American Bureau of Shipping has entered a dual class agreement with the Radeh Bandi Company, a newly formed classification organization in Iran. The agreement is for the purpose of promoting the interests of shipowners, shipbuilders, underwriters, and other parties concerned with ships holding, or intending to hold, the classification of both societies.

The memorandum of agreement was signed by **Robert T. Young**, chairman and president of the American Bureau of Shipping, and **Mohsen Zahedi**, chairman and president of Radeh Bandi Company, at ceremonies held last month at the Bureau's headquarters in New York City.

Mr. Young stated: "The es-

tablishment of the new classification organization in Iran is an important action that will be of benefit to the development of the Iranian merchant marine and to merchant shipping in general." The ABS chairman told Mr. Zahedi: "The Radeh Bandi Company has the Bureau's complete support, and we will do everything possible to assure its success." The RBC chairman expressed his appreciation and desire for close and effective cooperation.

The Bureau will station an exclusive surveyor in Iran and maintain an exclusive office in that country. It will also assist in the training of field surveyors and members of the technical staff of the new society.



BIG MAMMA: The Sprague, the largest sternwheel towboat ever built, recently moved into Avondale Shipyards for hull and bottom repairs. The 318-foot-long vessel, built in 1901 and maintained in continuous service for 46 years, holds the world's record for size of tow handled. In normal service, the Sprague carried 46 coal barges along with three fuel barges. In February of 1907, she set a world record that remains unbeaten—60 units totaling 67,000,307 tons of cargo. The tow measured 1,125 feet in length, was 312 feet wide, and carried as much cargo as could be handled by 1,500 railroad cars. After repairs at Avondale, the Sprague, known to rivermen as "Big Mamma," will return to Vicksburg, Miss., where it will be displayed as a historical site. For the past 15 years she has been in Vicksburg.

Philadelphia Resins Appoints McGuckin Gulf Coast Manager

Philadelphia Resins Corp., Montgomeryville, Pa., has announced the appointment of **John C. McGuckin** as Gulf Coast manager, with offices in Metairie, La. He will be responsible for sales engineering and technical service for the company's pourable chocking resins, nonskid deck coatings, protective tailshaft coatings, and glass-epoxy cable. A major field of interest will be cryogenic applications for chocking resins.

The company has stocking distributors in Mobile, Ala., Jacksonville, Fla., Houston, Texas, and Greenville, Miss.

Mr. McGuckin has been a sales engineer for the company, and was formerly a diesel engine test coordinator for the Naval Ship Engi-

neering Center in Philadelphia. He was also employed in the production department at the Philadelphia Naval Shipyard. He is an engineering officer in the Coastal River Support Division 22 of the U.S. Naval Reserve, home-based in Algiers, La.

Avondale Awards Transformer Shipsets Order To Magnetics

The Industrial Control Division of Magnetics, Sandy Lake, Pa., is under contract to Avondale Shipyards to build transformer shipsets of various KVA ratings for LASH cargo vessels. The order is an industry first in that Magnetics advanced the unique concept of banking three single-phase transformers in a common structure, with all interconnections bussed or wired at the factory, resulting in savings in wiring labor costs to the shipyard.

With the Magnetics units, the shipyard electrician merely has to connect his incoming primary and outgoing secondary three-phase. The new construction retains flexibility since any single-phase unit can readily be replaced, or the bank can be operated in open delta in an emergency.

In addition to being factory-wired, the Magnetics units have the added advantage of being completely factory tested as a three-phase transformer before delivery.

Safmarine Acquires So. African Lines Ltd.

South African Marine Corp. Ltd. has completed negotiations for the purchase of outstanding stock of South African Lines Ltd., it has been announced in Capetown.

The two companies maintain services between South Africa and Europe, with Safmarine also operating cargo liners to the United States. Safmarine owns 25 vessels and regularly charters 10 others. South African Lines operates seven vessels.



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MarAd Eastern Region Names Levay To Post In Market Development

Lester S. Levay has been appointed Market Development Specialist, it was announced by Thomas A. King, Eastern Region Director of the Maritime Administration, U.S. Department of Commerce. The Office of Market Development promotes greater support of U.S.-flag ships through implementation of President Nixon's program to revitalize the United States merchant marine.

Mr. Levay comes to his new position from Zim Lines, where he was employed as sales representative. Previous experience in the transportation field was in traffic and operations with Amerind Shipping Corp., and American Export Lines.

Spencer Publishes Brochure On Gas And Diesel Engine Heads

A brochure issued by Spencer Heads, Inc., Gladewater, Texas, describes its "engineering breakthrough for the prevention of diesel and gas cylinder head-cracking."

The patented Spencer "Adapted" Head extends the engineering principle of separating the greater combustion temperature and expanding cylinder head from the lesser expanding block or cylinder.

Spencer Heads' system goes a step further in engineering by manufacturing a "head within a head" with free-expansion "stress-area inserts" to eliminate stress points on combustion faces of heads which otherwise are susceptible to cracking.

Approximately 98 percent of head-cracking occurs through or between the spark plug openings and the valve opening. The Spencer system relieves this known stress spot by covering it only with a "Stress-Area Insert." Hot spots or stress areas are the vulnerable spots where head-cracking occurs on head after head. This is because of the narrow water-jacket passageway which restricts the combustion heat from being dispelled into the water sufficiently. This concentrated head build-up results in uneven expansion in this area and, just as a wire bent back and forth, it later breaks.

Spencer System provides for counterboring a head with a known stress area to a sufficient diameter and depth to allow for a stress area insert having a threaded boss screwing into a threaded hole in the counterbore. The stress area insert is .030 of an inch smaller in diameter than the counterbore in which it nests. The stress area insert absorbs this excessive heat and is free to expand to the gap. As a result, the counterbored insert-covered floor of the head now expands uniformly with the rest of the head—the stress has been eliminated.

Further information may be obtained from Spencer Heads, Inc., P.O. Box 299, Gladewater, Texas 75647.

F.E. Golden Joins Newport Ship Yard

Frederick E. Golden has been named contract coordinator at Newport Ship Yard, Inc. of Newport, R.I. He joins the 139-year-old firm following retirement from the Government service in June 1972, after 31 years during which he held positions in a supervisory capacity for over 21 years.

His last position was as a supervisor of ship surveyors for eight years for the Supervisor of Ship Building Conversion, and Repair with the First Naval District in Boston, Mass. His Government career included positions as Leadingman Electrician, Leadingman Fire Controlman, and Leadingman Ordnance Machinist.

In his new position with Newport Ship Yard, Mr. Golden will

be coordinating and processing all governmental contract activity at the firm.

Mr. Golden is a graduate of the Boston Trade School Franklin Technical Institute and received his bachelor's degree in business administration from Northeastern University in 1957. He holds licenses as master electrician, journeyman electrician and marine electrician.

PRE-ADVANCE NOTICE TO BIDDERS

15 Cubic Yard Dipper Clamshell Dredge

for
Panama Canal Company
(Serial No. PC-73-50)

The Panama Canal Company, a corporate agency and instrumentality of the United States of America, is planning to request bids for the construction and delivery of a non-self propelled diesel-electric powered 15 cubic yard dipper dredge, capable of excavating 60 feet below water level, with an 18 cubic yard clamshell option. The formal request for bids will be distributed on or about March 30, 1973; the bids will be opened on or about August 31, 1973 and will require construction and delivery in the Panama Canal within two years.

The basic design envisions a modified in-production model, self contained shovel-dredger machine, mounted on a suitably arranged barge hull, and adapted for sub-surface excavation. All main and auxiliary power will be supplied by a diesel-electric plant utilizing proven production model engine generator sets. Adequate winches, spuds and related equipment will provide a modern dredge with ready sources of procurement for normally required replacement parts. The dredge will be equipped with a machine shop and air conditioned day quarters for a crew of 11 men.

The basic specifications will be:

Length overall (over sponsor and fenders)	154'
Breadth overall (over fenders)	73'
Depth (maximum)	16'
Length of boom	65'
Total rating of prime movers	4500 hp

The estimated price range is \$3,000,000 to \$5,000,000.

An Advance Notice to Bidders will be issued prior to advertisement of the project by the Contracting Officer, Engineering and Construction Bureau, Panama Canal Company, Balboa Heights, Canal Zone. At that time, sets of drawings, together with specifications, will be furnished upon receipt of a deposit of \$100 per set.

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Terrence B. Miller, President,
WJG Radio, Inc.

The Lorain SD-VI Decoder can receive and store up to 6 calls on any of 6 frequencies. When the called 5-digit code is received, an audible signal sounds and the channel indicator lamp lights and remains on until reset. Saves time and money at both ends of a radio-telephone call.

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St. Louis Ship To Construct Another 8,400-Hp Towboat For Upper Mississippi Towing

St. Louis Ship, Division of Pott Industries, Inc., St. Louis, Mo., has received a contract from Upper Mississippi Towing Corporation of Minneapolis, Minn., for another triple-screw towboat.

The new towboat, to be named the Andrea Lynne, will be similar to the St. Louis Ship-built M/V Leslie Ann, delivered to Upper Mississippi in 1971. The Andrea Lynne will feature a Hydrodyne hull and Kort nozzles, and will measure 200 feet by 50 feet by 11 feet 6 inches. She will be powered by EMD 16-645E5 diesel engines, developing 8,400 hp at 900 rpm. The vessel will be delivered in mid-1973.

Kockums Delivers Eleventh VLCC—The Texaco Sweden



The eleventh 255,680-dwt tanker in a series of 20 such ships—the Texaco Sweden—is shown during her successful sea trials in the North Sea. Designed and built by Kockums, this class of ships has shown excellent results on trials.

Kockums Mekaniska Verkstads, Malmo, Sweden, recently delivered the 255,680-dwt VLCC Texaco Sweden to Texaco Overseas Tankship Ltd. of London. This tanker is the eleventh in the shipyard's current series of 20 such very large crude carriers. The delivery ceremonies took place at Malmo after successful trials in the North Sea, where a mean speed of 16.1 knots was attained. The contract specified a speed of 15.9 knots.

The Texaco Sweden was built under special survey of the American Bureau of Shipping and is fitted out in accordance with the laws and regulations of the British government.

The new tanker has an overall length of 1,117 feet 2 inches, a length between perpendiculars of 1,080 feet, a beam of 170 feet, a depth of 84 feet, a draft of 65 feet 10 1/4 inches, a cargo capacity of 11,962,855 cubic feet and a clean-ballast capacity of 272,417 cubic feet. The cargo section is divided into 15 cargo tanks and two slop tanks (260,835 cubic feet total). Clean ballast tanks are arranged only in the forward and aft peak tanks and as wing tanks in way of the engine room. Fuel oil is carried in a forward deep tank and in one center and two wing tanks adjacent to the engine room.

Propulsion is by a regular set of Kockum-Stal-Laval bridge-operated cross-compound triple reduction geared steam turbines of 32,000 shp at a propeller speed of 85 rpm. Steam is supplied from two Kockum-built Combustion Engineering type V2M-8 boilers with panel-welded and glass-wool insulated walls. In general, the engine room is automated for continuous one-man watches at sea.

The deck machinery consists mainly of two combined winch/windlasses, ten self-tension-

ing 30-ton mooring winches amidships and a 3-ton winch operated on a gantry aft of the bridge.

The bridge features a control room and chartroom equipped with a wide range of non-computerized equipment, including an all-electric doppler docking system, weather recorder and two radar sets with interswitch.

Carrington Slipway Experiencing Rapid Growth



The Roeborne, built for Cliffs Westinghouse Company, makes a gigantic splash and official opening of the new 40-acre flow-line shipyard at New South Wales.

The new Carrington Slipway at Tomago, New South Wales, is experiencing boom conditions. After a build-up of 15 years of business, the move to their new site in May of last year has succeeded in projecting an increase in visualized work to take place. Although the company had to delay the government shipbuilding program six months ago, they had 15 launches in 1972.

Projects under way for building of two ferries for the State of Queensland, the most sophisticated of the Australian coast, and a new shipyard at the Department of Aboriginal Affairs, Queensland.

Carrington Slipways has been building a specially designed slipway in the near future to introduce a new market. This 85-foot slipway has steering nozzles which enable the ship to maneuver full ahead, full astern.

The new shipyard is laid out in a building way that can be added to and would be capable of handling ships up to 100 feet in length and would double the capacity.

228,500-Dwt Iranian Ship Ordered From IHI Y —A First For Japan

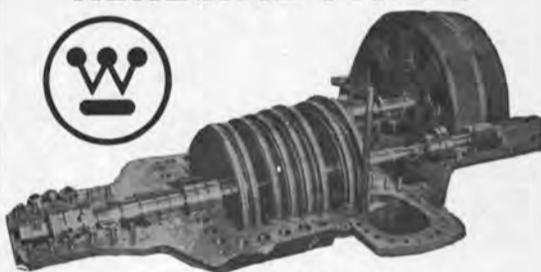
IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.), Japan, has secured a contract with the National Iranian Shipbuilding Co. of Iran at IHI's Tokyo office in 1972, for building a 228,500-dwt VLCC.

The contract was signed by the managing director of the National Iranian Shipbuilding Company, and H. I. IHI. This is the first time that a VLCC has been ordered from an Iranian shipowner.

The VLCC of 117,500 gross tons will measure approximately 1,100 feet in length; length between perpendiculars, 1,080 feet; breadth, 164 feet; depth, 84 feet. She will be powered by a single IHI turbine and will cruise at a speed of 16.5 knots.

Completion is scheduled for early 1974.

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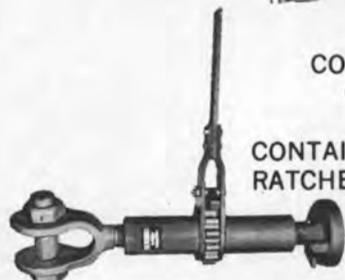
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Spanier Places NOHAB EXPRESS Into Operation On Mississippi



George S. Frierson Jr., president of George Engine Company, hands a model of the vessel over to shipowner Cliff Spanier of Spanier Marine Corporation, New Orleans, La.

The first NOHAB POLAR F engines delivered to the United States are now at work powering a new tug owned by the New Orleans shipping company Spanier Marine Corporation, and built by Halter Marine Services at their shipyard in Lockport, La.

The vessel was christened "NOHAB EXPRESS." Miss Cynthia Spanier, daughter of shipowner Cliff Spanier, served as sponsor during the christening ceremony, which included more than 300 guests along with representatives from NOHAB and George Engine Company, Inc.—the NOHAB distributor in the Western Hemisphere with the exception of Canada. GEICO is one of the largest diesel engine distributors in the United States and has more than 25 years of experience in the diesel engine business.

Since the agreement between GEICO and NOHAB was signed, more than 50 NOHAB POLAR F engines have been sold on the American market. Many of these are intended for installation in tugs and supply vessels.

NOHAB has about 500,000 horsepower on the books subdivided among about 250 engines in production in the workshops at Trollhattan, Sweden, making the company one of the leading manufacturers in the world of medium-speed diesel engines.



February 15, 1973

National River Academy Announces First Annual Invitational Golf Tournament

Floyd A. Mechling, chairman of the board of directors of the National River Academy, has officially announced the scheduling of the first National River Academy Invitational Golf Tournament to be held June 6 and 7, 1973, at the Helena Country Club in Helena, Ark. Mr. Mechling further states that a board of directors meeting will be held at the Academy's new training facility on the evening of June 5, 1973.

Noble C. Parsonage, executive vice president, Pott Industries, Inc., has been designated as chairman of the tournament with James E. Walden, president, Helena Marine Service, Inc., serving as co-chairman. The golf pro will be Bob Martin of the Helena Country Club.

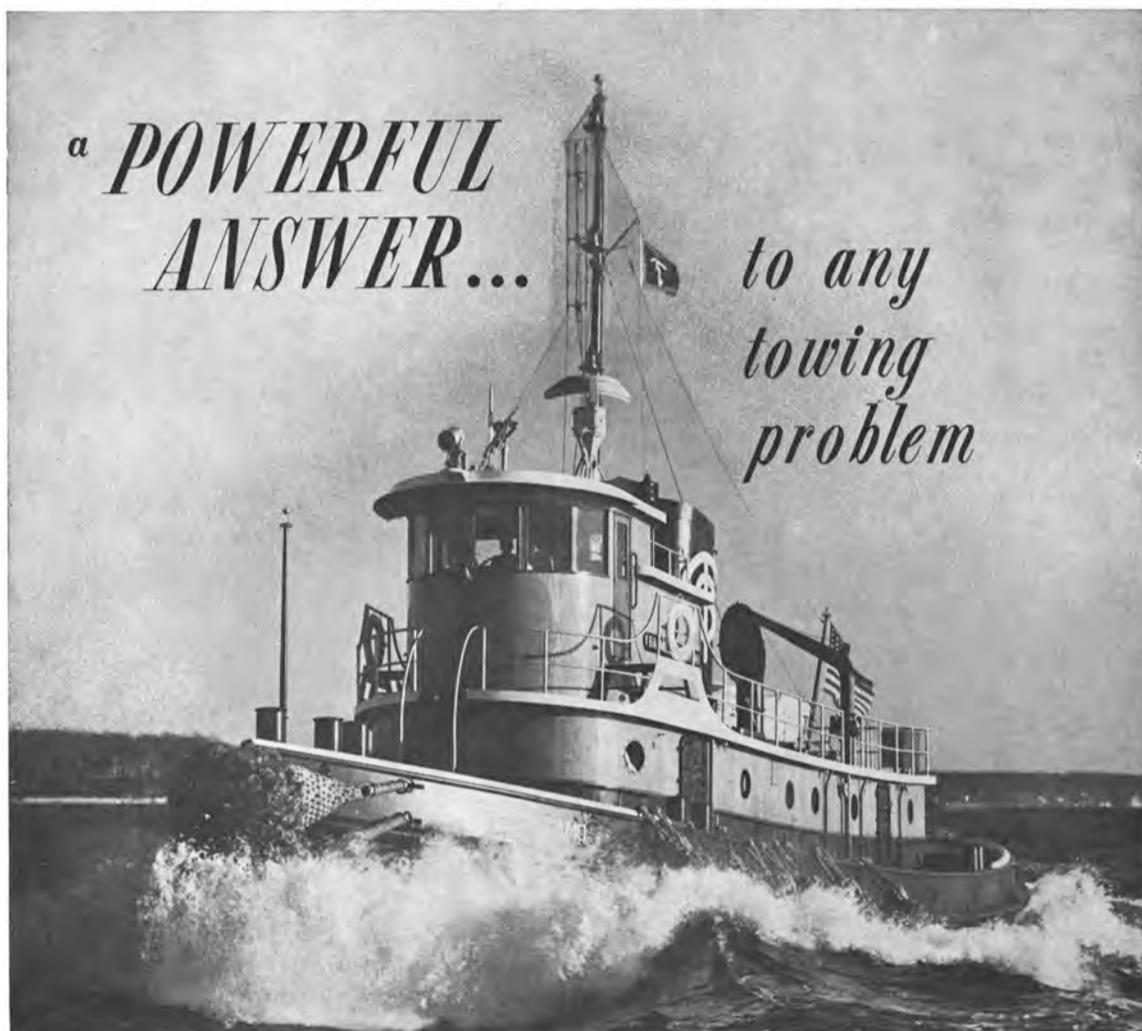
Invitations will be mailed in the near future.

Kockums And Gotaverken Merge In Supplying Shipboard Load Distribution Instruments

The two Swedish shipyards, Kockums Mekaniska Verkstads AB, Malmo, and AB Gotaverken, Goteborg, past competitors in supplying load distribution instruments, have recently decided to join forces in this field.

Kockums Loadmaster Computer and Gotaverken's Lodicator and Stalodicator instruments will be further developed and marketed in parallel by Kockums sales department for ship equipment, of which S.O. Svensson, Malmo, is the head.

Kockums Mekaniska Verkstads AB will also assume the Gotaverken commitments as to delivery, guarantee and service. It can be taken for granted, the announcement stated, that the organization will lead to improved service for the many hundreds of ships fitted with these important safety equipments.



Around the clock, Turecamo's modern fleet of fast, powerful tugs stand ready to instantly provide you with the very best in towing services. Added to this are the years of invaluable experience docking and undocking ships of all sizes and in every phase of towing operations.

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45

Reliance Electric Award To Lykes Bros. Steamship Co.



Hugh D. Luke, left, chairman and chief executive officer of Reliance Electric Company, presents a painting of the SEABEE Doctor Lykes to **Joseph T. Lykes Jr.**, chairman and chief executive officer of Lykes Bros. Steamship Co., Inc.

Lykes Bros. Steamship Co., Inc., of New Orleans, La., was recently honored at a dinner at the Pontchartrain Hotel for having created one of the nation's most outstanding merchant ships.

To mark the occasion, **Hugh D. Luke** of Cleveland, Ohio, chairman and chief executive officer of Reliance Electric Company, made the presentation of a large painting of the S/S Doctor Lykes to **Joseph T. Lykes Jr.**, chairman and chief executive officer of the Lykes organization.

Since 1964, Reliance has paid tribute to owners of ships flying the American flag, whenever a shipping company has placed in operation a new addition to the American merchant marine worthy of consideration as an outstanding ship.

The Lykes company was selected, Mr. **Luke** explained, because the Doctor Lykes, the first of three giant intermodal and container transports to be built by Lykes, was truly the most outstanding ship to join the American merchant marine in 1972.

Built by the General Dynamics Corporation at its Quincy, Mass., shipyard, the SEABEE-class Doctor Lykes entered service in mid-1972, and is now in regular operation between New Orleans and Galveston, and ports in the United Kingdom and Continental Europe. A second Lykes SEABEE, the S/S Almeria Lykes, has also joined the Lykes fleet and the third vessel of this class, the Tillie Lykes, is scheduled for delivery this month.

The unique Lykes SEABEES are 875 feet long and 106 feet wide, and are as tall as an eight-story office building. They can carry as many as 38-fully-loaded barges, or a combination of barges and containers, with a capacity for as many as 763 containers, in addition to other types of cargo.

The painting was done by artist **Kinley Shogren** of Charles Mill Lake, near Cleveland, Ohio. He has been commissioned by Reliance Electric to do the paintings since the company's program was started. It shows the Doctor Lykes moving up the Mississippi River at New Orleans, with the city's up-to-date skyline in the background. Since his graduation from the Cleveland Institute of Art in 1949, Mr. **Shogren** has won national recognition for his paintings depicting today's industry at work.

This marks the second time that Reliance Electric has selected a Lykes ship as the outstanding ship of the year. In 1965, the S/S Louise Lykes, built by Avondale Shipyards, Inc., New Orleans, and one of the nation's most highly automated vessels, was selected for honors.

The Reliance Electric Company installed all of the electric motors that drive the auxiliary machinery aboard the Doctor Lykes.

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Maintenance engineering experience in one of the following areas. Naval auxiliary machinery, propulsion and assault systems, Marine electronics, communications, and electrical equipment systems. Maintenance in repair of damage control outfitting and furnishing, ordnance and facilities. Navy 3-M (maintenance and material management) systems experience desired.

LOGISTICS ANALYSTS

Must be experienced in shipboard fuel, steam generations, propulsion, auxiliary machinery and electrical systems to assist in the preparation of Engineering Operational Sequence Systems (EOSS) and the Operational Stations Book (OSB) for new general purpose assault ships.

TRAINING ANALYSTS

Experience in shipboard manuals and automated propulsion systems to assist in development and instructional duties of the LHA and DD963 programs.

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To design hull, foundation and structures.

MARINE DRAFTSMEN

For piping and machinery systems, communication systems, propulsion and auxiliary machinery, HVAC.

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Including launching systems, torpedo handling systems, gun systems, cathodic protection systems and degaussing systems.

ELECTRICAL SYSTEMS DESIGNERS

Design lighting systems, ships control, instrument and control gauge boards.

DAMAGE CONTROL DESIGNERS

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If you qualify for one of the above openings, we invite you to send your resume to:

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U.S. Merchant Marine Academy Graduate, Class '44, Unlimited Master's License any Oceans, Commander, USCG (ret), 15 years experience in the field of Merchant Marine Safety which includes experience as resident inspector at new construction and ship repair yards. Age 48, strong, active and aggressive, seeks position consistent with experience in marine industry. Will relocate. For resume write to

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Growing tug-barge company is seeking an experienced Captain with notch push towing experience. Ideal opportunity for an ambitious, aggressive man. Port Captain will take charge of tug-barge fleet. Send detailed resume, including salary history and requirements to

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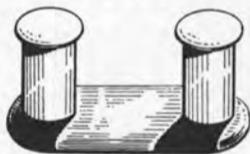
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- 4 Each General Motors Diesel Engines, Model 16-278, 1,600 HP, 750 RPM Direct Connected to—
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- 2 Each Farrel Reduction Gears, Double Input—Single Output, Ratio: 3.957 to 1, Pinon 850/950 RPM—937 HP, Main Gear 215/240 RPM, 1,875 HP
- Auxiliaries:
2 Each General Motors Diesel Engines, Model 8-268A with Delco Generators 200 KW, 250 Volt DC

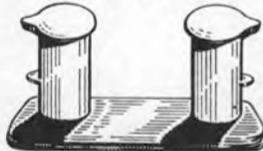
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- General Electric High and Low Pressure 8500 HP
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- General Electric T-2 Diaphragms..... 6000 HP
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- General Electric FN4-FN30..... 1500 KW
- General Electric FN3-FN20 10030 RPM 600 KW
- Westinghouse 5015 RPM..... 538 KW
- General Electric DORV 325..... 525 KW
- Allis Chalmers (G.E. Design) 5645 RPM 500 KW
- General Electric DORV 618N 10059 RPM 400 KW
- Worthington 6097 RPM..... 400 KW
- Allis Chalmers 8000 RPM..... 300 KW
- Allis Chalmers 5645 RPM..... 300 KW
- De Laval 5692 RPM 300 KW
- General Electric DORV 325 5636 RPM..... 300 KW
- Joshua Hendy (Terry Design) HM-5 5965 RPM..... 300 KW
- Westinghouse Non-Recessed 300 KW
- Westinghouse Recessed..... 300 KW
- Worthington 6097 RPM..... 300 KW
- General Electric DS 60-25 5660 RPM..... 250 KW
- Westinghouse 5015 RPM..... 250 KW
- General Electric DORV 518N 10012 RPM..... 240 KW
- Worthington 6510 RPM..... 150 KW
- Westinghouse 7283 RPM 60 KW

Many Units Complete
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**We Offer Complete Units
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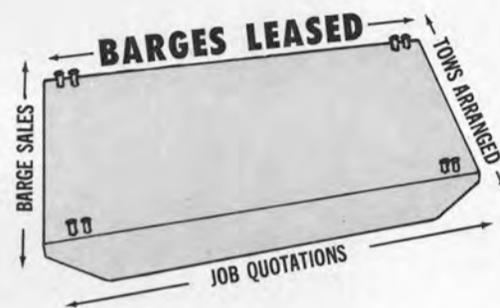


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Tonnage: Gross 3805 — Net 2123 — DWT 6090 —
Displ 8370

Main Propulsion: Single Screw, 1700 HP Diesel
Auxiliary Generators: 250 KW, 230V D.C. Diesel
Complete With All Accessories. Saw Very Little Service
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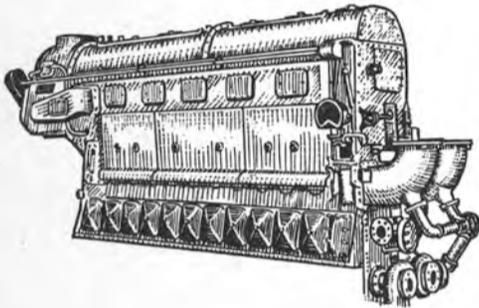
Cargo Vessel damaged by fire, steel hull 230' O/A capacity 1000 tons 55,000 cu. ft. refrigerated. Engine room complete, need new Super-Structure. Ship located in Central America. Contact Marine Surplus Inc., 3301 N.W. So. River Dr., Miami, Fla. 33142.



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MARINE DIESEL ENGINES

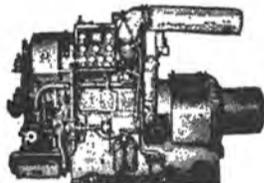


MATCHED PAIR . . . FAIRBANKS MORSE MODEL 38D8-1/8—1 Port; 1 Starboard. Used condition, 1800 HP, 800 RPM, 2 cycle, 8 1/2" bore, 10" stroke, Air Start. Complete with Westinghouse Reduction Gears, 2.216:1 ratio—with Hydraulic Coupling.

3—COOPER-BESSEMER DIESEL ENGINES, Model LS-8-DR, 1300 HP, 277 RPM, direct reversing, turbo charged.

2—SUPERIOR DIESEL ENGINES, Model VDSS, 1160 HP, 325 RPM.

MARINE DIESEL GENERATORS



2—DE LAVERGNE, Marine, 560 HP, 514 RPM, Serials #2180 and #2181, with Electric Machinery Generators, 375 KW, 450/3/60.

6—SUPERIOR Diesel Engines, Model GBD-8, Marine, 150 HP, 1200 RPM, 8 cylinder, with Delco Generators, 100 KW, 120/240 DC.

HERCULES, DOOC, 10 KW, 120 DC.

CATERPILLAR, D3400, 15 KW, 120/240 DC.

BUDA, 4 cylinder, 15 KW, 120/240 DC.

HERCULES, DJXC, 25 KW, 120 DC.

CUMMINS, WA255, 30 KW, 120 DC.

P&H, 387C-18, 45/56 KVA, 120/208/3/60.

BUDA, 6DH909, 40 KW, 120 DC.

1—GENERAL MOTORS, Model 3-268A, Marine, 150 BHP, 1200 RPM, 3 cylinder, with 100 KW Generator, 120/240 DC.

4—GENERAL MOTORS, Model 3-268A, 150 HP, 1200 RPM, 3 cylinders, with 100 KW Generators, 450/3/60.

BUDA, 6 DHG691, 60 KW, 120 DC.

GENERAL MOTORS, 6067, 60 KW, 450/3/60.

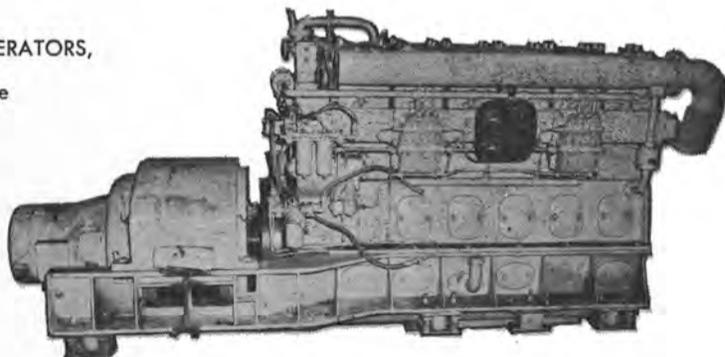
BUDA 6DC844, 75 KW, 125-250 DC.

CATERPILLAR, D17000, 75 KW, 120/240 DC.

LORIMER, F5SS, 75KW, 120/240 DC.

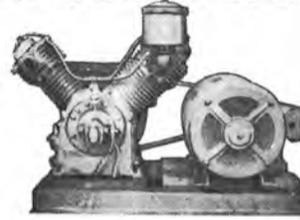
CATERPILLAR, D17000, 85 KW, 220/3/60.

For TURBINE GENERATORS,
See Following Page



4—COOPER-BESSEMER, Marine Model FSN6, 6 cylinders, 375 HP, 900 RPM, with General Electric Generators, 250 KW, 440/3/60.

AIR COMPRESSORS



2—SULLIVAN, Size WL60, Model A-UB-8, 100 PSI, 2 stage, with 30 HP G.E. Motors, 440/3/60.

2—GARDNER-DENVER, 150 CFM, 125 PSI, Class WB, Size 7x5 3/4x5, with Diehl Motors, 45 HP, 230 Volts DC, 870 RPM, 167 Amperes.

1—INGERSOLL-RAND, Size 5x5x4x4, 50 CFM, 150 PSI, with G.E. Motor, 20 HP, 440/3/60.

2—INGERSOLL-RAND, Size 4x1 1/2 x 3 1/2, 10 CFM, 600 PSI, with Diehl Motor, 7 1/2 HP, 120 Volts DC.

2—WESTINGHOUSE Air Brake Steam, Size 11 x 11 x 12, approximately 60 CFM at 100 PSI.

1—INGERSOLL-RAND, Model 40B, 155 CFM, 110 PSI, 870 RPM, with 40 HP Motor, 230 DC.

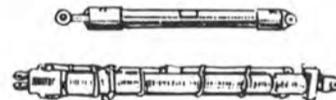
1—WORTHINGTON, 20 CFH, 3000 PSI, 4 stage, 585 RPM, with Worthington Steam Turbine, 47 HP, 5502 RPM.

HEAT EXCHANGERS

3—ROSS Lube Oil Coolers, size 1005.5.

2—ROSS Fresh Water Coolers, size 1206.

HYDRAULIC CYLINDERS



Bore	Overall Stroke	Rod Diameter	retracted length	Action
10"	12"	3.75"	45 1/2"	double
10"	26"	3.75"	58 1/2"	single
2"	8"	1 1/2"	20"	double
2.5"	15"	1.12"	25 1/2"	double
3"	8"	1.37"	15 1/2"	double
6"	8"	4"	144"	double

SPERRY GYRO COMPASSES



SPERRY MARK 14, Model 1 Gyro Compasses, used, good, complete with Master Compass, with Binnacle, Amplifier panel, control panel, carbon pile voltage regulator, motor generator set, alarm panel, and repeaters with mounts.

AXIAL FLOW FANS



Rebuilt
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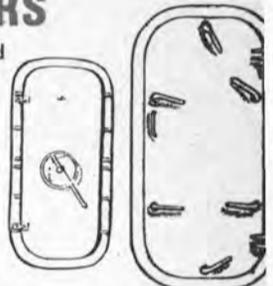
In 440 AC, in 115 DC, and in 230 DC, and in sizes 1 HP through 20 HP. Completely reconditioned.

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Size A 1/4	Size A3	Size A8
Size A 1/2	Size A4	Size A10
Size A1	Size A5	Size A12
Size A2	Size A6	Size A16

Steel Watertight DOORS

Used, Good
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Trimmed
Frames.



Many sizes available, priced reasonable. Some Typical Prices shown below. Please Inquire for other sizes.

26"x48"-4 Dogs-\$60.00 ea.
26"x57"-6 Dogs-\$80.00 ea.
26"x60"-4 Dogs, 6 Dogs-\$86.00 ea.
26"x66"-6 Dogs, 8 Dogs-\$100.00 ea.
26"x66"-Q.A. Type-\$175.00 ea.

REDUCTION GEARS

DE LAVAL Reduction Gear from S/S Texas a C3M ship, Type Double Reduction, 8500 HP size, HP Pinion 5015 RPM, LP Pinion 3461 RPM, low speed gear, 85 RPM.

WESTINGHOUSE Reduction Gear from S/S Montrose, an AP3 ship, size 8500 HP, Gear RPM 85, HP Pinion 5238 RPM, LP Pinion 4422 RPM.

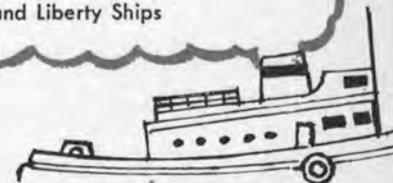
FARREL-BIRMINGHAM, as orig. used on two 1375 HP electric motors in submarine, 2 pinions, single output gear, pinion RPM 1302, Gear RPM 280; ratio 4.65:1.

WESTINGHOUSE, as orig. used on two 1362 HP electric motors in submarine, 2 pinions, single gear.

FALK Reduction Gears—Port & Starboard, Interchangeable with T-3 Tanker Gears, Falk No. 148-300. Also interchangeable with Falk Gears on AO51 Class Tankers (14 ships). Also on AO97 to AO100 Tankers.

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From C3M Vessel
From C3-S1-A3 Vessel,
C2-S-B1 Vessel (Moore Built,
AP2 & AP3 Victory
and Liberty Ships



CAPSTAN WINDLASSES



Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1 1/4" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

3—HESSE-ERSTED VERTICAL, Single Wildcat—for 1 3/8" Anchor Chain, single gypsy, with 35 HP General Electric Motor, 230 Volts DC, complete with Controller equipment.

HYDE, VERTICAL, Single Wildcat, for 1 1/8" Anchor Chain, single gypsy, with 20/5 HP Motor, 440/3/60.

ANCHOR WINDLASSES

1—LIDGERWOOD horizontal Anchor Windlass, double wildcat—for 2 1/16" Chain, double gypsy, with 50 motors, 230 volts, DC, complete with controls.

1—HORIZONTAL, of German Mfg., double wildcat—for use with 3" anchor chain, double gypsy with 230 VDC motor, complete with electrical control equipment.

AMERICAN ENGINEERING, horizontal, double 2 1/8" Chain, 65 HP, 230 DC, complete.

4—AMERICAN HOIST AND DERRICK COMPANY, horizontal, double wildcat—for 2 1/4" chain double gypsy, 70 HP, 230 Volts DC, with electric controls.

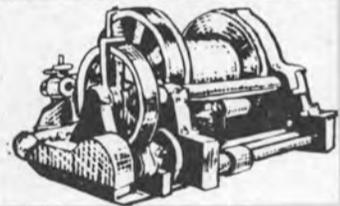
3—HESSE-ERSTED, horizontal, double wildcat, 2 1/8" chain, 60 HP, 230 DC.

1—HYDE HORIZONTAL ANCHOR WINDLASS double wildcat—for use with 2 1/8" Anchor Chain, and with General Motors Electric Motor, 60 HP, 230 volts DC, 560/1700 RPM, Type CDM 18831 AE. Complete with Contractor Panel, Resistors, and Master Switch.

ANCHOR WINCHES

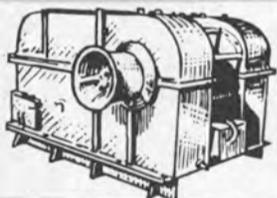
1—JAEGER, single drum—capacity approximately 900' of 1 1/2" wire rope, double gypsy, with 35 HP Motors, 230 Volts DC, complete with electricals.

STEAM TOWING WINCH



Single drum, capacity 2000' of 2" wire rope, cylinder size 9" bore by 10" stroke.

UNIWINCHES



LAKESHORE UNIWINCHES, with Allis-Chalmers Motors, 50 HP, 230 Volts DC, complete with Control Equipment.

Single speed, double drum, 7450 # at 220 FPM.

Single speed, single drum, 7450 # at 220 FPM.

CARGO HOISTER BLOCKS

5 ton rated, Steel, as removed from surplus ships. Manufactured by: Young, Draper, etc., 12" & 14" sizes.



\$49.50 each with pull test certificates

\$42.00 ea.

Fast Service
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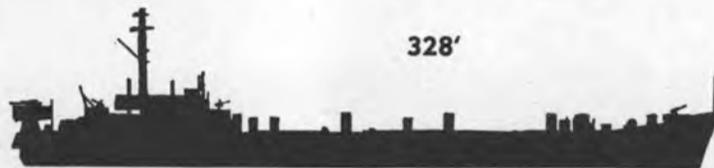


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2—L.S.T. TYPE VESSEL HULLS

For Immediate Sale



Steel Hull, 328' overall, 50' extreme beam, maximum draft 14', approximate displacement 1780 tons. To be sold stripped of all machinery and deck house. Located in Portland, Oregon.

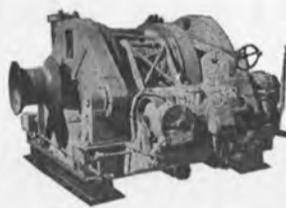
SUBMARINE DIESEL GENERATOR ENGINES

(Without Generators)

2—GENERAL MOTORS, Model 16-278A, 1600 HP, 750 RPM.

4—FAIRBANKS-MORSE, Model 38D8-1/8, 16 cylinder, O.P., 1600 HP, 720 RPM.

STERN ANCHOR WINCHES

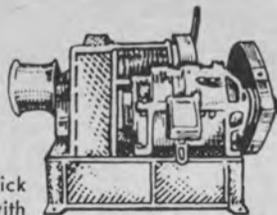


2—ALMON A. JOHNSON Stern Anchor Winches as removed from L.S.T. Vessels, line pull rating 100,000 pounds at 10 FPM in low gear, complete with Contractor Panels, Resistors, and Master Switches.

CARGO WINCHES

American Hoist and Derrick Company Winches with Westinghouse Motors, 50 HP, 230 Volts DC, complete with Contractor Panels, Master Switches, and Resistors.

Single Speed, Single Drum
Two Speed, Single Drum



OS & D RUBBER HOSE

21—6" size, 20' long sections with flanged ends, in little used, good condition.

12—4" size, 30' long sections, with flanged ends, in little used, good condition.

FOB Portland, subject to prior sale.

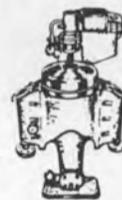
your choice
\$150
per section

CENTRIFUGES SHARPLES AND DE LAVAL

150 GPH—440 AC
—230 DC

350 GPH—230 DC

600 GPH—230 DC



TOWING WINCHES

JOHNSON TYPE AUTOMATIC TOWING MACHINES

2—A.A. Johnson Towing Machines from V-4-M-A1 Seagoing Tugs, drum spools 3000' of 2 1/4" diameter wire rope. Line pull rating 40,000 lbs. Winches have 50 HP, 230 DC Motors and are complete with Contractor Panels, Resistors and Master Switches.

UNIT WINCHES

American Hoist and Derrick Company

U3H—SINGLE DRUM, Single speed (4)
Line Pull: 7450# — 223 FPM,
6360# — 237 FPM,
3720# — 287 FPM.

U6H—DOUBLE DRUM, Single speed (2)
Line Pull: 7450# — 223 FPM,
6360# — 237 FPM,
3720# — 287 FPM.

Motor: Westinghouse, 50 HP, 230 Volts DC, 1900 RPM, Model 288212, 183 Amperes, compound wound, Frame 9 UW, horizontal.

Unit Winches complete with Contractor Panels, Resistors, Master Switches.

HATCHES from TANKER

12—47" diameter, with 16" coaming, Ullage Cover with strong back (1 bolt each side).

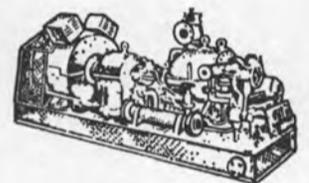
TURBINE GENERATORS

2—DE LAVAL, 360 HP, 440 PSI, 740°F, with Crocker-Wheeler Generator, 250 KW, 240/120 DC, 1200 RPM.

1—WORTHINGTON, 225 PSI, 397°F, 6510 RPM, with Westinghouse Generator, 150 KW, 120 DC, 1250 Amperes.

6—WESTINGHOUSE, 200 PSI, with Westinghouse Generators, 60 KW, 120 DC.

4—ALLIS-CHALMERS, 440 PSI, 740°F, with Allis-Chalmers Generators, 300 KW, 240/240 DC.



1—GENERAL ELECTRIC, 525 PSI, with G.E. Generator, 250 KW, 440/3/60.

1—GENERAL ELECTRIC, with G.E. Generator, 350 KW, 440/3/60.

GENERAL ELECTRIC, Type ATB-2, 1563 KVA, 1250 KW, 450/3/60.

ALLIS-CHALMERS, 440 PSI, 740°F, 300 KW, 120/240/DC

TERRY, TM5, 440 PSI, 740°F, 300 KW, 120/240 DC.

JOSHUA HENDY, 300 PSI, 550°F, with Westinghouse Generator, 300 KW, 120/240 DC.

WORTHINGTON, Form S4, 440 PSI, 740°F to a Westinghouse Generator, 250 KW, 440/3/60, and to a 90 KW, 120 DC.

DELAVAL, 450 PSI, 750°F, 300 KW, 120/240 DC.

TERRIFIC INVENTORY... AC & DC

Marine Pumps

CENTRIFUGAL

DC - HORIZONTAL

1—ALLIS-CHALMERS, 40 GPM, 30.2 ft. hd., with Allis-Chalmers Motor, 5 HP, 230 DC, 575/1150/RPM.

1—WORTHINGTON, Size 3UB1, 400 GPM, 280' head, with Westinghouse Motor, 50 HP, 230 DC.

1—WESTCO, 100 GPM, 100 PSI, 2" suction, 3" discharge, Imperial Motor, 10 HP, 120 DC.

2—WORTHINGTON, Size 8L1, 2100 GPM, 138.5 TDM, with Westinghouse Motors, 100 HP, 230 DC.

1—WARREN, Size 8DM11½, 1175 GPM, 11.1 PSI, with Reliance Motor, 10 HP 230 Volts DC.

1—WORTHINGTON, 3½" suction, 3" discharge, 150 GPM, 23.8 PSI, with Diehl Motor, 3.47 HP, 230 DC, 1750/3500 RPM.

3—GOULDS, 250 GPM, 100 PSI, Figure 3380, 4"x3", with 30 HP Motors, 230 DC.

4—WORTHINGTON, Size 8L1, 2100 GPM, 138.5 TDM, 100 HP, 230 DC.

4—WORTHINGTON, Size 12LA1, 4000 GPM, 67.3 TDM, 100 HP, 230 DC.

5—WORTHINGTON, Size 4L1, 400 GPM, 83' head, 15 HP, 230 DC.

2—ALLIS-CHALMERS, Type 5G, Size 5x5, 650 GPM, 29' head, 7½ HP, 230 DC.

2—ALLIS-CHALMERS, Type SS-L, Size 4x2, 45 GPM, 2 HP, 230 DC.

AC - HORIZONTAL

2—WARREN, 60 GPM, 50 PSI, 1.87 HP, 440/3/60, 3500 RPM.

1—WARREN, 17 GPM, 110 PSI, 3½ HP, 440/3/60, 3500 RPM.

1—WARREN, 600 GPM, 50 PSI, 8¼ HP, 440/3/60, 1135 RPM.

1—GARDNER-DENVER, 750 GPM, 360' head, 6" suction, 5" discharge, 3500 RPM, with G.E. Motor, 100 HP, 440/3/60.

1—WARREN, Size 3-SED-8, 150 GPM, 26.2' hd., with Westinghouse Motor, 3.96 HP, 440/3/60.

4—WORTHINGTON, 200 GPM, 100 PSI, 3½" suction, 3" discharge, Size 2UB1, with Wagner Motor, 25 HP, 440/3/60.

1—GARDNER-DENVER, 5" suction, 3" discharge, 350 GPM, 336' head, 50 HP, 440/3/60, 3500 RPM.

1—CARVER, 400 GPM, 100 PSI, 3½" suction, 2½" discharge, 3500 RPM, 35.7 HP, 440/3/60.

2—WORTHINGTON, 875 GPM, 10 PSI, 1160/860 RPM, with Westinghouse Motor, 4.45 HP/7.92 HP, 440/3/60.

3—WORTHINGTON, 6" x 6", 550 GPM, 25' head, 6 HP, 440/3/60, 1750 RPM.

2—BUFFALO, 250 GPM, 100 PSI, Class CCS, Size 4 x 3½", with Westinghouse Motors, 25 HP, 440/3/60.

(Continued)

AC - HORIZONTAL

1—GOULDS, 2000 CFM, 470' head, Size 8x10, 350 HP, 2300/3/60.

3—ALLIS-CHALMERS, 35 GPM, 100' head, Size 2x1½, 3 HP, 440/3/60.

DC - VERTICAL

1—AURORA, 4" x 3", with G.E. Motor, 25/40 HP, 230 DC, 1310/1750 RPM.

1—INGERSOLL-RAND, Size 8VCM, 8" suction, 8" discharge, with Westinghouse Motor, 15 HP, 230 DC, 850/1210 RPM.

1—INGERSOLL-RAND, 4" suction, 3" discharge, with Westinghouse Motor, 15 HP, 230 DC, 1310/1750 RPM.

1—WARREN, 6" suction, 3" discharge, with G.E. Motor, 5 HP, 440/3/60, 1725 RPM.

1—DAYTON-DOWD, 5" suction, 4" discharge, with Century Motor, 15 HP, 230 DC, 1310/1750 RPM.

2—ALLIS-CHALMERS, 170 GPM, 208' head, Type CF2V, 6" suction, 3½" discharge, 20 HP, 230 DC.

2—ALLIS-CHALMERS, 30 GPM, 208' hd, Type CF2V, 2½" suction, 1½" discharge, 7½ HP, 230 DC.

1—ALLIS-CHALMERS, 12,500 GPM, 10.4 PSI, Type LS-V, Size 20" x 20", 100 HP, 230 DC.

1—ALLIS-CHALMERS, 2520 GPM, 14.4 PSI, Size SE-V, 12" x 12", 30 HP, 230 DC.

2—ALLIS-CHALMERS, 600 GPM, 30 PSI, Type SGV, 5" x 5", 20 HP, 230 DC.

1—ALLIS-CHALMERS, 450 GPM, 120 PSI, 4" x 3", 50 HP, 230 DC.

3—GARDNER-DENVER, 1500 GPM, 56' head, 8" suction, 6" discharge, with 30 HP Motors, 230 DC.

1—WORTHINGTON, Type 20 LAS1, 13,000 GPM, 11.5 PSI, 100 HP, 230 DC.

2—DELAVAL, 80 GPM, 75 PSI, 5/10 HP, 230 DC.

1—WORTHINGTON FIRE & BUTTERWORTH, Size 3 UBS, 400 GPM, 300 PSI, 75 HP, 230 DC.

4—ALLIS-CHALMERS, Type SGV, 600 GPM, 30 PSI, 20 HP, 230 DC.

AC - VERTICAL

1—DE LAVAL, 155 GPM, 59.9 PSI, 440/3/60.

1—WARREN, 17 GPM, 55 PSI, with Westinghouse Motor, 4.26 HP, 440/3/60.

1—INGERSOLL-RAND, Size 2VHMA, 65 GPM, 75 PSI, 440/3/60.

1—BUFFALO, Size 6, 875 GPM, 10 PSI, 6.3 HP, 440/3/60.

2—WORTHINGTON, 275 GPM, 56.6 PSI, 22.9 HP, 440/3/60.

3—DAYTON-DOWD, 1160 GPM, 15 PSI, 10 HP, 440/3/60.

3—ALLIS-CHALMERS, 68 GPM, 114' head, 7½ HP, 440/3/60.

ROTARY PUMPS

DC - HORIZONTAL

3—NATIONAL TRANSIT, 50 GPM, 50 PSI, 3x2½, with G.E. Motor, 3 HP, 230 DC.

DC - VERTICAL

1—WORTHINGTON, Size 4GRVS, with Westinghouse Motor, 15 HP, 230 Volts DC, 1310/1750 RPM.

2—QUIMBY, Size 4D, 225 GPM, 50 PSI, 15 HP, 230 DC, 540/740 RPM.

2—QUIMBY, Size 5, 6 x 5, 400 GPM, 48 PSI, 25 HP, 230 DC.

2—QUIMBY, Size 6, 500 GPM, 70 PSI, 40 HP, 230 DC.

1—QUIMBY, Size 2½, 17 GPM, 405 PSI, 7½ HP, 230 DC.

2—QUIMBY, Size 5, 400 GPM, 60 PSI, 30 HP, 230 DC.

2—WORTHINGTON, Type 3GRVS, 90 GPM, 75 PSI, 7½ HP, 230 DC.

Rotary, AC - Vertical

2—NORTHERN, Size 7020, 10 GPM, 350 PSI, 200 RPM, 3.65 HP, 440/3/60, 1720 RPM.

2—BLACKMER, Size IN5INV, 50 GPM, 50 PSI, geared, 2 HP, 440/3/60.

HYDRAULIC PUMPS

WATERBURY, some Model A, some Model B, piston type Pumps, Size 2, Size 5, Size 10, Size 20, Size 50.

BOILER FEED PUMPS-STEAM

Size 11 x 7 x 18 vert. simplex

Size 11 x 7 x 24 vert. simplex

Size 12 x 8 x 24 vert. simplex

Size 12 x 8½ x 12 vert. simplex

Size 14 x 9 x 24 vert. simplex

TURBINE DRIVEN FIRE PUMPS

4—INGERSOLL-RAND, 1200 GPM, 98 PSI, Size 5UV, with Elliott Turbines, 84.3 HP, 3550 RPM, 1 stage, impulse type.

FAIRLEADS

Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

To Give You These Features:

One size fairlead with universal type sheave to accommodate wire rope sizes 1" up to and including 2".

Self Aligning, Swivel Type Head.

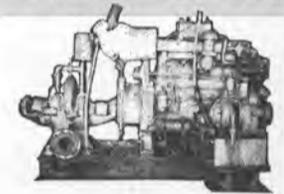
Dependable and Ruggedly built to perform consistently year after year with minimum maintenance.



Model Design \$1350 each

PRICES ARE F.O.B. PORTLAND, ORE.

FIRE PUMPS



2—BUDA, Model 6-LD-468, Diesel Engines, 6 cylinders, 100 BHP, Marine, Gardner-Denver. centrifugal Pumps, Bronze, horizontally split case, 1000 GPM, 280' head, 6" suction and 5" discharge.

CLYDE 17-DE-90 WHIRLEY CRANE

LIFTING RATE: 25 tons at 50 Ft. Radius at 50 to 60 FPM.

BOOM: 80' to headblock (with 10' whip)

WHIP: 10 tons at 125 FPM—2 part line

TRACK CENTERS: 20'—Engine: Cummins

HBIS 601, 180 HP supercharged, elec. start

MOTORS: Each leg (4 tot.) 7½ HP, 230 DC.

POWER: Diesel electric (DC)

FORGED LINE SHAFTING STEEL

1000 Tons of miscellaneous line shafting — Call on your requirements.

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AND LIBERTY SHIPS

SALT WATER EVAPORATORS OVERHAULED—TESTED

Used, Davis Engineering or equal, with ABS and/or Coast Guard certification. 5 sizes available:

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SIZE 36-17 SIZE 20-5

SIZE 36-14

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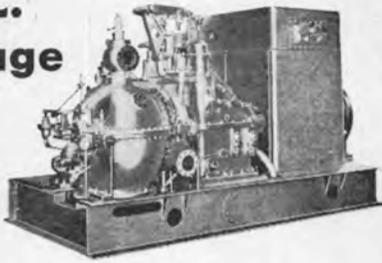
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1-3/8" size
1-1/2" size
2-1/16" size
2-1/4" size
2-5/8" size
2-3/4" size
3-3/8" size

TURBINE GENERATORS

A.C.
Voltage



- 4-1250 KW, General Electric. Turbines: Type FSN, 525 PSI, 7938 RPM. Generators: 1250 KW, 450/3/60, 3600 RPM, Type ABT2.
- 8-750 KW, General Electric. Turbines: Type FN3-FN24, 525 PSI, 10,033 RPM. Generators: 750 KW, 450/3/60, 1200 RPM, Type ATI.
- 4-500 KW, General Electric. Turbine: Type FN3-FN20, steam 375/425 PSI, 6 Stage, 9987 RPM. Generators: 500 KW, 450/3/60, 1200 RPM, Type ATI.

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Excellent for Grain or Oil Storage

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3". For oil storage, grain storage, drill barge conversion, etc. For details, contact H.B. Chait, V.P. at:

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PROPELLERS—Reconditioned A.B.S.
C-1MAV-1 Beaumont, Texas
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T2-SE-A1 T2 Tanker Jacksonville, Fla.

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T2-SE-A2 Mission Tanker Baltimore, Md.
T2-SE-A1 T2 Tanker Baltimore, Md.

BETHLEHEM Sparrows Point 29,000 Ton Hull 4518,
13600 HP @ 109 RPM. (Unused) Baltimore, Md.

RUDDERS—Reconditioned & Unused
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1500 KW GENERAL ELECTRIC TURBO GENERATOR SETS

TURBINE: 420/618 PSI 825/850° Total Temperature Type FN4-FN30 11 Stage 8145 RPM GEI-19320

GEAR: Type S195A 8145/1200 RPM

GENERATOR: 1500 KW 450 V 3 Ph 60 Cy .8 PF 1200 RPM Continuous 2340 KVA 2 Hrs Type ATI-HL

Four Units Available, Complete with Board, Condensers, Air Ejector and Condenser and Condensate Pumps. Removed from CRUISER ROANOKE. In Like New Condition.



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Heavy Duty, 8 volts, 500 amps, 13 3/4" wide, 27 1/4" long, 18" high. Weight in case, 488 lbs.

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Deck-Mounted BERGER FAIRLEADS

Model 614—1 1/4" line size
—14" sheave—5" shank
opening. Tapered roller bearings. 985 lbs. Approximate base dimensions: 32" x 24" fore and aft.

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100,000 lb. Almon Johnson Constant Tension Mooring Winches



5 Available. In very good condition. Series 232 mooring & anchoring winches—automatic self-tensioning. Wide range from 100,000 lb line pull at 10 FPM to 26,000 lbs at 400 FPM. Gypsy line pull 12,000 lbs at 125 FPM. Drum detachable through spiral jaw clutch for free spooling. Driven by 50 HP—230 VDC motors—Westinghouse CK—575 RPM—1/2 hour—75°C rise—stab. shunt—181 amps—max. RPM 1900. Cutler-Hammer brake—18"—type NM. Complete with magnetic control panel, resistor banks & remote control pedestal—mounted master switch.

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FUEL OIL TRANSFER PUMPS



Used, overhauled,
good condition

4-DeLaval horizontal Screw, 700 GPM, 150 PSI, 1180 RPM, with Continental Motors, 100 HP at 1190 RPM, 440/3/60, constant torque, continuous duty, Frame NF746F.

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NEW WATERTIGHT DOORS



6-Dog right and left hand hinged steel doors—with frames. Built and tested to A.B.S. specifications.

SIZE	NET WT.	PRICE
26"x48"	250 lbs.	\$225.00
26"x60"	300 lbs.	\$269.50
26"x66"	320 lbs.	\$297.50
30"x60"	330 lbs.	\$345.00

EACH DOOR

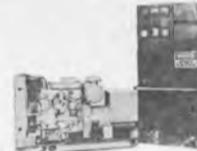
IMMEDIATE DELIVERY

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94 KVA—75 KW CAT. DIESEL SET

125/216/236/440/3/60
1800 R.P.M.



Caterpillar turbo-charged D-330 engine—4 cyl. radiator cooled. GENERATOR: 10 wire—low connection: 125/216 volts 250 amps 230 volts 236 amps; high connection: 460 volts 116 amps. Fully alarmed—electric starting—complete with free-standing switchgear. Test run only 75 hours. Static exciter.

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FALK IN-LINE MARINE REVERSE REDUCTION GEAR



SUITABLE TO 1600 HP WITH MODIFICATIONS

700 HP @ 750/246 RPM—30" clutch drum—ratio 3.05:1—equal to new. Can be used with up to 1600 HP by modifying with larger clutch drums & tires.

30" CLUTCH DRUM TIRES

FOR FALK GEAR

700 to 1000 HP. Unused surplus. Type MO-165-099—built originally for use on F.S. vessels and DPC tugs.

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NATIONAL METAL'S CURRENT T-2 INVENTORY

MANY OTHER ITEMS NOT LISTED • ALL ITEMS FURNISHED WITH A.B.S. OR LLOYDS'

TURBOGENERATORS

525 KW GENERAL ELECTRIC AUXILIARY TURBOGENERATOR UNIT

Complete with L.O. Cooler. Turbine: General Electric 525 KW, Type DORV-325M, 5645 RPM. Reduction Gear: General Electric Type S-162-D, 5645/1200 RPM, single helical. Generators: General Electric. (1) Type ABT, 3 phase, 400 KW, 450 VAC, 1200 RPM. (2) Type MPC, 75 KW, 110 VDC, 1200 RPM, Exciter. (3) Type MPLI, 55 KW, 120 VDC, 1200 RPM, Generator. (4) Auxiliary DC generators.

538 KW WESTINGHOUSE TURBOGENERATOR UNIT

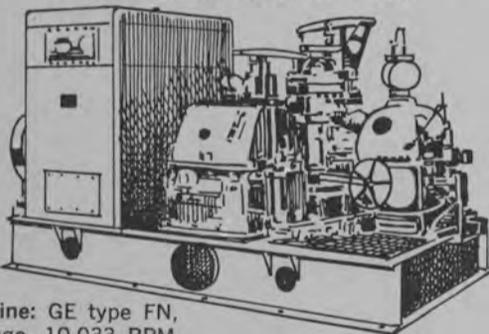
Complete with L.O. Coolers and exciters. Turbine: Westinghouse 538 KW, 5010 RPM. Inlet pressure 435 psi. Temp. 750 degrees F. Exhaust pressure 28 1/2 hg vac. Generators: (1) 400 KW, 450 VAC, 3 pole, 60 cycle, PF 80%, 1200 RPM, ship's service. (2) 32.5 KW, 125 VDC, 1200 RPM, variable voltage exciter. (3) 110 KW, 125 VDC, 1200 RPM, constant voltage generator. (4) 5 KW, 125 VDC, 1200 RPM, ship's service Generator-Exciter. Reduction Gear: Ratio 5010/1200 RPM.

535 KW GENERAL ELECTRIC TURBOGENERATOR UNIT

Complete with L.O. Coolers and exciters. Turbine: General Electric Mfg. drawing P-8453535, 3 stages, type DORV-325, 5645 RPM, rating 535 KW, inlet pressure 590 lbs., Superheat 325 degrees F., exhaust pressure 1 3/4 ABS. Reduction Gear: General Electric, type S-162-D, Class. 535 KW, Mfg. dwg, T-8453535, 5645/1250 RPM. Generator: General Electric, Dwg, T-8453535, type ATB-976, KNA 500, 450 volts AC, 3 phase, 60 cycle, 400 KW, 642 amps, 1200 RPM, PF .8, Frame 976, Exciter 120 volts DC. Control panel: General Electric, Dwg. 6367270, Type XF-100492, 6 circuits, 450 volts AC.

★★ ALSO AVAILABLE!! ★★

600 KW GENERAL ELECTRIC TURBOGENERATOR UNIT



Turbine: GE type FN, 6-stage, 10,033 RPM.

Reduction gear: GE triple-helix, triple reduction, 10033/1200 RPM. Generator: GE type ATI, 600 KW, 6-pole, 0.8 pf, 450 VAC, 3 phase, 60 cycle, 1200 RPM. Exciter: GE type MPLI, 7.5 KW, 120 VDC, direct connected. Air cooler: Surface type, for generator, complete with control panel.

MAIN MOTOR FOR T2

Gen. Elect. #5690714 Type TSM-80, 6000 HP, 30 RPM, form H.L., 2300 Volts, Amps. arm. 1160, P.F. 1.0, KVA 4625 Phase 3 cycle 60, Exciter volts 120, amps field 390 contin. @ 60°C. rise.

5400 KW MAIN GENERATOR

General Electric, S/N 79938, Marks 6937958 G-4, 5F-1690-2, 164-M.

PUMP UNITS

CARGO STRIPPING PUMP

(Steam) Worthington, vertical duplex, double acting, size 14" x 14" x 12", speed 46 ft./min., 700 GPM, 150 psi operating pressure.

MAIN FEED PUMP

Pump: Coffin Turbo Pump Co., single stage, centrifugal, size CG-12A, 6980/7030 RPM, 240/280 GPM, 254/280 HP, 6" x 3", 750 psi @ 1760 ft. head, complete with turbine.

MAIN FEED PUMP

Coffin, turbine drive, Type F, 7200 RPM, 200 GPM, 150 HP, 150 psi w 1329 ft. head.

MAIN CIRCULATING PUMP

Pump: Ingersoll Rand, type 24 VCM, single stage, double suction centrifugal, 585 RPM, 16,500 GPM against TDH 25 ft. @ 30 psi, 26" x 24". Motor: General Electric, Model 5K633AP1, Frame N-6336-B, 585 RPM, 440 volts AC, 191 amps, 3 phase, 60 cycle, complete with controller.

MAIN CIRCULATING PUMP

Pump: Ingersoll Rand, type 24 VCM, size 24", 585 RPM, 14,000 GPM @ 25 ft. TDH, 26" x 24", operating pressure 15 psi. Motor: Westinghouse, Model CS, Frame 876C, 125 HP, 585 RPM, 440 volts AC, 159 amps, 3 phase, 60 cycle, complete with controller.

MAIN CARGO PUMP UNIT

Pump: Ingersoll Rand, type 2 stage horizontal, size 6-GTM, 1750 RPM, 2000 GPM, 12" x 12", 100 psi @ 280 ft. head. With motor.

FUEL AND LUBE OIL PUMP

Pump: Quimby, size 2 1/2 head screw, 1200/600 RPM, 15 GPM @ 325 psi disch. press. Motor: General Electric, Model 5KF364PP1, Frame 364, 7.5/3.75 HP, 1160/580 RPM, 440 volts AC, 10/9.7 amps, 3 phase, 60 cycle, complete with controller.

LUBE OIL SERVICE PUMP

Pump: Quimby, Type vertical rotex, size 4-B, 1150 RPM, 175 GPM @ 60 psi with 20 ft. head, 6" x 5". Motor: General Electric, Model 5KF365AJX1, Frame 365, 5 HP, 1170 RPM, 440 volts AC, 20 amps, 3 phase, 60 cycle, complete with controller.

MAIN CONDENSATE PUMP

Pump: Ingersoll Rand, size 2VHM, 1760 RPM, 180 GPM @ TDH 165 ft., 5" x 2", disch. press. 67 psi. Motor: General Electric, Model 5KF365AJN-1, Frame 365V, 20 HP, 1765 RPM, 440 volts AC, 3 phase, 60 cycle, 25.5 amps, with controller.

AIR COMPRESSORS

COMBUSTION CONTROL AIR COMPRESSOR UNIT

Compressor: Ingersoll Rand, type 30, Model 253 x 5, 20 CFM at 100 psi, 600 RPM. Motor: General Electric, Model 5KG254B2782, Frame 254, Type K, 440 volts, AC, 7.5 amps, 3 phase, 60 cycles, 5 HP, 1723 RPM, complete with controller and switch.

SHIP SERVICE AIR COMPRESSOR UNIT

Compressor: Ingersoll Rand, Type 30, Model 5 x 5 x 4, 545 CFM at 100 psi, 750 RPM. With motor and base.

VALVES

Gate: 10", 12", 14", 16", 20" and 24"
Angle: 12", 14" and 18" Crossover: 16"
High suction: 26" Low suction: 26"

TURBINE ROTORS

5400 KW GENERAL ELECTRIC TURBINE ROTOR

ABS, 6275-31, AB-142-WD-8-10-44, 1701461
T8604259, 6275-31 67-KU-102032, A853BY 21 Jan. 1967.

525 KW GENERAL ELECTRIC TURBINE ROTOR

S/N 60137, ABS 71-LA-12430-624 A624 B, Reconditioned April 21, 1971.

5400 KW WESTINGHOUSE TURBINE ROTOR

ABS report 66KU11942 A853B, 6 Sept., 1966,
Marks: 6275-45. AB-142 WD9-30-44, 170-1467,
8604259-1, 6275-45.

5400 KW WESTINGHOUSE MAIN TURBINE (Profile type):

5400 KW ELLIOTT TURBINE ROTOR

ABS, 67-LA9644-830, AB-JCB-3-31-67, 9013039-
9230P1, 66-KU-11895, A853 1071941, AB142 WDG-
4-45.

MISCELLANEOUS T-2 EQUIPMENT

MAIN AIR EJECTOR

Main air ejector, Graham Mfg. Co., type 2 stage twin, size 163B, capacity, 65 PPH of air (220 GPM cont. @ 79°F.), oper. press. 150 PPH.

MAIN CONDENSER END

Graham (waterbox).

MAIN CONDENSER END

Westinghouse (waterbox).

MAIN CONDENSER END

Westinghouse (return head).

AUXILIARY CONDENSER END

Graham (waterbox and return head), surface condenser, size 1500 sq. ft., S/N 2915, Design press Shell 15-Tubes 25, Test press Shell 30-Tubes 50.

TAIL SHAFTS

ABS 59-S1768-AB810
Reconditioned, ABS 70-LA-11901-946

RUDDER WITH STOCK (complete)

SEND NOW FOR NEW 1973 CATALOG

HUNDREDS OF OTHER ITEMS
ALSO AVAILABLE!



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M.G. SETS

APPROX. 1/2 KW
110/1/60 M.G. SET
NEW—UNUSED



INPUT: 115 VDC—6.1 amps—3600 RPM. AC OUTPUT: 425 watts—110/1/60. Ball bearing, 13 7/8" long—7 9/16" wide—10 1/2" high. Has radio noise suppression filter. Net wt. 58 lbs—83 lbs packed for shipping.

\$89.50 EACH

**5 KW — 120/1/60 A.C. — REBUILT
10 HP 115 VDC TO 5 KW 120 VOLTS
SINGLE PHASE AC**



INPUT: 10 HP—115 volts DC — 78 amps — 1800 RPM.
OUTPUT: 5 KW—115 volts single phase A.C. 4-bearing —with 10 HP 115 volt D.C. magnetic starter.

**FIRST TIME IN A LONG TIME THAT 5 KW
UNITS ARE ON THE MARKET**

UNUSED—10 KW—120/1/60 M.G. SET



INPUT: Motor 25 HP — 120 VDC — 156 amps — 1800 RPM — flange-coupled to output generator.

OUTPUT: 10 KW generator — 120 volts 60 cycle single phase — 108 amps — 0.80 PF — with direct-connected 125 volt 8 amp exciter. Motor starter by Cutler-Hammer. AC generator has voltmeter and ammeter. Bassler voltage regulator.

**3.7 KW Reconditioned M.G. SET
115 VDC Input — 115/1/60 Output**

Manufactured by Century. Reconditioned—4 bearing ball bearing. MOTOR: 5 H.P.—115 volts DC—38 amps—1800 RPM—60°C continuous. GENERATOR: 3.7 KW—4 KVA—115 volts—60 cycle—single phase—0.85 PF—1800 RPM—10.4 amps.

**RECONDITIONED CONTINENTAL
220 D.C. TO 120/1/60 A.C.**

INPUT: 5 HP—230 VDC—20 amps. OUTPUT: 2.5 KVA — 2 KW—120/1/60 AC—0.8 PF—1800 RPM—21 amps. With controls. 38" long—15" wide—480 lbs.

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
539-1900 (301) 355-5050



**UNUSED
30,000 CFM**

AXIAL FANS

Made by Joy Manufacturing Co.—A30A4W6. MOTOR: 25/14 HP—440/3/60—36-20.4 amps—1200/1900 RPM.

**OTHER AVAILABLE
AXIAL FLOW FANS**

115 VOLTS DC
4000 CFM/5000 CFM/6000 CFM/10,000
CFM/12,000 CFM

230 VOLTS DC



Unused 2000 CFM 20AF —mfg. by Joy—0.75 HP motor—3450 RPM—3.4 amps—0.5" static—15" ID—17" flange

ALSO

8000 CFM/10,000 CFM/35,000 CFM

440 VOLTS A.C.

1000 CFM—Buffalo A1A4W5—3/4 HP—440/3/60/3450

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
539-1900 (301) 355-5050

BUYERS DIRECTORY

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Carrier Air Conditioning Co., Carrier Parkway, Syracuse, N.Y. 13201

BEARINGS
BJ Marine Bearings, a Borg-Warner Industry, P.O. Box 2709, Terminal Annex, Los Angeles, Calif. 90054
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

BOILERS
Babcock & Wilcox Co., 161 E. 42nd Street, New York, N.Y. 10017
Combustion Engineering, Inc., Windsor, Connecticut 06095

BOW THRUSTERS
Bird Johnson Co., 883 Main St., Walpole, Mass. 02081
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171

BUNKERING SERVICE
Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019
Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019
The West Indies Oil Co., Ltd., St. John's Antigua, W. I.

CARGO HANDLING EQUIPMENT
MacGregor International Organization, 49 Gray's Inn Road, London W.C.1., England

CATHODIC PROTECTION
Engelhard Industries, 430 Mountain Ave., Murray Hill, N.J. 07974

CLUTCHES, GEARS & BRAKES
Amarillo Gear Co., 517 No. Polk St., Amarillo, Texas 79105
Wichita Clutch Co., Inc., Wichita Falls, Texas 76307

COATINGS—Protective
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
Devoe & Reynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105
EGD Spee-Flo Co., 4631 Winfield Rd., Houston, Texas 77039
Marine Engineering & Construction Co., Inc., 1664 Tchoupitoulas St., New Orleans, La. 70130
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.

CONTAINERS—CONTAINER HANDLING SYSTEMS
Ameron Corrosion Control Div., Brea, Calif. 92621
Lighter Aboard Ship, Inc., 225 Baronne St., New Orleans, La. 70112
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98421

CONTAINER LASHINGS & COMPONENTS
W. W. Patterson Co., 830 Brockett St., Pittsburgh, Pa. 15233

CONTROL SYSTEMS
Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

CORROSION CONTROL
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144

CRANES—HOISTS—DERRICKS—WHIRLEYS
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Conrad-Stork, Div. Stork-Werkspoor, P.O. Box 134, Haarlem, Holland
Hoffman Rigging & Crane Service, 560 Cortland Street, Belleville, N.J. 07109
Houston Systems Mfg. Co., P.O. Box 14551, Houston, Texas 77021
Kocks Pittsburgh Corp., Four Gateway Center, Pittsburgh, Pa. 15222
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98401

CRANE LOAD INDICATORS
Mark Products, Inc., 10507 Kinghurst Dr., Houston, Texas 77072
Trans-Sonics, Inc., P.O. Box 326, Lexington, Mass. 02173

DECK COVERS (METAL)
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027

DECK MACHINERY
Appleton Machine Co., P.O. Box 2265, Iron Mountain, Mich. 49801
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
Pacific Pipe Co., 49 Fremont St., San Francisco, Calif. 94080
Pine Tree Engineering, subsidiary of Rice Barton Corp., P.O. Box 654, Brunswick, Me. 04011
A. G. Weser, Seebachwerft, 2850 Bremerhaven 1, Germany

DIESEL ACCESSORIES
A.G. Schoonmaker, Box 757, Sausalito, Calif. 95965

DIESEL ENGINES
Alco Engine Div., White Industrial Power, Inc., 100 Orchard St., Auburn, N.Y. 13021
Bruce GM Diesel, Inc., 180 Route #17 S. at Interstate 80, Lodi, N.J. 07644
Caterpillar Tractor Co., Industrial Div., 100 N.E. Adams St., Peoria, Ill. 61602
Colt Industries Inc., Power Systems Div., Beloit, Wisc. 53511
DeLaval Turbine Inc., Engine & Compressor Div., 550 85th Ave., Oakland, Calif. 94621
Electro-Motive Division General Motors, La Grange, Illinois 60525
George Engine Co., Inc., P.O. Box 8, Harvey, La. 70038
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
Sulzer Brothers, Ltd., Winterthur, Switzerland

DIESEL ENGINE MUFFLERS
Marine Products & Engrg. Co., 20 Vesey St., New York, N.Y. 10007

DOORS—Watertight—Bulkhead
Overbeke-Kain Co., 20905 Aurora Rd., Cleveland, Ohio 44146
Wolz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

ELECTRICAL EQUIPMENT
Arnessen Electric Co., Inc., 335 Bond St., Brooklyn, N.Y.
Galbraith-Pilot Marine Corp., 600 4th Ave., Brooklyn, N.Y. 11215
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014

EVAPORATORS
Riley-Beard, Inc., Maxim Evaporator Profit Center, P.O. Box 1115, Shreveport, Louisiana 71130
Aqua-Chem, Inc., Water Technologies Div., Box 421, Milwaukee, Wis. 53201
Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004

FAIRLEADS
Appleton Machine Co., P.O. Box 2265, Iron Mountain, Mich. 49801.

FENDERING SYSTEMS—Dock & Vessel
BJ Marine Products, subsidiary of Borg-Warner, P.O. Box 2709, Terminal Annex, Los Angeles, Calif. 90054
Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004

FITTINGS & HARDWARE
Rohvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

FLOATING EQUIPMENT—Steel—Aluminum Pontoons
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.

HYDRAULICS
Bird Johnson Co., 883 Main St., Walpole, Mass. 02081
Universal Hydraulics, Div. of Ohio Brass Co., 4500 Beidler Road, Willoughby, Ohio 44094

INSULATION—Marine
Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

LIGHTS—Emergency, Search & Navigation
Elco Corp./Safecraft Div., Maryland Road & Computer Avenue, Willow Grove, Pa. 19090
Snelson Oilfield Lighting Co., 1201 E. Doggett St., Fort Worth, Texas 76104.

LNG TANKAGE
Gazocan U.S.A. Inc., 125 High St., Boston, Mass. 02110

LININGS
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144

MACHINERY MONITORS
Bently Nevada Corp., P.O. Box 157, Minden, Nevada 89423

MARINE BLOCKS & RIGGING
Crosby Group, Box 3128, Tulsa, Okla. 74101

MARINE DRIVES—GEARS
Hoffert-Lowe, Inc., 108 Ridge Road, North Arlington, N.J. 07032
Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406
Western Gear Corp., Industrial Products Div., P.O. Box 126, Belmont, Calif. 94003

MARINE EQUIPMENT
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Kearfott Marine Products, 780 South 3rd Ave., Mt. Vernon, N.Y. 10550
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Peltz Brothers, Inc., 3499 Inventors Road, Norfolk, Va. 23502
Stow Mfg. Co., 225 Shear St., Binghamton, N.Y. 13902
Vokes Filter Div., (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

MARINE FURNITURE
Bailey Joiner Co., 115 King Street, Brooklyn, N.Y. 11231

MARINE INSURANCE
Adams & Porter, Cotton Exchange Bldg., Houston, Texas
Midland Insurance Co., One State St. Plaza, New York, N.Y. 10004
R.B. Jones Corp., 301 West 11th St., Kansas City, Mo. 64105

MARINE OIL BURNERS
John Zink Co., 4401 So. Peoria, Tulsa, Okla. 74105

MARINE PROPULSION
Babcock & Wilcox Co., 161 East 42nd Street, New York, N.Y. 10017
Combustion Engineering, Inc., Windsor, Connecticut 06095
Jacuzzi Bros., Inc., 11511 New Benton Highway, Little Rock, Ark. 72204
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Tech Systems, Inc., 405 Watertown Rd., Thomaston, Conn. 06787
Terry/Whitton, P.O. Box 350, New London, Conn. 06320
Turbo Power & Marine Systems, Subsidiary of United Aircraft Corp., 1690 New Britain Ave., Farmington, Conn. 06032

MARINE SURVEYORS
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Fla. 33316

MARITIME FINANCING
General Electric Credit Corp., 4 Corporate Drive, White Plains, N.Y. 10604

NAVAL ARCHITECTS AND MARINE ENGINEERS
J. L. Bludworth, 4030 Wynne St., Houston, Texas
Brelt Engrg. Inc., 441 Gravier St., New Orleans, La. 70130
Childs Engineering Corp., Box 333, Medfield, Mass. 02052
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517
Crandall Dry Dock Engrs., Inc., 238 Main St., Cambridge, Mass. 02142
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
Arthur D. Darden, Inc., 1040 International Trade Mart, New Orleans, La. 70130
Sharp DeLong, 29 Broadway, New York, N.Y. 10006
Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011
M. Mock Earle, 103 Mellor Ave., Baltimore, Md. 21228
Christopher J. Foster, 14 Vanderverter Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
Morris Gurainick, Inc., 583 Market St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
Hydraulics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, Calif. 93017
Janzen Engineering Co., 15 Charles Plaza, Baltimore, Md. 21201
James S. Krogen, 2500 S. Dixie Hwy., Miami, Fla. 33133
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 1180 Ave. of Americas, N.Y., N.Y. 10036
Marine Design Associates, P.O. Box 2674, Palm Beach, Florida
Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225
John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Nickum & Spaulding Associates, Inc., 71 Columbia St., Seattle, Wash. 98104
Ocean-Oil International Engrg. Corp., P.O. Box 6173, New Orleans, La. 70114
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 8-D So. New River Drive East, Ft. Lauderdale, Fla. 33301
Sidney Merritt Polhemus, Ballouville Rd., RFD 2, Dayville, Conn. 06241
Potter & McArthur, Inc., 253 Northern Ave., Boston, Mass.
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
T. W. Spaeftgens, 156 West 8th Ave., Vancouver 10, Canada
R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
Whitman, Requardt & Associates, 1304 St. Paul St., Baltimore, Md. 21202

Yankee Shipwrights, P.O. Box 35251, Minneapolis, Minn. 55435

NAVIGATION & COMMUNICATIONS EQUIPMENT
American Hydromath Co., 55 Brixton Rd., Garden City, N.Y. 11530
Collins Radio Co., M/S 407-321, Dallas, Texas 75207
ELCO Corp./Safecraft Division, Maryland Road & Computer Ave., Willow Grove, Pa. 19090
Electro-Nav, Inc., 501 Fifth Ave., New York, N.Y. 10017
FGM Systems Co., P.O. Box 20778, 2525 Walnut Hill Lane, Dallas, Texas 75220
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611
Loran Electronics Corp., 2307 Leavitt Road, Lorain, Ohio 44052
Magnavox Navigation Systems, 2829 Maricopa St., Torrance, Cal. 90503
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Co. Marine Products, 676 Island Pond Rd., Manchester, N.H. 03103
Raytheon Co., Submarine Signal Div., P.O. Box 360, Portsmouth, R.I. 02871
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Standard Communications Corp., 639 N. Marine Ave., Wilmington, Calif. 90744
Stor Lifeline, Ltd., 1148 W. 15th St., No. Vancouver, B.C., Canada
Teledyne Hastings Raydist, P.O. Box 1275, Hampton, Va. 23361
Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721

OILS—Marine—Additives

ESSO International, Inc., 1251 Avenue of the Americas, N.Y. 10020
 Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
 Mobil Oil Corp., 26 Broadway, New York, N.Y. 10004
 Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
 Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017

PAINT—Marine—Protective Coatings

Ameron Corrosion Control Div., Brea, Calif. 92621
 Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
 Devoe & Reynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105
 Hempel's Marine Paints, Inc., 25 Broadway, New York, N.Y. 10004
 International Paint Co., 21 West St., New York, N.Y. 10006
 Marine Engineering & Construction Co., Inc., 1664 Tchoupitoulas St., New Orleans, La. 70130

Mobil Chemical Company, Metuchen, N.J. 08840

Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
 Porter Paint Company, 400 South 13th Street, Louisville, Ky. 40203

PETROLEUM SUPPLIES

Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019

Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002

Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017

The West Indies Oil Co., Ltd., St. John's, Antigua, W. I.

PIPE—Cargo Oil

Kubota, Ltd., 22, Funado-cho 2-chome, Naniwa-Ku, Osaka, Japan

Tioga Pipe Supply Co., Inc., P.O. Box 5997, Philadelphia, Pa. 19137

PLASTICS—Marine Applications

Ameron Corrosion Control Div., Brea, Calif. 92621

Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231

Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936

PORTS

Port of Galveston, P.O. Box 328, Galveston, Texas

Jacksonville Port Authority, 2701 Tallyrand Ave., Jacksonville, Fla.

PROPELLERS: NEW AND RECONDITIONED

Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150

Bird-Johnson Co., 883 Main Street, Wolpole, Mass. 02081

Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102

Escher Wyss GmbH, P.O. Box 798, Ravensburg, Germany

Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich. 49502

Ferguson Propeller, 1132 Clinton St., Hoboken, N.J. 07030

PUMPS

Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City, Kansas 66110

Goulds Pumps, Seneca Falls, N.Y. 13148

Houttuin-Pompen N. V. Sophialaan 4, Utrecht, Holland

Jacuzzi Bros., Inc., 11511 New Benton Highway, Little Rock, Arkansas 72204

Worthington Corporation, Harrison, New Jersey 07029

RATCHETS

W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233

REFRIGERATION—Refrigerant Valves

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

ROPE—Manila—Nylon—Hawesers—Wire

American Mfg. Co., Inc., Noble & West Sts., Brooklyn, N.Y. 11222

Cating Rope Co., 309 Genesee St., Auburn, N.Y. 13022

Columbian Rope Co., 309 Genesee St., Auburn, N.Y. 13022

Du Pont Co., Room 31H1, Wilmington, Delaware 19898

Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604

Wall Rope Works, Inc., Beverly, N. J. 08010

RUDDER ANGLE INDICATORS

Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215

Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011

Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

SANDBLASTING EQUIPMENT

Pauli & Griffin Co., 826 Folsom St., San Francisco, Calif. 94107

SCAFFOLD BOARDS

Howmet Corporation, Southern Extrusions Division, P.O. Box 40, Magnolia, Arkansas 71753

SEWAGE DISPOSAL

Babcock & Wilcox Co., 161 East 42nd Street, New York, N.Y. 10017

Koehler-Dayton, Inc., P.O. Box 309, New Britain, Conn. 06050

LoMere Industries, Inc., 277 N. Main Street, Walworth, Wis. 53184

SHAFT REVOLUTION INDICATOR EQUIP.

Electric Tachometer Corp., 68th & Upland Sts., Phila., Pa. 19142

Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

SHIPBOARD VENTILATION

Coppus Engineering Corp., P.O. Box 457, Worcester, Mass. 01613

SHIPBREAKING—Salvage

The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202

Levin Metals Corp., P.O. Box 398, Point Station, Richmond, Cal. 94807

National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731

Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

SHIP BROKERS

Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y. 10006

Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119

SHIPBUILDING STEEL

Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042

Bethlehem Steel Corp., 25 Broadway, New York, N.Y. 10004

Huntington Alloy Products, Div. International Nickel Co., Inc., Huntington, W. Va. 25720

International Nickel Co., 1 New York Plaza, New York, N.Y. 10004

SHIPBUILDING—Repairs, Maintenance, Drydocking

Astilleros Espanoles, S.A. Zurbano, 70, Madrid 10, Spain

Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150

Barbour Boat Works, Inc., P.O. Box 1069, New Bern, N.C.

Bellard, Crighton & Cie, P.O. Box 2074, Route des Docks, 59, Dunkirk, France

Bellard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium

Bertram Marine, Division of Whittaker, 3663 N.W. 21 Street, Miami, Fla. 33142

Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004

Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885

Bludworth Shipyard, Inc., Box 5426, Cypress St., Brady Island, Houston, Texas 77012

Brodgradiliste "SPLIT", P.O. Box 107, Split, Yugoslavia

Conrad Industries, P.O. Box 790, Morgan City, La. 70380

Curacao Drydock, Inc., P.O. Box 153, Willemstad, Curacao, N.A.

Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801

Dravo Corporation, Neville Island, Pittsburgh 25, Pa.

Empresa Nacional Bazan, 65 Castellana, Madrid 1, Spain

Equipment Systems, Inc., A Microdot Co., P.O. Box 95, Port Deposit, Md. 21904

Equitable Equipment Co., Inc., P.O. Box 8001, New Orleans, La. 70122

General Dynamics, Electric Boat Division, 99M Eastern Point Road, Groton, Conn. 06340

General Dynamics, Quincy Division, Quincy, Mass. 02169

Gotaverken American Corp., 39 Broadway, New York, N.Y. 10006

Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126

Havre de Grace, Havre de Grace, Md.

Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.

Marathon LeTourneau Gulf Marine Division, P.O. Box 3189, Brownsville, Texas 78520

Marathon LeTourneau Marine Division, LeTourneau Rural Station, Vicksburg, Mississippi 39180

Marathon LeTourneau Offshore Pte., Ltd., P.O. Box 83, Tamon Jurong Post Office, Singapore 22, Singapore

Marathon Shipbuilding Company, P.O. Box 870, Vicksburg, Miss. 39180

Marathon Shipbuilding Company (U.K.) Ltd., Clydebank Bunbartonshire, G81-1YB, Scotland

Marine Engineering & Construction Co., Inc., 1664 Tchoupitoulas St., New Orleans, La. 70130

Maryland Shipbuilding & Drydock, P.O. Box 537, Baltimore, Md. 21203

Mattson Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047

Mitsui Shipbuilding & Engrg. Co. Ltd., 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo, Japan

Mitsubishi Heavy Industries, Ltd., 5-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan

Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655

National Steel & Shipbuilding Corp., San Diego, Calif. 92112

Newport News Shipbuilding and Dry Dock Co., Newport News, Va.

Newport Ship Yard, Inc., 379 Thames St., Newport, R.I. 02840

Northwest Marine Iron Works, P.O. Box 3109, Swan Island, Portland, Oregon 97208

Nuclear Service & Construction Co., Inc., 9296 Warwick Blvd., Newport News, Va. 23607

O.A.R.N. (officine Allestimento e Riparazioni Navi) Genoa, Italy

Odense Steel Shipyard Ltd., P.O. Box 176, DK-5100 Odense, Denmark

Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156

Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862

Peterson Builders, Inc., 334 So. 1st Ave., Sturgeon Bay, Wis. 54235

St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111

Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan

Savannah Machine & Shipyard Co., P.O. Box 787, Savannah, Ga. 31402

Sembawang Shipyard (Pte) Ltd., P.O. Box 3, Sembawang, P.O. Singapore, 27

Star Shipyards, Ltd., 61 Duncan St., New Westminster, Vancouver, B.C., Canada

Sumitomo Shipbuilding & Machy. Co., Ltd. 2-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan

Swedish Shipbuilding Association, Fack S-402 70, Gothenburg 8, Sweden

Teledyne Sewart Seacraft, P.O. Box 108, Berwick, La. 70342

Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004

Tracor/Mas, Inc., P.O. Box 13107, Port Everglades, Fla. 33316

SHIP MODEL BASIN

Hydro-nautics, Incorporated, Laurel, Maryland 20810

SHIP ROUTING

Weather Routing, Inc., 90 Broad Street, New York, N.Y. 10004

SHIP STABILIZERS

Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143

John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048

Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

STEAM GENERATING EQUIPMENT

Bobcock & Wilcox Co., 161 East 42nd Street, New York, N.Y. 10017

Combustion Engineering, Inc., Windsor, Connecticut 06095

STEERING SYSTEMS

Wm. E. Hough Co., 1125 P.N.W. 45th St., Seattle, Wash. 98107

SWITCHBOARDS

Hose McCann Telephone Co., Inc., 524 West 23 St., N.Y., N.Y. 10011

TOWING—Salvage, Lighterage, Barge Chartering

Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002

Bouchard Transportation Co., Inc., 25 West Barclay St., Hicksville, L.I., N.Y. 11801

Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202

Henry Gillen's Sons Lighterage, West End Ave., Oyster Bay, N.Y. 11771

James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004

Interstate Oil Transport Co., 214 Transportation Center, Six Penn Center Plaza, Philadelphia, Pa. 19103

McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

McDonough Marine Service, P.O. Box 26206, New Orleans, La.

Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048

L. Smit & Co., 11 Broadway, New York, N.Y. 10004

Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002

Turecama Coastal and Harbor Towing Corp., 1752 Shore Parkway, Brooklyn, N.Y. 11214

VALVES AND FITTINGS—Hydraulic—Safety Flanges

Dover Corp. / Norris Division, P.O. Box 1739, Tulsa, Okla. 74101

Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn, N.Y. 11231

Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696

Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027

Mesco Tectonics, Inc., 5 Central Ave., Clifton, N.J. 07011

WELDING EQUIPMENT

Tweco Products, Inc., P.O. Box 666, Wichita, Kan. 67201

WIRE ROPE

Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042

Bethlehem Steel Corp., Bethlehem, Pa. 18016

Macwhyrte Wire Rope Co., 2959 14th Ave., Kenosha, Wis. 53140

United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230

ZINC

Smith & McCrorken, 153 Franklin St., New York, N.Y. 10013

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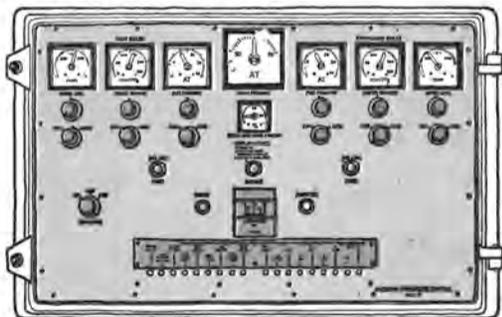
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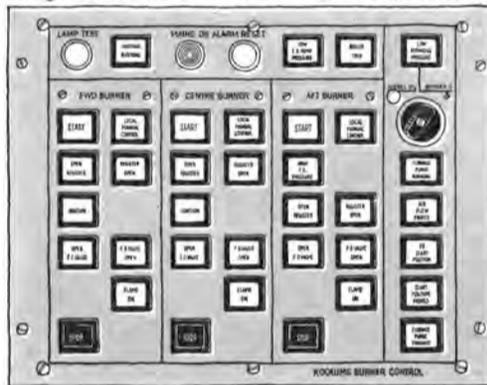
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