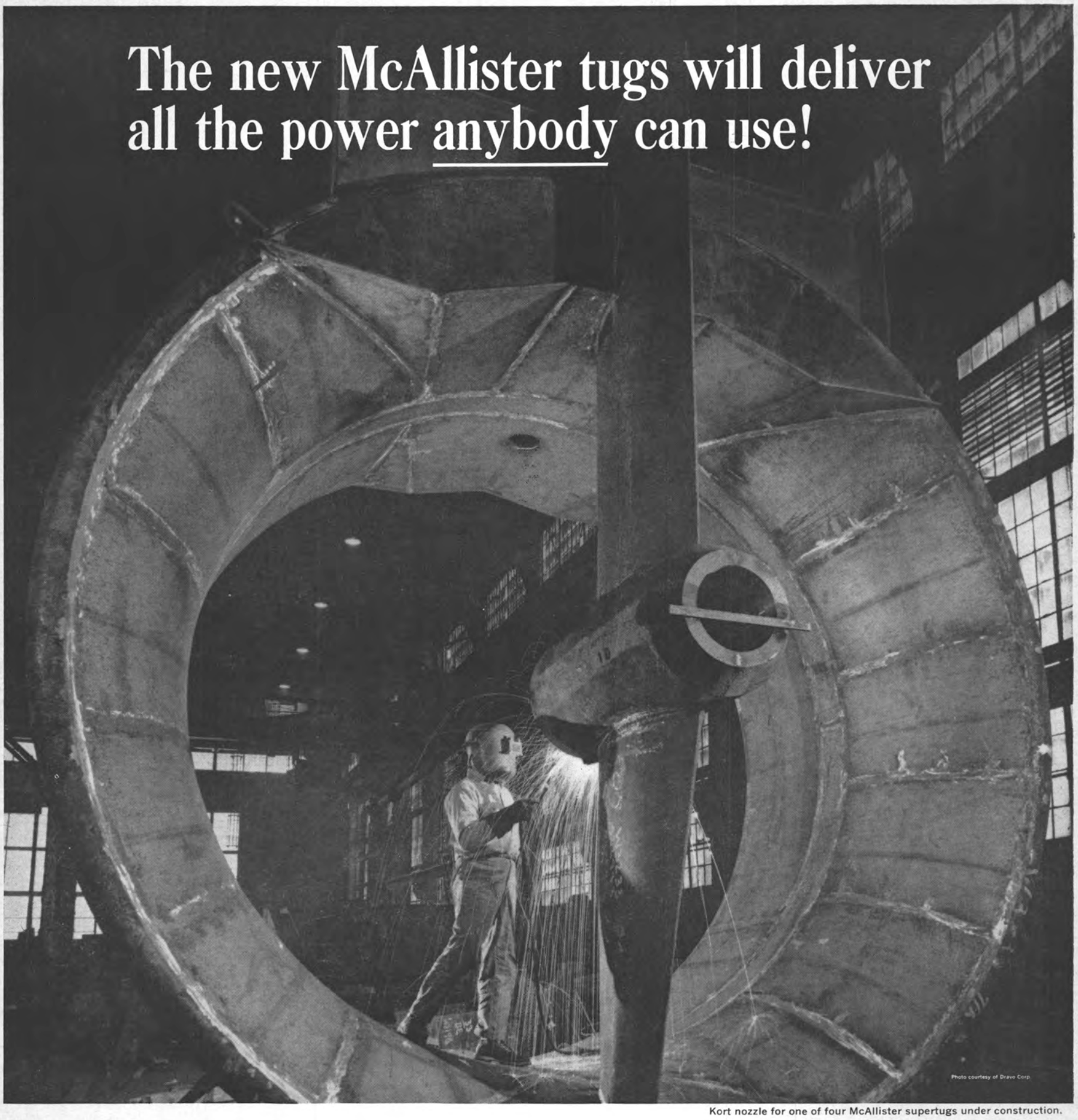
MARITIME REPORTER
AND
ENGINEERING NEWS

Scientists And Equipment Transported On Lake Erie Ice By Bell Aerosystems ACV

(SEE PAGE 6)

APRIL 1, 1969



Kort nozzle for one of four McAllister supertugs under construction.

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This 16-foot "ring" is called a Kort nozzle...and it adds literally 25 to 40% more thrust than the conventional open-propeller can deliver. And it adds maneuverability, too. In docking, undocking, towing, any harbor movement.

McAllister is adding *four more* of these high powered Kort nozzle type tugs in the multimillion-dollar expansion of its fleet. McAllister has the power to get your job done right.

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Savannah Machine To Convert T-2 Tanker

A multi-million-dollar contract has been awarded to Savannah Machine & Foundry Co., of Savannah, Ga., by Hudson Waterways Corp., New York, for the conversion of the T-2 tanker Transontario into a container carrier.

Tuna Seiner Order To Martinac Shipbuilding

Bumble Bee Seafoods has ordered a tuna seiner to be built by J. M. Martinac Shipbuilding Corp., Tacoma, Wash. To be equipped with a 2,800-bhp single diesel, it will have dimensions of 165 feet by 34 feet by 17 feet.

Peterson To Build Six Large Navy Tugs

Peterson Builders, Inc., Sturgeon Bay, Wis., is being awarded a $5,083,500 fixed-price contract for construction of six large Navy harbor tugs (YTB). The Naval Ship Systems Command is awarding the contract.

Graham To Build Three Ocean-Going Trawlers

Graham Boats, Inc., of Pascagoula, Miss., has been contracted by Gulf City Fisheries, Pascagoula, Miss. for the construction of three ocean-going trawlers. The dimensions for each trawler are as follows: 70 feet by 22 feet by 12 feet. Each vessel will be powered with 400-total-bhp diesel machinery.

ABS Publishes Rules For 1969

The 1969 edition of the American Bureau of Shipping's "Rules for Building and Classing Steel Vessels" has been published. Revised and published annually, the Rules are invaluable to the shipbuilder, naval architect and marine engineer.

The 1969 Rules incorporate several important changes and additions, the most extensive dealing with transverse internal members in large ships, particularly tankers. Also included are the limits on hull girder shearing stress based on still water conditions. Further testing of tanks in new designs is required in some cases. The section on hull welding has been brought up-to-date to reflect current practices, while spare parts for diesel engines have been expanded in agreement with other classification societies.

The 1969 edition of the Rules costs $12.50 and may be ordered from Bureau offices throughout the world or from Publications Department, American Bureau of Shipping, 45 Broad Street, New York, N.Y. 10004.

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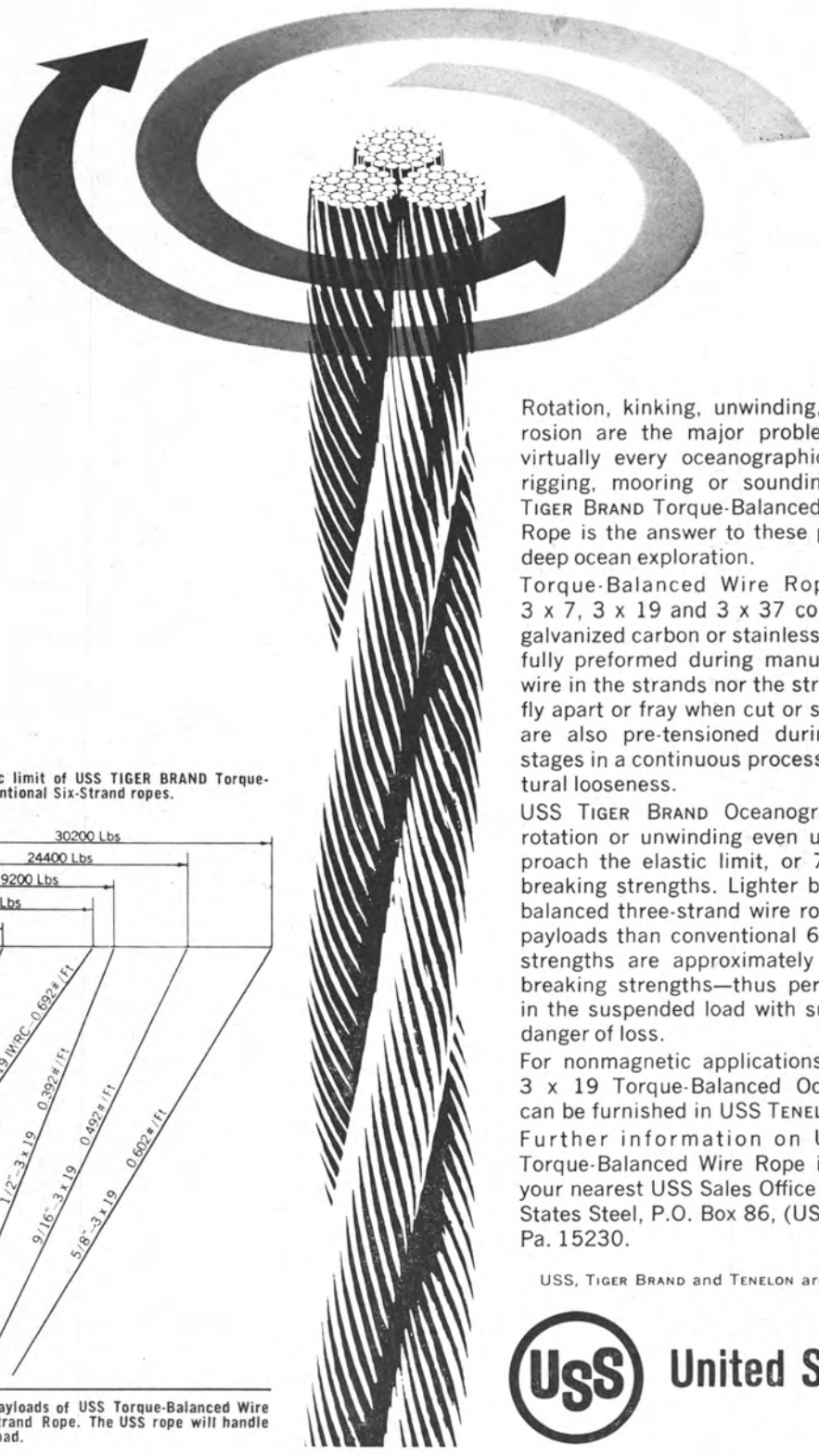
Tiger Brand Torque-Balanced Three-Strand Wire Rope... engineered to resist rotation, kinking and unwinding.



Rotation, kinking, unwinding, breakage and corrosion are the major problems encountered in virtually every oceanographic hauling, hoisting, rigging, mooring or sounding application. USS TIGER BRAND Torque-Balanced, Three-Strand Wire Rope is the answer to these problems of modern deep ocean exploration.

Torque-Balanced Wire Rope is produced in 3 x 7, 3 x 19 and 3 x 37 construction, in either galvanized carbon or stainless steels. Because it is fully preformed during manufacture, neither the wire in the strands nor the strands in the rope will fly apart or fray when cut or severed. These ropes are also pre-tensioned during final production stages in a continuous process that removes structural looseness.

USS TIGER BRAND Oceanographic Ropes resist rotation or unwinding even under loads that approach the elastic limit, or 75% of their listed breaking strengths. Lighter but stronger, torque-balanced three-strand wire ropes allow for higher payloads than conventional 6-strand ropes. Yield strengths are approximately 88% of minimum breaking strengths—thus permitting an increase in the suspended load with substantially reduced danger of loss.

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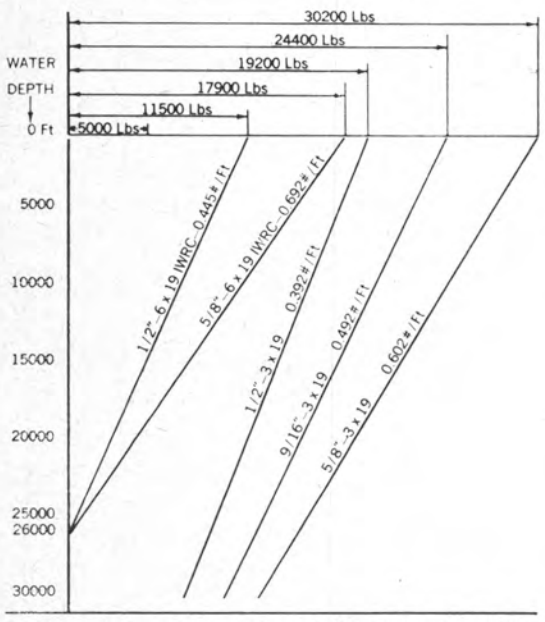
Comparative values for elastic limit of USS TIGER BRAND Torque-Balanced Wire Rope and Conventional Six-Strand ropes.



These curves compare safe payloads of USS Torque-Balanced Wire Rope and Conventional Six-Strand Rope. The USS rope will handle approximately 50% more payload.

United States Steel

Bell's ACV Travels Over Lake Erie Ice In Canadian Water-Pollution Study

Riding on its four-foot cushion of air, the ACV is shown out on Lake Erie ice where it attained an average speed of 30 miles per hour while covering 2,700 square miles.

A United States aerospace company and the Canadian government joined forces recently in a winter water-pollution study utilizing an air cushion vehicle (ACV) for transportation on ice-bound Lake Erie.

Begun in early February, the month-long experiment involved Textron's Bell Aerosystems Company and the Canada Centre for Inland Waters of Burlington, Ontario, one of the world's leading freshwater research organizations. The Centre's program is coordinated by the Canadian Department of Energy, Mines and Resources, but involves active participation of other federal agencies and universities.

The program was designed primarily to establish the feasibility of using an ACV for transporting scientists and their equipment across the frozen lake to water sampling stations; thereby enabling the Centre to extend its studies through the winter months.

The ACV is owned and operated by Bell Aerosystems, U.S. leader in the development, production and operation of ACV's. Designated the SK-5, it rides on a four-foot cushion of air which is created by a turbine-powered lift fan which forces air into chambers beneath the craft where it is captured by a flexible, bag-like container called a "skirt."

Capable of speeds exceeding 60 miles per hour, the vehicle can travel over water, land and marsh, as well as ice. In March 1967, an SK-5 became the first surface vehicle to ever make a wintertime crossing of Lake Erie — a 235-mile journey which established its potential for Arctic missions.

The Centre's Lake Erie project and subsequent SK-5 evaluation was under the direction of Operations Officer **Derek J. Cooper** who, with two assistants, covered approximately 2,700 square miles on the eastern third of Lake Erie, conducting analyses at some 25 stations. Two Bell operators piloted the craft.

The Bell ACV was rigged with a special, bow-mounted platform from which scientific instruments were lowered through holes drilled in the ice. The samples extracted were the basis for subsequent determinations of the chemical, plankton and thermal content of the water at varying depths. As many as 25 samples were taken from a single station.

In addition, daily weather information was relayed from these stations to the Canadian mainland.

Columbus Line Orders Three Containerships For U.S.-Australia Run

Dr. **John Henry de La Trobe,** chairman of the board of directors of Columbus Line, Inc., has announced that the parent company, Hamburg-Sud in Hamburg, of which he is managing director, has placed an order for three container vessels with the Howaldtswerke Deutsche Werft shipyard in Hamburg, Germany. These three vessels will be employed in the Columbus Line service between ports on the East Coast of North American and Australia/New Zealand.

They will be full containerships of 24,000 dwt and have a service speed of 22 knots. The length will be 618 feet and the breadth will be 93½ feet. Each vessel will be able to carry 900 containers, including 450 reefer containers.

It is expected that two of these vessels will be completed during the second half of 1970, and the third will be completed early in 1971.

Western Gear Names Lamoureux Manager Industrial Products Div.

Fred N. Lamoureux has been appointed manager of Western Gear Corporation's Industrial Products Division, Belmont, Calif., President **Bernard J. Bannan** has announced.

An authority on marine propulsion and industrial gearing, Mr. **Lamoureux** was transferred from Houston, Texas, where he had been manager of Western's Southwestern Division for six years. Previously, he was that division's supervisor of engineering, and before that had been a design engineer at Western Gear's research engineering facilities at corporate headquarters in Lynwood, Calif.

In his new post, Mr. **Lamoureux** succeeds Vice-President **Edward W. Jenks,** who was promoted to group vice-president of Western Gear. Mr. **Lamoureux** is a member of the Society of Automotive Engineers, and The Society of Naval Architects and Marine Engineers.

"Subseatrain"—Submarine Tug And Barges Described To San Diego Section Of Sname

Attending San Diego Section, SNAME, meeting were, left to right: Capt. **Ken Romberg,** USN (ret.), naval architect, National Steel and Shipbuilding Company; **John Taylor,** student, Webb Institute of Naval Architecture on temporary assignment to National Steel and Shipbuilding Co.; **Thomas S. Hand,** papers chairman, SNAME, San Diego Section, U.S. Naval Ship Engineering, San Diego; **William N. White,** co-author of "Feasibility Study of a Subseatrain" and guest speaker, employed by the U.S. Naval Shipyard, Mare Island, and **W. V. Markey,** Acme Ornamental Iron Works, Inc., San Diego.

Cargo transported beneath the surface of the sea in a string of unmanned submersible barges towed by a nuclear-powered main propulsion unit is a new concept in marine transportation. This has been termed the 'Subseatrain' in a technical paper presented to members and guests of the San Diego Section of The Society of Naval Architects and Marine Engineers at a recent meeting held at the San Diego Yacht Club.

"The subseatrain would be capable of moving 72,000 tons of containerized cargo at 24 knots or 890,000 tons of bulk oil at 16.5 knots," commented **William N. White,** co-author of the technical paper.

A subseatrain consists of 1 to 12 barges, each 200 feet long, 80 feet wide, and 75 feet high, towed in tandem by a nuclear-powered, submersible tugboat having 240,000 shp. The cargo barges would be loaded in port prior to the arrival of the subseatrain in order to minimize delay, which is one of the biggest factors in cost of handling cargo.

"When the subseatrain would arrive at the local port terminal (seatrain station), tugboats (switching engines) would be dispatched to tow the outgoing barges to the subseatrain, and bring the incoming barges into port, where they could be unloaded whenever it would be convenient."

In the original design, the barge was very deep in draft and could not be towed into shallow water. This problem was solved by constructing the barge as two separate hulls hinged together to allow each section to float on its side, thus, drawing much less water and capable of moving about in any port in the world.

"The subseatrain has several characteristics that make it competitive," explained Mr. **White.** "First, it is unlikely that any single surface ship could be built to carry the large cargo deadweights mentioned, and if it were, it could not enter very many ports. Second, the unique feature of the proposed subseatrain would be its versatility. It would be able to carry many different kinds of cargo simultaneously in any proportions desired. The subseatrain would not have to enter a harbor to discharge or pick up its cargo. In addition, the seatrain would not be affected by storms or fog on the surface and could be operated on a strict timetable. Another possible advantage would be the ability of the subseatrain to pass through the Suez Canal, a feat that large surface ships cannot perform. If two towing units were built, it would be possible to operate one subseatrain in the Atlantic and one in the Pacific, using the Panama Canal to exchange cargo barges in transit from ports in one ocean to ports in the other. The subseatrain may also be able to open new trade routes under the Arctic ice cap if the problem of navigation can be solved. Finally, the subseatrain design offers one solution to the military problems inherent in moving large quantities of cargo of all types in secret, with little chance of detection until safely in port."

The other author of this "subseatrain concept," in addition to Mr. **White,** was **George Lamb.** This study was made by the two naval architecture and marine engineers while students at the University of Michigan.

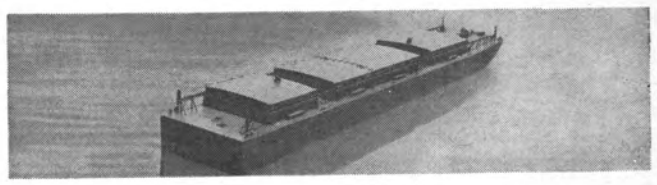
Further studies and tests are being made on this new concept in an effort to reduce the number of minor problems encountered and to make it more economical to construct and operate.

Tacoma Boat To Build Hovercraft Hull

Tacoma Boatbuilding Company, of Tacoma, Wash., has been awarded a subcontract by Aerojet-General Corp., El Monte, Calif. for the construction of the hull of the hovercraft which the Maritime Administration and the Navy Department recently ordered from Aerojet. The vessel, designed for a maximum speed of 80 knots, will be 80 feet by 37 feet, and will have a displacement of 100 tons; it will use waterjet propulsion units, driven by gas turbines.

When you have a BIG LOAD to move

BARGES DO THE JOB BEST



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American Bureau of Shipping Chairman Reports

Another Record Year For The Bureau

An increase over the previous year of nearly 2,300,000-gt in the tonnage of vessels under contract to American Bureau of Shipping classification made 1968 another record year for the Bureau.

Announcing this at the Annual Meeting held on March 18, at the Bureau headquarters in New York, **Andrew Neilson,** chairman and president, said that he was "particularly happy" about this "substantial increase"—the highest peacetime total in the Bureau's history.

"The increasing confidence of shipowners and shipbuilders in the ability of the Bureau to provide classification services of a high order is shown by these figures", said Mr. **Neilson.** "At the year's end the Bureau had under contract to be built to its classification, 1,056 vessels totaling 12,923,000 gt (22,175,000 dwt)—an increase of 2,296,000 gt compared with the figure for the previous year."

The number of vessels classed during the year—614—was somewhat lower than the 691 ships classed during 1967, continued Mr. **Neilson.** However, the total tonnage classed increased by nearly 700,000 gt to 3,956,000 gt.

"The Bureau, as an international classification society, has offices in almost every major seaport in the world", he said, "and it is gratifying to report that at the end of 1968, vessels were building to our classification in 30 countries, including the United States. This means that the Bureau's services are becoming increasingly well known and are giving us an opportunity to apply successfully our classification techniques in the shipbuilding countries of the world. It also gives the Bureau technical and surveying staffs the experience of learning from shipbuilding practices abroad."

Vessels ABS Classed

At the end of 1968 the Bureau had 2,947 active seagoing vessels of over 1,000 gt under its classification, totaling slightly more than 40,000,000 gt. This large number of vessels had significance for the whole maritime community in that the Bureau had a complete history of each ship, from its approved plan stage onward. "This means that the service experience with these vessels, which is carefully analyzed by our staff by means of the surveyors' reports, is used to make changes in our Rules, where necessary, so that merchant ships can be better built and better maintained."

During the year, 233 active seagoing vessels of 1,756,000 gt were dropped from Bureau classification. As was the case in 1967, these vessels were largely Liberty ships, T2 tankers and other war-built ships no longer suited for commercial use. In the past year, 114 active Liberty ships, 12 T2 tankers and 48 other war-built ships were removed from Bureau classification. In addition, 59 other active sea-going vessels lost Bureau class.

Mr. **Neilson** said that the Bureau was traditionally prominent in the classing of large vessels and had under contract at the end of the year 90 vessels of over 100,000 dwt each, for a total of 18,000,000 dwt. The average capacity for vessels in this group was about 200,000 dwt.

Important Research

"In this connection," he said, "I want to mention an important research development which we expect will have a profound influence in the structural design of large vessels. This is The Arizona Project, a program jointly sponsored by Chevron Transportation Corporation and the Bureau, and being conducted at the University of Arizona. In our opinion, DAISY, the computer program developed for this project, is the most sophisticated program available to the marine industry today for structural analysis."

Exclusive Offices

In 1968, exclusive offices were established in Madras, India, and Turku, Finland. The Bureau now has exclusive surveyors in 34 countries and non-exclusive surveyors in 59, thereby giving surveyor coverage to the principal ports of the world.

Container Vessels

Discussing container vessels, Mr. **Neilson** said that there are presently about 150 vessels in service which have container carrying capacity, with a deadweight tonnage of nearly one and three-quarter million tons. About one-third of these are full container vessels, most having speeds in excess of 20 knots. On order are about another 120 container-carrying vessels, more than 90 of which are for 1969 delivery. The average deadweight capacity and speeds of these vessels are even greater than those presently in service. By mid-1970, container vessels in service will have a capacity totaling almost 4 million deadweight tons. "I am pleased to report that the Bureau is participating heavily in the classification of these ships both here and abroad."

The Great Lakes

On the Great Lakes, the very large bulk carrier of 39,000 dwt being built for United States Steel Corporation at American Ship Building Company, Lorain, Ohio, is building to ABS classification. This vessel is 833 feet by 105 feet by 41 feet 6 inches, and is driven by a diesel engine of 14,000 bhp. Also building to Bureau classification is the largest Lake vessel ever to be built. This bulk carrier, which has dimensions of 988 feet 6 inches by 105 feet by 49 feet, is under construction for the account of Bethlehem Steel Corporation by the Litton Industries yard at Erie, Pa.

Links With Other Societies

Mr. **Neilson** said that an important development in 1968, in which the Bureau took an active part, was the formation in Hamburg of the International Association of Classification Societies. The association is made up of the American Bureau of Shipping, Bureau Veritas, Germanischer Lloyd, Lloyd's Register of Shipping, Nippon Kaiji Kyokai, Norske Veritas and Registro Italiano Navale.

In an effort to improve the lines of communication with the International Maritime Consultative Organization, commonly known as IMCO, the International Association of Classification Societies made a formal request to the Secretariat of IMCO for consultative status with that organization. The question would be on the agenda for the May meeting, "at which time we have every reason to believe favorable action will be forthcoming."

Government's Responsibility

Commenting on government's role, Mr. **Neilson** said: "Government has a very great responsibility to see that the ships under its flag are built and maintained to standards which they consider satisfactory. It is my sincere belief that the classification societies can be of tremendous assistance to governments in carrying out many of the vital functions in plan approval, surveys during construction, and periodic and damage surveys throughout the life of ships.

"The American Bureau of Shipping has the organization and technical ability to lighten the load of government. It also has the conviction that the best interests of the maritime community will be served by allowing the classification societies to play their traditional role."

New Board Members

Elected to the board of managers at the Annual Meeting of the members were: **Worth B. Fowler,** president, American President Lines Ltd.; **R. S. Haddow,** president, Amoco Shipping Co.; Dr. **John J. McMullen,** president, United States Lines, Inc.; **Charles O. Peyton,** vice-president, Esso International, Inc.; **Spyros S. Skouras,** president, Prudential Lines; Capt. **H. E. Van Der Linde,** manager Marine Transportation, Continental Oil Co.

The board of managers is the governing body of the Bureau. The membership of the Bureau is composed of shipowners, shipbuilders, marine underwriters and other persons prominently identified with maritime commerce.

New Bureau Members

Fifteen men were elected as new members of the Bureau at the Annual Meeting of the board of managers. They are: **Theodore W. Anderson,** president Hendy International Co.; **Christian F. Buekema,** vice-president, Lake Shipping, United States Steel Corp.; **Wilson Watts Brooks,** partner, John L. Wortham & Son; **Sam F. Davis,** president, Tampa Ship Repair & Dry Dock Co., Inc.; **Richard P. Eide,** manager, Marine Department, The Cleveland-Cliffs Iron Co.; **Chester C. Goss,** president, CIT Corporation; **N. H. Hallenborg,** managing director, Kockums Mekaniska Verstad; Capt. **R. V. Laney,** USN (ret.), vice-president, Quincy Yard, General Dynamics Corp.; Capt. **W. G. Leback,** vice-president, marine operations, Sea-Land Service, Inc.; Capt. **Neville Levy,** president, Equitable Equipment Co., Inc.; **Robert H. Lucas,** president, Fraser Shipyards, Inc.; **M. DeW. Marsh,** managing director, South African Marine Corp. Ltd.; **J. E. Nivin,** vice-president and general manager, Jeffboat, Inc.; **C. Dean Ramsden,** president and general manager, Pacific Coast Engineering Co., and **Edward Renshaw,** president, St. Louis Ship Div., Pott Industries, Inc.

Down at the Battery, overlooking New York harbor, is Moran's strategically located radio and control room—the nerve center of the Moran operation. This room, with Moran's eleven-man dispatching team, is a beehive of activity 24 hours a day, every day. Surrounded by land telephones, ship-to-shore radio telephones, VHF radio, Western Union ticker, Telex machines, walkie-talkies and long range telescopes, these Moran men direct the intricate movements of Moran tugs in the world's busiest harbor. They have at their fingertips the vast store of knowledge necessary about ship movements and up-to-the-minute harbor conditions, and are constantly in touch with arrivals and departures of ships and other traffic.

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First of Four 15,000-HP Reduction Gears Delivered To Ingalls By Lufkin Foundry For 34,000-Dwt Diesel Propelled Tankers

View of 15,000-hp Lufkin Model HDL 6640 marine reduction gears being shop assembled.

Lufkin Foundry and Machine Company has delivered the first of an order of four 15,000-hp Lufkin Model HDL 6640 marine reduction gears which will be coupled with diesel engines for oceangoing tankers.

This is the first such application of diesel power in major U.S.-flag commercial vessels of this size and capacity. The 34,000-dwt tankers will have an overall length of 669 feet 8 inches, a cargo capacity of 300,000 barrels and a speed of 16.6 knots.

Their ultimate use will be as tankers chartered to the Military Sea Transportation Service. Owners of the ships will be Falcon Tankers, Inc., New York. Ingalls Shipbuilding Corp., Pascagoula, Miss., will build the vessels around the engine packages, which are too large to install in completed ships.

Lufkin's gear unit was sent to Pascagoula, where it will be coupled with the engine, built by Fairbanks Morse Inc., division of Colt Industries, with home offices in Beloit, Wis. Fairbanks Morse manufactures the 12-cylinder Model 38A20 diesel engines, which exceed the power output of any diesel engines now made in the United States.

Rated at 1,250 hp per cylinder at 450 rpm, the engines are more compact than other current marine diesels with a comparable power output, a feature expected to cut operating costs and increase the vessels' capacity for cargo, fuel and equipment.

Weighing a total of 196,000 pounds, it is the largest gear unit ever designed and built by the Lufkin, Texas manufacturing firm. The bull gear alone weighs 32,000 pounds and has a 46-inch face width and 91.267-inch OD.

The gear box holds 715 gallons of lubricating oil. The main gear lube-oil pump is of the automatic reversing type, with a rated output of 140 gpm, an auxiliary electric motor pump rated at 15 hp and a 90-gpm capacity, which is utilized for standby and prelube.

The unit was set up for unmanned engine room operation by means of monitoring devices added to the lube-oil system.

Installed in a 16-foot by 16-foot by 9-foot gear box, the unit consists of one high-speed gear set and one low-speed gear set. It utilizes a Fawick dual-element 46VC1200 brake mounted on the reduction gear intermediate shaft. Power is transmitted to the gear box through a special combination 18CB Holset coupling and Fawick dual-element 51VC1600 air clutch.

It is a double-reduction in-line gear, providing 111.3 propeller rpm at an engine speed of 450 rpm. The overall ratio is 4.047:1.

The propeller thrust is carried by a special Kingsbury 43-inch thrust bearing built into the gear unit. The bearing was designed to take a normal thrust of 235,000 pounds, a bollard thrust of 300,000 pounds and a reverse thrust of 200,000 pounds.

John Stevens Joins Ship Design Firm As Vice-President

J. B. Hargrave, Naval Architects, Inc., of 205½ Sixth Street, West Palm Beach, Fla., has announced the appointment of **John N. Stevens** as vice-president.

Mr. **Stevens** will be in charge of the commercial design section of the firm. The company, best known for pleasure craft designs, has experienced a substantial increase in commercial work and maintains a full-time staff in that department. Recent and current projects include a fast aluminum ferry, a 300-passenger sightseeing boat, two drift fishing boats, a 72-foot fiberglass trawler and an 81-foot steel trawler. Large vessel work includes the structural design of a 44,000-ton oil and bulk-carrying barge.

Prior to joining the Hargrave firm, Mr. **Stevens** was assistant vice-president, Far East operations, for National Bulk Carriers, Inc., in charge of shipbuilding in Japan. He had previously held positions as consultant to Mitsubishi Heavy Industries, Ltd., vice-president of Naess Shipping Company, New York, and assistant manager, Marine Department, Standard-Vacuum Oil Company.

Todd Shipyards Corp. Buys Engineering Firm Sells Products Division

Todd Shipyards Corporation has announced that it has completed the purchase of Designers & Planners, Inc., of New York and Galveston, a naval architecture and marine engineering firm, and has executed formal agreements for the sale of its Products Division to Combustion Equipment Associates, Inc., of New York. Designers & Planners was acquired for 18,000 shares of Todd Shipyards Corporation stock. The sale of the Products Division and investment in related subsidiary companies in England and Canada was for cash in excess of $2-million.

John T. Gilbride, Todd's president stated that Designers & Planners will be a wholly owned Todd subsidiary and will increase Todd's marine design and engineering capabilities in view of the anticipated heavy workload in ship construction and conversion fields. Designers & Planners will, however, continue to operate autonomously in order to offer services to all segments of the maritime industry.

The Products Division and the subsidiary companies manufacture and market gas and oil burning combustion equipment, which products do not fit into Todd's announced diversification objective of further growth in the metal die casting and plastic injection molding equipment fields. Such equipment is now manufactured and marketed by Lester Engineering Company, Cleveland, Ohio, a 99-percent-owned subsidiary of Todd.

Paceco To Build Alumina Unloader For Baltimore Pier

The bulk handling division of Paceco, Alameda, Calif., has been awarded a contract to design and manufacture an alumina unloader to be installed at Hawkins Point Cargo Pier in Baltimore, Md.

The unloader will have a handling capacity of approximately 1,000 tons per hour, stand 105 feet high and have an outreach of 79 feet.

It is being built under contract with Bechtel Corporation, which is serving as engineer-constructor for Eastalco Aluminum, Buckeystown, Md. Eastalco is a subsidiary of Pechiney Enterprises Inc. and Howmet Corp., which are building an aluminum reduction plant near Frederick, Md. The plant will receive the alumina—a raw material basic to the production of aluminum—from Baltimore by rail car.

Paceco engineers are designing an elaborate dust collecting system for the unloader, since the powdery alumina easily escapes in the form of dust while being handled.

Start-up of the unloader is scheduled for early 1970.

Jeffboat To Build Twin-Screw Towboat

Jeffboat, Inc., Jeffersonville, Ind., was contracted by Humble Oil & Refining Co., Houston, Texas, to build a twin-screw towboat. Designated Hull No. 2247, it will have dimensions of 90 feet by 28 feet by 10 feet 6 inches and will be equipped with 1,700-total-bhp diesels.

TOWING INDUSTRY SYMBOL—A mounted bronze propeller was presented recently to the Department of Transportation as a symbol of the nation's barge and towing industry. The propeller is from the tug Foss No. 12, a retired unit of the Foss Launch & Tug Company fleet. The propeller was presented to Secretary of Transportation **John A. Volpe** in ceremonies at the Department of Transportation. The presentation was made by **Braxton B. Carr,** president of The American Waterways Operators, Inc., the national association of the barge and towing industry, of which Foss Launch & Tug Company is a member. Participants in the ceremony were, left to right: Mr. **Carr, F. A. Mechling,** executive vice-president, A. L. Mechling Barge Lines Inc., Joliet, Ill., chairman of AWO's Legislative Committee; **G. W. Gladders,** president, G. W. Gladders Towing Company, Inc., St. Louis, Mo., immediate past chairman of the board of AWO; **George H. Blohm,** vice-president and general manager of Cities Service Tankers Corporation, New York City, newly elected chairman of the board of AWO; and Secretary **Volpe,** with hands on the propeller.

Some of our nation's newest ships are 20 years old.

If you think the warships in our mothball fleet are somewhat past their prime, consider our merchant marine:

Only one in five of the nation's merchant ships is under 10 years old. Two-thirds of them are too old, too small, too slow, too costly to operate to compete effectively with newer foreign vessels. At the present rate of replacement, and retirement of tonnage older than 25 years, our present dry cargo merchant fleet of 663 ships could be down to 260 vessels in 4 years.

That's a dangerous situation. For our country is far from self-sufficient. Of 77 strategic materials needed to turn the wheels of American industry, we must import 66—and already we're relying on foreign shipping for nearly 95% of our imports and exports. Meanwhile other nations are building more ships than we are, Russia by 8 to 1. Russia and 13 others are outbuilding us in terms of tonnage.

We must rebuild our merchant fleet now. No business is more urgent. Not even outer space. And unless we build the ships we need in U.S. yards, we can't be sure of getting either ships or shipping at a time when we might need them even more than now. With modern yards on every U.S. coast, Todd is ready to do its share... in shipbuilding, repairs, and conversion.

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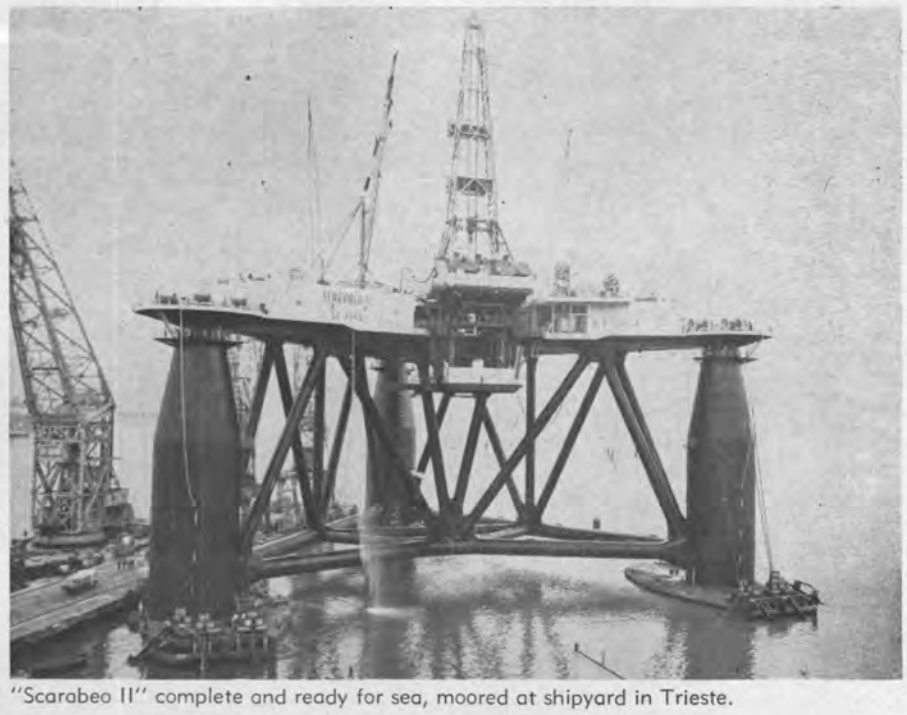
This is one of a series of advertisements appearing in a selected list of national magazines reaching leaders of industry, finance, the defense department, and the government.

A Combination Of Skills Produces

Scarabeo II



"Scarabeo II" complete and ready for sea, moored at shipyard in Trieste.

Completed late in 1968, the semi-submersible drilling unit Scarabeo II is currently at work in the middle of the Adriatic Sea, almost exactly half way between Italy and Yugoslavia. As the newest semi-submersible unit to be placed in service, it represents the latest technical advance in this relatively new and demanding field, drilling for oil and gas in waters far from shore.

The Scarabeo II is a unique combination of American technology and Italian shipbuilding craftsmanship, and is owned by SNAM-Progetti S.P.A. of Milan, Italy. The design is by the firm of Friede & Goldman, Inc., naval architects and marine engineers, of New Orleans, La. The unit was built by the San Marco Yard of the Cantieri Riuniti del Adriatico of Trieste.

The Scarabeo II may be considered a second generation development of a type of drilling unit conceived by Friede & Goldman, Inc., and first utilized in the design of the Sedco 135 class. While differing in dimensions and in many details from the earlier units, the Scarabeo II employs the three caisson principle.

The unique appearance of this type of semi-submersible drilling rig stems from the basic requirement of providing a low-motion platform for drilling purposes. The three vertical caissons offer a very small waterplane area to the buoyant effect of passing waves, thus minimizing heave, roll and pitch. Stability against capsizing is accomplished by having the three caissons centered at relatively large distances. The Scarabeo II has an overall length of 352 feet, a maximum breadth of 306 feet, and each of the three caissons is 36 feet in diameter. Each caisson rests on a stream-lined footing having dimensions of 120 feet long, 60 feet wide and 25 feet deep. The elevated main deck is 176 feet above the bottom of the unit, and provides a vast triangular area for machinery, storage space, and accommodations of personnel. When under tow, the vessel has a draft in the range of 20 to 24 feet, and while drilling, the draft is increased by ballasting to the 70 foot range. The vessel can drill while resting on the ocean floor in water depths to 120 feet. In deeper water, the vessel drills while afloat.

The unit has been constructed to meet the requirements of both the American Bureau of Shipping, and the Registro Italiano. Of all-welded steel construction, a considerable portion of the structure is made of high-tensile material manufactured in Italy. The constructioin of units of this type has taken place in many countries of the world, and each shipyard has usually differed in erection technique. The San Marco Shipyard elected a similar approach to that used in Japan. Pile supports were driven in the harbor bottom, the three footings were separately launched, and were placed upon these pile supports. The caissons and the connecting bracing were installed by floating cranes and the elevated deck erected upon these supports. Only when fully completed, was the drilling unit lifted off these supports by the simple expedient of pumping out ballast water.

The drilling machinery is typical of the giant equipment utilized offshore. The drawworks is an Ideco Model 2500 manufactured under license in Italy by Nuova Pignone, driven by Siemens electric motors. The two main mud pumps are 1,600-hp National Supply manufactured units and a third smaller pump is from Ideco-Pignone. The electric driven rotary table is an Ideco HS-275. The drilling mast has been supplied by Lee C. Moore Corporation. The underwater blowout preventer stack is by Cameron Iron Works. Rucker constant-tension units are fitted for both the riser system and the guide lines. Bulk mud and cement are stored in pressure tanks manufactured by Halliburton.

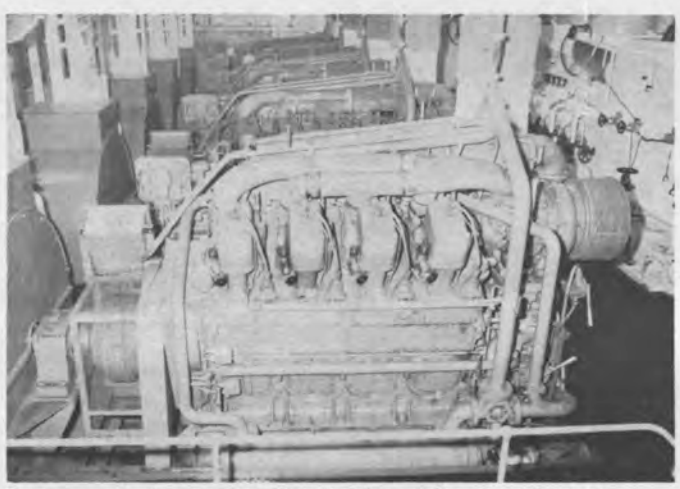
Three cargo-handling cranes are installed, all supplied by Clyde Iron Works. One of these is a 70-ton stiff-leg derrick and the other two are 40-ton revolving cranes.

One of the most important systems aboard a semi-submersible drilling vessel is the mooring system. This unit is equipped with nine giant mooring winches, each powered by a 75-hp electric motor. Each winch has 3,000 feet of wire rope, 2⅜ inches in diameter connected to 30,000-pound anchors. This system will permit working in water depths up to 600 feet deep.

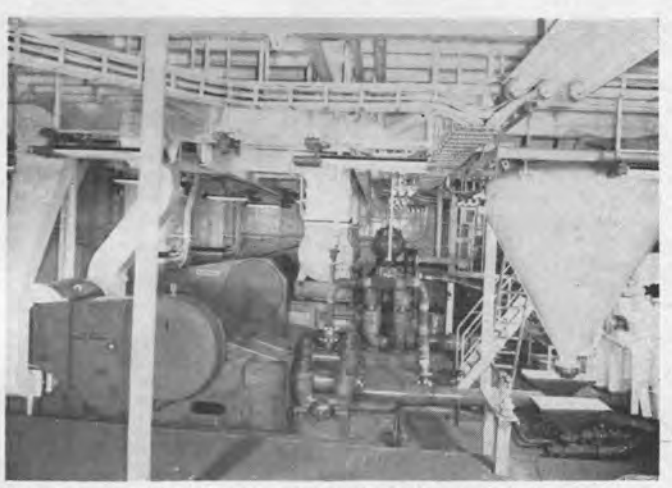
Perhaps the most unique machinery onboard the Scarabeo II is the diesel-electric powerplant, incorporating for the first time on an offshore drilling vessel the principle of generating alternating current power with static conversion to d-c power where motor speed control is essential. The electrical generators, controls, switch gear and converters, have all been supplied by the German firm of Seimens A. G. The diesel-electric sets supply alternating current to a common bus, and in turn this bus can be tapped for any number of power using devices. Where d-c motors are used, namely, for the mud pumps, drawworks and the rotary table, the a-c current passes through a thyristor which converts the alternating current into direct current. The highly successful direct-current system used for drilling rigs up to now requires each d-c motor to be connected directly to an individual d-c generator in order to obtain speed control. This necessitates running many diesel engines even when the total amount of power used is a fraction of that operating on the line. On the Scarabeo II only sufficient generators need be operating to satisfy the total load. This should result in a reduction in wear on the diesel engines and in the total fuel consumption. Five diesel-electric units were installed, each consisting of a 1,200-hp Fiat, Type A 238ESS, diesel driving a Seimens generator.

The accommodations are of a very high standard. Accommodations are provided for a total of 66 persons—two private cabins, 18 two-man cabins, and 7 four-person rooms. The interior of the accommodations are of fireproof construction and furnished with high-quality furniture. Air conditioning is provided during warm weather, and heating for winter conditions. The galley is fully equipped with electric ovens, ranges, refrigerators, dishwashers, etc., all of Italian manufacture. Two large dining rooms and a separate large recreation room have been installed.

While at this time the Scarabeo II has only been working for several months, reports indicate excellent performance in all respects. The vessel has already experienced an unusually severe winter storm, during which motions were surprisingly small. The electrical system has been particularly satisfactory, and promises to become a major contender for future drill-rig applications.



Engine room, showing five Fiat diesels and Siemens generators.



Pump room with mixing pump and mud pumps behind it.

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FUELS AND LUBRICANTS

George H. Blohm Elected Chairman Of American Waterways Operators

George H. Blohm

George H. Blohm, vice-president and general manager of Cities Service Tankers Corporation, New York City, was elected chairman of the board of The American Waterways Operators, Inc., at the annual meeting of directors of the nationwide trade association of the barge and towing industry held in Washington, D.C.

He succeeds **G. W. Gladders,** president of G. W. Gladders Towing Company, Inc., St. Louis, Mo., who has served as AWO chairman for the last year. Mr. **Gladders** continues as a director of the Association.

Braxton B. Carr was elected to his 13th annual term as president of the Association, which has headquarters in Washington, D.C. and field offices in New York and New Orleans.

William E. Cleary was elected to his 14th annual term as secretary-treasurer. He operates the Association's North Atlantic regional office in New York City.

A native of Brooklyn, New York, Mr. **Blohm** has been associated with Cities Service since 1945. He has worked in some depth with all forms of transportation, including rail, motor, air, pipeline, and since 1961, deep sea. He has been directly involved with inland waterways transportation since 1947 when he was appointed assistant traffic manager of Cities Service Oil Company. He was named manager of the traffic department in 1957, and manager of the Inland Waterways Division of the company's marine department in 1961. He transferred to Cities Service Tankers Corporation in 1963, where he served as treasurer and manager of marine business until his election as vice-president and general manager in 1966.

The new AWO board chairman attended the Academy of Advanced Traffic, Operations Research Institute. He was admitted to practice before the Interstate Commerce Commission in 1946.

Mr. **Blohm** has served on The American Waterways Operators, Inc.'s, board of directors since 1964. He has also worked actively as a member of the Association's Legislative Committee.

He is a member of the American Petroleum Institute, Association of Interstate Commerce Commission Practitioners, Commerce and Industry Association of New York, National Industrial Traffic League, the Traffic Club of New York, Propeller Club of the Port of New York, The National Waterways Conference, and the Whitehall Club.

The following new directors of AWO took office at the time of the annual board meeting in Washington: **E. E. Ahlemeyer,** vice-president, National Marine Service Incorporated, Engineering Services Division, Hartford, Ill.; **T. F. Ellis Jr.,** president, Ellis Towing & Transportation Company, Galveston, Texas; Capt. **S. V. Gardner,** manager, Baton Rouge Branch, Marine Department, Humble Oil & Refining Company, Baton Rouge, La.; **Robert A. Guthans,** vice-president, Southern Industries Corporation, Mobile, Ala.; **Earl C. Rose Jr.,** chairman, Rose Barge Line, Inc., Clayton, Mo.; Capt. **C. C. Rasmussen,** president and general manager, Bay and River Navigation Company, San Francisco, Calif.; **Howard A. Watters,** vice-president-transportation, Central Soya Company, Inc., Fort Wayne, Ind., and **John W. Weaver,** vice-president of supply and distribution, Standard Oil Company (Kentucky), Louisville.

The AWO board is made up of 38 water carrier executives from throughout the United States.

Re-elected to the board were: **J. Frank Belford Jr.,** president, Seaboard Shipping Company, Division of Moran Towing & Transportation Company, Inc., New York, N.Y.; **Gresham Hougland,** executive vice-president, Crounse Corporation, Paducah, Ky.; **Robert F. Lynch,** manager, Inland Waterways Operations, Mobil Oil Corporation, New York, N.Y.; **James P. McAllister,** president, McAllister Lighterage Line, Inc., New York, N.Y.; **E. W. McCarthy,** executive vice-president, Gulfport Shipbuilding Corporation, Port Arthur, Texas; **D. L. Mechling,** vice-president-operations, A. L. **Mechling** Barge Lines Inc., New Orleans, La.; **F. A. Mechling,** executive vice-president, A. L. Mechling Barge Lines Inc., Joliet, Ill.; **Jerry L. Page,** president, Southern Barge Line Corporation, Paducah, Ky., and **William S. Streckfus,** vice-president, Streckfus Steamers, Inc., St. Louis, Mo.

Additional AWO directors, in addition to Mr. **Blohm** and Mr. **Gladders,** who continue in office are: **F. T. Ainsworth,** manager, Southern Region, Distribution and Traffic, The Dow Chemical Company, Freeport, Texas; **William F. Akin,** vice-president, Nashville Bridge Company, Nashville, Tenn.; **Marvin Bacon,** president, Bacon Towing Co., Inc., Houston, Texas; **Peter J. Brix,** executive vice-president, Knappton Towboat Company, Portland, Ore.; **Francis B. Bushey,** president, Spentonbush Transport Service, Inc., Brooklyn, N.Y.; **John Buursema,** vice-president-operations, G. B. Zigler Company, Morgan City, La.; **Alex S. Chamberlain,** Producers Towing Company, Louisville, Ky.; **Thomas B. Crowley,** president, Crowley Launch and Tugboat Company, San Francisco, Calif.; **John M. Donnelly,** executive vice-president, Ingram Barge Company, New Orleans, La.; **Frank M. Garavelli,** Frankie & Johnnie's Boat Store, Memphis, Tenn.; **James G. Hines,** president, Hines, Incorporated, Bowling Green, Ky.; **Robert J. Hughes,** president, James Hughes, Inc., New York, N.Y.; **William C. McNeal,** vice-president, Oil Transport Company, Inc., New Orleans, La.; **T. Truxtun Morrison,** manager, Barge Department, Peavey Company, Alton, Ill.; **Frank T. Stegbauer,** vice-president, Southern Towing Company, Memphis, Tenn.; **H. G. Williams,** president, Gulf Atlantic Towing Corporation, Jacksonville, Fla.; **B. E. Williamson,** secretary-treasurer, Marine Welding & Repair Works, Inc., Greenville, Miss.; **C. G. Willis Jr.,** president, C. G. Willis, Inc., Paulsboro, N.J., and **J. Knox Woodruff,** senior vice-president, Puget Sound Freight Lines, Seattle, Wash.

Marco Announces Staff Changes

Peter G. Schmidt, president of Marine Construction & Design Co. (Marco), Seattle, Wash., has announced the appointment of **Robert F. Allen** as vice-president-general manager of the multi-faceted firm. Mr. **Allen** has been with Marco since 1957, and has been vice-president-sales for the past four years.

Mr. **Schmidt** also appointed **D. W. Lerch** as vice-president-engineering; **Eilif Kuhnle** as vice-president-finance, and **John R. Logan** as manager-sales.

Marco's facility in Seattle includes shipbuilding, repair, and manufacturing services for the ocean science as well as the fishing industry.

Two Blount Designed And Built Tugs Delivered To Antigua

Blount Marine Corp., Warren, R.I., recently delivered to the Government of Antigua two 85-foot by 24-foot by 10-foot docking tugs.

The Blount-designed tugs are an important part of Antigua's new deep-water project. The deep-water project, completed at a cost of approximately $6-million, gives St. John's, Antigua, a harbor and port facilities equal to any in the Caribbean area.

The contract for the design and construction of the tugs was awarded to Blount after review of proposals submitted by several U.S. shipyards, by representatives of the Antigua government and their consulting engineers, Stanley Consultants, Inc., of Muscatine, Iowa. Moran Towing Company of New York is cooperating with the Antigua government in the training of the tug docking crews.

Each tug is powered by a pair of Caterpillar D-398 diesel engines capable of developing a total of 2,000 hp, giving the tug a bollard pull in excess of 45,000 pounds. The engine drives a 76-inch, four-bladed Federal propeller through a 3.95:1 reduction gear. Exceptional sharp turning and maneuvering characteristics are provided by the special Blount skeg design and the electro-hydraulic steering gear, supplied by Sperry.

The tugs are completely pilothouse controlled with a Blount-designed monitoring system covering all important functions of the vessel, and Morse engine controls. A Hose-McCann sound-powered telephone system is installed.

Ship's power is furnished by two Caterpillar 60-kw 120/240-volt a-c generator sets and distributed through a Smith-Meeker switchboard. The modern galley is outfitted with electric stove, refrigerator and freezer.

Hughes Brothers, Inc., New York, furnished the Uniroyal rubber bow fender and the 10-inch rubber bumper that protects the entire hull.

A fire monitor, furnishing 200 gpm at 125 psi, is mounted on the top of the pilothouse. The monitor and the four fire-fighting stations, together with portable carbon-dioxide extinguishers, provide the tugs with fire-fighting capabilities that will be valuable at the new port.

The first tug sailing from Warren, R.I. for delivery which took eight days.

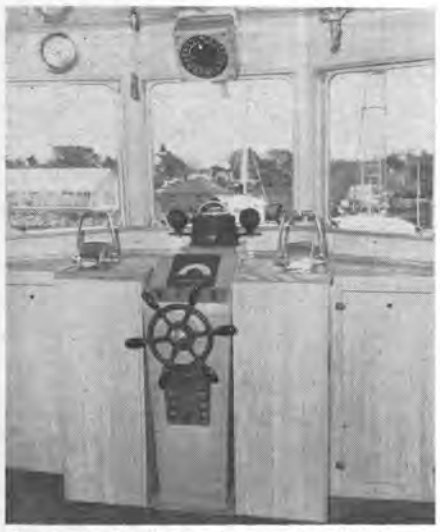
Each tug has a fuel capacity of 13,500 gallons and can carry 2,500 gallons of fresh water.

Well ventilated quarters are provided for a crew of seven.

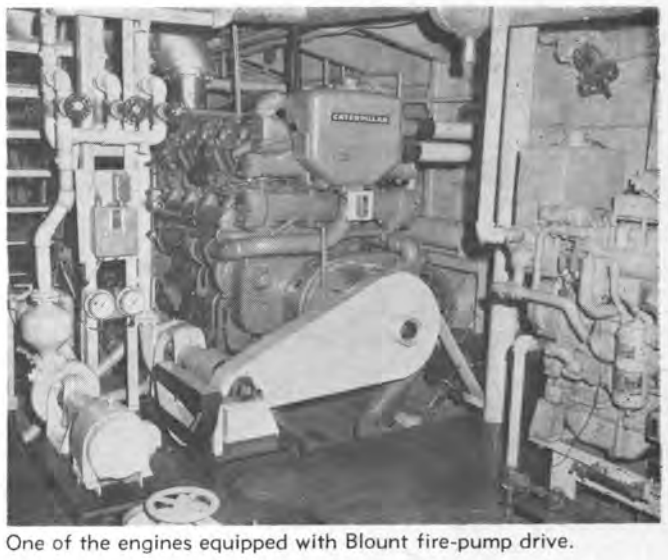
Both vessels were built to the highest standards of American Bureau of Shipping for +A1 Rivers and Harbors, and both vessels are classed by ABS.

The first tug, Pathfinder, was delivered by a Blount crew in eight days with a stopover at Bermuda.

The second tug, Usher, was the first vessel completed by Blount on its new ship-assembly line.


Compact wheelhouse has good visibility.


Modern galley is combined with the mess room.


One of the engines equipped with Blount fire-pump drive.

Survey Shows Jump In Domestic Ship Construction

Plans for commercial cargoships and tankers to be built during the next five years call for about $4-billion in domestic ship construction. The value of current ships and vessels reported by naval architects stands at about $2.3-billion according to an in-depth survey conducted in the marine industry.

Results of the maritime industry survey were disclosed at a recent meeting of The Society of Naval Architects and Marine Engineers in Houston, Texas by **Donald L. Frisby,** senior market specialist for Armco Steel Corporation.

Mr. **Frisby** cited Armco's deep involvement in the marine industry as the reason for conducting the survey of naval architects, ship owners and operators, and shipyards. Armco's Houston Works is a major supplier of alloy and high-strength plate steels, as well as conventional grades, to the booming Gulf area shipyard industries.

"The survey," he added, "says that domestic ship construction will be at an extremely high level for the next few years."

Seventy-five percent of the industry leaders rejected the conversion of reserve fleet vessels as a source of added domestic fleet capacity. The general opinion was that considering size and speed of vessels and operating costs, the reserve fleet vessels could not compete even with modernization.

Vessel speed is a good example of the gap in reserve fleet capability and today's needs. While the older vessels could average 12 to 14 knots, the industry today wants containerships capable of 27 knots, double the speed of older vessels. Cargoships and freighters should be capable of more than 22 knots, the survey indicated, and the desired speed for tankers is about 18 knots.

Steam turbines led as the most popular form of propulsion, with 56 percent of the respondents favoring this method. Conventional diesel and gas turbines drew substantial support, while nuclear power was mentioned by 8 percent.

Faster ship turnaround was rated as an important step toward increasing efficiency of operations, along with increased automation and increased cargo capacity.

Increased cargo capacity ranked with cost as a major factor in design and construction of new vessels. For container shipments, most industry leaders indicated a preference for standardized boxes. Roll-on and roll-off designs and lighter or barge techniques which can utilize standard containers were also mentioned.

High-strength steels in new ship construction got a strong vote of confidence, with 75 percent of the respondents predicting their increasing use.

Using high-strength steels for commercial cargoships, which began just two years ago and has expanded rapidly, offers several alternatives to ship operators. Owners expressed overwhelming preference for building with high-strength steels to increase capacity and increase speed. For operators, the cargo cost per ton/mile is a key target.

Matson Expanding Containership Service To Far East Ports

Matson Navigation Company has appointed Delgado Shipping Agencies, Inc., of Manila, as general freight agent in the Philippines, it was announced by **R. J. Pfeiffer,** vice-president of Matson's Far East freight service.

Matson is expanding its Pacific Coast-Japan intermodal freight container service to the Philippines, Hong Kong, Taiwan, Okinawa and Korea.

F. J. D. Clemo, Delgado's managing director in Manila, said Matson's proposed expansion of container service has stirred wide interest among shippers and business and government interests in the Philippines.

"All aspects of the Philippine economy will benefit from Matson's expansion of container freight service," Mr. **Clemo** said.

Unique Pilothouse Lift Installed On Chotin Towboat Built By Port Allen Marine

Latest addition to the Chotin fleet, the MV Sugarland, is shown here entering a bend on the Lower Mississippi.

The MV Sugarland, a 138-foot by 42-foot by 11-foot 6-inch triple-screw towboat is the 17th boat built by Port Allen Marine Service since they started building boats three years ago. The name Sugarland was taken from one of the first vessels on which Capt. **Joseph Chotin**, founder of Chotin Transportation, Inc., was pilot. The new 3,375-hp vessel was added to the Chotin Transportation, Inc. fleet to be used primarily in the movement of various chemicals between Houston and Chicago.

Design of the new Sugarland was a joint venture of Port Allen and Chotin and contains a pilothouse lifting mechanism that is a barge industry innovation. This feature is a double-lift retractible pilothouse to facilitate operations on the Illinois River and in the immediate Chicago area where there are numerous low bridges. The pilothouse lifting mechanism is of a new design by Port Allen based on an idea by Capt. **Scott Chotin.** Pilothouse lifts are powered by a jack-screw mechanism manufactured by Philadelphia Gear Corporation for primary lift and by a hydraulic unit for secondary lift that enables full extension of the pilothouse to an eye-level height of approximately 28 feet above the water line. The radar mast is also hydraulically operated and extends as the pilothouse is extended and automatically lowers as the pilothouse is lowered.

The monitoring systems on the pilothouse console indicate to the pilot pertinent information concerning the operating condition of the main and auxiliary engines. Another feature of the boat is that the port and starboard flanking rudders operate independent of each other. The three main steering rudders have interconnected linkage, allowing standard parallel operation. Full follow-up and non-follow-up steering plus automatic pilot are among the features of the new vessel.

The Sugarland is powered by three 1,125-hp turbo-charged Model 399 Caterpillar engines. Two D333 Caterpillar generating sets supply the electrical power for the vessel, each having 24-volt automatic starting and shut-down features. In event of a mechanical failure the operating set would automatically shut down and the other would start up. The vessel is equipped with horizontal offset 5.3 to 1 ratio Philadelphia Gear Corporation reduction gears, and Avondale 86-inch stainless-steel propellers.

There are accommodations for a crew of 10 and guest quarters for two persons, six staterooms in all, each with private bath. All quarters and pilothouse are air conditioned throughout.

Port Allen in just five short years has grown from a small barge cleaning and gas-freeing facility with 10 employees to a full fledged shipyard with 160 employees. Some of the accomplishments of the yard are the construction of 17 towboats, construction of deck barges and dredge hulls, plus the fabrication of bridge caissons and other specially designed steel fabricated items. Yard activities include: sandblasting, painting and repairs to barges and boats; a gas-freeing facility; plus a gas-freeing facility in the Baton Rouge harbor.

ICHCA Sponsored Conference On Bulk Shipping Opportunities Scheduled For April 15 In N.Y.

"Bulk Distribution—New Opportunities for International Transportation" will be the theme at a technical conference April 15. The conference will be sponsored by the U.S. National Committee of the International Cargo Handling Coordination Association (ICHCA) at the Biltmore Hotel, Madison Avenue at 43rd Street, New York City 10017.

The container explosion has dominated news in the international transportation in recent years. Another trend, no less important, has preceded with much less publicity—this has been the bulk revolution. ICHCA has gotten together a group of bulk distribution experts who will cover some important new developments which are important to all in international transportation.

Speakers and their topics are: **Hugh C. Downer,** senior vice-president, Marcona Corp.—"The Latest Technological and Economic Developments in Ocean Transportation;" Dr. **A. T. Yu,** vice-president-operations, Robins Engineers and Constructors—"Latest Technological Developments in Materials Handling Equipment in Port and Interface Situations;" **Phillip J. Maddex,** engineering and management consultant—"Transportation of Bulk Ores and Minerals in World Markets;" **Robert Farnsworth,** Matson Research Corporation—"Total Systems Approach on Bulk Cargo," and **L. Robert Folan,** vice-president, Ohio River Company—"Case History Integrated Transportation System—Inland Waterways." **Henry G. Hohorst,** ACF Industries, will lead a panel discussion on specialty bulk shipments of foodstuffs and chemicals.

Persons interested in attending should apply to ICHCA, Room 1515, 466 Lexington Avenue, New York, N.Y. 10017. The registration fee for non-members is $25.00.

Halter Building Tug For Red Star Towing

Halter Marine Services, Inc., New Orleans, La., is building a twin-screw tugboat for Red Star Towing & Transportation Co., New York. Designated Hull No. 226 it will have the following dimensions: 109 feet by 31 feet by 16 feet 4 inches and will be powered by two General Motors, Model 16-645-E2 diesel engines developing a total of approximately 4,000 bhp.

Sub-Bottom Profiling System Developed By Edo Western

An Acoustic Sub-Bottom Profiling System designed specifically for operation in continental shelf depths has been developed by Edo Western Corporation, Salt Lake City, Utah. The system is designed to provide high resolution sub-bottom data of the first 30-150 feet of strata. The 415 System readily lends itself to applications in offshore mining, exploration, construction, site surveys or pipeline burying by providing high resolution data of sediment characteristics. The system can also be used to locate buried objects or pipelines.

A unique transducer is utilized to provide an extremely short, high power pulse. The system operates at 3.5 or 7 kHz, and the transducer generates 1-2 cycles of the signal frequency with no ringing or noticeable decay time. This short pulse is the key to the high resolution of the Model 415 System. Optimum presentation of the received data is provided by the wide dynamic range adjustable TVG (time varied gain) receiver system.

The TVG control permits a low receiver gain prior to receipt of the first bottom echo, with rapid increase in gain following the bottom signal to accentuate the sub-bottom data. The starting time and rate of gain change of the TVG are adjustable by front panel controls. The received data is displayed on a precision bathymetric recorder providing a 19-inch record with an 18-db dynamic display range.

The packaging of the Model 415 System permits either portable operation or a permanent installation in a 19-inch equipment rack. The transducer configuration offers a choice between a hull or over-the-side mount, or a mounting in a hydrodynamically designed towed vehicle. For further information contact Edo Western Corporation, 2645 South 2nd, West, Salt Lake City, Utah 84115.

York Trailer Introduces Knock-About Container Van

York's rugged container-bodied Dockwalloper can be supplied as a bolt-together assembly. For export, non-container parts are detached and packed in the body which then travels as a standard ISO container.

First production models of the Dockwalloper, York Trailer's new knock-about container-bodied city-delivery van, are now being completed at York's Northallerton, England, container plant. The low-cost Dockwalloper is believed to be the first trailer van to be based on ISO container design and, as such, is an exceptionally rugged vehicle, ideal for withstanding the bangs and scrapes of alley and loading-dock maneuvering.

The Dockwalloper, which comes in 20- and 30-foot lengths, is basically a steel ISO container mounted on a single axle running gear and provided with landing gear, a rear bumper and a 2-foot-long tailshelf to facilitate loading-dock operations and curbside loading and off-loading. Normally it will be supplied ready for the road, with the noncontainer components — tailshelf, running gear, landing gear, etc.—welded to the body. But it can be supplied as a bolt-together assembly, a feature which gives it an interesting export capability. With the non-container components stowed inside the body, the Dockwalloper becomes its own self-contained package and travels as a standard ISO container.

Using the volume production facilities of the container factory, which is the largest and most highly-automated in Europe, accounts for the low cost of the Dockwalloper.

In spite of its all-steel construction and the fact that its body is designed to satisfy the container strength specifications of the International Standards Organization, British Standards and Lloyds, the Dockwalloper is a remarkably light van. The 20-foot unit weighs only 6,500 pounds, the 30-foot only 8,200 pounds. This gives payloads of 9½ tons and 15½ tons, respectively. Cubic capacity of the 20- and 30-foot vans is 1,092 cubic feet and 1,657 cubic feet, respectively. The door opening is 7 feet 6 inches wide by 7 feet high.

A maintenance plus of the Dockwalloper is its exceptional resistance to corrosion. Like all steel containers built at York, every steel component, before assembly, is passed through an automated pretreatment plant where the surface of the steel is converted into a non-metallic, rust inhibiting, zinc crystal skin which is then coated with phenol epoxy aluminum. After assembly, surfaces are further protected by primers ready for finish painting to customer requirements. This elaborate corrosion inhibiting is intended to prepare containers for deep-sea operation. Applied to a delivery van, it results in significant savings in repainting costs over the life of the trailer.

As it is, to all intents, a York container on wheels, the Dockwalloper is not the prettiest of vehicles. The corrugated walls were designed for strength and lightness rather than beauty. For operators to whom appearance is important, aluminum cladding is available as an optional extra. Further information may be obtained by writing to: York Trailer Company Limited, Corby, Northants, England.

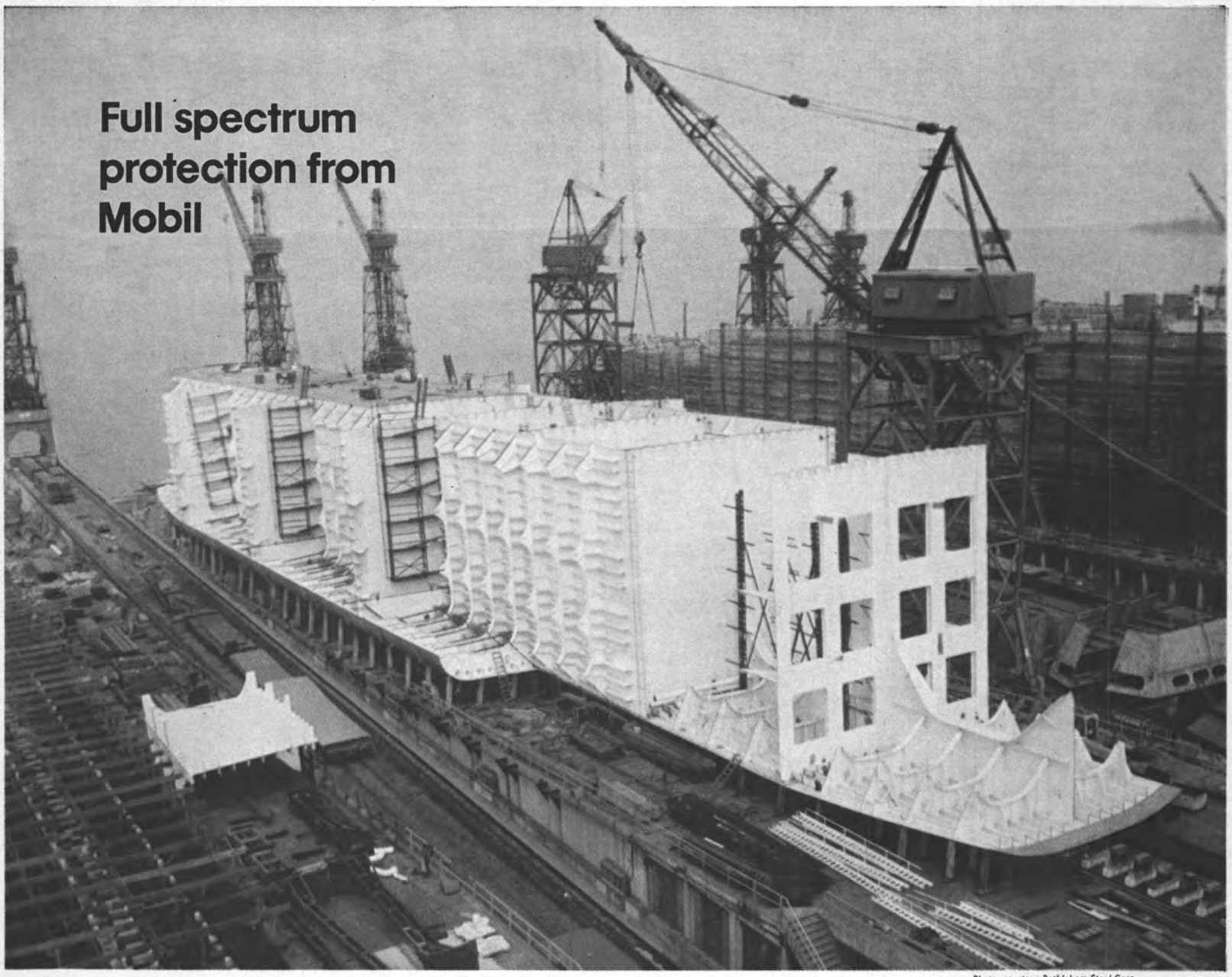


Photo courtesy Bethlehem Steel Corp.

Prevent corrosion and eliminate costly steel replacement with Sovapon Tank Coating Systems.

The ship above is one of several tankers now under construction at Bethlehem Steel, Sparrows Point Shipyard. All of her cargo tanks are being protected with Sovapon Tank Coating to prevent corrosion and eliminate costly steel replacement.

Sovapon Tank Coating, a specially formulated epoxy lining, has been successfully used in liquid cargo tanks and/or deep tanks on over 70 vessels. Sovapon's length of service exceeds 10 years.

The primer used both internally and externally on the above tanker's hull is Mobil 53 Series After-Blasting Shop Primer. It has the unique qualities of quick dry, good weldability and flame cutting. And it provides an excellent base for topcoating.

For details on Sovapon Tank Coating Systems, write today!

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MARINE FUELS • MARINE LUBRICANTS • MARINE COATINGS
WORLDWIDE MARINE SERVICE

Also from Mobil: Automotive Finishes, Industrial Metal Coatings, Packaging Coatings, Specialty Chemicals, Wood Finishes

Shipbuilders Council Re-Elects E.M. Hood

Edwin M. Hood was re-elected president of the Shipbuilders Council of America at the 48th annual meeting of the Washington-based national trade association. Also re-elected were **Edward P. Ruddy,** secretary, and **Mrs. Beverly C. Kendall,** treasurer. The association's membership comprises major commercial shipyards and suppliers of marine equipment.

Mr. **Hood,** in presenting his annual report, expressed confidence that the industry is "on the brink of unprecedented growth."

"From preliminary figures, it would seem that industry activity levels reached a post-war high in 1968, and a reawakened national interest in the 'sufficiency' of U.S. sea power could well lead to the commencement, within the next several years, of the largest peacetime shipbuilding effort the nation has ever undertaken."

The shipyards' spokesman said as a result of the "expanding presence of the Soviet Union on the oceans," President **Nixon** can be expected "to adopt a more forward stance with respect to sea power, maritime and shipbuilding matters than has taken place during the last eight years."

Mr. **Hood** noted that President **Nixon** prior to his election pledged the efforts of his administration to maintain "a United States Navy second to none and to the prompt restoration of the United States as a first-rate maritime power."

"Though there is much optimism and support favoring full achievement of the sea power goals defined by President **Nixon,**" Mr. **Hood** said, "even partial accomplishment will result in a greater magnitude of naval and merchant shipbuilding than has been the case in the recent past." And, he noted:

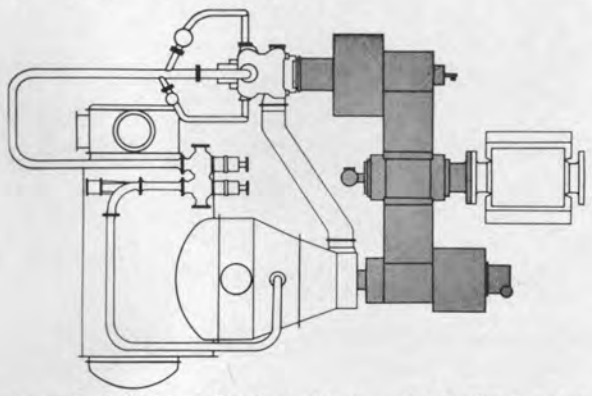
"Fortunately, every major yard in the United States is 'gearing up' for the prospect of affirmative action on the part of the new administration and to accommodate non-government market potentials. Through management skills, capital improvements, new techniques and cost reductions, a renaissance in U.S. shipbuilding which began about five years ago has been rapidly moving forward. It holds great promise for the future in terms of work stability, employment for craftsmen and shipyard profits.

"The private shipyard industry could well be on the brink of unprecedented growth."

Stal-Laval Propulsion Units Installed On Encounter Bay— Largest European Containership

The Encounter Bay, a 29,150-dwt containership, is the largest containership to be built so far at a European shipyard. It was recently delivered to her owners Container Fleets Ltd., London. The Encounter Bay is the first containership in a series of six, all of which will be delivered to Container Fleets during 1969. The six ships will operate between Europe to Australia.

This ship was constructed at the Ross yard of Howaldstwerke-Deutsche Werft, Hamburg, Germany. Like her five sistherships, she is driven by 32,450-shp steam turbine machinery, designed and built by Stal-Laval Turbine AB, Sweden. This power provides a speed of about 23 knots at 140 rpm of the propeller.



Layout of Stal-Laval AP machinery with turbines, gears and condenser arranged in one single plane.

The propulsion machinery is of the Stal-Laval Advanced Propulsion single-plane type with the h-p turbine and the l-p turbine in a cross-compound arrangement. The reduction of the turbine rotor speeds from about 6,000 rpm on the h-p side and 3,600 rpm on the l-p side to a propeller speed of 140 rpm is achieved by a two-stage gearing arrangement with epicyclic gears in the first and parallel gears in the second reduction.

Steam conditions at the maneuvering valve inlet are 925 psi and 945°F. The turbines have three bleed points, one in the h-p turbine and two in the l-p turbine. Exhaust steam from the auxiliary turbines is passed into the cross connection between the h-p and l-p turbines. The main condenser is of the double-pass type with pump circulation of the cooling water. The high technical-economical optimum condenser pressure of 1.9-inch Hg results in a small condenser size. The feed-heating system consists of two l-p feed heaters and one direct-contact deaerating feed heater.

The turbo-generator and turbo-feed pump are of the back pressure type. The turbines are operated on superheated steam and exhaust to the back-pressure system.

The Stal-Laval AP-machinery, introduced in 1963, has gradually increased its market share and now accounts for about 30 percent of all marine turbines on order throughout the world. Orders received during 1968 represented more than one million shp.

proven performer

At the time we launched her for Tidewater Marine Service in 1961, the 65-foot "Rip Tide" was the largest, toughest, and one of the fastest crewboats ever produced for the offshore oil industry.

Eight years later, crewboats have grown considerably bigger and a bit faster. We doubt if they will ever be much tougher.

After a stint on the Gulf Coast, "Rip Tide" was dispatched to Alaska's Cook Inlet where infamous ice and tidal conditions wreak havoc on marine equipment.

The illustration above was taken March 6, 1969 after "Rip Tide" had returned home to Morgan City for refurbishing.

The veteran boat was given a badly needed coat of paint and some engine repairs, but a careful survey showed her hull and cabin to be sound enough for Tidewater Marine to send "Rip Tide" abroad once more for an extended assignment in the Persian Gulf.

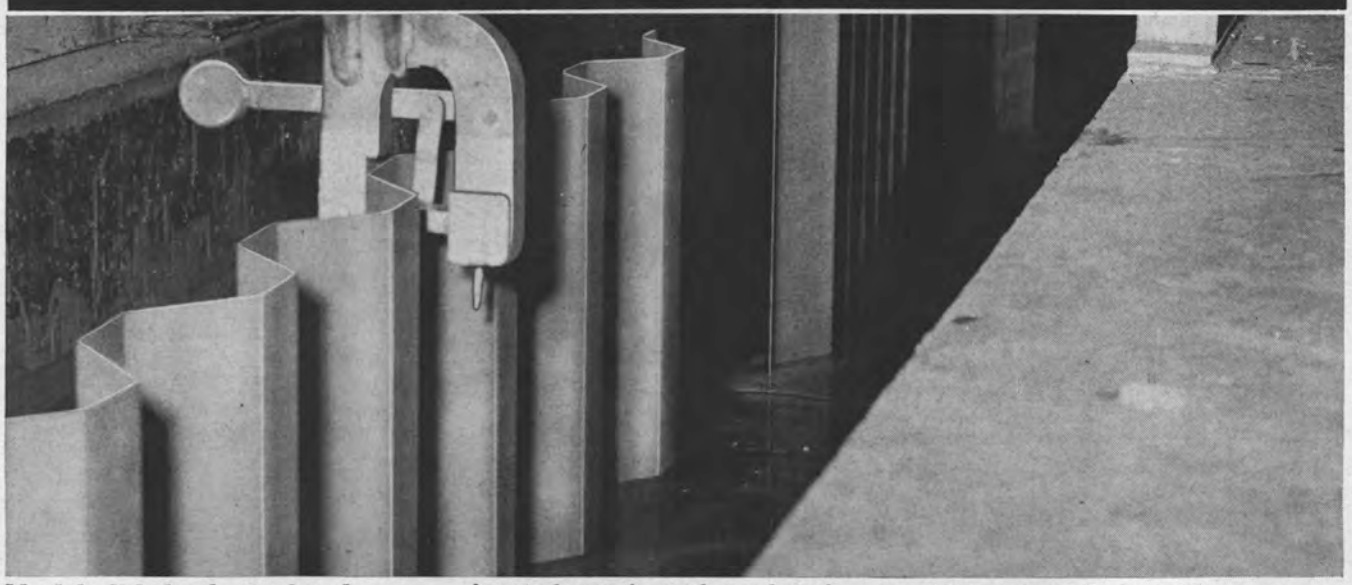
This, we think, is pretty fair proof of the performance you can expect from boats built by Sewart Seacraft.

A TELEDYNE COMPANY **Sewart Seacraft**

World's largest builders of high speed steel and aluminum boats.
P. O. Box 108, Berwick, La. 70342, Tel. 395-3572 (Code 504)

(An equal opportunity employer)

ALCHEM protection! The big bonus with York steel containers



York builds both steel and aluminum containers-and builds them well. But we believe there is an especially good case in favour of steel...

The steel box is tougher. It withstands dockside battering better.
A steel box costs less to buy- less to repair.

Then comes a big BUT...
What about corrosion on steel under sea-going conditions?

That's where York's ALCHEM process comes in.
We believe that there is nothing so thorough elsewhere in the container industry.

It transforms the surface of steel, eliminating its inherent tendency to rust.

Here's how.
Descaled and degreased parts pass automatically through:

1 Zinc phosphate spray converts surface of steel into a non-ferrous zinc crystal - a powerful rust inhibitor.
2 Hot chromate rinse completes chemical change, creates a non-metallic surface and inhibits electrolytic corrosion.
3 Phenol epoxy aluminum immersion in 4200 gallon tank to provide all-over aluminum coating: baked hard, prior to assembly.
4 Epoxy stoving undercoating applied in automated booth.
5 Amino-Alkyde stove enamel finish applied by airless sprays.
6 Stove bake at 325°F gives hard, even finish highly resistant to salt spray. Complies with Ministry of Defence (UK) Spec 1053. And that's it, the most thoroughly protected steel container you can buy!

What price ALCHEM protection?
Effectively... nothing. You pay no more for York's ALCHEMIZED containers. The longer life, the lower maintenance costs come as a bonus.

Like to know more about York Containers? Send back the coupon and we'll quote you. Please mark Container Type that interests you.

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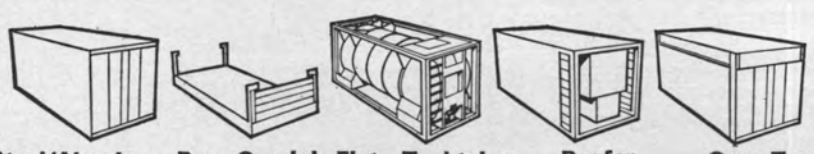
Address_____



Steel/Aluminum Box ☐ **Gondola Flat** ☐ **Tanktainer** ☐ **Reefer** ☐ **Open Top** ☐

YORK

Canada: York Transport Equipment Limited, Kelfield St, Rexdale, Ontario, PO Box 67, Phone (417) 247-7231

UK: York Trailer Company Limited, Corby, Northants, England Phone 05366-3561.

Holland: York Trailer Europa NV, Noldijk 113 Barendrecht, Near Rotterdam, Phone 01857-444/5 Night Service 01896-5725

GC8

Philadelphia Section, SNAME, Holds Joint Meeting With Welding Society

Principals at the recent Philadelphia Section meeting were, left to right: **K. C. Thornton,** Section vice-chairman; **M. Letich,** discusser; **G. H. Boyd,** Section chairman; **R. H. Hagan,** author; **D. McDevitt,** discusser; **C. Zeien,** meeting coordinator, and **G. A. Johnson,** Section secretary-treasurer.

The Philadelphia Section of The Society of Naval Architects and Marine Engineers held its February meeting in conjunction with the Philadelphia Section of the American Welding Society. **Richard H. Hagan,** engineering manager, Aero/Hydrospace Division, Sun Shipbuilding and Dry Dock Company, presented a technical paper, entitled "Design and Fabrication of Deep Diving Pressure Hulls."

This paper describes the basic design parameters and the construction of the recently completed pressure hull for the Deep Submergence Rescue Vehicle (DSRV). A brief discussion on the design considerations used for externally loaded spherical vessels is presented together with the rationale used in selecting HY-140 as the pressure hull material for DSRV. A description of the fabrication techniques, including material processing, machining, welding, fixturing, and testing is given with particular emphasis on the problems inherent to each operation. Because of the quite rigid design requirements, tolerance control played an important part in delivering a vessel suitable for its intended 5,000-foot operating depth.

The meeting was coordinated by **Charles Zeien,** vice-president, engineering Sun Shipbuilding, and formal discussions were given by **Mathew Letich,** American Bureau of Shipping, New York City and **David McDevitt,** of the Naval Ship Research and Development Center, Washington, D.C.

Dillingham Agrees To Acquire Foss And Pacific Tow Boat Co.

Dillingham Corporation has agreed in principle to acquire the businesses and assets of Foss Launch & Tug Co., of Seattle and Tacoma, Wash., and its affiliate, Pacific Tow Boat Co. of Everett, Wash., in exchange for Dillingham common stock, it was announced by **Lowell S. Dillingham,** president of Dillingham; **Sidney D. Campbell,** president of Foss, and **Walter D. Wallace,** president of Pacific. The acquisition is subject to approval by Foss-Pacific shareholders and boards, as well as the Dillingham board of directors. The two companies are engaged primarily in towing operations on the Pacific Coast and in Alaska. On the consummation of the transaction, the Foss-Pacific companies will continue to operate under their present management as a part of Dillingham's Maritime Services Division. In 1968, Foss-Pacific and their subsidiaries had total revenues in excess of $25-million.

Foss, a pioneer towing company, was founded by Andrew and Thea Foss in Tacoma, Wash. in 1889. The companies operate a fleet of over 250 tugs, workboats and barges on Puget Sound, in Alaskan waters and the Pacific Ocean.

Foss-Pacific will augment Dillingham's present maritime transportation services which currently operate between the Hawaiian islands, the West Coast of the United States and in Australian waters. Approximately 13 percent of Dillingham's 1968 revenues were derived from ocean-oriented activities which include oceanographic engineering, dredging, shipbuilding and ship repair, in addition to maritime transportation activities.

Pott Industries Acquires Behm Companies

Richard P. Conerly, president of Pott Industries, Inc., has announced that all of the stock of Behm Company, Inc. and Behm Piping and Erection Company, Inc., had been acquired in an exchange for common stock of Pott Industries Inc. An initial payment, of $1,103,264 represented by 51,243 shares of Pott common stock, has been made. An additional payment, also in Pott common stock, may be required in 1972, dependent upon the earnings of the Behm companies for the preceding four years.

Located at Osawatomie and Greeley, Kansas, the Behm companies are metal fabricators for the oil and chemical industries. The fabrication of pipe, pressure vessels, drums and towers for refineries, extruded nozzle, manifolds, headers and bends, pipe coils and heaters, is done in carbon and alloy steels, stainless, aluminum, clad materials, and a number of more exotic metals. Net income of $163,000 resulted from $2,021,000 of sales in 1968.

Pott Industries Inc. is engaged primarily in the construction and repair of towboats, barges, and other equipment used on the inland waterways and in the operation of barges and towboats on the Mississippi River System and the Gulf Intracoastal Waterway.

Carrier Promotes Shank To Product Manager

Jere R. Shank

Jere R. Shank has been appointed product manager of transportation refrigeration equipment for Carrier Air Conditioning Company, Syracuse, N.Y., according to **William LaGrange,** special products group sales manager.

A graduate of the University of Syracuse, Mr. **Shank** has specialized in transportation, marine and military equipment production, and sales engineering, since joining Carrier in 1952. He is a member of the special panel on cargo containers of the American Bureau of Shipping.

Bethlehem Appoints C.R. Wise Manager Ship Repair Sales

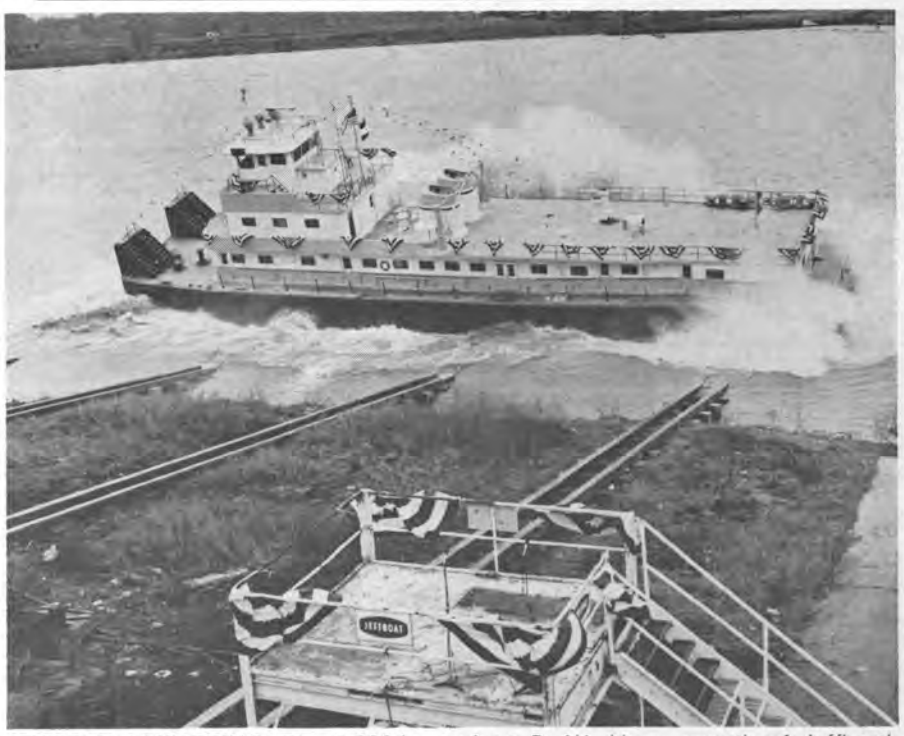
Clifford R. Wise

Daniel D. Strohmeier, vice-president of shipbuilding for Bethlehem Steel Corporation, has announced the appointment of **Clifford R. Wise** as manager of ship repair sales.

Mr. **Wise** is advancing from assistant manager of ship repair sales. He succeeds **Lester S. Sparrell,** who retired after more than 43 years of service with Bethlehem.

Mr. **Wise** attended the U.S. Naval Academy from 1936 to 1940. He joined Bethlehem at its Baltimore Key Highway ship repair yard in 1940 as an assistant ship superintendent. In mid-1942 he was appointed general foreman in charge of ship repair. He was transferred to Bethlehem's New York office in 1945 as part of the ship repair sales force, specializing in foreign sales. In 1951 he was named assistant manager of ship repair sales.

He is a member of The Society of Naval Architects and Marine Engineers, Maritime Associates, The Propeller Club, Whitehall Club, Downtown Athletic Club, and other organizations. He is also a member of the Board of Managers of the Seamen's Church Institute of New York.



JEFFBOAT LAUNCHING: The 5,000-hp towboat R. W. Naye, seventh of Jeffboat's eleven-boat 5,000-hp series to go into service with the American Commercial Barge Line fleet, is shown above at her launching at the Jeffersonville, Ind., shipyard. Named for **R. Wesley Naye,** vice-president of ACBL and president of Jeffboat, Inc., the vessel was sponsored by **Mrs. R. Wesley Naye.** The new towboat will be outfitted and placed into service on the Ohio and Mississippi River systems, according to an announcement by **Floyd H. Blaske,** president of ACBL. Jeffboat and ACBL, together with its affiliate companies, form the Inland Waterways Services Division of Texas Gas Transmission Corp.

Electro-Motive Division Announces Staff Changes

The following organizational changes have been announced by **F. T. Battey,** general service manager of Electro-Motive Division of General Motors, La Grange, Ill.

Frank P. Boatwright is promoted to the position of manager of the product installation section. Mr. **Garrett H. Schure** succeeds Mr. **Boatwright** as supervisor of the service department training center.

New appointments are **Earl P. Niemiec** as utility district engineer to operate from La Grange and to cover a new district to be established. **John M. Vance** will handle special assignments for the general service manager. **Louis F. Turney** succeeds Mr. **Vance** as manager of the product warranty section.

Mr. **Boatwright** joined Electro-Motive as a field instructor in December of 1961. He became an instructor in the training center in August, 1962, and in August of 1966 he became supervisor of the service department training center.

Mr. **Schure** also began his career at Electro-Motive as a field instructor in June of 1959. He became an instructor in the training center in June, 1962.

Mr. **Niemiec** joined Electro-Motive in engine test in October of 1949. After successive jobs in the service department, he became supervisor, product installation in June, 1961, and in April, 1968, became manager, product installation.

Mr. **Vance** joined Electro-Motive in 1945 as a field service engineer. In 1952 he became manager product service, and in 1961 he became manager product warranty.

Mr. **Turney** joined Electro-Motive in February of 1941 as a machine operator. He became a technical engineer in the service department in February, 1964, and a warranty statistician in April, 1968.

Ferro-Cement Boat Designed For 44 MPH

As the result of a design by naval architect **Frank R. Carius,** ferro-cement boats have achieved another dimension. Mr. **Carius,** of Vancouver, British Columbia, drew the plans for a ferro-cement boat that can obtain speeds up to 44 mph.

The plans were commissioned by **Ted Karrys,** president of Nau-Tek Ltd., of Toronto, Ontario. "We didn't see why a high-speed cement boat could not be built," Mr. **Karrys** said. "We were told that such a boat could not stand the tremendous vibrations caused by high speed, but we felt the proper design could overcome many problems."

Mr. **Carius,** who has been designing boats for 17 years, enjoyed the challenge presented by Mr. **Karrys.** He began working with ferro-cement about three years ago, but does not specialize in it. However, he estimates there are about 27 various ferro-cement boats of his design under construction. Over the years, he has designed about 5,000 boats that are in use in Canada and the U.S.

For this high-speed boat, he selected a deep-V hull because of the open angles at the bottom and the sides. However, he said the bottom of a ferro-cement boat cannot be flat. "There has to be a slight arch to avoid any sharp increase in vibrations," he explained. He said this boat has a 24-degree deadrise at the transom.

The final product has been named 'The Monster' by Nau-Tek. It is 29 feet long, has a 10-foot, four-inch beam and weighs about four tons. It is powered by two 300-hp Interceptors and has a Perkins 4.107M diesel auxiliary engine.

Mr. **Carius** also has designed a second version, which has a cabin that sleeps six. This is powered by the new Perkins V8.510M marine diesel developing 185 hp.

Mobil-Sponsored Symposium On Diesel Engine Technology

R. G. Coffin, general manager, marine sales department, Mobil Sales and Supply Corporation, addressing the Mobil Diesel Engine Technology Symposium in Tokyo.

Over 150 representatives of Japanese diesel engine manufacturers and ship owners and operators met in Tokyo on February 25 and 26 for a Mobil Oil Corporation-sponsored diesel engine technology symposium. It was the first such symposium ever held in Asia. The two-day meeting explored new horizons in technology with cooperation between engine builders and suppliers of fuels and lubricants.

Papers were presented by **Richard G. Coffin,** vice-president, Mobil Sales and Supply Corporation and general manager, marine sales department; Dr. **Hideo Fujitz,** professor in the department of technology, Meiji University; and Dr. **Iwao Koizumi,** professor in the department of technology, Tokyo University. Mobil diesel research specialists from the United States, the United Kingdom, Sweden and Japan also participated.

Mr. **Coffin** described the steps being taken by Mobil to insure that the proper marine lubricants are ready for engines being built or to be built. He noted Mobil's extensive use of the computer as a tool in forecasting and planning and, as an indicator of accelerating change, observed that 30 percent by volume of Mobil's 1967 worldwide sales of industrial and marine lubricants represented products not in existence five years earlier.

New Capac System Protects Internal Piping And Sea Chests

A new Capac cathodic protection system, similar to those used to safeguard hulls, propellers, and rudders against corrosion, has been designed by Engelhard Industries, Newark, N.J., to protect the internal piping, water boxes and sea chests of ships. The new unit has been successfully sea-tested on six oil tankers for over two years.

The Capac impressed current system, developed by Engelhard Minerals & Chemicals Corporation, is enabling the oil companies owning the tankers to utilize steel water boxes and piping in place of expensive copper-nickel.

Up to four separate, automatically controlled systems are installed on each ship. One system protects the water boxes and tube sheets of the main condenser; a second is installed to protect over 80 feet of steel sea-water-circulating pipe; and a third system protects the water boxes, tube sheets and steel heads of the lube-oil coolers. Current in the systems is released from platinum-surfaced titanium anode rods, which have a life expectancy of 10 years. Fully automatic control is provided to assure adequate current at sea without providing excessive current while at dock.

American Export Buys Large Trucking Firm

American Export Industries Inc. has executed a contract to acquire the stock of Eastern Express Inc., a Terre Haute, Ind., trucking concern, for cash.

Details of the acquisition have not been disclosed. The purchase was announced by **Jakob Isbrandtsen,** president of American Export and **W. M. House,** chairman of Eastern Express.

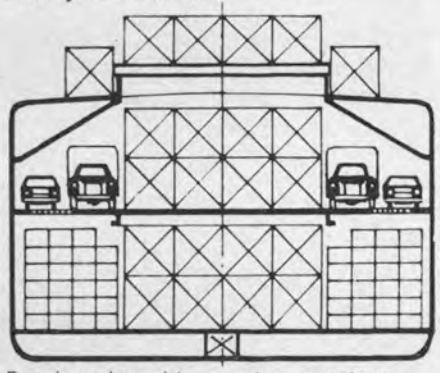
American Export is the diversified parent of American Export Isbrandtsen Lines.

Eastern Express, which is privately owned, will become a subsidiary of American Export Industries. Eastern's gross revenue is about $55-million a year. It operates 2,500 vehicles and trailers in service in 14 states.

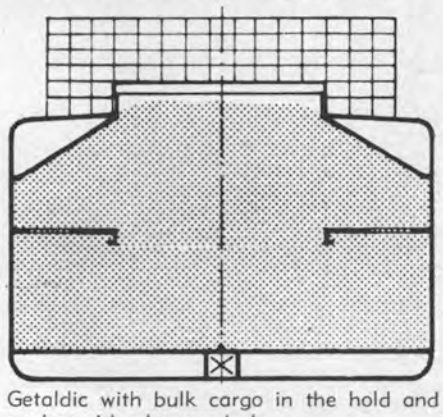
Astilleros Launches Freedom Class Ship

The Seville plant of Astilleros de Cadiz, S.A. has launched the Getaldic, the second vessel in the Freedom Hispania series ordered by Atlantska Providba of Yugoslavia.

The 471-foot 6-inch Freedom Hispania vessels are being built in Spain under an agreement between the Astilleros de Cadiz, S.A., and Algoship International, Canadian Algonquin Maritime and Ishikawajima-Harima Heavy Industries.



Freedom-class ship carrying containers, wheeled vehicles and packaged lumber.



Getaldic with bulk cargo in the hold and packaged lumber on deck.

The propulsion machinery, constructed by Astilleros de Cadiz, S.A. in Manises (Valencia), is principally composed of a Manises-Sulzer 6RD-68 type, 8,000-bhp, 150-rpm diesel engine.

The Manises factory has also built some other equipment for the vessel, thus complementing the major work done by the Seville shipyards.

At the same time as the Getaldic was being launched in the shipyard, plans for three new Freedom Hispania vessels to be constructed for the State Maritime Company of Chile were being drawn in another workshop.

Moffitt To Handle Exports Of Spongex For B.F. Goodrich

Lucian Q. Moffitt, Inc., Akron, Ohio, has been appointed the export sales distributor for B. F. Goodrich Spongex plastic, surface floats, according to Moffitt president, **Claire A. Drach.**

Spongex surface floats, rated 'excellent' for sea service, are widely used on fishing nets and as crab pot markers. Featuring greater tensile strength than most flexible materials, the floats are made of Koroseal — Goodrich's formulation of polyvinyl chloride.

The floats are available in 28 sizes, three colors and three shapes: cylindrical, oval and tapered. Many of the floats also are reinforced with solid plastic grommets to prevent ripping or splitting.

Moffitt also is national and international distributor of Goodrich Cutless marine bearings and Ceramaloy marine products.

A new technical bulletin (M-90), describing Spongex plastic, surface floats, is available from Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309.

Get this new tool for selecting steel... Armco's Marine Steels Property Card

Here's condensed information on the wide variety of Armco steels for marine construction.

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American Ship Names Kopp Group V-P Of Metal Fabricating

John B. Kopp, a key executive of The American Ship Building Company and its subsidiaries since 1964, has been named group vice-president of the recently formed Metal Fabricating & Building Materials Group, it was announced by **George M. Steinbrenner III,** chairman and chief executive officer of American Ship.

Mr. **Kopp** has been president of The Cincinnati Sheet Metal & Roofing Company, a wholly owned subsidiary since March, 1967. He will continue as operating head of Cincinnati Sheet Metal, while performing the new, broader duties under the corporate restructuring outlined by American Ship in January.

The Metal Fabricating & Building Materials Group is probably the fastest growing part of American Ship. In addition to the huge Cincinnati complex, it includes a large facility in Nashville, Tenn.; Pope Steel Building Products, Greenfield, Ind.; and the most recent acquisition, Standard Metal Fabricators with major plants in Omaha and Denver.

Still to be named are group vice-presidents for Transportation Cargo and Material Handling; and Marine Technology and Pollution Control. **Walter J. Knapp** has already been named group vice-president of the fourth group—Shipbuilding and Ship Repair.

Mr. **Kopp** joined American Ship as a vice-president in January, 1964 and became a member of the board of directors later that year. He was named senior vice-president in 1965 and remained in that capacity until 1967, when he became president of Cincinnati Sheet Metal, a leader in the metal building products field.

Mr. **Kopp,** a veteran in both the shipbuilding and metal fabrication fields, was president of Ingalls Iron Works Company of Birmingham, Ala. and Pittsburgh, Pa., prior to his association with American Ship. He was with Ingalls from 1949 through 1963.

He is a 1941 graduate of Webb Institute of Naval Architecture where he received degrees in mechanical engineering and naval architecture.

He began his business career with Cramp Shipbuilding Company, Philadelphia, and rose to general superintendent before moving to the Jeffersonville Boat & Machine Company, Jeffersonville, Ind., where he conceived and developed the now popular 'integrated' design for general cargo barges.

Newport News Names Moriarty To Key Post In Facilities Division

E. S. Moriarty

E. S. Moriarty has been named assistant superintendent of Newport News Shipbuilding and Dry Dock Company's facilities division, according to **F. C. Davis,** vice-president, operations. Mr. **Moriarty** was formerly construction coordinator in the yard operations division.

A graduate of the United States Naval Academy, he received a B.S. degree in 1953. Following Navy service, Mr. **Moriarty** joined the shipyard in 1958 as a designer. He is presently a commander in the Naval Reserve.

He has worked as a staff supervisor in both the production engineer's office and the machinery division, and as a staff engineer in machinery installation.

Schnepf Completes 40 Years Of Service With Mobil Oil Corp.

Richard C. Schnepf

Richard C. Schnepf, of Scotch Plains, N.J., has completed 40 years of service with Mobile Oil Corporation.

Mr. **Schnepf** joined Mobil as a clerk in 1929. Later, he became a marine representative in Norfolk, Va., and then in New York City. In 1945 he was named Southeast district marine manager, with headquarters in Baltimore, and in 1950 he returned to New York as district manager. He has been marine sales manager of the North American division since 1958.

Mr. **Schnepf** is a member of The Society of Naval Architects and Marine Engineers, Propeller Club, Downtown Athletic Club, Maritime Exchange and the Marine Square Clubs.

Medusa Takes Option On Fleet Steamship

Medusa Portland Cement Co., Cleveland, Ohio, has taken a long-term option on the Interlake fleet steamship C. H. McCullough Jr. The vessel would be converted to a self-unloading cement carrier. The Medusa company is not contemplating buying the vessel this year, but might close the transaction in 1970.

Zimmie Acquires Hyde Division Of Bath—Forms Subsidiary To Handle Deck Machinery

William E. Zimmie

Claud Clark

Thomas P. Mackey

W. E. Zimmie, Inc., diversified manufacturer of mechanical and chemical products for the marine industry, has announced the acquisition of the marine products business of Hyde Division of Bath Iron Works Corporation.

The announcement of the acquisition was made by **William E. Zimmie,** president of the Cleveland-based company.

The Hyde products are one of the broadest lines of power-driven deck machinery available to the marine trade. As a result of the acquisition, Zimmie, Inc. is the only company offering virtually all machinery outside of the main propulsion system. In addition to direct marine applications, the Hyde equipment may also be used in offshore drilling.

The cash transaction included the use of the Hyde name, all engineering data, specifications and records, tools, jigs and fixtures. Hyde has been a wholly owned subsidiary of Bath Iron Works, Bath, Maine. Zimmie, Inc. will form a Hyde Corporation subsidiary to manufacture the marine products in Cleveland, Ohio.

Claud Clark, who has been product manager for Hyde, will serve as president of the new subsidiary. In addition to Mr. **Clark,** other key Hyde engineering personnel will be retained, according to Mr. **Zimmie. Thomas P. Mackey,** general manager of the W. E. Zimmie, Inc., Marine Division, will be executive vice-president of the subsidiary.

Hyde products include cargo, ramp and towing winches, steering gears, anchor windlasses and capstans. All are available as electric, hydraulic or steam-driven units. Other Hyde marine products acquired by Zimmie, Inc. are universal mooring chocks and specially designed handling equipment for oceanographic devices.

Zimmie, Inc. has been manufacturing electro-hydraulic constant-tension mooring winches, and main-condenser evacuating systems, vacuum-priming systems and control-air compressor systems utilizing liquid-ring vacuum pumps and compressors. These latter products are sold by Zimmie, Inc.'s Sihi Division. The company also produces a patented chemical mud remover sold under the registered trade name Zimmite. This product is used as a preventive maintenance treatment in the ballast tanks of 80 percent of the Great Lakes fleet.

All products are manufactured domestically, thus qualifying the company as a supplier for Maritime Administration subsidized ships. The Zimmie mechanical products will now be sold through the new Hyde subsidiary.

According to Mr. **Clark,** who had been with Hyde for 20 years, "We have been a widely accepted supplier to the marine industry for more than a century. This covers the time from when we were the first to manufacture anchor windlasses until now when we are supplying complete deck machinery systems for the new LKA Navy supply ships being built at Newport News."

Commenting on the acquisition, Mr. **Zimmie** said, "The principal reason we were interested in purchasing the Hyde marine product business was because of its recognized engineering capabilities. In both our mechanical and chemical product areas, we have always been a highly technically oriented company. The design and engineering excellence associated with the Hyde name for many years, fits perfectly our corporate objectives. We will continue to seek additional acquisitions which fit this pattern."

Litton Names Casey Senior Vice-President

Joseph T. Casey has been promoted to senior vice-president of Litton Industries, it was announced by **Roy L. Ash,** president. He will continue with responsibility for all Litton financial functions, including the controller and treasurer activities.

Mr. **Casey** has served as vice-president, finance, since November, 1967. He was elected a corporate vice-president in August, 1967, after holding the position of Litton controller since he joined the company in November, 1963.

Previously, he was manager of audits and other client services at the New York City office of Touche, Ross Bailey and Smart. A graduate of Fordham University, Mr. **Casey** is a member of the American Institute of Certified Public Accountants and the Financial Executives Institute. He is a vice-president of the advisory board of directors of the California Museum of Science & Industry and a director of the California Space Museum.

International Shipping Exhibition To Be Held In Athens June 2-8

Exhibitors from 15 leading maritime countries will converge on Athens in June for what promises to be one of the most important international exhibitions. It is "Posidonia '69," a new international shipping trade show that will run from June 2 to 8 at the Zappeion Palace.

Well over 100 exhibitors—including some of the world's top shipbuilders, repairers, marine engineers and equipment manufacturers — will be demonstrating their products and services to customers from the world's second largest marine market, the Greek shipowning fraternity.

Greek owners from all parts of the world will attend an important shipping congress which is being held concurrently with the exhibition, and 20 of the more prominent owners are members of the "Posidonia '69" sponsorship committee; these members include the president of the Greek Shipping Co-operation Committee and the president of the Union of Greek Shipowners.

Exhibitors in Athens will represent companies in Belgium, Denmark, France, Germany, Britain, Greece, Hong Kong, Italy, Japan, the Netherlands, Norway, Poland, Sweden, Switzerland and the U.S.A.

A spokesman for Maritime Presentations Ltd., London, organizers of the exhibition, said today: "The powerful Greek shipping market continues to expand in every way, and huge new building programs are being put in hand, particularly for supersize tankers and bulk carriers, and for passenger vessels. These ships require to be designed, built, engined, fitted out, maintained, and repaired. This underlines the importance of "Posidonia '69," through which leading builders and suppliers will be able to make a direct approach to this lucrative market."

Sir **Hugh Casson,** the well-known architect, has been retained as consultant and designer, and the organizers have appointed **R. B. Shepheard,** the former joint director of the Shipbuilders & Repairers National Association, as technical adviser for the exhibition.

Naval Engineers Schedule Annual Meeting For May 1-2

The American Society of Naval Engineers will hold the eighth ASNE Day Program, including the 52nd Annual Banquet, on May 1 and 2 at the Shoreham Hotel, Washington, D.C.

On May 1 the Society will hold its annual business meeting and hear three technical papers during the afternoon. The papers are: "Topside Design for Electromagnetic Effectiveness" by Capt. **M. Eckhart Jr.,** Ship Concept Design Division, Naval Ship Engineering Center; "The Ship-Sonar Interface" by **Isidore Cook,** Naval Ship Research and Development Center, and "A Study of the Operational Interface—The Coastal Hydrographic Survey Ship System Concept Formulation" by **Gary L. Jayne,** Oceanographic and Instrumentation, Ships Acquisition Project, Naval Ship Systems Command.

During the morning session on May 2 three technical papers will be presented. These are: "Ship Design Automation in the Pre-Contract Definition Period" by Dr. **Robert S. Johnson,** Ship Concept Design Division, NAVSEC; "Ship System Design Analyses" by **H. D. Clarke Jr.,** Ship Concept Design Division, NAVSEC, and "Major Subsystem Interface" by **T. D. Hobart,** Acquisition Engineering Directorate, Naval Electronic Systems Command Headquarters.

At the May 2 afternoon session there will also be presented three papers as follows: "Solid State Control for Shipboard Power Plants" by **A. Nitsch,** General Electric Company, Industrial Control Department; "The Effect of Electronics on Deep Submergence Design" by Capt. **W. M. Nicholson,** Deep Submergence Systems Project Office, and "A Naval Architect Sums Up" by **Owen H. Oakley,** Ship Concept Design Division, NAVSEC.

Dr. **Elmer W. Engstrom,** chairman of the executive committee, board of directors, Radio Corporation of America, will be the principal speaker at the luncheon to be held on May 2. Adm. **Bernard A. Clarey,** USN, vice-chief of naval operations, will be the speaker at the banquet to be held on May 2.

German Liberty Ship Well Received By Owners

Three German shipyards — Bremer Vuikan Schiffbau und Maschinenfabrik, Flensburger Schiffsbau-Gesellschaft, and Rickmers Werft, have announced that they had received, up to the end of 1968, a total of 30 orders for construction and delivery of their new design 'The German Liberty Ship.' As previously announced, the three shipyards, in free cooperation, designed this type of vessel as a replacement of the old war-built ships. The design resulted in a multi-purpose vessel with special features for handling all types of general cargo as well as bulk cargo.

The high number of orders received—as far as it is known, the group of the three German yards is in second position, behind the Japanese yards and their Liberty replacement—is regarded as a positive reaction of shipowners to a real multi-purpose vessel for worldwide trading. More than half of the vessels have been ordered by German shipowners, while the remaining orders came from other European customers. As several letters of intent have been signed by prospective customers, the three yards expect further orders within a short time.

During 1968, three ships of the above-mentioned 30 vessels have been delivered by Flensburger Schiffsbau-Gesellschaft, and about 25 will be put into service during 1969 and 1970.

Hall, Hargrave, Kersey And Pulley To Head New Depts. At Newport News Shipbuilding

Newport News Shipbuilding and Dry Dock Co., Newport News, Va., a major component of Tenneco Inc., has announced the organization of a new computer center.

According to **E. J. Tanner,** vice-president finance and comptroller, the center has been organized into five departments: Computer operations, computer programming, computer systems and procedures, general systems and procedures, and data collection and control.

J. L. Pulley will head the computer operations department. He was previously assistant manager of the data processing department. A native of Ivor, Va., he joined the shipyard in 1940. He was made assistant chief of data processing in 1956 and chief in 1960.

R. F. Hall Jr. has been named head of data collection and control, which combines the activities of three former departments, piece work counting, labor cost reporting and data processing.

Mr. **Hall** has had continuous service with the company's accounting division since 1936. Prior to his new appointment, he was manager of the labor cost reporting department.

The computer systems and procdures department will be headed by **E. F. Hargrave,** who joined the shipyard's tabulating department in 1939. He was made chief of the data programming department in 1966, and assistant manager of data systems and programming in January 1968.

A native of Newport News, Mr. **Hargrave** studied advanced accounting at Newport News Business College.

J. E. Kersey Jr. has been appointed head of the general systems and procedures department. A native of Lynchburg, Va., he joined the company in 1942 and has worked in various accounting and cost engineering departments. He has also served as subcontract administrator.

D. W. Boyce was named to the staff of the computer center. A native of Elizabeth, N.J., he came to work in the Newport News shipyard in 1941. Prior to that he worked for I.B.M. and Westinghouse.

Director of the computer center is **E. T. Prince,** who recently came to the shipyard from Ernst and Ernst, in Richmond, Va.

B&W Buys Canton Plant Of E.W. Bliss Company

The Babcock & Wilcox Company has agreed to purchase the Canton plant of the E. W. Bliss Company, a Gulf and Western company, and other available property in the Bliss Industrial Park at Canton, Ohio, it was announced jointly by **George G. Zipf,** president and chief executive officer of Babcock & Wilcox, and **Carl E. Anderson,** chairman and president of Bliss.

"The purchase provides us with immediate manufacturing capability to meet the requirements of our Power Generation Division," Mr. **Zipf** said. "The present work force of about 300 at the plant will be retained by Babcock & Wilcox and in all probability will be expanded in the near future."

The transaction, for approximately $8-million, became effective on March 31.

The 68-acre facility, which includes approximately 700,000 square feet of heavy manufacturing space and a large amount of equipment, will be converted from the manufacture of heavy machinery to the fabrication of components for steam generating equipment such as used by the electric utility industry.

Babcock & Wilcox plans to operate the facility as the Canton works of the Power Generation Division which has its headquarters at Barberton, Ohio.

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NSSC Issues RFP To Various Firms For Two Dredges

The Naval Ship Systems Command, Washington, D.C., has issued RFP 69-R-0597-(Q) to various firms for the construction of a 34-foot, 8-inch dredge and a 43-foot, 12-inch dredge, with associated repair parts for each.

The RFP issued is the first step of a two-step procurement. It was received by a number of companies, including the following: American Marine & Machinery, Inc., Nashville, Tenn.; The American Ship Building Co., Lorain, Ohio; Dixie Dredge Corp., Miami, Fla.; Dravo Corporation, Pittsburgh, Pa.; Dredge Manufacturing Corp., Hallandale, Fla.; Ellicott Machine Corp., Baltimore, Md.; Ingalls Iron Works Co., Birmingham, Ala.; Nashville Bridge Co., Nashville, Tenn., and New York Engineering Co., New York City.

Fast-Setting Concrete For Marine Repairs Described In Bulletin

A wide range of municipal, highway, industrial, marine and construction uses for a new fast-setting concrete repair product is described and illustrated in a six-page, two-color bulletin (A-22) available from Atlas Minerals & Chemicals Division of ESB Incorporated.

Besides the ability to set in 6 minutes, Exide Mari-Crete can be used to make repairs to either vertical or overhead surfaces by hand or with a trowel only — no forms required. And, in addition to its use in patching concrete surfaces, it can be used for repairs to pilings, piers, loading docks, barges and ships, including underwater sections.

Also described in the bulletin are Mari-Crete's other characteristics. It has high tensile and compressive strength; one-minute mixing; and the capability to adhere to concrete, stone, brick, wood and steel — even underwater.

For a free copy of the bulletin, write to Atlas Minerals & Chemicals Div., ESB Incorporated, Mertztown, Pa. 19539.

Newport News Names Sanderson Foreman Transportation Dept.

W. K. Sanderson

W. K. Sanderson has been appointed foreman of the transportation department of Newport News Shipbuilding and Dry Dock Co., Newport News, Va., a major component of Tenneco Inc. The announcement was made by **L. B. Peterson,** manager of purchases.

Mr. **Sanderson** is a 1934 graduate of the University of Pittsburgh, with B.S. and M.S. degrees in mechanical engineering.

He joined Newport News Shipbuilding in 1941, in the steel storage department. From 1942 to 1946 he worked for the shipyard's wartime subsidiary, North Carolina Shipbuilding Co. In June 1953 he was named assistant foreman of the transportation department.

As foreman, Mr. **Sanderson** succeeds **M. B. McWilliams,** who recently retired.

Halter Marine To Build Oil-Well Supply Boat

Halter Marine Fabricators, Inc., of Moss Point, Miss., has been contracted by Slater Boat Service, Belle Chasse, La., to build an offshore oil-well supply boat. The vessel has been designated Hull No. 224.

Wall Shipyard To Build Three Steel Workboats

The Corps of Engineers of Little Rock, Ark., has contracted Wall Shipyard (M & W Marine Ways, Inc.), Harvey, La., for the construction of three, all-welded steel workboats.

The total price of the contract is to be $267,576.

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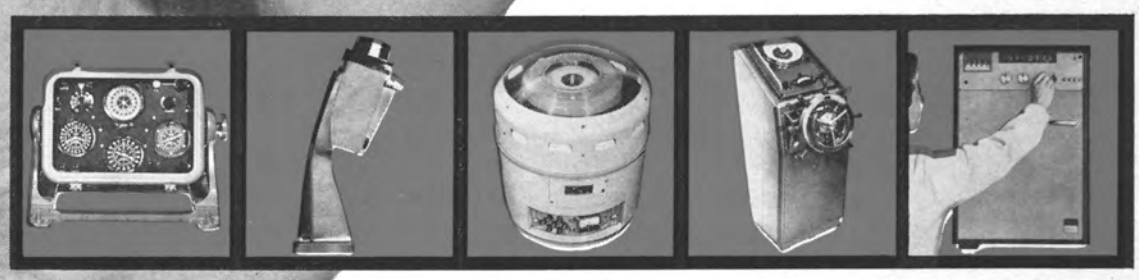

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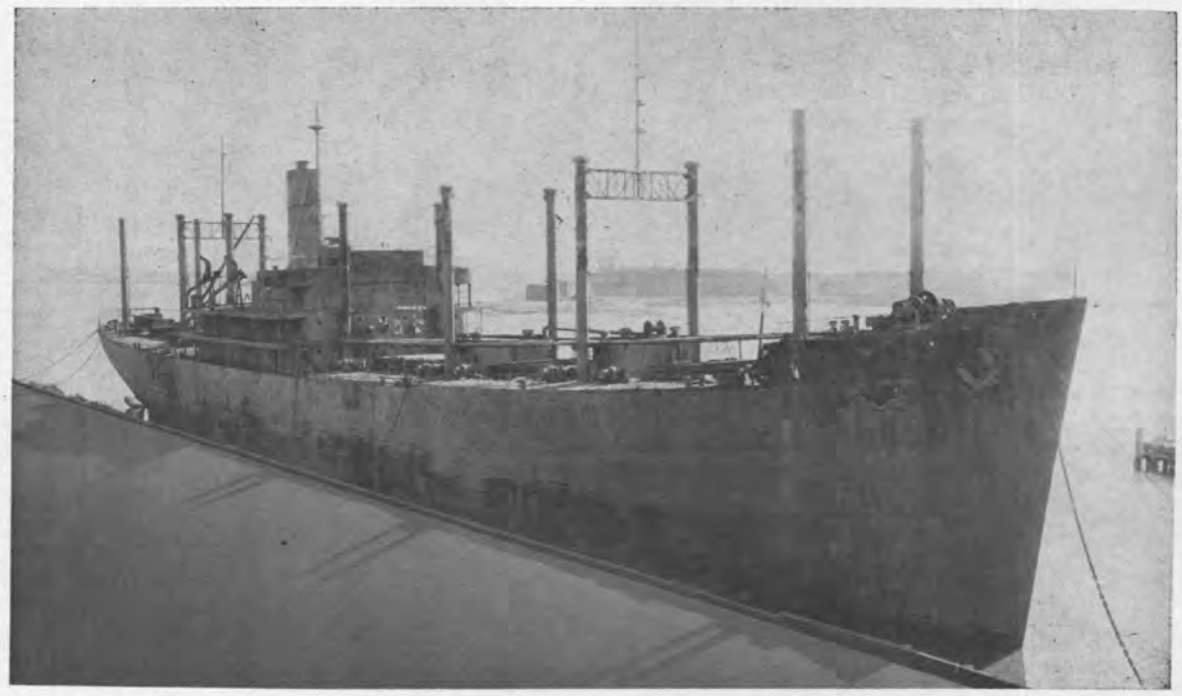

EQUIPMENT FROM MOORE DRYDOCK C-3 EX-MORMACSEA — HULL 197

350 KW TURBO GENERATORS: **Turbine**—De Laval 503 HP—10,000 RPM—6-stage—440#—282° superheat—28½" exhaust. **Gear**—De Laval—10,000/1200 RPM. **Generator**—Crocker-Wheeler 350 KW—120/240 DC—1458 amps—1200 RPM—compound wound—#230194 & 230195. Also fits Federal Hull 198. BOILERS: Foster-Wheeler type D—2-pass design —525# pressure. FORCED DRAFT FAN MOTORS: Westinghouse SK—46.5/13.81—2400/1660/960 RPM—230 VDC. PROPELLERS: 21'8" diameter—21.669 pitch. REDUCTION GEAR: De Laval 5015/3461/729/85—serial 228972. SHAFTING: 24'x19" diam. STEADY BEARINGS: 19¼" o.d. EVAPORATOR: Paracoil 36-17/48-23/28-11. MAIN FEED TRIPLEX: Worthington—4½"x8"—160 GPM @ 510#—72 HP—230 VDC—975/1750. MAIN CIRCULATOR: Worthington 20" LAS—12,000 GPM—19' head—100 HP Westinghouse motor—frame 184.5—230 VDC—485/645—365 RPM.

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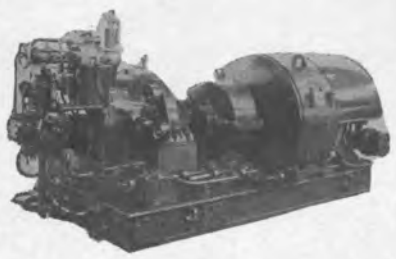
TURBO-GENERATORS



300 KW — From AP2 Ex-Medina Victory

TURBINE: Worthington-Moore—serial 7547 & 7548—440 lbs.—740°TT—28½" vacuum—type S4—5-stage—6097 RPM. GEAR: Type 14x7—6097/1200 RPM. GENERATOR: Crocker-Wheeler 102-HD—120/240 VDC—125 amps—40° rise—serial No. 973643 & 999795—compound wound. Armature flange 8¼" —B.C. 7"—12 holes. NEW ARMATURE AVAILABLE FOR THIS GENERATOR. SEE 3RD PAGE FOLLOWING.

300 KW — From AP3 Ex-Ridgefield Victory

TURBINE: Worthington-Moore type S4—5-stage—6097 RPM—740°TT—440#—serial No. 7108 & 7106. GEAR: 6097/1200—type 14x7—serial No. 7108—5.081:1 ratio. GENERATOR: Crocker-Wheeler 102-HD—300 KW—120/240 DC—6-pole—3-wire—stab. shunt—1200 RPM—type CCD—serial 973583. Suitable for units 7541 & 7543 and 7089 & 7188. WILL SELL ARMATURE SEPARATELY: 12-Hole flange—⅝" bolt holes—8.247" diam.—7" B.C. —flange & shaft 5".

300 KW Murray

TURBINE: G.E.—DORV—325M—440#—740°TT—5645 RPM. GEAR: S-192—5645/1200. GENERATOR: Ideal—120/240 VDC—1250 amps—stab. shunt.

300 KW GENERAL ELECTRIC

TURBINE: G.E.—DORV—325M—440#—740°TT—reduction gear S-192. GENERATOR: G.E. 120/240 VDC—1250 amps—stab. shunt.

TURN TO 3RD PAGE FOLLOWING FOR 300 KW SPARE ARMATURES

BOILER SOOT BLOWER ELEMENTS

12 Units—Diamond Power Specialty Corp.—type FM-1220—for blower units S-3, S-4—84¼" overall—2" tubes—22 jets —calorized metal.

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3 Units—2" ID tubes—15 jet—8'10½" OA—with 2" steel coupling—with FM-1220 unit blower.

ENTIRE LOT $450.00

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VEE-type—Sullivan—7x4½x4½—60 CFM—15 HP—230 volts—1850 RPM—light compound—with starter. **INGERSOLL-RAND ALSO IN STOCK**—model 15—type 40—5x4x4.

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Mfg. by Graham—unused ABS and reconditioned ABS. Main condenser water boxes—AP3—Allis-Chalmers.

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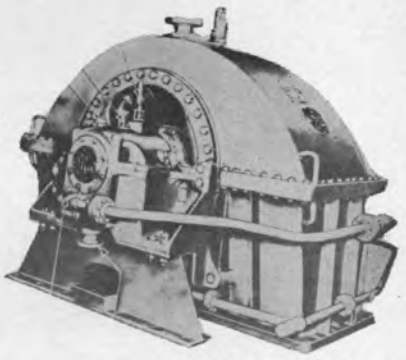

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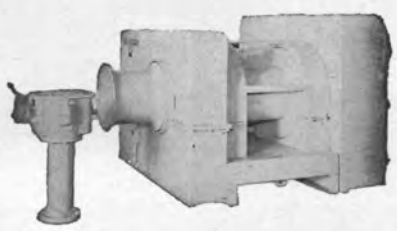

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Ingersoll-Rand 18VCM bronze pump—20" suction—18" discharge—vertical. Flanges opposite each other. Distance flange-to-flange 4'5". Suction bolt circle 25"—discharge bolt circle 22¾". Suction (20) ¼" holes—discharge (16) ¼" holes. PUMP WEIGHT: 5100 lbs. MOTOR: 5700 lbs.—Allis-Chalmers 75 HP—230 VDC—500/670 RPM—frame E-Bu-162—drawing No. 31099.

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Manufactured by Allis-Chalmers. 10.9 lb. head—36" flange to flange—12" suction and discharge—17" bolt circle—19½" O.D. flange. This pump was substituted for a Worthington LAS on a Victory Ship and was easily fitted into the existing piping. The flange to flange dimensions were only slightly larger. MOTOR: 25 H.P.—230 volts DC—stabalized shunt—92 amperes—type EBU-100 — 18812MK — 1150 RPM.

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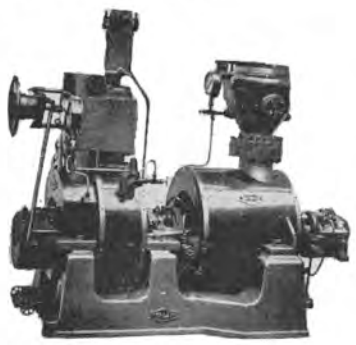

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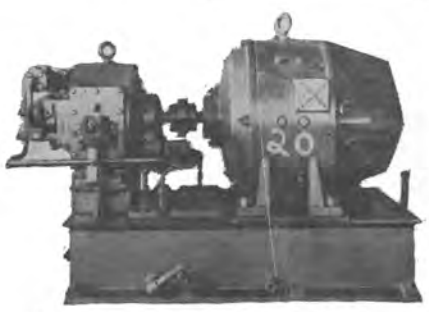
PUMP: 7000 GPH—585 PSI—1380 ft. head—5600 RPM. TURBINE: 480 PSIG—750°TT—exhaust 5 PSIG.



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Worthington—vertical simplex—11x7x24.

HORIZONTAL DUPLEX PUMPS

Size 6x6x6 pumps.

AUX. CIRCULATOR MOTORS: 25 HP—230 VDC—96 amps—658/875 RPM—G.E. and Reliance

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PROPELLER: DORAN—Seattle—4-blade—20'6" diam.—6' pitch—heal #4931—ABS (59) 645R.
ALSO TAILSHAFT—RUDDER—RUDDER CARRIER—UPPER STOCK

FORCED DRAFT FANS & TURBINES: Westinghouse type 25-TD-18—231.6 lbs. steam—exhaust 15.6 lbs.—superheat 31°F—max. capacity 19,000 CFM—static pressure 10.7—3950 RPM—45.8—serial nos. 5A2167-11 & 5A2167-12.

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G.E. HP & LP TURBINES & REDUCTION GEAR—8500 HP—9350 HP Oregon Shipbuilding Hull #1224—Instruction Book 16263

TURBINES: G.E.: L.P.—8-stage—3509 RPM—#62043 H.P.—8-stage—6159 RPM—#62042 REDUCTION GEAR: #75143—type MD-48-A—8500 HP—9350 max.—6159/3509/763/85 RPM. Maneuvering valve, operating cylinder, etc.

PACIFIC FEED PUMPS – TYPE JB

Horizontally split—diffuser type centrifugal. CAPACITY: 150 GPM @ 542# or 1242' normal—185 GPM @ 600# or 1418' max. Steam inlet 440 @ 507°TT—RPM 3740—water rate 35 lbs/HP—pumping temp. 240°. Total weight 1 unit 3100 lbs. OAL turbine & pump on base 8' 9⅜"—OAW about 2'.

A 300 KW VICTORY SHIP & C-2 GENERATOR ARMATURES

CROCKER-WHEELER

New—as pictured above—with ABS certificate. From VC2-S-AP2 Ex-Medina Victory. For Crocker-Wheeler generator 102-HD-DP—type CCD—compound—serial 973-643; 999-795 and others in this group. Bearing shaft size commutator end—3½"; Flange size 8¼" OD; Bolt Circle 7", with 12 holes ½" diameter.

ALLIS-CHALMERS

120/240 volts DC—type MCW 21-11—1200 RPM—stab. shunt—148171 & 148173—from ex Stamford Victory—completely re-wound anuary 10, 1968—ABS—(1).

WESTINGHOUSE

120/240 volts DC—1250 amps—1200 RPM—stab. shunt—frame CB 208.4—Instruction Book 8301—51-S-20P-923 and 18-83H-313.

GENERAL ELECTRIC

120/240 volts DC—1250 amps—1200 RPM—stab. shunt—serial No. 2222725-2222807—In G.E. Instruction Book G.E.I. 16584.

C-2 ARMATURES

North Carolina C2-S-AJ-I—General Electric—120/240 volts DC—type MPC—stab. shunt.

T2-SEA-1 TANKER MAIN STEAM & AUXILIARY EQUIPMENT

B MAIN TURBINE ROTORS

Large Turbine Rotors—Lynn
Large Turbine Rotors—Schenectady
Elliott Turbine Rotors—Fit G.E. small Schenectady turbine

C G.E. MAIN PROPULSION GENERATOR REVOLVING FIELD

G.E. reconditioned—June 1967

D G.E. MAIN GENERATOR STATORS

E

REWOUND WESTINGHOUSE MAIN PROPULSION GENERATOR REVOLVING FIELD

Was rewound for Gulf when removed from "Gulf Moon". Since that time, it has been re-checked in the Westinghouse Service Shop and balanced. ABS and ready to go. —December 18, 1968—certificate number 68-BA4831 — A-67B-JW — 12/18/68 Baltimore.

WRITE FOR COMPLETE INFORMATION

F WESTINGHOUSE MAIN GENERATOR STATOR WITH OR WITHOUT COOLER

G

WESTINGHOUSE MAIN MOTOR FIELD COILS

COMPLETE SET

Westinghouse — universal type — newest design—80 pieces—one set.

H

T2 RUDDER

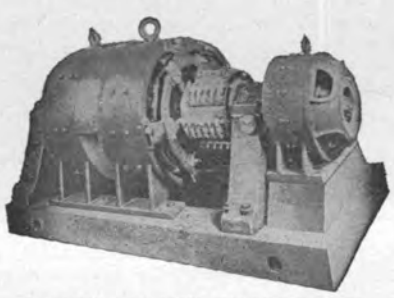
Reconditioned—ready to go.

T2 TAILSHAFTS

Reconditioned

PROPELLERS

T2 propellers



I WESTINGHOUSE EXCITER SETS

110 KW—28 KW—5 KW available
110 KW—32.5 KW—5 KW available

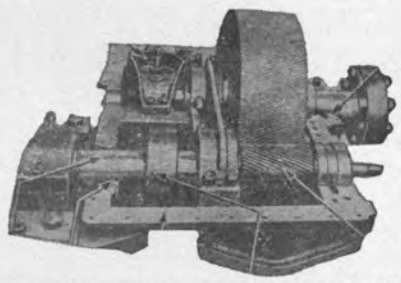
J

LORIMER

Emergency Generator Engine and Generator Parts

K MAIN CIRCULATING PUMP MOTOR

125 HP—Westinghouse—Frame 876C—type CS—squirrel cage — 440/3/60 — 585 RPM. Reconditioned to ABS. Ready to go immediately.



L G.E. AUX. TURBO-GEN. REDUCTION GEARS

Bull gear & pinion. With ABS.

M WESTINGHOUSE AUXILIARY GENERATOR REDUCTION GEARS AND BEARINGS

COOLERS

N MAIN MOTOR AIR COOLER

Westinghouse—ABS—ready to ship

O MAIN GENERATOR AIR COOLER

Westinghouse — reconditioned with ABS—ready to ship

P

G.E. MAIN GENERATOR COOLER
type G4—bronze heads—AL brass tubes

ALL MACHINERY FROM U.S.M.C. NORTH CAROLINA C2-S-AJ1

INCLUDING MASTS, BOOMS, KINGPOSTS, AND RIGGING

Send us your inquiries

CENTRIFUGAL PUMPS

— ALLIS-CHALMERS —

MAIN CIRC. PUMP

9500 GPM @ 27'—800/600 RPM—type S.B. 20x20 — horizontal. MOTOR: Allis-Chalmers 100 HP—230 volts—600 RPM—Frame EB-162.

TURBINE DRIVEN MAIN FEED PUMP

Allis-Chalmers type BK-4—150 GPM @ 1465' head—180 GPM @ 1342' head. TURBINE DRIVE: Type ZS-1—94 HP normal—440 PSI —740°TT—4400 RPM.

AUXILIARY CIRCULATOR

Allis-Chalmers 8x6 — SE — 1500 GPM — 27' head—1200/1600—15 HP motor—horizontal.

MAIN CONDENSATE

6x3 CF2V — Allis-Chalmers — vertical — 120 GPM—185' head—1310/1750 RPM—15 HP.

AUXILIARY CONDENSATE

3x1½ SSL — 20 GPM — 185' head—1310/1750 RPM—7½ HP—vertical.

FIRE PUMP

4x3 B-2 — Allis-Chalmers — 400 GPM—280' head—1425/1900 RPM—50 H.P.

CIRCULATING PUMPS

Hot water & auxiliary sea water circulating pumps—1½x1½ SSH—20 GPM—10' head —1750 RPM—½ HP—and 80 GPM—70' head—2620/3500 RPM—3 HP.

— WORTHINGTON —

MAIN FEED PUMP

2 UQS-2—150 GPM @ 1465 T.D.H.—4000 RPM—115 HP. Turbine. Form S2RM—Moore steam turbine—1½" steam inlet—440 lbs WP —750°F @ 10 lbs gauge. Water rate 26.8 lbs BHP/HR.

MAIN CIRCULATOR

20-LAL-18 — 20" suction — 20" discharge — horizontal—9500 GPM—27' TDH—800 RPM — 100 HP. MOTOR: 100 HP — 360 amps — 800/600 RPM—horizontal—Frame 183 SK—light compound.

6-L-1 AUXILIARY CIRCULATING

1500 GPM—27' head—1450 RPM—horizontal —8" suction—6" discharge—15 HP—230 DC —56 amps—1450/1090—frame 83SK.

2½UZS-1 MAIN CONDENSATE

Vertical—6" suction—3" discharge—120 GPM —185' T.D.H. — 1750 RPM — 15 HP — 230 VDC—56 amps—1750/1310—ambient 50°C —frame 83SK.

3-UB1—FIRE SERVICE

Horizontal — 4x3 — 400 GPM — 281' head—1750—50 HP Motor—230 VDC—178 amps —1310/1750 RPM—frame 133SK.

AUX. SALT & HOT WATER CIRCULATING

1½ D—20 GPM—10' TDH—1750 RPM—3 HP salt water circ.—1 HP hot water circ.

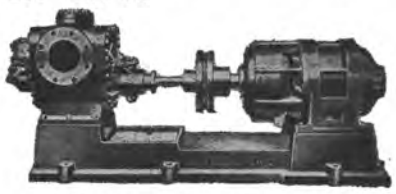
RECIPROCATING STEAM PUMPS

— WORTHINGTON —

- Port Feed — 8½x5¼x15 — 50 GPM—600 lbs.—VS
- Fire Service & Standby — 12x11x18 — 400 GPM—125 PSI—VS
- Dirty Ballast—Clean Bilge 10x11x18—400 GPM—50 PSI—VS
- Fuel Oil Standby—7x4x10—11 GPM—400 lbs—VS
- Lube Oil Standby—7½x9x12—250 GPM—47' head—VD
- Make-up Evaporator Feed—3x2 3/4x3—20 GPM—50 lbs.—HD
- Contaminated Evaporator Feed—20 GPM—75 lbs—HD
- Salt Water Evaporator Feed—3x2 3/4x3—20 GPM—35 lbs.—HD

— POWER RECIPROCATORS —

- Drinking water—2½x2—10 GPM—70 lbs—¾ HP—230 volts DC
- Sanitary—2½x2—30 GPM—80 lbs—2 HP —230 volts DC



KINNEY MOLASSES PUMP

430/215 GPM—size 8x8—pressure 60 lbs.—142/280 RPM—Motor RPM 875/1750—Reducer Falk 6.25:1. GE Motor—30/15 HP.

STEERING GEAR

McKiernan-Terry — size 10½ RAM Electro-Hydraulic. MOTOR: 40 HP. Westinghouse—frame 143S—690 RPM—230 volts.

— REFRIGERATION EQUIPMENT —

• CARGO REFRIGERATION PLANT

Compressor 7G8-EF—size 240—897 cu. inches —minimum displacement 39.2 tons—Carrier. Has 365 sq. ft. 3-pass Freon 12 condenser. MOTOR: 35 HP — 230 VDC — 1310/1750 Westinghouse—type 113-SK.

• SHIP SERVICE REFRIGERATOR

York 4x4—type Y-38—model 44-Fe—50 sq. ft. condenser. MOTOR: 10 HP—230 VDC—type SK—frame 43—1750 RPM—37.3 amps.

• COLD DIFFUSER

York type 4—Fan-Fin unit 1155 CFM—82 sq. ft. York type 2—543 CFM—36.8 sq. ft.

• CARGO WINCHES

North Carolina built type 73-S — mfg. by AH&D—50 HP—230 volts DC.

• BAILEY BOARD COMPONENTS

G.E. 300 KW TURBO GENERATORS

GENERATOR: Type DORV-325M — 5645 R.P.M. — 440 Lbs.—740° TT—18" exhaust. GEAR: Type S-192—right hand—5645/1200 —G.E. GENERATOR: G.E. 300 KW—120/240 —1200 RPM—type MPC—stab. shunt. WILL SELL ROTORS — GEARS — ARMATURES SEPARATELY.

SPRAY DEAERATING HEATER

54000 lbs. water/hour. Elliott Co.

FEED WATER HEATERS

- FIRST STAGE—Shell & tube—45000 lbs/hr —100°—172°F—305 sq. ft.—Heat Transfer Products.
- THIRD STAGE—5400 lbs/hr—240° to 318° 200 sq. ft. effective surface. Heat Transfer Products Co.

EVAPORATORS

Contaminated water — 36-14 Paracoil-Davis Eng.—Distiller 2F72D Davis.

EMERGENCY DIESEL GENERATOR SET

Heavy duty—75KW—120/240 DC—720 RPM Ideal. ENGINE: Lorimer 115 HP—7½x9½—720 RPM—4-cycle—radiator cooled. With all switchgear. OAL 12'4"—OAW 49"—OAH 79" Weight 10,500 lbs.

M.G. SET

D.C. final AC—Bus—MG set—5.5 HP—230 Volt 1800 RPM input—Diehl's—3 KW 120/1/60 output.

AIR EJECTORS

Ingersoll-Rand main air ejector and auxiliary air ejector.

AIR COMPRESSOR

Ship service — type PB-2 — 7x4x4 — Chicago Pneumatic—15 HP—230 volts—1750 RPM.

COMBUSTION CONTROL

Worthington—4¼x2½x2¾—2-stage — 17.9 CFM at 100 lbs.—5 HP—230 volts DC.

FORCED DRAFT BLOWER

Type 6-SL — 12000 CFM — 8.1 S.P. — 1830 RPM— Buffalo Forge. MOTOR: Allis-Chalmers type EB-100—20 HP—1190/1830 RPM—230 volts—75 amps.

FUEL OIL BURNER

Todd HexPress—3 per boiler.

FUEL OIL HEATERS

ALCO—4400# fuel oil—from 100° to 230° —shell & tube type—unit in four sections.

FUEL OIL METER

2"—DVHP—30 GPM—Buffalo.

SEPARATOR

Oil and water—50-ton—McNab Victor.

DeLAVAL OIL PURIFIERS

Unimatic model designation 55-N-13—for turbine or light oils—200 GPH. Powered by 2 HP 230 volt DC Allis-Chalmers motor—frame 224.

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N.Y. Metropolitan Section, SNAME, Reviews The Risks Involved In Marine Investments

Officers of New York Metropolitan Section attending the recent meeting were, left to hight: top row, **C. D. Hanley,** T and R representative: **T. Lewis-Jones,** publicity committee chairman; **M. Macpherson,** vice-chairman; **W. J. Signell,** secretary-treasurer, and **R. G. Mende,** chairman. Bottom row, **N. R. Farmer,** meetings committee chairman, and **H. J. Karsch,** papers committee chairman.

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers heard an interesting paper on capital investment opportunities, at a recent meeting. The paper was prepared by **Robert F. Klausner,** of Esso International-Tanker Department and was entitled "The Evaluation of Risk in Marine Capital Investment."

The author advised that future costs and revenues in capital investment opportunities can seldom be predicted with certainty. As a result, there is usually some doubt as to the outcome of an investment. The chance that an investment may not prove profitable represents the investor's risk.

This paper considered the problems which uncertainty and risk present in the evaluation of capital investments. Several traditional methods of dealing with uncertainty and risks are considered and shown to be deficient. A relatively new evaluation technique, which utilizes probability theory and computer simulation, is described and its advantages highlighted.

N. Re To Manage Computer Programming At Newport News

Nicholas Re

Nicholas Re has been named manager of the computer programming department at Newport News Shipbuilding and Dry Dock Co., a subsidiary of Tenneco Inc. **E. J. Tanner,** vice-president-finance and comptroller, announced the new appointment.

The computer programming department is a part of the shipyard's newly established computer center, directed by **E. T. Prince Jr.**

Mr. **Re,** a native of Dowell, Ill., received a degree in mathematics in 1961 from Southern Illinois University. He is currently working toward an MBA degree in data processing at George Washington University.

From 1961 until 1964, he served as an officer in the United States Air Force. His service career centered on the use and development of computers.

In February, 1964, he joined the System Sciences Division of Technical Operations, Inc., in Arlington, Va.

Alpine's Pneumolift Can Raise Materials From Ocean Floor

A new patented invention is in operation, raising sand and gravel from 125-foot to 150-foot depths beneath water surface at rapid and economical rates for use in land reclamation. Invented by Marine Sand and Gravel, Inc., of Lafayette, La., an affiliate of Alpine Geophysical Associates, Inc., the Pneumolift raises sand and gravel at a rate of over 185 cubic yards per hour.

Operating on the gas-lift principle, compressed air is injected under low pressure through jets on an inner pipe into the interior of a concentric pipe, forcing material to the surface. Using this technique, no pressurization of the subsurface formation is required.

An important feature of the Pneumolift is its provision for opening and closing the inlet jets while in position. This prevents the material from developing obstructions and results in a unit which is virtually maintenance free, as well as being easily installed and operated. Injection of high-pressure air is controllable to achieve optimum manipulation of the sand and gravel. Provision is included for the use of a hydraulic system within the subsurface formation for conditioning and handling the material during operations.

Pneumolift is not limited in application to sand and gravel, but is suitable for materials such as sewage, sludge, oil sands, minerals, and many other materials which cannot be properly handled by conventional pumping apparatus.

The Pneumolift is available for contract work, lease, rental, or license. For more information contact Alpine Geophysical Associates, Inc., 65 Oak Street, Norwood, N.J. 07648.

National Metal Appoints Henry E. Henderson To East Coast Office

Henry E. Henderson

National Metal and Steel Corporation has announced the appointment of **Henry E. Henderson** as East Coast representative, according to **Phillip M. Hofmann,** general sales manager.

National Metal, located at 1251 New Dock Street, Terminal Island, Los Angeles Harbor, Calif., is the largest ship dismantling facility on the Pacific.

Mr. **Henderson** will handle East Coast sales for National Metal in the marine machinery replacement market.

He is president-elect of the Marine Sales Association and member of the Maritime Association of the Port of New York.

Mr. **Henderson** is also former vice-president of The Marine Purchasing Corporation, a subsidiary of Marine Transport Lines.

National Metal's New York office will be maintained by Mr. **Henderson** in the Maritime Exchange, 80 Broad Street, New York 10004, telephone WHitehall 4-8360.

H.O. Penn Machinery Appoints James Burns

W. Bedell Morrison, vice-president, Engine Division, H. O. Penn Machinery Company, Inc., has announced the appointment of **James J. Burns** as the company's Manhattan representative. Mr. **Burns** succeeds **Carl Schuh** who is leaving in order to complete requirements for his master's degree.

Mr. **Burns** joined H. O. Penn Machinery Company, Inc., in July, 1966 and was a parts salesman prior to his assignment to the engine division. In his new capacity, he will be responsible for the sale of Caterpillar marine, industrial, diesel and gas engines, as well as Caterpillar standby and continuous-duty diesel and gas-powered electrical generating sets, and H. O. Penn-designed electrical switchgear. Mr. **Burns** will be working closely with the Engine Division's supervisor of sales development, **Joseph Donnelly.**

The new Penn representative is a graduate of New York State University, Farmingdale, New York and a member of the New York Athletic Club.

Herculite Fabrics Names J.R. Zola Marketing Director

J. Richard Zola

J. Richard Zola has been named director of marketing for Herculite Protective Fabrics Corp., Newark, N.J., a subsidiary of Eckmar Corp.

In addition to his broad marketing responsibilities at Herculite, Mr. **Zola** will supervise sales activities of the company's line of specialty fabric products.

Prior to joining Herculite, he served as a manager of sales for the Specialty Chemicals Division of Allied Chemical Corp. He had previously held various sales management positions for other Allied Chemical divisions.

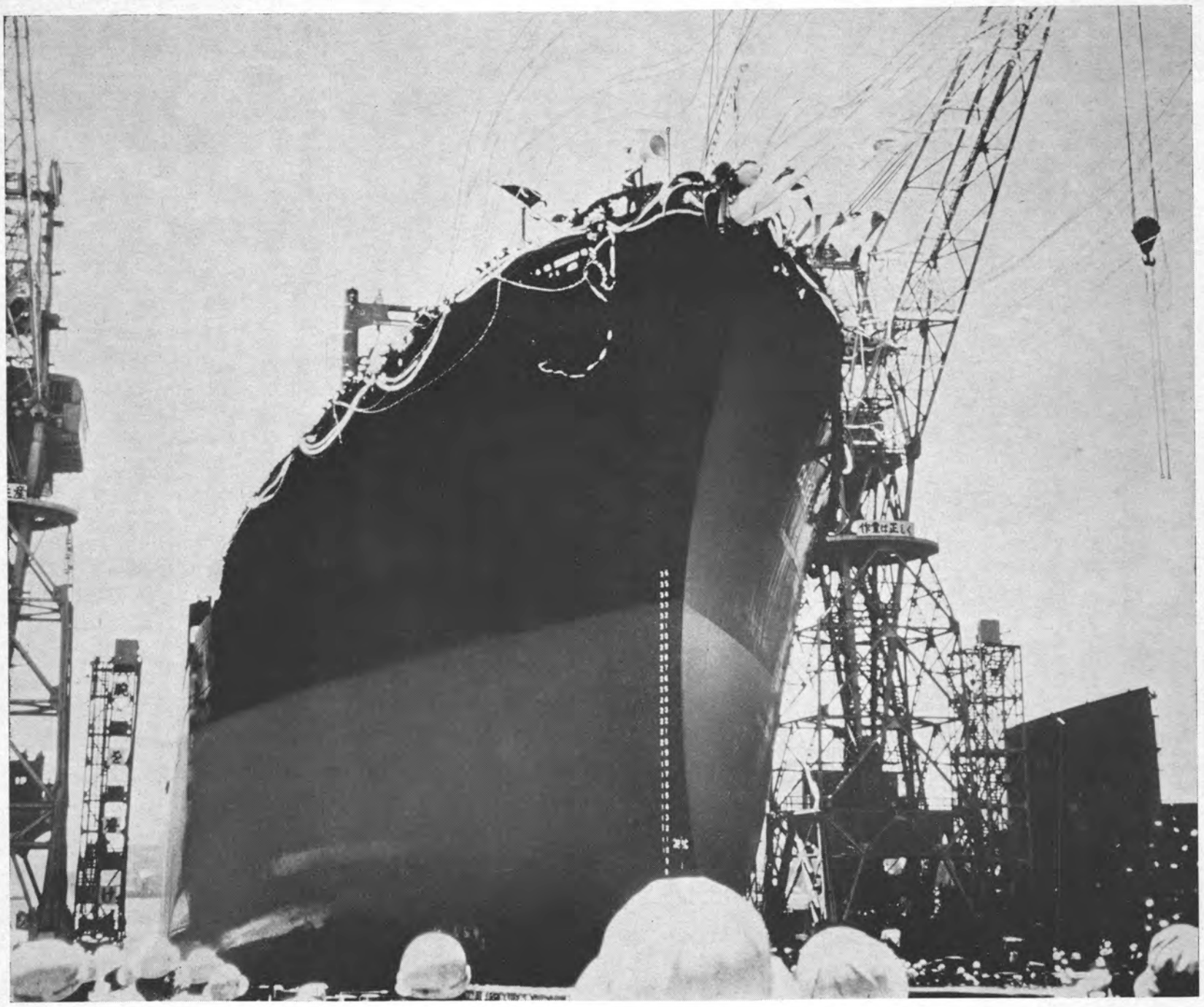
The 35-year-old native of Saginaw, Mich., graduated from Michigan State University in 1956 with a B.A. degree. He is a former army officer. Mr. **Zola** holds membership in several national professional organizations.

Herculite is a leading manufacturer of specialized laminated and coated fabrics for hospital, maritime, construction, petroleum and other industrial applications.

MarAd Relocates Office Of Atlantic District

The Atlantic Coast District of the Maritime Administration has relocated its office in New York City to the new Federal Building at 26 Federal Plaza, New York, N.Y. 10007. The Federal Building is located one block east of Broadway, between Duane and Worth Streets.

The telephone numbers of the Atlantic Coast District office remain the same as at the former location, 45 Broadway.



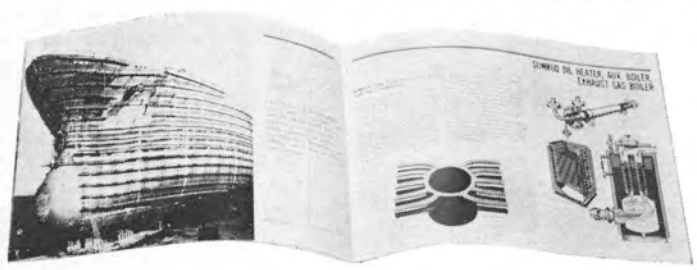
Building a ship in Japan? Contact Gadelius now.

From forward deck machinery to aft pitch propellers, Gadelius supplies the Japanese ship building industry with a wide variety of marine equipment. Some of these products are imported to Japan, others are manufactured locally.

Japanese shipbuilders are fully familiar with our products and organization. We've operated in Japan for over 60 years.

Besides, selling, installing and servicing our fine marine equipment, we offer you consultation and technical supervision.

Send for our new Marine Catalogue today.



Its 40 pages describe such fine marine products as ASEA deck cranes, Stal cooling plants, Diamond Sootblowers, Ljungström air preheaters, Gunclean tank cleaning equipment, and much much more. All kinds of auxiliary equipment from 20 leading U.S. and European manufacturers.

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Just write Gadelius K.K., P.O. BOX 802, Kobe Port, 651-01 Japan, and we'll send you a copy.

Accident And Sick Rate In Maritime Industry Declined During 1968

The accident and illness rate in the maritime industry continued a downward trend during the year 1968, according to the annual analysis of injury and illness statistics released in New York City by the Marine Index Bureau, Inc.

Bruno J. Augenti, president of the MIB, an industry-wide agency established in 1937 which records reported illnesses and injuries of seamen, said that the average number of jobs (54,000) during 1968 produced a combined injury and illness total of 40,801 — a decline to 75.6 percent from 79.7 percent recorded on the same number of seamen's jobs in 1966. The 1967 statistics covered an average of 57,000 jobs and the illness-injury frequency rate for that year was 77.5 percent. "This decline of 4.1 percentage points in just two years" he said, "continues a downward trend which began after the combined injury and illness percentage reached the record high level of 91.2 percent in 1963."

The Bureau's analyses of seamen's injuries and illnesses are based on reports received involving seamen employed aboard privately owned, oceangoing U.S.-flag ships of 1,000 gross tons and over, and those on government-owned vessels operated under General Agency Agreement and Navy owned, contract operated tankers and Atlantic range missile tracking ships. The annual average number of seafaring jobs is based on monthly reports of employment aboard these vessels as published in the U.S. Department of Commerce, Maritime Administration Merchant Marine Data-Sheet, "Manpower." The statistics exclude seamen and seafaring jobs aboard Civil Service manned MSTS ships and those on the Great Lakes and Inland Waterways.

Fort Schuyler Alumni Elects Maley President

Capt. James M. Maley

The election of Capt. **James M. Maley** USNR (ret.) as president of the Alumni Association of the New York State Maritime College, was announced recently.

Captain **Maley,** Class of 1931, is a retired member of the Maritime College faculty, and is now with the Continental Insurance Companies. He is a commissioner of pilots of New York State and a member of the executive council of the State University of New York Alumni Confederation. He succeeds **Abraham Rosenburg,** under whom he had served as vice-president for two years.

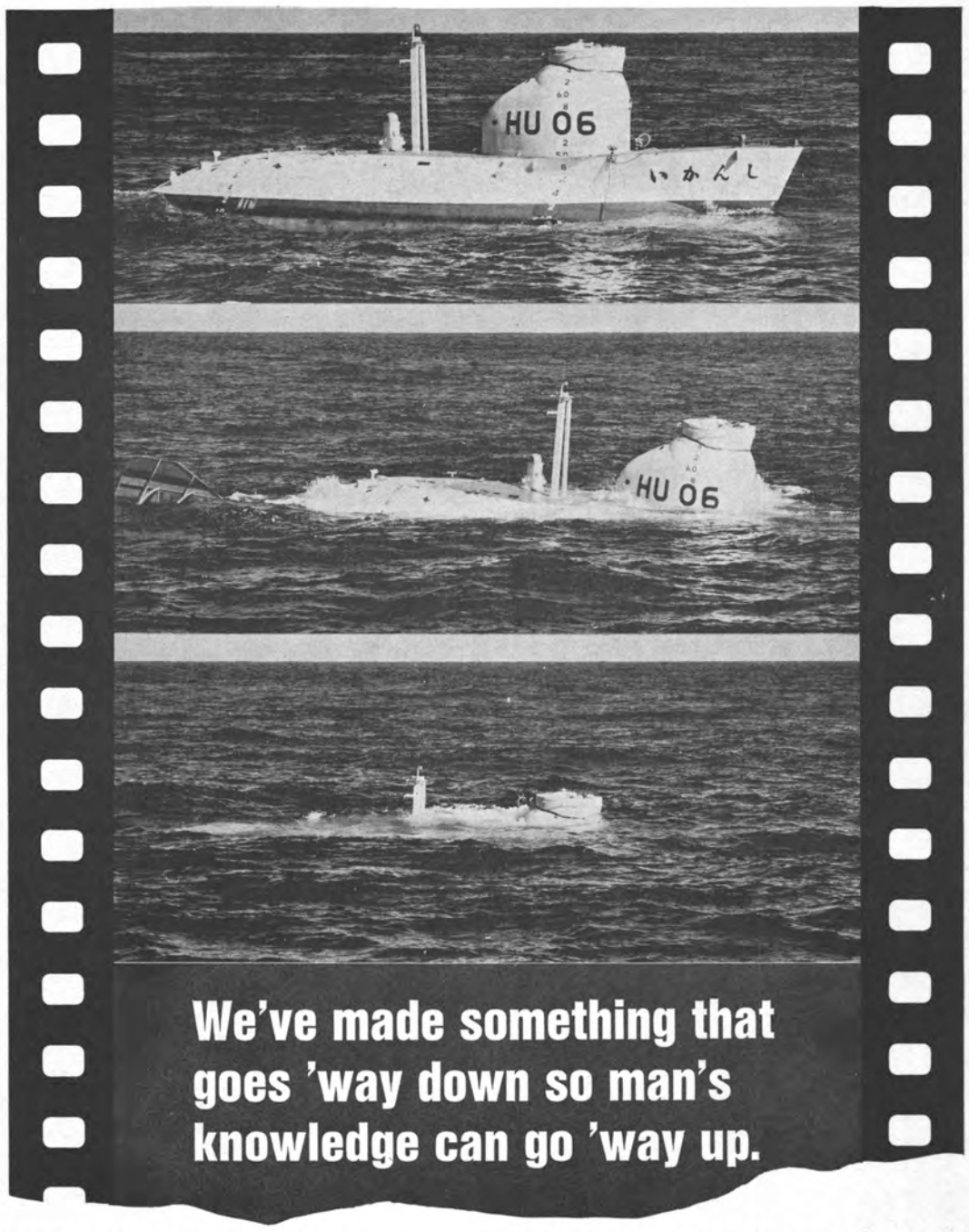
Other officers elected were Capt. **Brian McAllister** and **C. P. Georgiopoulos,** vice-presidents; **Raymond P. Hayden,** secretary, and Prof. **Lester A. Dutcher,** treasurer. Elected to the executive committee were **Peter R. Bresman, Arthur S. Coe,** and Capt. **Martin F. Horwath.**

Ogden Acquires Race Tracks, Golf Club, Motel And Real Estate

Ralph E. Ablon, chairman of the board of Ogden Corporation, and **James F. Edwards,** have announced that Ogden had completed its acquisition of various components of Edwards Enterprises including four race tracks, a golf club, motel, and undeveloped real estate to be planned and developed by Ogden under the direction of **Charles Luckman,** president of Ogden Development Corporation.

Mr. **Ablon** stated that recreation aspects of Edwards Enterprises would be operated as a separate Ogden capability and Mr. **Edwards** would continue as head of Ogden Recreation activities.

Ogden Corporation is a multi-management industrial operating company with diverse interests including foods, marine construction, metals, technology products, transportation systems, and real estate development.



We've made something that goes 'way down so man's knowledge can go 'way up.

It's the Shinkai—a very special research submarine that we built for the Japanese government's Maritime Safety Agency.

Its name means "Deep Sea". And on its first trial run recently, it dived to 600 meters (1,980 feet), testing its wide array of scientific equipment.

The Shinkai will be used to enlarge our understanding of the sea depths around Japan and the life that is found there.

We've acquired quite a bit of knowledge at Kawasaki. And we put a lot of it to use in building the Shinkai.

Our technical abilities also go to work on things like giant 300,000 dwt tankers. We bring out skills to tasks like building, repairing, refitting and remodeling other craft like bulk carriers, combined bulk carriers, cargo liners and refrigerated fruit carriers.

And we know a lot about U-Plant power systems, M.A.N. diesel engines and electro-hydraulic steering gears. Plus a wide range of auxiliary marine machinery.

No matter what your marine needs or problems are, call Kawasaki. We'll dig deep to come up with the right answer for you.

We've got a new name! We used to be Kawasaki Dockyard. Now we've merged with Kawasaki Aircraft Co. and Kawasaki Rolling Stock Mfg. Co. And now we're Kawasaki Heavy Industries, Ltd. Now with more than 28,000 skilled people . . . with combined technical know-how and abilities . . . with more flexibility. Now we can serve you better than ever before!

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Bethlehem Sparrows Point Awarded Contract To Build Multi-Product Tanker

Hendy International Company, representing PPG Industries, and Bethlehem Steel Corporation, have reached agreement for the construction of a special tanker to serve a new PPG chemicals complex in Puerto Rico.

The 33,400-deadweight-ton ship will be constructed by Bethlehem's Sparrows Point, Md., shipbuilding yard at a cost in excess of $15-million. The Hendy organization, of Los Angeles, will operate the vessel.

A multi-product tanker, the ship will deliver chemicals from a three-plant PPG facility primarily to the East and Gulf coasts of the United States. The major products of the plants, at Guayanilla, part of a $150-million PPG chemicals project in Puerto Rico, will be ethylene glycol, vinyl chloride monomer, clorine and caustic soda.

Scheduled for delivery in early 1971, the new ship will be an adaptation of Bethlehem's standard 37,000-deadweight-ton oil tanker design. It will have an overall length of 660 feet, breadth of 90 feet and depth of 48 feet 9 inches. Single-screw, geared steam-turbine propelling machinery will develop 15,000 shp and provide a service speed of better than 16 knots.

Bethlehem's central control system will permit direct control from the bridge of ahead and astern power and speed.

Many special chemical-carrying features will be provided for the transport of PPG's products, such as stainless steel construction for some of the cargo tanks. Other tanks will be insulated and provided with refrigeration.

In addition to the Guayanilla complex, PPG is also building, in a joint venture with Commonwealth Oil Refining Company, Inc., an olefins plant near Penuelas. Both sites are on the southern coast of Puerto Rico.

The Bethlehem Sparrows Point yard also has on order for Hendy International three petroleum tankers of 69,800-deadweight-tons. These also are scheduled for delivery in 1971.

Albina Starts Work On First Waterman C-4 Conversion

Conversion work, amounting to about $2,420,000, has begun on the General Le Roy Etinge, C-4 troopship, for return to dry cargo service for Waterman Steamship Corporation. Removal of excess gear and drydocking for wheel and bottom work was completed the second week in March. Acceleration of the conversion work is expected to require 200 men per shift on a 2-shift basis for the Etinge and the General R. M. Blatchford, second ship, that is expected to arrive at the Swan Island ship-repair facilities of the Port of Portland where Albina Engine and Machine Works, Division of Dillingham, will carry out the conversion project.

Handling C-4 conversion at Albina Engine and Machine Works are, left to right: Vice-President **Herb Hansen** and Capt **E. L. Chapman,** of Waterman Steamship Corporation, and **Harold Sipp,** superintendent of Albina.

Capt. **E. L. Chapman** will be hull superintendent for the Waterman Corporation under direction of their vice-president, **Herb Hansen.** Main conversion work will involve removal of top deck accommodations down to the main deck line and restoring the ship to cargo-handling capacity similar to original design. The midship house will be relocated near the stack, and some preparation for container-handling is being considered. The conversion work on the two vessels is expected to last some 8-months and the total cost figure of $4,840,000 for both vessels may be increased with additional work as the project moves towards completion. Manager of ship repair **Dick Brewer** and superintendent **Harold Sipp** will supervise work for Albina.

Tidewater Marine Acquires Hamer Hammer Services

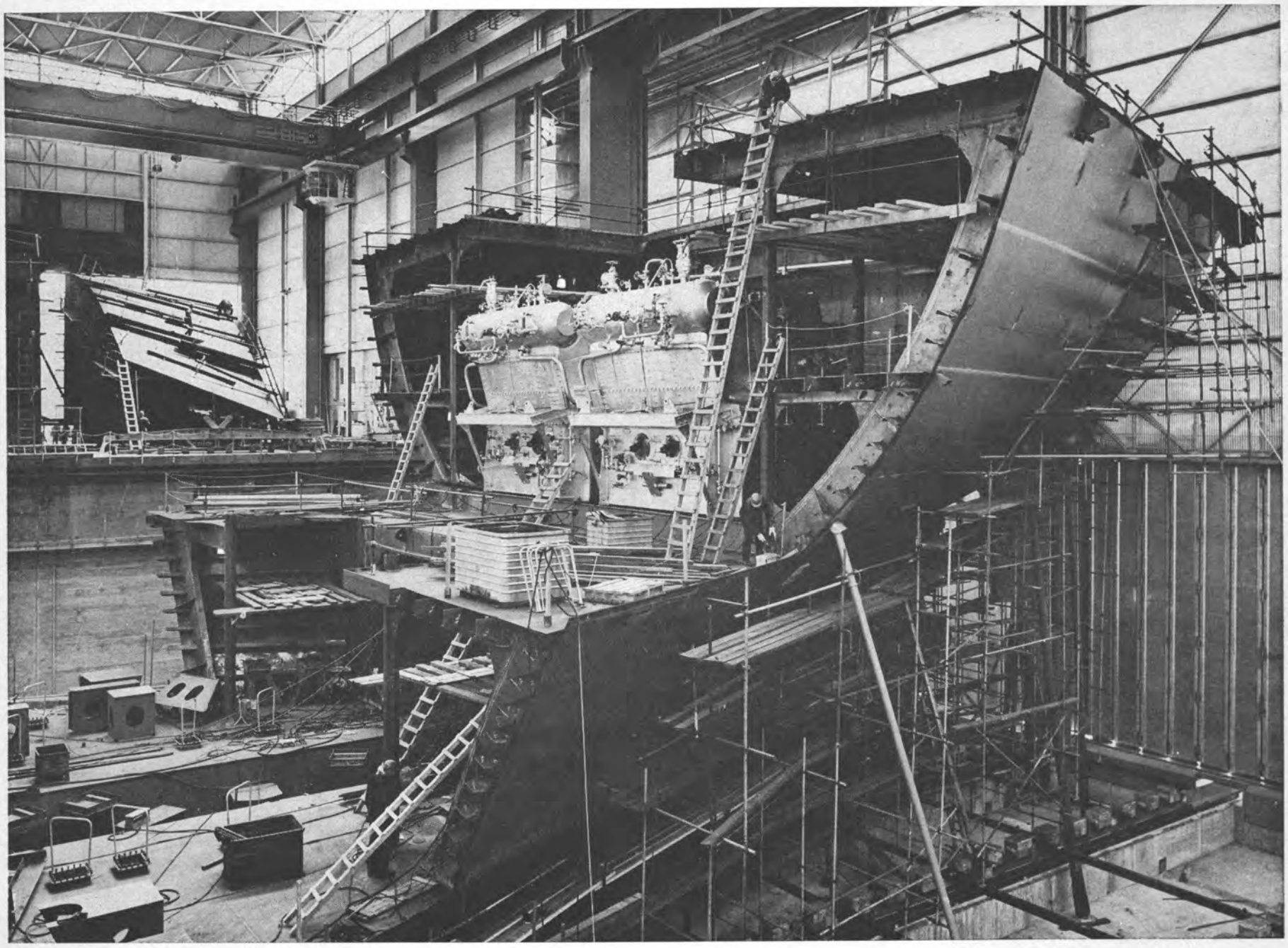
Hamer Hammer Services, Inc., of Morgan City, La.. has been acquired by Tidewater Marine Service, Inc., New Orleans, in exchange for 48,000 shares of Tidewater Marine common stock.

Announcement of the acquisition was made jointly by **John P. Laborde,** president of Tidewater Marine and **Milton H. Hamer,** president of Hamer Hammer. The two companies had announced "agreement in principle" to the acquisition December 30, 1968.

Mr. **Hamer** will continue as president of the company, which will be operated as a wholly owned subsidiary of Tidewater Marine and no other changes of management or personnel are contemplated, said Mr. **Laborde.**

Hamer Hammer leases diesel hammers and personnel for driving oil well casings. Tidewater Marine, which operates a fleet of 400 vessels of all types in service to the offshore oil industry worldwide, has never previously been engaged in this type of work, said Mr. **Laborde.** He added that the capabilities of the Hamer firm will "complement Tidewater Marine's overall contribution to the inland and offshore oil and gas industry."

Indoor shipbuilding for better ships



THE ARENDAL SHIPYARD WITH BUILDING DOCKS FOR SHIPS UP TO 250,000 TONS D.W.

Shipbuilding at Götaverken's Arendal Yard is a modern, indoor process. And a clean process all along the production line — from the moment incoming steel plate is shot-blasted and painted, up to the time the hull emerges into the open. Temperature indoors is maintained at a favourable, uniform level. This permits welding and assembly work to be carried out to specifications unattainable under outdoor shipbuilding conditions. In fact, every step in hull construction is improved and more controllable when the work is done indoors. As an example, Arendal's highly automated straight-line production has enabled Götaverken to build a 70,000 ton ship in 75 working days; that is, from the beginning of the work in the building dock to the delivery of the ship. Among the ships on the production list at the Arendal Yard is a series of tankers in the 210,000—228,000 tons d.w. range.

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Ralph Medros Appointed Assistant General Manager By General Dynamics-Quincy

Ralph Medros

Robert E. McMahon

Ralph Medros, formerly director of materials and procurement, was named recently to the newly created position of assistant general manager of the Quincy division of General Dynamics Corp.

General manager **Robert V. Laney,** to whom Mr. **Medros** will report, announced the appointment.

Reporting to Mr. **Medros** will be **Lewis Emmerich,** manager of manufacturing; **Samuel B. Winram,** manager of planning and control; **Charles J. Palmer,** director of engineering and **Robert E. McMahon,** newly appointed director of materials and procurement.

In a division notice, Mr. **Laney** said "The establishment of the assistant general manager and the appointment of Mr. **Medros** will provide the Quincy division additional concentration and capacity to achieve our basic business goals while enabling me to devote more attention to the DX program and other duties of my office."

Mr. **Medros** was corporate director of purchasing and traffic when he transferred to the Quincy division in May 1968.

He joined General Dynamics in 1967, after 27 years with General Electric, with whom he held executive posts in industrial purchasing, traffic, material control and manufacturing.

Educated at Northeastern University, majoring in industrial management, Mr. **Medros** furthered his studies with several advanced management courses.

Mr. **McMahon** joined General Dynamics in May 1968, after 17 years with General Electric's jet engine facilities in Evandale, Ohio.

He began as a production clerk and was a production control supervisor and assembly foreman before moving into the materials organization in 1957. He was manager of purchasing contracts administration at the time he left the company.

Mr. **McMahon** graduated from Xavier University, Cincinnati, Ohio, in 1950 and earned his MBA there in 1958.

Baldt Anchor, Chain & Forge Now A Division Of Baldt Corp.

Baldt Anchor, Chain & Forge, of Chester, Pa., formerly a division of the Universal Marion Corporation, became a division of the Baldt Corporation effective December 1968, it was announced by **E. J. McGuiness,** managing director for the division. The change will not affect the personnel or operating management of the Chester-based firm. The Baldt Corporation is a Delaware corporation, dating from 1965, while the anchor and chain division dates from 1900.

Baldt Anchor, Chain & Forge, with its main plant and headquarters at 6th and Butler Streets, in Chester, Pa., is believed to be the world's largest manufacturer and supplier of marine anchors and anchor chain. It offers worldwide service from Chester, Pa.; Fieldsboro, N.J.; New Orleans, La.; San Francisco, Calif.; Houston, Texas; Sweden, Germany and Japan.

A Report On The Operation Of The

GTS Wm. M. Callaghan

Charles E. Hoch*

About 13 months ago, the GTS Adm. Wm. M. Callaghan, under charter to the Military Sea Transportation Service and operated for its owners, Sunexport, by the American Export Isbrandtsen Lines, Inc., entered the North Atlantic service carrying roll-on/roll-off cargo between the ports of Philadelphia and Bremerhaven.

The Callaghan is, frankly, an experimental ship, and during her first year in service has contributed greatly to the knowledge and understanding of the use of aircraft-type gas turbines in marine service.

A roll-on/roll-off ship, such as the Callaghan, provides an excellent test bed for gas-turbine engines, which combine the desirable characteristics of high horsepower, low weight and small space requirements.

The machinery plant is based on the use of two FT-4A2 gas turbines manufactured by Pratt & Whitney Aircraft in Hartford, Conn. These units incorporate the FT-4 jet engine, together with a two-stage free-power turbine, all mounted axially in a common casing.

The FT-4A2 engines burn JP-4, JP-5 and other high-quality distillate fuels. The Callaghan is currently using a military specification marine diesel fuel. Fuel meeting these specifications is available worldwide. Fuel consumption is about 0.51 lb./shp hour at 20,000 hp/shaft.

In her first year of operation, the Callaghan has made 17 round trips between either Philadelphia and Bremerhaven or New York and Bremerhaven. In that time the ship has steamed over 130,000 nautical miles, carried a total of 477, 159 measurement tons of cargo consisting of 23,227 vehicles. As yet, we have not been able to develop fully, on a continuing basis, the service speed of the Callaghan. However, we have sufficient records to indicate that the Callaghan will probably have a service speed generally in excess of 24 knots, and during good weather speeds in excess of 25½ knots will be available to us within the 40,000-hp rating.

At a drydocking shortly after the Callaghan was launched, three buckled areas were found in her bottom amidships, probably resulting from high way-end pressure during launching. These buckles were faired; however, at the guarantee-survey drydocking, approximately the same buckles had reappeared. It is my opinion that this buckling is due to a combination of relatively high hull stresses due to light loading, together with the use of relatively thin high-tensile strength plating on the ship's bottom. As a result, it was necessary to repair some plates and to replace others and install panel breakers running longitudinally between the floors over a good portion of the ship's bottom area.

The outboard shafting is a torque tube. During the guarantee survey, all the protective fiberglass and resin coating was missing from the torque tube and the exposed sections of the solid tailshaft with the result that the end fittings of the torque tube operating in a hostile atmosphere had cracked. It was necessary to reweld these extensive cracks and recoat the shaft. How satisfactory this fix is will not be known until the ship is drydocked for examination within the next several months.

The Callaghan was designed to handle a weight cargo of approximately 7,000 tons. It is expected that in service handling military vehicles that the actual cargo carried will weigh between 4,500 and 7,000 tons. However, to date, our average loading has been of 'balloon' cargo and, except for one trip in which we carried 3,000 tons and another trip in which we carried 4,320 tons, our average loading has been less than 2,500 tons and this has proved to be a problem. With this light loading in the North Atlantic, the Callaghan has been less than a seakindly ship. In an attempt to reduce pounding in very heavy weather, the master has felt it necessary to quarter the seas, and under such conditions has reported extremely heavy rolling.

However, during the trip in which the Callaghan carried 4,300 tons of cargo, the master reported that she rolled easily and regularly in moderate weather with a total roll period of about 12 seconds. This is a high-sided ship and, unless laden in excess of 4,000 tons, it really does not have sufficient grip on the water to insure seakindliness under North Atlantic conditions. It is primarily for this reason that we are now contemplating the installation of solid ballast of a type which can be readily removed should the ship move into another service.

In addition, we are experimenting with the use of seawater ballast in the fuel oil tanks, both of which, in my opinion, will greatly improve the seakindliness. There is a secondary reason for this ballasting. In this big ship, lightly laden and with deeptanks forward and settling tanks aft, high hull stresses can be achieved unless the ship is carrying a fairly good load spread. The addition of the 1,500 tons of ballast, plus the ballasting of double bottom fuel tanks will markedly reduce the hull stresses.

The performance of the gas turbines is, to my mind, outstanding. Except for one major incident, the performance of these engines, particularly in an experimental ship, has been attended with a lesser number of problems than we would expect to experience in a steamship of like horsepower.

On September 6-7, during a passage to Bremerhaven, the temperatures downstream of the compressor turbines showed a sudden and marked rise to an extent that it became necessary to secure the starboard engine. Investigation showed that a fire had started within the engine and it was necessary to replace that engine in Bremerhaven with the spare which we always carried aboard. You might be interested to know that this engine change-out was made in about 30 hours by shipyard employees who had never done this before and at a total cost of approximately $1,700. What had happened is that a heat shield attached to the fuel manifold had vibrated loose and had cut the fuel manifold in the engine with a resultant fire. These heat shields are not necessary in marine service and we have subsequently removed the heat shields on both engines.

At the time of this fire we had 5,018 hours on the engine with no significant failures. By the same token, both engines have provided continuous, completely satisfactory service with minimum maintenance. At the moment, I do not know what the overhaul cycle of the gas generator will be because we are still building experience in this area, but my estimate is that it will not be necessary to overhaul these engines at lesser intervals than 8,000-10,000 hours.

Overhaul will be done either by the manufacturer or by firms specializing in this work for the aircraft industry. The substitution of a rebuilt gas generator is a very simple problem and one which can be accomplished during a normal turnaround, without delay to the ship. I cannot be too enthusiastic at this time about these engines. They have proved, to date, their worth in a continuous-duty service under rugged service conditions.

This is not to say, however, that we have not had problems with the machinery installation in the Callaghan. We have had lots of problems, but those associated with the engines have been, primarily, in the area of instrumentation and control. The instrumentation and control console, in my opinion, leaves much to be desired. The quality of the instrumentation, the provision of power to the instrumentation, the shutdown features of the instrumentation, have all given operational problems of no mean consequence.

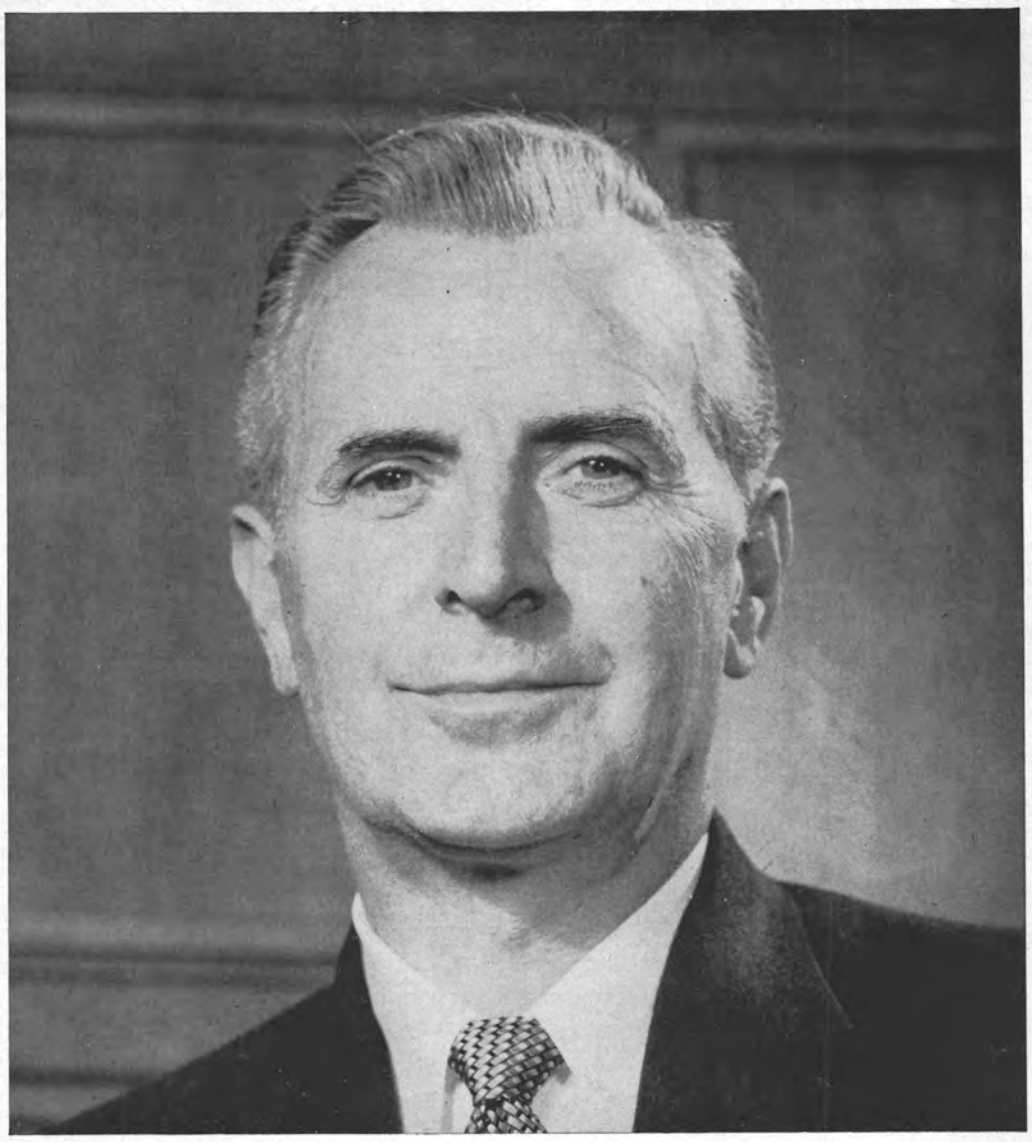
The reversing/reduction gears employed, although an extension of existing technology, are by far the largest by horsepower ever built for marine use and we are highly pleased with the maneuvering features provided by these gears. This reversing system, in conjunction with the rapid response of gas-turbine engines, is remarkable.

The starboard high-speed idler gear lost portions of several teeth at a time which we have been unable to pin down and it was only through routine examination that we found this defect. The gears were dressed and continued in service with the starboard engine running slightly below full horsepower. During the guarantee survey a new gear was installed and the ship is now back up to full speed on both engines. We expect that the reversing/reduction gears will continue to give us satisfactory service for many years to come.

Based on the wear experienced to date, on the clutch bands, we believe that the original bands may very well last the life of the ship. In any event, it is not much of a job to replace these units.

We look forward to continued profitable use of this ship in our service for many years. It is our hope that the lessons we have learned with respect to gas-turbine propulsion will be of value to the American merchant marine.

*Mr. **Hoch,** superintendent engineer, Military Sea Transportation Service, Washington, D.C., presented the paper condensed here before a recent meeting of the Society of Marine Port Engineers New York, N.Y., Inc.



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American Bridge Division Builds 16 Giant Barges For Oyster Shell Dredging

Workers at the Ambridge Plant of U.S. Steel's American Bridge Division, launched this giant deck barge destined for heavy-duty work in the dead-reef oyster-shell dredging industry in the South. This barge was one of 16 recently constructed at the plant for Southern Industries Corporation, of Mobile, Ala.

A western Pennsylvania steel plant is playing a key role in one of the South's major and fast growing industries—dead-reef oyster-shell dredging.

The Ambridge, Pa. plant of U.S. Steel's American Bridge Division has completed an order for 16 giant deck barges for Southern Industries Corporation of Mobile, Ala. These will be added to the growing fleet of Radcliff Materials, Inc., a division of Southern Industries Corporation and used to market oyster shells recovered from dead-reef deposits in Gulf Coast bay waters by nine hydraulic dredges.

Radcliff dredges about 5-million tons of shell annually for a wide range of products including asphaltic concrete, masonry units, chemical grade lime, poultry feed supplement and even as a ruminant roughage for cattle.

C. J. Bogman, marine product manager for American Bridge, said the contract was unique in several respects. "It was probably the largest contract ever awarded for this class barge; the barges were among the largest ever built at our Ambridge facility and the first ever produced by us for this end use."

United States Steel Corporation supplied the steel for the 2,200-ton capacity barges. Each is 240 feet long, 50 feet wide and measures over 10 feet from keel to deck. A 4-foot 6-inch high steel cargo box built around the deck retains the shells. A long rake forward, a short rake aft and skegs will make towing efficient on both rivers and open water.

The new barges will help Southern Industries to continue and expand an industry that they pioneered 40 years ago, and that has now become a prime industrial and economic factor in the Southland.

"We are very proud to be a part of this growing, vital industry," Mr. **Bogman** said. "Production of these deck barges at the Ambridge plant represents a strong link between industry in western Pennsylvania and the Gulf South."

Hartmann Serving As Agent For Ghana Black Star Line

The F. W. Hartmann & Co., Inc. has announced that the Ghana-flag cargoliner Pra River is now being handled in United States North Atlantic seaports as part of its new agency service for Black Star Line.

According to the announcement by **Joseph F. Daly,** president of Hartmann, the company assumed the role of general agents in the U.S. and in Canada on January 1, but the strike of longshoremen delayed operations of Black Star Line vessels. The Pra River arrived in New York on March 17, following calls in Philadelphia, where she unloaded a cargo of cocoa and other products.

One of 16 relatively new cargo ships in the Black Star fleet, the Pra River sailed from New York after loading under what agency officials reported to be the beginning of a planned surge in ship operations of the ship fleet that flys the national flag of Ghana.

One aim of the operation of Black Star Line vessels, under the F. W. Hartmann banner, will be the establishment of a regular service from North Atlantic and Gulf Coast ports to West African areas. At the present time, Black Star ships will be used in a monthly service with vessels serving both Gulf and North Atlantic ports.

However, with the expected increase in regular operations and cargo carrying growth, the service will be improved with the possibility that separate lines will be utilized in the Northeast and Gulf areas, **John Benasich,** the Black Star Line manager, told a press briefing.

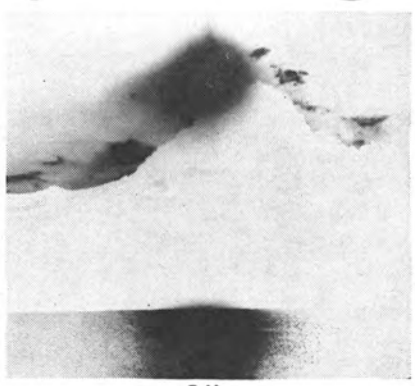
The shipping line, which until recently was part of a joint service operations with Israeli-flag interests, is continuing its long-range program of introducing modern tonnage to its growing fleet. **A. A. Boateng-Bediako,** the owners' representative in the U.S., reported that a new 17-knot freighter has recently been launched in Spain and that another new vessel is on the way.

Trade prospects for the Ghana shipping company are considered highly promising in light of continuing improvements in the West African nation's economic outlook and the growth of international commerce.

Ghana, the world's leading producer of cocoa, also exports logs and timber, gold, manganese, and diamonds mainly for industrial use. Its imports consist mainly of manufactures, machinery, transport equipment, and food products.

A.M.

Refineria Panama gives you 24 hour bunkering service by barge.



P.M.

Refineria Panama gives you 24 hour bunkering service by barge. At each end of the Panama Canal.

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Mitsubishi Shoji Kaisha	Japan	781-2222 Tokyo	211-0211

American Ship Building And Erie Marine Div. Award Contracts To Walz & Krenzer

Walz & Krenzer, Inc., of Rochester, N.Y., has recently been awarded contracts by the American Ship Building Company and the Erie Marine Division of Litton Industries with a total value in excess of one-half million dollars.

For American Ship, watertight doors of a special design to close off sections in the way of longitudinal conveyor belts, will be supplied for a new 858-foot self-unloading bulk carrier being built for United States Steel Corporation. Designs have already been approved by U.S.C.G. and A.B.S.

For Litton, 35 power-operated hinged hatches will be furnished for a new 1,000-foot self-unloading bulk carrier being built for Bethlehem Steel Company.

W&K introduced their first patented sliding sideports on the Aquarama, and Marine Star in 1953. Since then they have supplied equipment for over 800 major ships sailing under American, Canadian and foreign flags.

Current regulations do not require watertight doors in the way of longitudinal conveyor belts. Walz & Krenzer developed a design that eliminates the major problem of belt clearance between the closing sections of the door, thereby reducing belt wear during conveyor operations. Regulatory bodies are now encouraging the use of these closures for existing as well as contemplated vessels. These W&K patent pending doors separate a ship into several compartments, contributing to the safety of both the crew and the vessel.

Chesapeake Section Paper Describes Pacer-Class Design

Principals attending Chesapeake Section Meeting were, left to right: **R. Taggert,** Section chairman; **O. H. Oakley,** Naval Ship Engineering Center, meeting moderator; **T. J. Chwirut,** author, and **Charles B. Cherrix,** author.

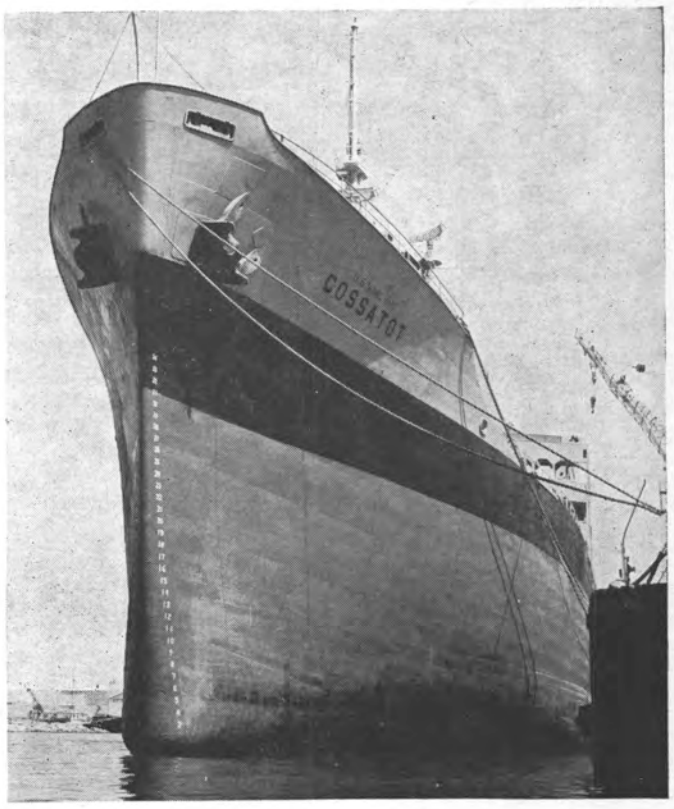
Attendees at the February meeting of the Chesapeake Section of The Society of Naval Architects and Marine Engineers, held at the Washington Navy Yard Officers' Club, heard an interesting paper entitled "Pacer Class—Commercial Cargo Ship," written and presented by **Theodore J. Chwirut** and **Charles B. Cherrix** of the U.S. Maritime Administration.

The authors presented the results of their extensive study predicated on the premise that a low-cost, general cargo ship of moderate size, simplified and capable of being built in quantity would prove useful in the commercial and military posture of the United States. The design goal of the paper does not have as its purpose a finished product ready for construction, but rather a preliminary design devoid of sophisticated features. The authors stated that the construction of minimum-cost ships with the ability to be operated successfully in commercial service could be achieved with a total cost reduction of 20-25 percent in comparison to the modern cargoliner.

Since this concept of a minimum-cost general-purpose cargo-liner was presented to industry for its critique many discussions followed the presentation. Of particular interest was the discussion by Dr. **Gallin** of Blohm & Voss who commented on some parallels between the paper and studies made by his shipyard in the area of a simplified hull form.

Two 210,000-DWT Tankers Ordered From Sasebo

The Japanese shipbuilding firm of Sasebo Heavy Industries Co., Ltd., has received an order for two 210,000-dwt tankers from the Island Navigation Corp. of Hong Kong. The vessels, which will be operated by two subsidiaries of the Hong Kong firm, are due for delivery in September and December of 1972.



Bethlehem Yards Can Do ...*and Quickly*

As a result of a collision last year off Santa Cruz Island near Santa Barbara, California, the 16,250-dwt, T-2 tanker, USNS Cossatot, sustained heavy damage. Her port bow was stove in, with the damage extending from the forecastle deck to the forepeak tank top, and through the ship all the way to her starboard side. The repair job was a major one, and was performed by a major repair yard: Bethlehem's San Pedro Yard in Los Angeles Harbor.

The yard cut away and renewed the vessel's damaged bow section, including side shell plating port and starboard, and chain locker bulkheads. The anchor windlass was rebuilt, and the entire hull repainted in drydock. Just 35 days after she arrived at the yard, the Cossatot was back in service.

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DELIVERED BY SCHNITZER: Barge COPAC No. 10, shown on the ways at the Schnitzer yard in Portland, Ore., was recently delivered to Columbia Pacific Towing of Stevenson, Wash., by Schnitzer Leasing, division of Schnitzer Industries. The 150-foot by 45-foot by 12-foot barge with chip bin will be operated on the Columbia and Willamette Rivers servicing the expanded COPAC fleet.

Italian Firm Awards Contract To Hydranautics To Build Crane Hydraulic System

Hydranautics, Goleta, Calif., a subsidiary of The Cosmodyne Corporaion, has been awarded a $100,000 contract to design and build a hydraulic system to raise and lower a 1,000,000-pound barge-mounted crane.

Micoperi, a Milan, Italy firm, is building the barge and crane for ocean salvage work. Erected, the height and weight of the crane raises the center of gravity of the barge so high that it could capsize while under tow to another port in rough seas.

Hydranautics was called on to design and fabricate a system that would erect and lower the crane on the barge, and to design the traveling dollies on which the crane would ride as it moved from one position to another.

The system will erect the 167-foot high crane in 3 hours 30 minutes and lower it in 1 hour 30 minutes.

Key feature of the system are the Hydranautics patented hydraulic grippers which provide movable anchor points. This eliminates the need for a long ram head on the hydraulic system, thereby significantly reducing cost and weight.

Hydranautics designs and fabricates heavy equipment handling systems with hydraulics.

Cosmodyne, headquartered in Torrance, Calif., is a diversified manufacturer of technological equipment for the cyrogenics, marine, aerospace, and leisure-time markets for both the government and private industry.

Adm. Will Elected President Of International Trade Group

Adm. **John M. Will,** USN (ret.), chairman of the board of American Export Isbrandtsen Lines, has been elected president of the Italy-American Chamber of Commerce. Admiral **Will** succeeds **Theodore Gommi,** formerly vice-president and director of Schenley Industries, Inc.

West Indies Shipyard Builds Two Barges

The Robinson Point Shipyard Ltd., of Belize, British Honduras, has completed a two-barge contract awarded the firm by Shell De Centro America of San Salvador. The barges were delivered to Shell B.H. Ltd.

The first vessel was a tank barge having a 100,000-gallon capacity. It was designed by Schuller and Allan, Inc., naval architects in Houston, Texas. This barge was designed for ocean service and has been certified by the American Bureau of Shipping for A.1. Full Gulf of Mexico.

The second unit was a 10,000-gallon tank barge designed by the same naval architects. It will be used for harbor bunkering and to service offshore facilities.

Robinson Point Shipyard is being kept busy with drydockings, repairs and new construction. The firm is presently rebuilding its marine railway so that it can handle vessels of 500 tons and 250 feet long.

Burton To Build Three Offshore Oil-Well Supply Boats

Penrod Drilling Co. has contracted Burton Shipyard, Inc., of Port Arthur, Texas, for the construction of three offshore oil-well supply boats. Designated Hull Nos. 453, 454 and 455, each vessel will have the following dimensions: 165 feet by 38 feet by 13 feet and will be powered with 2,250-total-bhp diesels.

Barge Construction

American Marine Corp., New Orleans, is to build a deck cargo barge for Tidewater Explorations, Inc., New Orleans, La. To be of 800-dwt, it will have dimensions of 140 feet by 35 feet by 10 feet. The barge has been designated Hull No. 1027.

American Marine will also build three additional deck cargo barges for the same company. Designated Hull Nos. 1028 through 1030, each 800-dwt barge will have dimensions of 140 feet by 40 feet by 9 feet.

Bethlehem-Beaumont Yard was contracted by **James C. Storm** of the Storm Drilling Co., Houston, Texas, to build four deck cargo barges. The barges have been designated Hull Nos. 4847 through 4850. To be of 800-dwt, each barge will have the following dimensions: 140 feet by 39 feet by 9 feet.

Gretna Machine & Iron Works, Inc., Harvey, La., is to build a 6,000-dwt tank barge for Bouchard Transportation Co., Inc., New York. Designated Hull No. 186, its dimensions will be 300 feet by 56 feet by 21 feet 6 inches.

Gretna Machine is also building another tank barge for Dixie Carriers, Inc., Harvey, La., for the transportation of acid. The barge has been designated Hull No. 184 and will have the following dimensions: 210 feet by 48 feet by 11 feet and be of 2,300-dwt.

Gunderson Bros. Engineering Corp., Portland, Ore., is building a combination carfloat and caustic soda tank barge for Foss Launch & Tug Co., Seattle, Wash. It has been designated Hull No. 16,173, and will be named Foss 252. The barge will have a 9,000-dwt capacity and have dimensions as follows: 312 feet by 56 feet by 18 feet.

Hillman Barge & Construction Co., Pittsburg, Pa., is to build four deck cargo barges for Thomas Jordan, Inc., New Orleans, La. To be of 800-dwt, each bargt will have dimensions of 140 feet by 39 feet by 9 feet.

Ingalls Iron Works Co., Birmingham, Ala., was contracted by Humble Oil & Refining Co., Houston, Texas, to build an **1,800-dwt oil** barge. Designated Hull No. 1696, it will have dimensions of 147 feet 6 inches in length, 12 feet 6 inches in depth.

Jeffboat, Inc., Jeffersonville, Ind., is to build a pipe-laying barge for Houston Contracting Co., Belle Chasse, La. Designated Hull No. 2248, it will have the following dimensions: 370 feet by 85 feet by 24 feet and be of 10,000-dwt.

Kelso Marine, Inc., Galveston, Texas, was awarded a contract by Southeastern Drilling, Inc., Dallas, Texas, for the construction of a deck cargo barge. Designated Hull No. 36, it will have dimensions of 180 feet by 50 feet by 14 feet and be of 2,000-dwt.

Reliance Marine Transportation & Construction Corp., Kingston, N.Y., is to build a deck cargo barge for stock purposes. To be of 1,000-dwt, it will have dimensions of 130 feet by 40 feet by 11 feet 3 inches. The barge has been designated Hull No. 776.

Todd-Seattle Yard is building a deck cargo barge for Foss Launch & Tug Co., Seattle, Wash. Designated Hull No. 48, it will have the following dimensions: 280 feet by 60 feet by 17 feet and be of 4,300-gt and 8,000-dwt. When completed, the vessel will be chartered to Alaska Steamship Co., Seattle, Wash.

Babcock & Wilcox Awarded $43-Million AEC Contract

Babcock & Wilcox has received a $43,000,000 contract from the Atomic Energy Commission for the manufacture of nuclear cores to be used by the Navy.

The work will be performed at B&W's Naval Nuclear Fuel Division in Lynchburg, Va.

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An all steel, diesel propelled ferry capable of a speed of approx. 12 to 13 knots, carrying 50 to 60 automobiles and 250 passengers. Preferably less than 10 years old. Please send all details, specifications and price.

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De Laval	300 KW
Hendy (Terry Design)	300 KW
Westinghouse	300 KW
Westinghouse	250 KW
Worthington	150 KW
Westinghouse CA 20	100 HP
Westinghouse CA 20	50 HP
Westinghouse HP & LP Turbine	4400 HP
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G.E. Main Turbine Rotor T2	6000 HP
G.E. HP & LP Turbine C2	6000 HP

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1—20″ Hydraulic Cutter Head Dredge, Diesel, 420 Gross Ton, Sectionalized, 1,600 Total Horsepower.

1—6 Cubic Yard Walking Clamshell Dredge. 3-48″ x 60′ Spuds, 1,000 Gross Tons, Diesel Electric, 130′ x 45′ x 10′.

1—30″ Dredge Booster Plant, 3,200 HP, Diesel Electric, Mounted in 200′ x 35′ x 6′ Vessel.

1—22″ Dredge Booster Plant, 3,000 HP, Diesel Electric, Mounted on three Lowboy Trailers.

2—1000 HP Tugboats, Push Knee Bow, 65′ x 22′ x 9′, Twin Screw, W/Two GM 8-268A Diesel Engines. Two 4-Blade, 60″ Props. Accommodations for 8, complete with Navigational Aids.

2—Floating Warehouse Barges, Navy Type LSM Vessel, 203′ x 34′ x 13′, W/15 Ton Traveling Gantry Crane on full length rail. Two GM 3-268A driving 150 KW Generators.

1—Flat Steel Barge, 150′ x 35′ x 8′.

1—Luhrs 32′ Fiberglass Sportsboat, 300 HP Chrysler Gasoline Engine, Single Screw, Sleeps 4. 88 Total Hours, New 1968.

1—Dredge Tender, 563′ x 68′ W/80 Ton Colby Traveling Gantry Crane on Rail full length Main Deck. 10,000 Ton.

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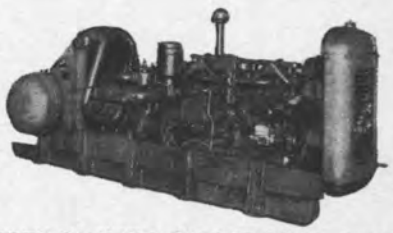

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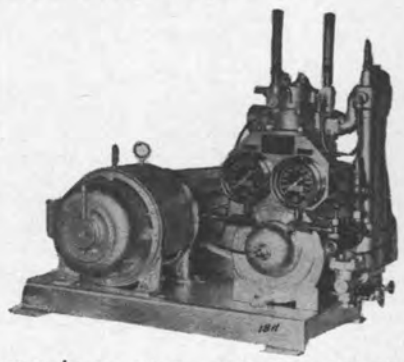
Ingersoll-Rand compressor—315 cu. ft. at 125 lbs. —driven by International Harvester UD-18 diesel. Tank mounted on skid—radiator cooled—from Corps of Engineers salvage vessel.

SHIPS SERVICE - 50 CFM/150 LBS

Ingersoll-Rand—type 30—class R—5x5x4x4—50 CFM @ 150 lbs. 20 HP 440/3/60 motor & controls—1750 RPM—50°C—class A. Complete with centrifugal unloader. OAL 4' 1⅛"—OAH 3' 2½" —OAW 2' 6½"—total weight 1505 lbs.

$1250



10 CFM/600 LBS - DIESEL STARTING

Ingersoll-Rand type 30—class T—4 x1½x3½—10 CFM at 600 lbs.—7.5 HP—motor is 440/3/60—1750 RPM—class A—50°C—weight 700 lbs. Complete with inter- and after cooler. OAL 3'6"—OAH 4'1½"—OAW 2'2¾".

$1750

20 CFM/100 LBS

Worthington—5½x3⅛x3½—VA2—20 CFM @ 100 lbs. Motor 5 HP—440/3/60—1750 RPM—marine type ball-bearing drip-proof—fan cooled—with magnetic starter & self-unloader. OAL 4' 8½"—OAH 28"—OAW 25' 5". T2 ships service.

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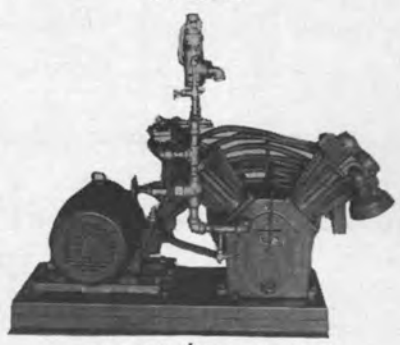

20 CFM/100 LBS

Ingersoll-Rand type 30—model 253x5—5x3x3½ —20 CFM @ 100 lbs—self unloader. Westinghouse 5 HP 440/3/60 motor. T2 ships service.

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54 CFM/100 LBS

Ingersoll-Rand type 30—5x5 & 4x4—54.4 CFM @ 100 lbs. Motor 15 HP—440/3/60—1750 RPM—with magnetic control, self-unloader, etc. Weight complete 1122 lbs. OAL 4' 11¼"—OAH 2' 10"—OAW 2' 7¾". T2 combustion control.

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52 CFM/100 LBS

Worthington 6½x3½x4—VA2—52 CFM @ 100 lbs. Motor is 15 HP—440/3/60—1750 RPM. Complete with magnetic starter, self-unloader, etc.

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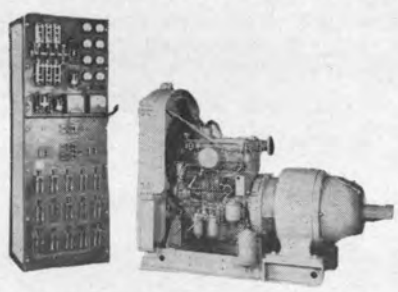

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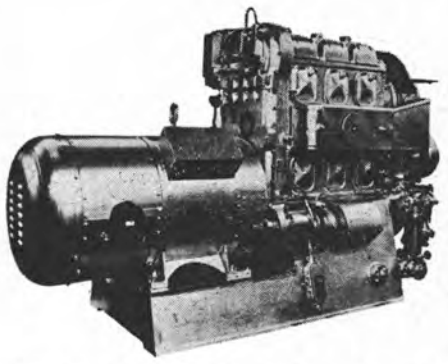
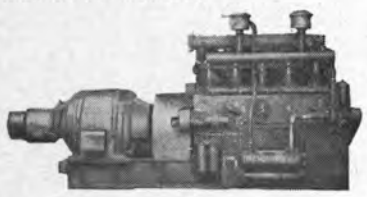
BUDA, radiator cooled, 15 KW, 120/240 Volts DC.
FAIRBANKS-MORSE, radiator cooled, 25 KW Continental Generator, 120/208/3/60.
Hercules DJXC, 25 KW, 120 DC.
GM 3-71, 30 KW, 120 DC.
Cummins A1, 30 KW, 120 DC.
MURPHY, Model ME 66, radiator cooled, 75 KW, 120/240 Volts DC.
CATERPILLAR DIESEL ENGINE, Model D17000, 167 HP, 900 RPM, Heat Exchanger cooled, with Louis-Allis Generator, 85 KW, 220/3/60.
LORIMER, F5SS, 75 KW, 120/240 DC, radiator cooled.
COOPER-BESSEMER, JS-5, 250 KW, 240 DC.



LORIMER 100 KW
450/3/60 Volts DC.



BUDA 6DHG691, 60 KW, 120 Volts DC.

GM-3-268A, 100 KW, 240/120 Volts DC.

SUPERIOR GBD-8, 100 KW, 240/120 Volts DC.

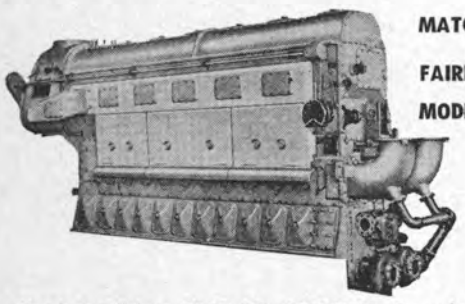
SUPERIOR, Model IDB-8, 100 KW, 450/3/60.

GENERAL MOTORS Diesel Generator Sets Model 3-268A, 152 BHP, 1200 RPM, heat exchanger cooled, with 100 KW Generators, 450 volts AC, 3 phase, 60 cycles.

GM 8-268A, radiator cooled, air start with Westinghouse Generator, 250 KW, 440/3/60, complete with switchboard.

GENERAL MOTORS DIESEL ENGINES, Model 8-278, with 500 KW Generators, 115/230 DC.

MARINE DIESEL ENGINES



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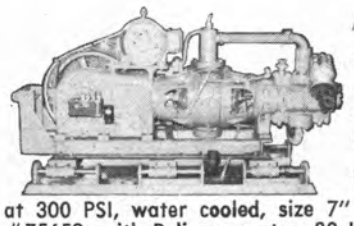

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INGERSOLL-RAND, 50 CFM, 600 PSI, Model 30, with Westinghouse Motors, 15 HP, 230 DC.

WESTINGHOUSE Air Brake, 246 CFM, 140 PSI, with 50 HP Motors, 440/3/60.

WORTHINGTON, 175 CFM, 125 PSI, with 50 HP Motors, 440/3/60.

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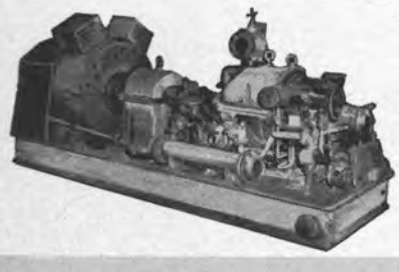

WESTINGHOUSE Turbines, 440 PSI, 740° F, with Westinghouse Generators, 250 KW, 120/240 DC.

DE-LAVAL Turbines, 450 PSI, 750° F, with Crocker-Wheeler Generators, 300 KW, 120/240 DC.

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JOSHUA HENDY Turbines, 300 PSI, temperature 550° F with Westinghouse Generators, 300 KW, 120/240 Volts, DC.

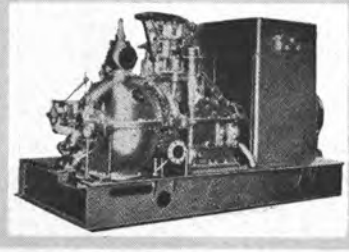
WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, driving on same comman shaft a 250 KW Generator, 440/3/60, and a 90 KW Generator, 125 Volts DC.

WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, with Crocker-Wheeler Generators, 300 KW, 120/240 Volts DC.

GENERAL ELECTRIC Turbine, Type FN3-FN24, Steam 265#G., Serial 54110, with G.E. Generator, 750 KW, 440/3/60, Frame 985 Y, Serial 580447.

JOSHUA HENDY Turbines, with Westinghouse Generators, 150 KW, 120 volts DC.

TERRY TURBINES, type TM5, 440 PSI, 750° F, with Crocker-Wheeler Generators, 300 KW, 120/240 DC.



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1—Ingersoll-Rand, 3000 GPM, 250' head, Size 8ALV, with Westinghouse Motor, 250 HP, 2200/3/60, 1775 RPM.

1—Worthington, 400 GPM, 150 PSI, 5½" suction, 3½" discharge, with G.E. Motor, 75 HP, 440/3/60, 3550 RPM.

2—Goulds, 300 GPM, 336' head, 3" suction, 2" discharge, with G.E. Motors, 50 HP, 440/3/60, 3550 RPM.

7—J.C. Carter, 365 GPM, 250' head, stainless steel, 3" suction, 3" discharge, with 220/440/3/60 Motors.

6—326 GPM, 138' head, C.I. pump housing, 3" suction, 3" discharge, with Westinghouse Motors, 20 HP, 220/440/3/60, 1755 RPM.

6—682 GPM, 60' TDH, C.I. pump housing, 5" suction, 5" discharge, with Westinghouse Motors, 15 HP, 220/440/3/60, 1700 RPM.

2—Worthington, 80 GPM, 60 PSI, 2½" suction, 2" discharge, with G.E. Motors, 8 HP, 440/3/60, 3450 RPM.

3—Worthington, 650 GPM, 9 PSI, 6" suction, 6" discharge, with Star Motors, 6 HP, 440/3/60.

1—Worthington, 175 GPM, 20 PSI, 3½" suction, 3" discharge, with G.E. Motor, 3.74 HP, 440/3/60, 3450 RPM.

4—Worthington, 60 GPM, 22 PSI, 3½" suction, 2" discharge, with G.E. Motors, 3 HP, 440/3/60, 3450 RPM.

3—Allis-Chalmers, 35 GPM, 100' head, 2" suction, 1½" discharge, with Allis-Chalmers Motors, 3 HP, 440/3/60, 3500 RPM.

1—Allis-Chalmers, 65 GPM, 80' head, 1½" suction, 1½" discharge, with Allis-Chalmers Motor, 3 HP, 220/440/3/60, 3500 RPM.

2—Worthington, 13 GPM, 51 PSI, 1½" suction, 1½" discharge, with G.E. Motors, 2.64 HP, 440/3/60, 3490 RPM.

1—Worthington, 75 GPM, 22', 3" suction, 2½" discharge, with G.E. motor, 1.9 HP, 440/3/60, 3450 RPM.

5—Worthington, 30 GPM, 30 PSI, 1½" suction, 1½" discharge, with G.E. Motors, 1.75 HP, 440/3/60.

14—Warren, 6 GPM, 36 PSI, 1¼" suction, 1" discharge, with G.E. Motors, 1.25 HP, 440/3/60, 3450 RPM.

AC PUMPS—Vertical Centrifugal

6—Worthington, 275 GPM, 56.6 PSI, 8½" suction, 3½" discharge, with G.E. Motors, 22.9 HP, 440/3/60, 1180 RPM.

4—Worthington, 490 GPM, 35 PSI, 7" suction, 4½" discharge, with G.E. Motors, 19.6 HP, 440/3/60, 1175 RPM.

6—Chicago Pump Co., submersible, 400 GPM, 6 # suction, 30 # discharge pressure, with Wagner Motors, 15 HP, 440/3/60, 1740 RPM.

6—Dayton-Dowd, 1160 RPM, 15 PSI, 10" suction, 8" discharge, with Wagner Motors, 10 HP, 440/3/60.

4—Worthington, 100 GPM, 40 PSI, 5" suction, 3" discharge, with G.E. Motors, 7.37 HP, 440/3/60, 1750 RPM.

4—Warren, 135 GPM, 35 PSI, 6" suction, 3" discharge, with G.E. Motors, 6 HP, 440/3/60.

1—Worthington, 35 GPM, 62.4 PSI, 3" suction, 2" discharge, with G.E. Motors, 5.83 HP, 440/3/60, 1150 RPM.

7—Allis-Chalmers, 68 GPM, 114' head, Type SSV-C, 3" suction, 1½" discharge, with Wagner Motors, 7½ HP, 440/3/60, 1750 RPM.

3—Worthington, 350 GPM, 11.1 PSI, 10" suction, 3½" discharge, with G.E. Motors, 5 HP, 440/3/60, 1150 RPM.

12—Allis-Chalmers, 10 GPM, Size 2"x2½", with Wagner Motors, 3 HP, 440/3/60, 3600 RPM.

AC PUMPS—Horizontal Rotary

4—Warren, 197 GPM, 175 PSI, with Electro Dynamics Motors, 30 HP, 440/3/60, 1750 RPM.

2—Northern, 10 GPM, 350 PSI, 3" suction, 2" discharge, 200 RPM, with G.E. geared Motors, 5 HP, 440/3/60.

3—DeLaval, 25 GPM, 50 PSI, with G.E. Motors, 1.8 HP, 440/3/60.

AC PUMPS—Vertical Rotary

2—DeLaval, 550 GPM, 50 PSI, with G.E. Motors, 27.4 HP, 440/3/60, 1180 RPM.

7—Quimby, Size 2½, 10/6 GPM, 350 PSI, 2½" suction, 1½" discharge, with Wagner Motors, 6/3 HP, 440/3/60, 1160/865 RPM.

8—Blackmer, 50 GPM, 35 PSI, 420 RPM, with G.E. geared Motors, 2 HP, 440/3/60, 1750 RPM.

DC PUMPS—Horizontal Centrifugal

6—Worthington, Size 8L1, 2100 GPM, 138.5 TDM, with Westinghouse Motors, 100 HP, 230 DC, 1310/1750 RPM.

6—Worthington, Size 12 LA1, 4000 GPM, 67.3 TDM, with Westinghouse Motors, 100 HP, 230 DC, 1310/1750 RPM.

6—Worthington, Size 3UB1, 400 GPM, 280' head, with Westinghouse Motor, 50 HP, 230 DC, 1310/1750 RPM.

2—Weil, 400 GPM, 100 PSI, with 40 HP Motors, 230 DC.

1—Goulds, Figure 3380, 4" suction, 3" discharge, 250 GPM, 100 PSI, with 30 HP Motor, 230 DC, 2200 RPM.

6—Worthington, Size 4L1, 400 GPM, 83' head, with Westinghouse Motors, 15 HP, 230 DC, 1225/1750 RPM.

1—Aldrich, 8" suction, 6" discharge, with G.E. Motor, 12/25 HP, 115 DC.

3—Warren, 1175 GPM, 11.2 PSI, with Reliance Motors, 10 HP, 230 DC.

4—Gardner-Denver, 900 GPM, 30' head, with Crocker-Wheeler Motors, 10 HP, 230 DC.

1—Westco, 100 GPM, 100 PSI, 2" suction, 2" discharge, with 10 HP Imperial Motor, 115 DC.

DC PUMPS—Horizontal Centrifugal

2—Yeomans, 135 GPM, 3" suction, 115' head, 3" discharge, with Kimble Motor, 10 HP, 230 Volts DC.

2—Warren, size 5, 600 GPM, with Electro-Dynamics Motors, 8/4.5 HP, 230 Volts DC.

1—Warren, 5" suction, 4" discharge, with Reliance Motor, 7½ HP, 115 Volts DC.

1—Dayton-Dowd, 3" suction, 2½" discharge, with Crocker-Wheeler Motor, 5 HP, 120 DC.

1—Ingersoll-Rand, Model A, 45 GPM, 125' head, with G.E. Motor, 5 HP, 115 Volts DC.

3—Ingersoll-Rand, Size 1MVR, 50 GPM, with Electro-Dynamics Motors, 3.9 HP, 230 DC.

1—Fairbanks-Morse, 250 GPM, 13' head, with Fairbanks-Morse Motor, 3.72 HP, 230 Volts DC.

2—Worthington, 150 GPM, 22 PSI, 3½" suction, 3" discharge, with Diehl Motors, 3.47 HP, 230 Volts DC.

DC PUMPS—Horizontal Centrifugal

1—Yeomans, 40 GPM, 75' head, 1½" suction, 1" discharge, with Master Motor, 2 HP, 230 Volts DC.

2—Westco, 20 GPM, 50 PSI, with Century Motors, 1½ HP, 120 Volts DC.

2—Worthington, 60 GPM, 23.7 PSI, 2½" suction, 2" discharge, with Diehl Motors, 1.43 HP, 230 Volts DC.

7—Warren, 4 GPM, 38 PSI, 1½" suction, 1" discharge, with Century Motor (4-230 DC, 3-115 DC), 1.25 HP.

DC PUMPS—Vertical Centrifugal

2—Buffalo, Size 3 SAV, 400 GPM, 125 TDH, with Electro-Dynamic Motors, 50 HP, 230 Volts DC, 1350/1800 RPM.

1—Gardner-Denver, 1500 GPM, 56' head, 8" suction, 6" discharge, with Century Motor, 30 HP, 230 Volts DC, 1750 RPM.

1—Ingersoll-Rand, Size 18VCM, 8500 GPM, with Electro-Dynamic Motor, 20/40 HP, 230 Volts DC, 410/545 RPM.

2—Worthington, 16" LAS-2, 5600 GPM, 10 PSI, with G.E. Motor, 20/40 HP, 230 Volts DC, 540/720 RPM.

1—Ingersoll-Rand, 10" suction, 10" discharge, 1050/2000 GPM, with G.E. Motor, 20 HP, 230 Volts DC, 805/1150 RPM.

1—Worthington, 340 GPM, 33.6' 6" suction, 3" discharge, with G.E. Motor, 15 HP, 230 Volts DC.

1—Ingersoll-Rand, 1050 GPM, ... 5" suction, 5" discharge, with Crocker-Wheeler Motor, 15 HP, 230 Volts DC. 1150 RPM.

2—Ingersoll-Rand, 450 GPM, 15' head, 4" suction, 3" discharge, with G.E. Motors, 10/15 HP, 230 Volts DC, 1300/1750 RPM.

1—Allis-Chalmers, 750 GPM, 30.3' head, 5" suction, 5" discharge, with Star Motor, 10 HP, 230 Volts DC, 1750 RPM.

2—Buffalo, Size 3SLV, 425 GPM, 35 TDH, with Electro Dynamic Motors, 7½/15 HP, 230 Volts DC, 1310/1750 RPM.

3—Ingersoll-Rand, Size 1VHM, 18 GPM, 75 PSI, 3¼" suction, 1½" discharge, with G.E. Motors, 7½ HP, 230 Volts DC.

1—Worthington, 175 GPM, 50 PSI, 4" suction, with G.E. Motor, 7½ HP, 230 Volts DC.

2—Ingersoll-Rand, Size ..... 8 VCM, 1400 GPM, with Electro Dynamic Motors, 5/10 HP, 230 Volts DC, 950 RPM.

2—Ingersoll-Rand, Size 1½ VBM, 70 GPM, with Electro Dynamic Motors, 5/10 HP, 230 Volts DC, 1500/2000 RPM.

2—Ingersoll-Rand, Size 1MVR, 20 GPM, with Electro Dynamic Motors, 3/1.5 HP, 230 Volts DC, 1950/2600 RPM.

2—Worthington, 8" LS-1, 1400 GPM, 10 PSI, with G.E. Motors, 5/10 HP, 230 Volts DC, 875/1200 RPM.

2—Worthington, Type 1½ UZS-3, 20 GPM, 75 PSI, with G.E. Motors, 5 HP, 230 Volts DC, 1800 RPM.

2—Weil, 20 GPM, 40 PSI, 1½" suction, 1¼" discharge, with G.E. Motors, 3 HP, 230 Volts DC.

DC PUMPS—Horizontal Rotary

3—Worthington, Size 5GES, 400 GPM, 50 PSI, with Westinghouse Motors, 20 HP, 230 Volts DC, 1750 RPM.

1—DeLaval, 15 GPM, 350 PSI, 2½" suction, 2½" discharge, with Diehl Motor, 10 HP, 230 Volts DC.

2—Viking, Type EKK, 60 GPM, 70 PSI, 2" suction, 2" discharge, with Diehl Motors, 5 HP, 230 Volts DC.

3—National Transit, 50 GPM, 50 PSI, 3" suction, 2½" discharge, 3 HP, 230 Volts

DC PUMPS—Vertical Rotary

6—Quimby, Size 5, 400 GPM, 60 PSI, 6" suction, 5" discharge, with Westinghouse Motors, 30 HP, 230 Volts DC.

1—DeLaval, IMO, 250 GPM, 40 PSI, with G.E. Motor, 15/20 HP, 230 Volts DC, 1310/1750 RPM.

3—Worthington, Model 4GRVS, 225 GPM, 35 PSI, with G.E. Motors, 15/20 HP, 230 Volts DC.

4—Worthington, Model 4GRVS, 175 GPM, 50 PSI, with G.E. Motors, 7½/10 HP, 230 Volts DC.

1—Quimby, Size 4, 175 GPM, with Electro Dynamic Motor, 7.5/10 HP, 230 Volts DC, 865/1150 RPM.

2—Worthington, Type 3GRVS, 90 GPM, 75 PSI, 2¾" suction, 2½" discharge, with Diehl Motors, 7½ HP, 230 Volts DC.

1—Quimby, Size 2, 8 GPM, with Electro Dynamic Motor, 2/5 HP, 230 Volts DC, 575/1150 RPM.

2—Worthington, Type 2GRVS, 7 GPM, 400 PSI, with G.E. Motors, 2½/5 HP, 230 Volts DC, 900/1800 RPM.

BOILER FEED PUMPS — TURBINE & ELECTRIC

4—Worthington, Vertical type, single acting, triplex, constant speed, size 2¼ x 4, 47 GPM, 525 PSI, with G.E. Motors, 20 HP, 230 Volts DC.

2—Worthington, 5" UFD, 460 GPM, 750 PSI, 5" suction, 5" discharge, driven by Sturtevant Steam Turbine, Size CC-22', Type 21, 2½" steam inlet, 5½" exhaust.

2—Aldrich Pump Co. Triplex, Vertical, Size 2½ x 4, 65 GPM, 575 PSI, with G.E. Motors, 25 HP, 230 Volts DC.

2—Ingersoll-Rand, 165 GPM, 575 PSI, with turbine drives.

TURBINE DRIVEN PUMPS — Various

2—Worthington, Size 20-LAL-18, Main Condenser, Centrifugal, 10500, 27' head, Vertical, with Whiton Turbines, 95 HP.

1—Ingersoll-Rand, Size 5UV, Centrifugal, Horizontal, 1200 GPM, 225' head, 6" suction, 5" discharge, with Elliot Turbine, 84.3 HP.

1—Worthington, Fire, Flushing & Emergency Bilge, Centrifugal, Horizontal, Rating—Fire: 500 GPM, 150 PSI, Flushing: 1000 GPM, 60 PSI, Bilge: 750 GPM, 25 PSI, 5½" suction, 4½" discharge, with Whiton Turbines, 72.9 HP.

1—DeLaval, Fuel Oil Transfer, Vertical, Rotary, 250 GPM, 150 PSI, 7" suction, 6" discharge, with DeLaval Turbine, 35 BHP.

8—Goulds Main Circulating, Vertical, Centrifugal, 3700 GPM, 13 PSI, Size 12", with Elliot Turbines, 30 HP.

2—DeLaval Fuel Oil Service, Vertical, Rotary, 50 GPM, 350 PSI, 3½" suction, 3½" discharge, with DeLaval Turbines, 14.4 HP.

4—DeLaval—IMO, L.O. Service, Vertical, Rotary, 300 GPM, 45 PSI, 6" suction, 6" discharge, with DeLaval Turbines, 14.1 HP.

8—Allis-Chalmers, Type SSC-V, 68 GPM, 114' head, 3" suction, 1½" discharge, with Carling Turbines, 7½ HP, 1750 RPM.

2—Warren, 85 GPM, 60 PSI, For Lube Oil Service, Turbine Driven.

2 — Warren, Main Circulating, 3500 GPM, 13.5 PSI, Turbine Driven.

STOCKLESS ANCHORS

3,000 pound size
8,000 pound size
10,000 pound size

USED, GOOD QUALITY . . . SAVE!

ANCHORS... Unused, surplus 3000 # size Danforth

ANCHOR CHAIN . . .

Used, good, with or without test certificate . . .
1 1/2" size
1 3/8" size
2 1/16" size
2 1/4" size

ANCHOR WINDLASS

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 2⅛" Chain, 65 HP, 230 DC, complete.

7—American Hoist and Derrick Company, horizontal, double wildcat—for 2¼" chain double gypsy, 70 HP, 230 Volts DC, with electric controls.

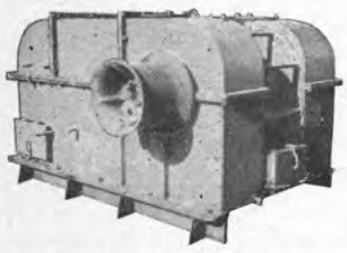
3—Hesse-Ersted, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

1—Hyde Horizontal Anchor Windlass double wildcat—for use with 2⅛" 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

2—Jaeger, single drum—capacity approximately 900' of 1½" wire rope, double gypsy, with 35 HP Motors, 230 Volts DC, complete with electricals.

UNIWINCHES



LAKESHORE UNWINCHES, 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.
Two speed, single drum, 7450 # at 220 FPM, 14400 # at 105 FPM.

HYDRAULIC CYLINDERS

3000 PSI

Bore	Stroke	Rod Diameter	Overall retracted length	Action
10"	12"	3.75"	45½"	double
10"	26"	3.75"	58½"	single
2"	8"	1½"	20"	double
2.5"	15"	1.12"	25½"	double
3"	8"	1.37"	15½"	double
6"	8'	4"	144"	double
13"	9'7"	5½"	14'	double

STEERING STANDS

Brass Steering Stands. Complete with angle indicator on top, used, 11" base diameter by 35½" high, and with 42" overall, 8-spoke brass steering wheel.

$149.50 each

CAPSTAN WINDLASSES

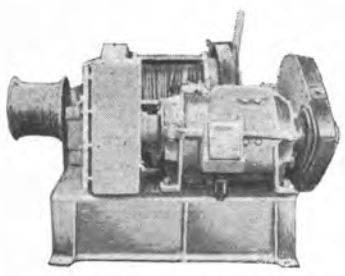
Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1¼" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

3—Hesse-Ersted Vertical, Single Wildcat—for 1⅜" Anchor Chain, single gypsy, with HP General Electric Motor, 230 Volts DC, complete with Controller equipment.

Hyde, Vertical, Single Wildcat, for 1⅛" Anchor Chain, single gypsy, with 20/5 HP Motor, 440/3/60.

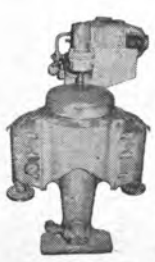
McKiernan — Terry, Single Wildcat — for ¾" chain, Single Gypsy, with underdeck drive with Star Motor, 7½ HP, 115 DC, with Electrical control equipment.

CARGO WINCHES



American Hoist and Derrick Company Winches with Westinghouse Motors, 50 HP, 230 Volts DC, complete with Contactor Panels, Master Switches, and Resistors.
Type 66—single speed, single drum.
Type 67—two speed, single drum.

CENTRIFUGES



Sharples Purifiers—For Diesel Service or for Lube Oil Service.

150 GPH—440 AC, 230 DC
350 GPH—230 DC
600 GPH—230 DC

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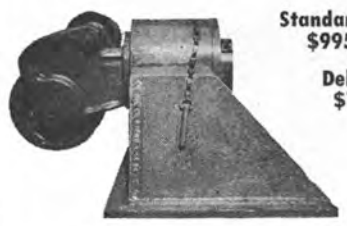
Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

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.

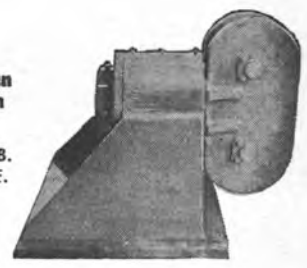
Dependable and Ruggedly built to perform consistently year after year with minimum maintenance.



Standard Design $995 each

Deluxe Design $1250 each

Model Design $1350 each



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HIGH SPEED COUPLINGS

(Flexible Couplings between Turbines and Reducing Gear)

1—Set from C3-S1-A3 Vessel
1—Set from C2 Vessel (Moore built)
1—Set from AP2 Victory Ship

PROPELLERS

From C2-SU Vessel
From C2 Vessel (Moore built)
From AP2 Victory Ship
From Liberty Ships and LST Vessels

PROPELLER SHAFTS

From C3-S1-A3 Vessel
From C2-S-B1 Vessel (Moore built)
From C2-SU Vessel
From Liberty Ships and LST Vessels

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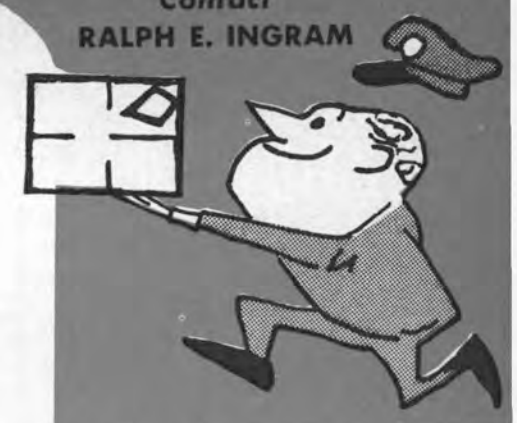

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Rebuilt—Guaranteed

LaDel, STURTEVANT etc.

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

EXAMPLE LISTING:

Size A¼	**@ $160 each**
Size A½	**@ $185 each**
Size A1	**@ $215 each**
Size A2	**@ $290 each**
Size A3	**@ $350 each**
Size A4	**@ $410 each**
Size A5	**@ $500 each**
Size A6	**@ $550 each**
Size A8	**@ $630 each**
Size A10	**@ $695 each**
Size A12	**@ $750 each**
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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, repeater panel, and repeaters with mounts.

Machinery and EQUIPMENT

as removed from S.S. "JAMES O'HARA" (AP-179) C3-S1-A3

for Immediate Sale!

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CARGO HOISTER BLOCKS

5 ton rated, steel, as removed from surplus Liberty Ships. Manufactured by Young, Draper, etc. 12" or 14" sizes, your choice

$29.50 each

$35.00 each with pull test certificates.

HP TURBINE, Allis-Chalmers, Impulse Reaction type, 5003 RPM, 740° F, 440 PSI, Serial #1737.

LP TURBINE, Allis-Chalmers, Straight Reaction, Type, 4289 RPM, 740° F, 440 PSI, Serial #1738.

2 — TURBINE GENERATORS, Allis-Chalmers, Turbines: Impulse Condensing Type, 740° F, 440 PSI, 8000 RPM, Generators: 300 KW, 240 Volts DC, 2 wire, 1200 RPM.

CARGO WINCHES
2—Jaeger, 2 drum, 2 speed, 50 HP, 230 DC.
2—Parkersburg, 2 drum, 1 speed, 50 HP, 230 DC.
2—O.C.S., 2 drum, 1 speed 50 HP, 230 DC.
2—Vulcan, 1 drum, 2 speed, 50 HP, 230 DC.
2—American Hoist & Derrick, 1 speed, 1 drum, 50 HP, 230 DC.

SALT WATER EVAPORATOR, Davis, Size 36-17, rated 2500 lbs. per hour.

MAKE UP FEED EVAPORATOR, Davis, Size 26-8, rated 1500 lbs. per hour.

LAKESHORE TOPPING WINCHES, single speed, capacity 10,000 # at 67 FPM, 5 HP, 230 DC.

ANCHOR WINDLASS, Markey, Type CWA-4, horizontal, double wildcat—for 2 5/16" anchor chain, 70 HP, 230 DC.

MAIN CONDENSER, Allis- Chalmers, 7800 sq. ft. cooling service, 2 pass, horizontal.

LUBE OIL PURIFIER, Sharples, Type M-34-W-22U43, 350 GPH, 230 Volts DC Motors.

FUEL OIL STANDBY PUMP, Worthington, horizontal duplex, Size 5½" x 3" x 6", 13 GPM, 410 PSI.

GENERAL SERVICE PUMP, Worthington, vertical simplex, Size 12 x 14 x 18, 600 GPM, 50 PSI.

FIRE & STANDBY PUMP, Worthington, vertical duplex, Size 12 x 8½ x 12, 400 GPM, 150 PSI.

BOILER FEED PUMP, Worthington Auxiliary, vertical simplex, Size 11 x 7 x 24, 120 GPM, 550 PSI.

FRESH WATER PUMPS, 2—Worthington, Size 4x6, horizontal duplex, 100 GPM, 80 PSI, 7½ HP, 230 DC.

BALLAST PUMP, Allis-Chalmers, Type SGV, Size 5 x 5, double suction, vertical centrifugal, 600 GPM, 30 PSI, 20 HP, 230 DC.

SUBMERSIBLE BILGE PUMPS, 2—Worthington, 5", vertical centrifugal, 600 GPM, 30 PSI, 20 HP, 230 DC.

BILGE PUMP, Allis-Chalmers, Size 5 x 5, Type SGV, double suction, vertical centrifugal, 600 GPM, 30 PSI, 20 HP, 230 DC.

EVAPORATOR TUBE NEST DRAIN PUMPS, 2—Allis-Chalmers, Type SS-LH, horizontal, Size 2½ x 2, 17 GPM, 127' head, 5 HP, 230 DC.

MAIN CONDENSATE PUMPS, 2—Allis-Chalmers, Type CF-2V, vertical volute, Size 6 x 3½, 170 GPM, 208' head, 20 HP, 230 DC.

DISTILLER CONDENSATE PUMPS, 2 — Allis-Chalmers, Type SS-L, horizontal centrifugal, Size 4 x 2, 45 GPM, 2 HP, 230 DC.

AUXILIARY CONDENSATE PUMPS, 2—Allis-Chalmers, Type CF-2V, vertical volute, Size 2½ x 1½, 30 GPM, 208' head, 7½ HP, 230 DC.

DIESEL OIL PUMP, Viking, Type ZKK, gear type, Size 3 x 2½, 40 GPM, 30 PSI, 2 HP, 230 DC.

DISTILLER FRESH WATER DISTRIBUTION PUMPS, 2—Allis-Chalmers, Type SS-DH, horizontal centrifugal, Size 2½ x 2, 55 GPM, 51' head, 2 HP, 230 DC.

FIRE PUMPS, 2—Allis-Chalmers, Type B2-V, vertical centrifugal, Size 4 x 3, 400 GPM, 280' head, 50 HP, 230 DC.

MAIN FEED PUMP, Terry Turbine, Type ZS-1, 124 HP, with Ingersoll-Rand horizontal pump, Size 4 x 3½, 4 stage, 250 GPM, 1340' head.

STEERING GEAR PUMP, Waterbury, Size 5, Type K, with Westinghouse Motor, 55 HP, 230 Volts DC.

LUBE OIL SERVICE PUMPS, 2—Quimby, vertical screw, Size 5, 400 GPM, 48 PSI, 6 x 5, 25 HP, 230 DC.

FUEL OIL TRANSFER PUMP, Quimby, vertical screw, Size 4D, 225 GPM, 50 PSI, 15 HP, 230 DC.

FUEL OIL SERVICE PUMP, Quimby, vertical screw, Size 2½, 20 GPM, 400 PSI, 2½ x 1½, 10 HP, 230 DC.

ICE WATER CIRCULATING PUMP, Allis-Chalmers, Type SS-RH, 10 GPM, 81' head, 1" x ¾", vertical volute, 1 HP, 230 DC.

HOT WATER CIRCULATING PUMP, Allis-Chalmers, Type SS-HH, 35 GPM, 70' head, 1¼ x 1¼, vertical volute, 2 HP, 230 DC.

REFRIGERATION CONDENSER CIRCULATING PUMPS, 2—Allis-Chalmers, Type SJK, 180 GPM, 81' head, 2½ x 2, horizontal volute, 7½ HP, 230 DC.

MAIN CONDENSER CIRCULATING PUMP, Allis-Chalmers, Type LS-V, 12,550 GPM, 20' head, 20 x 20, vertical volute, 100 HP, 230 DC.

AUXILIARY DISTILLER CIRCULATING PUMPS, 2—Allis-Chalmers, Type SG, 650 GPM, 29' head, 5 x 5, horizontal volute, 7½ HP, 230 DC.

AUXILIARY CONDENSER CIRCULATING PUMPS, 2—Allis-Chalmers, Type SE-V, 2820 GPM, 29.2' head, 12 x 12, vertical volute, 40 HP, 230 DC.

AIR COMPRESSOR, Ingersoll-Rand, Type 40, 2 stage, air cooled, 194 CFM, 110 PSI, 40 HP, 230 DC.

FORCED DRAFT BLOWERS, 2—American Blower, Sirocco capacity 17560 CFM, 5½ SP, 75 HP, 230 DC.

COURSE RECORDER, Sperry, Mark 65091.

AUTOMATIC PILOT, Sperry, Mark 642840.

LIFEBOAT DAVITS, 2—sets, Welin, gravity trackway type, Size 135, capacity 21,500#.

AIR COMPRESSOR, Chicago Pneumatic, 161 CFM, 100 PSI, 2 stage, air cooled, Model PB2, 40 HP, 230 DC.

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FORGED STEEL LINE SHAFTING

Excellent buys on used—good shafting for re-machining to your requirements:

6—Sections 19" diameter, 23'—11" long, flanged

1—Section 19" diameter, 23'—8" long, flanged

3—Sections 19" diameter, 22'—10" long, flanged

12—Sections 19" diameter, 22'—6" long, flanged

6—Sections 14⅛" diameter, 26'—6" long, flanged

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2—Sections 14⅛" diameter, 13'—9" long, flanged

39—Sections 13½" diameter, 22'—0" long, flanged

15—Sections 13½" diameter, 14'—0" long, flanged

1 Only, Model 17-DE-90

CLYDE WHIRLEY CRANE

LIFTING RATE: 25 tons at 50 foot 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).

1 Only

ORTON WHIRLEY GANTRY

With specifications similar to Clyde 17-DE-90. Complete specifications and prices on request.

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

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SIZE 36-14
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PROMPT QUOTATIONS & DELIVERY

ELECTRIC MOTORS

Many Radio, Radar & Electronic Equipment. Motor-Generator Sets. Let us have your inquiries.

MISCL. D.C. MOTORS

1—Westinghouse, 304 HP, 115 V, DC, 900 RPM, Sh. Wd., 2 pedestal bearings.

3—Allis-Chalmers, 50 HP, 230 V, DC, 600 RPM, Comp'd Wd., Mod. MDS-11975.

6—Westinghouse, 50 HP, 230 V, DC, 600 RPM, Comp'd Wd., Type CK, Fr. 9.

4—Westinghouse, 9.3 HP, 230 V, DC, 640/852 RPM, Type SK, Fr. 93.

20—Westinghouse, 7½ HP, 120 V, DC, 1750 RPM, Stab. Sh. Wd., Type SK, Fr. 43.

Others in stock: 5 HP & up . . . 115 & 230 V.

230 VOLT D.C. MOTORS

1—250 HP, G.E., Type CY, Form HJ, Model 24G, 1200 RPM Horizontal, 2 B.B., Shunt Wd.

2—220 HP, G.E., Type CDM—1348S, Form HA, Model 25G 339, 1800 RPM, Stab. Sh. Wd. Horizontal, 2 B.B.

6—100 HP, Westinghouse, Type SK, FR. 163, Style 1B4631, 1150 RPM, Shunt Wd. Horizontal, 2 B.B.

2—55 HP, Electro-Dynamic, FR 25-SL, 550 RPM, Compound Wound, Single Ball Bearing. Originally for high pressure Air Compressor.

6—50 HP, Westinghouse, 600 RPM, Compd. Wd., Type CK, FR 9, Horizontal 2 B.B.

1—40 HP, Allis-Chalmers, 1750 RPM, Compound Wound, Horizontal, 2 B.B.

1—40 HP, G.E., Type CDM, FR 95, Model 35A1663, 1800 RPM, Compound Wound, Horizontal, 2 B.B.

1—18/25 HP, Electro-Dynamic, 1225/1750 RPM, Compd. Wd., FR. 7½ S, Horizontal, 2 B.B.

6—15 HP, Allis-Chalmers, 1225/1750 RPM, Stab. Sh. Wd., Type EB90, Horizontal, 2 B.B.

2—10 HP, Allis-Chalmers, 1225/1750 RPM, Compd. Wd., Type EB80, Horizontal, 2 B.B.

4—9.3 HP, Westinghouse, 640/852 RPM, Type SK, FR. 93.

120 VOLT D.C. MOTORS

1—304 HP, Westinghouse, 900 R.P.M., Shunt Wound, Horizontal, Pedestal Bearing.

3—25 HP, G.E., Type CDM, 1200 R.P.M., Horizontal, 2 B.B., unused. Removed from M.G. Sets.

20—7½ HP, Westinghouse Type SR, FR 43, Stab. Sh. Wd., 1750 RPM,.

STEERING GEAR MOTORS

2—General Electric, 30 HP, 230 V, DC, 600 RPM, Stab. Sh. Wd., Type CDM, Fields Continuous Duty, Armature 1 Hr.

1—Westinghouse, 35 HP, 230 V, DC, 850 RPM, Stab. Sh. Wd., Type SK, Fr. 123, Fields Continuous Duty, Armature 1 Hr.

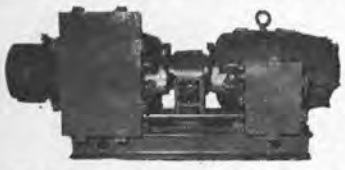
SHIP'S LIGHTING M-G SETS

230 V, DC/115 V, DC. Ship's Lighting M.G. Sets for C3-S1-A-3 150 K.W. and Moore built C2 100 K.W.

SPECIAL D.C. GENERATORS

3—Unused, G.E., 15 KW, 100 A, 15 V, Type CDM, 1200 RPM, 2 B.B., D.P. Generators.

MOTOR-GENERATOR SETS
Unused Surplus in Original Boxes



Janette M-G Sets. Input: 1.75 HP, 230 V, DC, 7.2 Amperes, 1800 RPM. Output: 1-KVA (.85 KW), 115/1/60, 4 ball bearing, with speed regulator, and with noise filters. Navy Type CJM-21151, continuous duty. Net weight 435 #, Dimensions 44" L, 19½ W, 18⅝" H. Instruction book and parts list included.

D.C. MARINE CONTROLLERS

1—Cutler-Hammer, 250 HP, 230 V, DC, No. 232 793A14.

2—General Electric, 225 HP, 230 V, DC, CR 5430-B32D.

6—Westinghouse, 100 HP, 230 V, DC, Type 8585A SO-1B4636.

1—Cutler-Hammer, Unused, 50 HP, 230 V, DC, No. C280981A290, Contactor Panel for Stern Anchor Haulage Winch. Many others from ¼ HP & up—115 and 230 V.

ROTOTROLS

15—Westinghouse Rotorols, driven by 5 HP, 440 V, 3 phase, 60 cycle, 1700 RPM, AC Motors.

D.C. TRANSFER PANEL

Cutler-Hammer, 3-pole, 300 A, 120/240 V, DC, Bul. 6007, No. B870102A2.

SPARE ARMATURES

For C-3-S1-A3 Auxiliaries . . . Send for List A-1. Many others — Let us have your inquiries.

SWITCHBOARDS

Westinghouse Propulsion Control Switchboards as used on S-4 Vessels. AC and DC Switchboards. Let us know of your requirements.

CIRCUIT BREAKERS

2 and 3 Pole Air Breakers, 2 and 3 Pole Molded Case Navy Type Breakers. 2 and 3 Pole Trip Elements for Molded Case Breakers.

Need 3 Wire 120/240 Volts DC for Shore Power? Motor-Generator Sets and Engine Driven Units from 15 KW to 500 KW . . . Let us quote.

D.C. GENERATORS

2—500 KW, 120/240 V, Westinghouse FR. CB813.7, 750 RPM, 2 Pedestal Bearing, with Balance Coils. Removed from GM 8-278 Engines.

2—250 KW, 120/240 V, Westinghouse, 1200 RPM, Single Pedestal Bearings. Balance Coils not available, Type 12S18P107PH, removed from Turbines.

2—150 KW, 120 V, G.E., Type CDM-1348-S, Form HA, Model 25G 340, 1800 RPM, Compound Wound, Horizontal 2 B.B.

1—150, 120 V, GE, Type CDM, Form AA, Model 24G, 1200 RPM, Compound Wound, Horizontal, 2 B.B.

6—100 KW, 120/240 V, Westinghouse, Type SK, FR. 143.8, 1800 RPM, Single Ball Bearings. Balance Coils available.

3—100 KW, 120/240 V, Delco, 1200 RPM, Single Bushed Bearings, with Balance Coils. Removed from Superior GDB-8 Engines.

1—100 KW, 120/240 V, Allis-Chalmers, 1200 RPM, Single Sleeve Bearing, Shunt Wound, Type 4-14-45-13, removed from GM 3-268A Engine.

10—90/165 KW, Westinghouse, 125/400 Volt, Type SK, FR. 185, Shunt Wound, separately excited (120 V), 1200 RPM, Horizontal, 2 B.B.

4—75 KW, 120 V, G.E., Type CDM-1234, Mod. 24GA71, 1200 RPM, 2 Ball Bearing, Tapered Shaft. Removed from Motor-Generator Sets.

6—60 KW, 120 V, Westinghouse, Type SK, FR 143, Style 3B2855-PH, 1800 RPM, 1 B.B. Removed from Turbines.

6—60 KW, 120 V, Westinghouse, Type SK, FR. 153-L, Style 1B4632, 1200 RPM, Compound Wound, Horizontal, 2 B.B.

A.C. TO D.C. M.G. SETS

From 250 Watts to 500 KW in 115 Volt, 230 Volt and 120/240 Volt, 3 Wire DC. Any drive including Synchronous Motor. Let us have your inquiries.

Reconditioned MOTOR GENERATOR SETS

MANY SMALLER UNITS IN STOCK

230 VOLTS D.C. TO A.C.

Hertner. Input: 230 V, DC, 24A. Output: 3.5 KVA, 440 V, 60 cy., 3Ø.

Hertner. Input: 230 V, DC, 28A. Output: 5 KVA, PF .85, 115 V, 60 cy., Ø1.

Continental. Input: 230 V, DC, 28A. Output: 7.5 KVA, 3.5 KW, 120 V, 1Ø, 60 cy., 62.5A.

Century. Input: 10 HP, 230 V, DC. Output: 7.5 KVA, 3.75 KW, 120/1/60.

Bogue. Input: 230 V, DC, 57A, 15 HP. Output: 10 KVA, PF .8, 120 V, 60 cy., 1Ø.

Fidelity. Input: 15 HP, 230 V, DC. Output: 12.5 KVA, 10 KW, 120/1/60.

Bogue Electric. Input: 15 HP, 230 V, DC. Output: 12.5 KVA, 10 KW, 120/1/60.

Burke Electric. Input: 20 HP, 230 V, DC. Output: 25 KVA, 12.5 KW, 120/1/60.

General Elec. Input: 25 HP, 230 V, DC. Output: 18.75 KVA, 15 KW, 120/1/60.

Star Kimble. Input: 30 HP, 230 V, DC. Output: 25 KVA, 20 KW, 120/1/60.

Ideal. Input: 40 HP, 230 V, DC. Output: 31.3 KVA, 25 KW, 450/3/60.

Star Elec. Input: 40 HP, 230 V, DC. Output: 33.4 KVA, 25 KW, 450/3/60.

General Elec. Input: 230 V, DC, 40 HP. Output: 25 KW, 480 V, 60 cy, 3Ø, 24A, 1800 RPM.

Star Elec. Input: 125 HP, 240 V, DC. Output: 93.75 KVA, 75 KW, 450/3/60.

115 VOLTS D.C. TO A.C.

Marathon. Input: 1 HP, 115 V, DC. Output: .500 KVA, .425 KW, 115/1/60.

Bludworth. Input: .75 HP, 115 V, DC. Output: .500 KVA, .450 KW, 115/1/60.

Elec. Spec. Input: 1 HP, 90/130 V, DC. Output: .500 KVA, .500 KW, 115/1/60.

Century. Input: 1.5 HP, 115 V, DC. Output: .750 KVA, .600 KW, 102/1/60.

Janette. Input: 13 Amp, 115 V, DC. Output: 1 KVA, 110/1/60.

Elect. Prod. Input: 1.5 HP, 115 V, DC. Output: 1 KVA, 115/1/60.

Allis-Chalmers. Input: 14 Amp, 115 V, DC. Output: 1.250 KVA, 1 KW, 115/1/60.

Cont. Elect. Input: 6 HP, 115 V, DC. Output: 2.9 KW, 440/3/60.

Louis Allis. Input: 10 HP, 105/130 V, DC. Output: 7.5 KVA, 440/3/60.

Cont. Elect. Input: 12 HP, 120 V, DC. Output: 7.5 KVA, 440/3/60.

Star Elect. Input: 12½ HP, 115 V, DC, 1800 RPM. Output: 7½ KW, 120 V, 60 Cy.

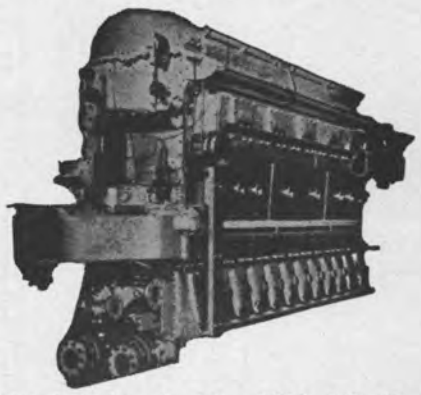
Ideal. Input: 40 HP, 115 V, DC. Output: 31.3 KVA, 25 KW, 450/3/60.

Continental. Input: 50 HP, 115 V, DC. Output: 50 KVA, 25 KW, 120/3/60.

Burke. Input: 20 HP, 115 V, DC. Output: 25 KVA, 12½ KW, 120/1/60.

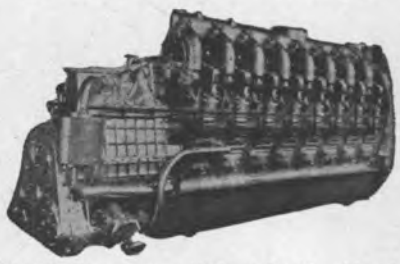
RCA. Input: 4 HP, 105/130 V, DC. Output: 2.22 KVA, 2 KW, 120/1/60.

FAIRBANKS - MORSE 38D8 1/8 DIESEL



(4)—10 Cylinder—2-cycle—1800 HP @ 800 RPM. 8⅛x10—air starting—reversible. Complete with Harrison coolers, sylphon valves, strainers, filters, etc. For immediate delivery.

G.M. 16-278A 1700 BHP MAIN PROPULSION DIESEL ENGINES



16-Cylinder Vee type—8¾ x 10½. Air starting —never run commercially. All taken from Navy D.E. vessels. You'll be surprised by the good condition of these engines. Buy now and save.

USE AS PROPULSION ENGINES OR BUY FOR PARTS

You'll be surprised at the condition. Only 6 engines remaining for sale.

$9750.00

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
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SPECIAL 12" SIGNALING SEARCHLIGHTS

New—Unused, General Electric, or Westinghouse, 1000 watt, 115 volts, signaling shutter.

AL EPSTEIN, INC.

Most anything in Marine Supplies

(504) 525-5526 P.O. Box 51569
1226 St. Thomas St. New Orleans, La. 70150
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VERTICAL BOILER

Suitable for
Pile Drivers
Steam Cranes
Hoists, etc.

$1450.00

100 HP @ 100 PSI. Water heating surface 747 sq. ft. — total heating surface 1144 sq. ft. A.S.M.E. Built by International Boiler Works—East Stroudsburg, Pa. Height to top of cylinder 12' 0"—diameter 66"—4" main steam line—2 1½" safety valves —practically new—very little if any use. Oil burning. Boiler stamped Mass.—Standard—100#—5290—National Board No. 6395.

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7 x 10 CLYDE DOUBLE DRUM WINCHES

Drum 8500 lbs @ not less than 120 FPM; 13,000 lbs at no specified speed. Gypsy head 22,500 lbs. static pull. Foot brake to hold 17,000 lb. pull. Steam cylinders with standard 250 PSI.
DIMENSIONS:
9' 5¾" wide over winch heads
5' 10½" wide on bedplate
4' 1" deep over bedplate
6' 5" overall—brake pedal, etc.
2" steam—2½" exhaust.
Drums 16" diameter—20" wide—33 13/16" over flanges. Rebuilt by U.S.N. equal to new.

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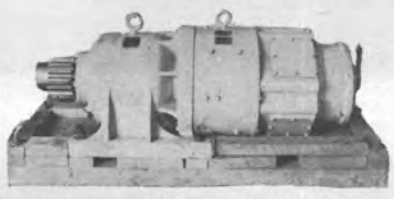
NOTICE!

DREDGES — CONTRACTORS
OLD FAITHFUL IS BACK!!!
NEW 20 HP 230 VOLT D.C.

GEARHEAD MOTORS

30 R.P.M. OUTPUT



Star Electric Co.—20 HP—230 VDC—73 amps—1200 R.P.M.—compound wound—1 hr. duty—55° rise—with reduction gear 41.2:1—type 5R3165.

$1450.00 EACH

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LESLIE PUMP GOVERNOR VALVE

New—in original crates. For U.S. Naval Vessels—type CT-HNS-3. For merchant vessels—type CTHS. Size 2". Typical serial 241-423. For immediate delivery.

$495

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NEW – UNUSED 10 H. P. REVERSING CAPSTANS

Shipboard Use
Duty 10,000 lbs @ 60 FPM

MOTOR: 10 HP—totally enclosed—fan cooled—continuous duty — horizontal flange mounted — special shaft & oil seal fitted—440/3/60—1760 RPM. CONTROL: Marine type water-tight push-button—forward/reverse/stop—watertight starter box—rated for 40 starts per hour—triple pole contactor with silver contacts, thermal overload relay and trip adjustment. DIMENSIONS: Barrel 10" diameter — Flange 10" diameter — approx. 26" wide and 36" long.

6 IN STOCK FOR IMMEDIATE DELIVERY

$1675

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TRANSFORMERS

15 KVA—3 per bank—450 V primary—117 volt secondary.

$190.00 PER BANK

Also inquire about other sizes: 10 KVA/20 KVA/25 KVA/37 KVA

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DUPLEX STRAINERS
in good condition

4" **$349.00**
22" x 3" between mounting holes

2" **$249.00**
15" x 3" between mounting holes

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AXIAL FLOW FANS

NEW UNUSED 230 V. D.C.

Navy size A10D2W6—LaDel Co., 10,000 CFM @ 3" S.P. MOTOR: Reliance Motor Co.—7.5/3.1 HP, 230 VDC—1310/1750 RPM. DIMENSIONS: 32⅛" OD—31¼" BC—29¼ ID—40¾" length.

$450.00

Navy size A8D2W5—Buffalo Forge Co.—8000 CFM @ 3" S.P. MOTOR: G.E. 6/1.8 HP—230 VDC—1310/1750 RPM. DIMENSIONS: 30 9/16" OD—29¼" BC—27¼ ID—37¾" length.

$329.50

AF80—Sirocco—8000 CFM @ 2" S.P. MOTOR Welco 4/1.9 HP—230 VDC—1310/1750 RPM. DIMENSIONS: 30½" OD — 29¼ BC — 27¼ ID—37¾" length. U.S. Maritime type fan.

$329.50

AF100—Sirocco—10,000 CFM @ 2" S.P. MOTOR: Welco 5/2.2 HP—230 VDC—1310/1750 RPM. DIMENSIONS: 32½" OD—31⅛" BC—29¼ ID—40⅝" length. U.S. Maritime type fan.

$375.00

NEW — UNUSED — 115 V.D.C.

20000 C.F.M. — 115	10000 C.F.M. — 115
16000 C.F.M. — 115	5000 C.F.M. — 115 (explosion-proof)
12000 C.F.M. — 115	4000 C.F.M. — 115

RECONDITIONED — 440 V.A.C.

A1A4W5 to A16A4W5—with starter—440/3/60

1000 C.F.M.	6000 C.F.M.
2000 C.F.M.	8000 C.F.M.
3000 C.F.M.	10000 C.F.M.
4000 C.F.M.	16000 C.F.M.

LARGE AXIAL FLOW FANS
30000 C.F.M.

A304W5—25 HP—440/3/60, 30000 C.F.M. @ 3" static; 40000 CFM @ 1" static. I.D. 44¼"

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M.G. SETS

NEW JANETTE 1 KVA SETS

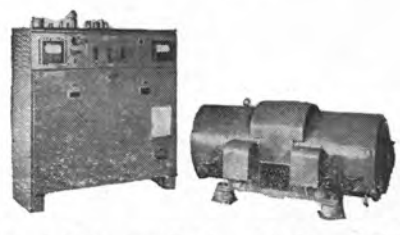
2-Bearing Sets—type D.E.—3L. MOTOR INPUT: 2 HP—115 volts DC—3.5 amps—1800 RPM. OUTPUT: type C.E.I.—120 volts 60 cycle single phase. 8.3 amps—40°C Temp rise—0.8 P.F.

$179.50

1.24 KW G.E. MG SETS

G.E. Motor—3 HP—115 volts DC—1800 RPM. OUTPUT: G.E. generator—1.24 KW—1.56 KVA —120/60/1—0.8 PF—14.2 amps—1800 RPM. With spare armature. Overspeed trip on motor side.

$339.50



25 KW IDEAL M.G. SETS

INPUT: 40 HP—115 volts DC—290 amps—1800 RPM—frame 445. OUTPUT: Generator 31.5 KVA —25KW—440/3/60—1800 RPM. Control cabinet includes motor starter & generator control.

UNUSED SURPLUS 1 KVA SETS

INPUT: 1.75 HP—115 Volts DC—17 amps—1800 RPM. OUTPUT: 1 KVA—115 volts—8.7 amps—60 cycle single phase—0.9 PF. Unit is self-excited and will carry load immediately on starting. Regulation ±5%. Complete with magnetic starter & spare parts. Units designed and built to rigid Navy specs. SIZE: 19.5" long—26.5" wide—16" high. Weight 285 lbs. SPARES: 85 lbs. CONTROL: 20"X15"X10"—75 lbs.

$189.50

NEW 0.5 KVA HERTNER SETS

Type CHT-211761. INPUT: Motor 115 volts DC—9.0 amps—1800 RPM—1 HP. OUTPUT: 0.5 KVA —115 volts single phase 60 cycle—4.3 amps—.85 PF.

$127.50

CONTINENTAL: 3.7 KW—Input: 7½ HP 230 volts DC/28 amps/1800 RPM. Type D-324X—continuous. Output: Generator type DS-324XB 3.7 KW/7.5 KVA/120/1/60—62.5 amps—0.5 PF compound wound.

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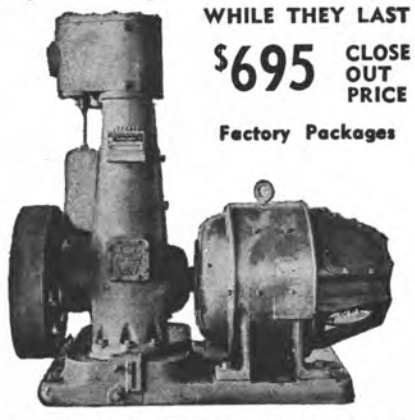
NEW YORK OFFICE: 11 Broadway — New York, N. Y. 10004 PHONE: 943-2640

NEW-UNUSED LIBERTY SHIP
Troy-Enberg 20 KW Generators

WHILE THEY LAST

$695 **CLOSE OUT PRICE**

Factory Packages



120 volts DC—400 RPM—drip-proof marine type. 2-Wire direct connected set. Reciprocating 6 x 7 type E vertical self-oiling steam engine—plug & piston valve—220 lbs PSI—80 lbs. BP.

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NEW - UNUSED
1-5/16 ANCHOR WINDLASS

Made by Ideal Electric Co.—with spares. Double wildcat—1-5/16"—15 HP—115 volts DC—1750 RPM—all controls—two outboard gypsies. Wildcats 36" between centers—6000 lb line pull @ 50 FPM. DIMENSIONS: O.A. width over gypsies—84"; OA length 81". Will sell windlass without power if desired.

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14" & 16"
ALL-BRONZE
PORTLIGHTS
with deadlights

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RENT, LEASE OR SALE!

BARGE MOUNTED REVOLVING CRANE 50-Ton capacity, Barge dimensions: 57' wide x 190' long.
CRANES-WHIRLEYS: One American 1956 model R20 HHE heavy duty 50 Ton. One practically new American model 254 capacity 90 Tons at 50', 25 Tons at 140'. One Clyde model 24E 50 Tons at 45'.
CONTINUOUS LIBERTY SHIP DISMANTLING—Marine parts always available.
STEEL BARGES AVAILABLE IMMEDIATELY—180'x42'x 12' and 150'x42'x12'—A.B.S. Newly Constructed. OTHER SIZES ALSO AVAILABLE.

SCHNITZER INDUSTRIES
American Ship Dismantlers, Inc.
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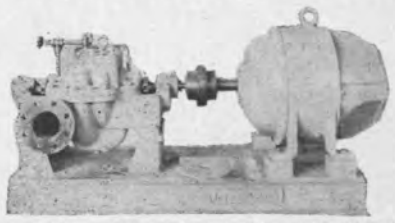
Phone: (503) 224-4321 Cable: Schnitzerbro Telex: 503-224-1082
Ft. of Adeline St., Oakland, Calif. Phone: 415-444-3919

MARINE PUMPS - FIRE - BILGE - GENERAL SERVICE



GENERAL SERVICE BUTTERWORTH & FIRE

2-Stage 300 GPM @ 339 ft. Mfg. by Gould & Ingersoll-Rand. Bronze—5 x 4—50 HP 230 VDC —2500 RPM—with magnetic starters—reconditioned.

NEW ALL-BRONZE BUFFALO PUMP

Fire & General service—550 GPM @ 30 lbs.—14.5 440/3/60 motor—built for USN.

AUXILIARY CONDENSATE

Worthington—1½ UZ-3—20 GPM @ 208'—5 HP—230 VDC—1577/2250 RPM—2½" suction —1½" discharge.

INGERSOLL-RAND FIRE & BILGE PUMP

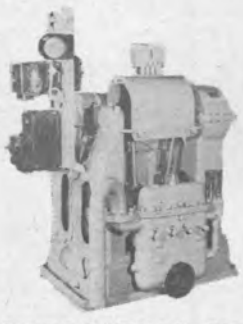
Self-Priming

200 GPM—bronze—224' head—90/100 lbs fire service—suction lift 23'—3500 RPM. MOTOR: 20 HP—440/3/60/3500 RPM—28 amps—G.E. type KF—frame 326—class B—totally enclosed—Navy Service A — 3½" suction — 3" discharge. PRIMER MOTOR: 1½ HP — 440/3/60/3600 RPM—fan cooled—totally enclosed—2.2 amps. Nash priming pump complete with priming valve. Reconditioned.

$497.50

BRONZE FEED-WATER BOOSTER PUMPS

220/237 GPM @ 144' head—2-stage—1750 RPM with 30 HP 440/3/60 motor control & spares. Built for USN.



RECIPROCATING PUMP

80 GPM @ 60 lbs.—self-priming motor-driven, with air dome. 2-Cylinder—5" bore—8" stroke—4" suction—3" discharge Variable speed 6 HP motor—230 VDC—reduction gear ratio 22:1. German-built—long a favorite on foreign ships for reliability.

$1250.00

INGERSOLL-RAND FIRE & FLUSHING PUMP

200 GPM—total head 224'—discharge pressure 100 PSI — 3½" suction — 3" discharge — 3500 RPM—bronze construction—flanged. MOTOR: 20 HP — 440/3/60/3600 RPM — G.E. type K.F.—frame 326 — full load amps 28 — fan cooled — ambient 50°C—class B insulation—totally enclosed — Navy Service A. DIMENSIONS: OAL 37¼"—OAW 18 31/32"—OAH 18½"—total weight 1225 lbs. Reconditioned.

$397.50

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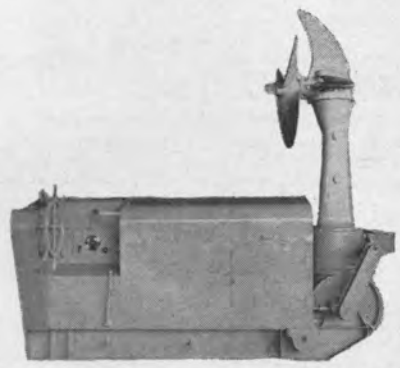
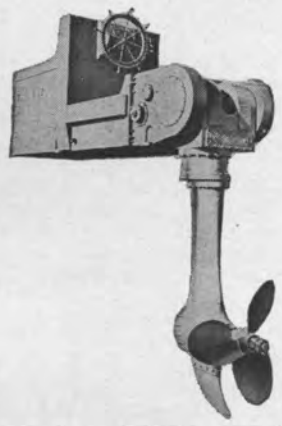
539-1900 301 355-5050

MURRAY & TREGURTHA
DIESEL PROPULSION UNITS

JUST ARRIVED — 7 UNITS



Model 02-D—powered by 6-cylinder G.M. 6-71 diesel—driven through Oliver gear—8708—forward ration 1:1.27—reverse 1:1—3 blade propeller—48" diameter—24" pitch—left hand—manual steering—electric starting. RECONDITIONED—READY TO GO!



1 Model 0-7 unit in stock. Powered by twin GM 6-71 diesels with hydraulic clutch & electric steering. Propeller diam. 64" pitch 48". Tailfin raised & lowered mechanically. 7' from bottom of unit to propeller hub center. Weight about 20,000 lbs. Propeller speed 308 RPM. Unit can develop up to 500 HP. Formerly used on Cargill Grain Co. barge "Carpolis". Actual photo on request. Can be demonstrated running in shop.

THE BOSTON METALS COMPANY

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

CARRIER REFRIGERATION UNITS

40-Ton Air Conditioning & Cargo Refrigeration Units

Carrier compressor—model 7G8-EF—freon compressor with manual cylinder cut-out—426 RPM—39.4 tons—suction temp. 45°F—cond. temp.—105°F—35 HP—230 volt DC motor. Complete with motor control—refrigeration condenser—receiver — fittings. 8 Complete units. Dimensions: Compressor 6'8½" long—4' 10½" OAW—approx. 6' high over suction connection. Condenser about 14' long—approx. 12" diameter. Just removed from Grace Line vessels. Excellent for fishing industry, banana boats, air-conditioning quarters, etc.

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Baldt Anchor, Chain & Forge, P.O. Box 350, Chester, Pa. 19016
Blue Water Marine Supply, Inc., 2102 69 St., P.O. Box 9156, Houston, Texas 77006
DiMattina Supply Co., 59-61 Seabring St., Brooklyn, N.Y. 11231

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Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309

BOILERS
Combustion Engineering, Inc., Windsor, Connecticut 06095
Foster Wheeler Corp., 666 Fifth Ave., New York, N.Y. 10019

BOW THRUSTERS
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171

BULKHEAD PANELLING
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Fuel Service Inc., P.O. Box 712, Pascagoula, Miss. 39567
Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y. 10019
Independent Petroluem Supply Co., 277 Park Ave., N.Y. 10017
Refineria Panama, S. A. 277 Park Ave., New York, N.Y. 10017
The West Indies Oil Co., Ltd., St. John's Antigua, W. I.

BURNERS—Oil
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y.

CABLE - ELECTRIC MARINE
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150

CARGO CONTAINERS—Components
Fruehauf TrailerDiv.,Fruehauf Corp., 10940 HarperAv.,Detroit 32,Mich.

CATHODIC PROTECTION
Engelhard Industries, Inc., 850 Passaic Ave., E. Newark, N.J. 02029

CLUTCHES, GEARS & BRAKES
Koppers Company, Inc., Power Transmission Dept., 3602 Scott St., Baltimore, Md. 21203
Wichita Clutch Co., Inc., Wichita Falls, Texas 76307

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Amercoat Corp., 201 N. Berry St., Brea, Calif. 92621
Calfonex, Inc., 166 Coolidge Ave., Englewood, N.J. 07631
E. I. Dupont De Nemours & Co., Inc., Wilmington, Delaware 19898
Enjay Chemical Company, 60 West 49th St., New York, N.Y. 10020
Eureka Chemcial Co., 234 Lawrence Ave., South San Francisco, Calif. 94080
Plasma Chemical Systems, Inc., 13909 Lee Jackson Hway, Chantilly, Virginia 22021
USS Chemicals (Div. of U. S. Steel), P. O. Box 86, Pittsburgh, Pa.

CONTAINER HANDLING SYSTEM
Clyde Iron Works, Inc., P.O. Box 370, Duluth, Minn. 55801
Lighter Aboard Ship, Inc., 225 Baronne St., New Orleans, La. 70112
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
RPC Corp., Marine Sales, 200 Park Ave., New York, N.Y. 10017
Star Iron & Steel Co., 336 Alexander Ave., Tacoma, Wash. 98421

CONTAINER LASHINGS
American Forge & Mfg. Co., Box 74, McKees Rocks, Pa. 15136

CONTROL SYSTEMS
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Lake Shore Electric Corp., 205 Willis St., Bedford, Ohio 44014
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231

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Eureka Chemcial Co., 234 Lawrence Ave., South San Francisco, Calif. 94080
Radiator Specialty Co., 1400 Independence Blvd., Charlotte, N.C. 28205

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Clyde Iron Works, Inc., P.O. Box 370, Duluth, Minnesota 55801
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 7 Dey Street, N.Y., N.Y. 10007
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98401
Wiley Mfg. Co., Box 97, Port Deposit, Md. 21904

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Lockstad Co., Inc., 179 W. 5th Street, Bayonne, New Jersey 07002
Marine Moisture Control Co., 39 Redfern Ave., Inwood, L.I., N.Y.

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Beebe Bros., Inc., 2724 - 6th Avenue So., Seattle, Wash. 98134
Clyde Iron Works, Inc, P.O. Box 370, Duluth, Minn. 55801
Garrett Marine Div. of the Garrett Corp., 255 Attwell Dr., Rexdale, Ontario, Canada
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 7 Dey Street, N.Y., N.Y. 10007
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
A. S. Pusnes, MeK. Verksted, Arendal, Norway
Smith-Berger Mfg. Corp., 3236 16th Ave.S.W., Seattle, Wash. 98134
Western Gear Corp., Heavy Machinery Div., Everett, Wash. 98201

DECKING
Asbestolith Mfg. Corp., 257 Kent St., Brooklyn, N.Y. 11222
Metropolitan Floor Covering, Inc., Div. of Drehmann Paving & Flooring Co. 2101 Byberry Rd., Philadelphia, Pa. 19116

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Kiene Diesel Accessories, Inc., P.O. Box 216, Franklin Park, Ill. 60131

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Bruce GM Diesel, Inc., U.S. Route 46 at Savoy St., Lodi, N.J. 07644
Burmeister & Wain, 2 Torvegade, Copenhagen K, Denmark
Electro-Motive Division General Motors, La Grange, Illinois 60525
Fiat, Turin, Italy, U.S.A. 375 Park Ave., New York, N.Y. 10022
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
M.A.N. Maschinefabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany.
H. O. Penn Machinery Co., Inc., Caterpillar dir., 140th St. & East River, New York, N.Y. 10454
Stewart & Stevenson Services, Inc., 4516 Harrisburg Blvd., Houston, Texas 77011
Stork Dieselmotoren, Kromhout Motoren, P.O. Box 4196, Amsterdam, Holland.

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Marine Products & Engineering Co, 20 Vesey St., New York, N.Y. 10007

DOORS—Watertight—Bulkhead
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Overbeke-Kain Co., 209 Aurora Rd., Bedford, Ohio 44014
Walz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

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Arnessen Marine Systems, Inc., 335 Bond St., Brooklyn, N.Y.
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150
Oceanic Electrical Mfg. Co., Inc., 148 Perry Street, N.Y. 10004
Owesen & Co., Inc., 315 Notre Dame, New Orleans, La. 70130
Pauluhn Electric Mfg. Co., Inc., 422 Broome St., New York 10013
Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029

EVAPORATORS
Aqua-Chem, Inc., 225 N. Grand Ave., Waukesha, Wis. 53186
Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004
Mechanical Equipment Co., Inc., 861 Carondelet St., New Orleans, La. 70130

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Kerotest Mfg., Corp., 2516 Liberty Ave., Pittsburgh, Pa. 15222
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202

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

FUEL RECOVERY
Tretolite Div., Petrolite Corp., 369 Marshall Ave., St. Louis, Mo. 63119

GALLEY RANGES
Elisha Webb & Son Co., 136 So. Front St., Philadelphia, Pa. 19106

HEAT EXCHANGES
Aqua-Chem. Inc., 225 N. Grand Ave., Waukesha, Wis. 53186

HEATERS—Ship
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231

HYDRAULICS
Bond Hydraulics Equipment Service Inc., 9264 Kennedy Blvd., North Bergen, N.J. 07047
Vickers, Marine & Ordnance Division, P.O. Box 302, Troy, Mich. 48084

INSULATION—Marine
Bailey Carpenter & Insulation Co.,Inc.,74SullivanSt.,Brklyn,N.Y.11231
Johns-Manville, Box 14, New York, N.Y. 10016
Reef Industries, Inc., P.O. Box 23221, New Orleans, La. 70123

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Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
Metal Finishers, Inc., (Mecrome Division), 3125 Brinkerhoff Road, Kansas City, Kansas 66115

MARINE DRIVES—GEARS
Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406
Western Gear Corp., Industrial Products Div., P.O. Box 126, Belmont, Calif. 94003

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Decca Radar, Inc., 386 Park Ave. So., New York, N.Y. 10016
Electronics Concepts Inc., (Div. of Automatic Sprinkler Corp. of America) P. O. Box 813, Charlottesville, Va. 22902
Fisher Research Laboratory, 1890 Embaracadero Road, Palo Alto, California 94303
Griffith Marine Electronics, Inc., 79 Fourth Street, New Rochelle, N. Y. 10801
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

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Brazos Engineering, a div. of Metallic Bldg. Co., 4625 Holmes Road, Box 14240, Houston, Texas 77021
Gadelius, K. K., P.O. Box 802, Kobe Port, 651-01 Japan
Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
H & H Engineering Co., 430 So. Navajo, Denver, Colo. 80223
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Kearfott Marine (Div. of The Singer Co.) 21 West St., New York, N.Y. 10006
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
Vokes Filter Div. (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221
Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029

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Combustion Engineering, Inc., Windsor, Connecticut 06095
De Laval Turbine, Inc., 853 Nottingham Way, Trenton, N.J. 08602
Foster Wheeler Corp., 666 Fifth Ave., New York, N.Y. 10019
General Electric Co., Schenectady, N.Y. 12305
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York 10014
Stal-Laval, Inc., 147 E. 50th St., New York, N.Y. 10022
Western Gear Corp., Precision Products Div., P.O. Box 190, Lynwood, Calif. 90262

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Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Motorola Communications & Electronics, Inc., 4935 W. LeMoyne Ave., Chicago, Ill. 60651
RF Communications, Inc., 1680 University Ave., Rochester, N.Y. 14610
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Marine Products Operation, 213 East Grand Avenue, South San Francisco, California 94080
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101

NAVAL ARCHITECTS AND MARINE ENGINEERS
BG Marine Services, Div. of Genge Industries, Inc., 4419 Van Nuys Blvd., Sherman Oaks, Calif. 91403
Coast Engineering Co., 711 West 21 St., Norfolk, Va. 23517
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Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
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J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
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Marine Applications Co., Inc., P.O. Box 167, Mineola, N.Y. 11502
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
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George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
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R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
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Mobil Oil Co., Inc., 26 Broadway, New York, N.Y. 10004
Refineria Panama, S. A., 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., 50 W. 50 St., New York 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017
PAINT—Marine—Protective Coatings
Amercoat Corp., 201 N. Berry St., Brea, Calif. 92621
Devoe & Raynolds Co., Inc., Marine Division, Newark, N.J. 07105
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
International Paint Co., 21 West St., New York, N.Y. 10006
Mobil Chemical Company, Metuchen, N.J. 08840
PETROLEUM SUPPLIES
Independent Petroleum Supply Co., 277 Park Ave., New York 10017
Refineria Panama, S. A. 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., W. 50 St., New York 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017
The West Indies Oil Co., Ltd. St. John's, Antigua, W. I.
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Atlas Minerals & Chemical Div., ESB, Inc., Mertztown, Pa. 19539
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231
Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936
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Baldwin-Lima-Hamilton Corp., Phila., Pa. 19142
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Bird-Johnson Co., 883 Main Street, Walpole, Mass. 02081
Escher Wyss, G.M.B.H., 798 Ravensburg, Germany
PUMPS
Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City. Kansas 66110
De Laval Turbine, Inc., 853 Nottingham Way, Trenton, N.J. 08602
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American Forge & Mfg. Co., McKees Rocks, Pa. 15136
W. W. Patterson Co., 830 Broket St., Pittsburgh, Pa. 15233
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York Corp., Grantley Road, York, Pa. 17405
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Columbian Rope Co., Auburn, N.Y. 13022
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604
Plymouth Cordage Company, Plymouth, Mass. 02364
Tubbs Cordage Company, 200 Bush St., San Francisco, Calif.
Wall Rope Works, Inc., Beverly, N. J. 08010
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RUDDER ANGLE INDICATORS
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Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
SEALS
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Syntron, a division of FMC Corp., 398 Lexington Ave., Homer City, Pa. 15748
SEARCHLIGHTS
Portable Light Co., Inc., 67 Passaic Ave., Kearny, N.J. 07032
Snelson Oilfield Lighting Co., 1201 E. Daggett St., Forth Worth, Texas 76104
SEWAGE DISPOSAL
Youngstown Welding & Engineering Co., 3708 Oakwood Ave., Youngstown, Ohio 44509
SHIPBREAKING—Salvage
The Boston Metals Co., 313 E. Baltimore, Md. 21202
National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731
Northern Metal Co., Minor & Bleigh Sts., Philadelphia, Pa. 19136
Peck Equipment Co., 3500 Elm Ave., Portsmouth, Va. 23704
Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201
SHIP BROKERS
Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119
SHIPBUILDING—Repairs, Maintenance, Drydocking
Albina Engine & Machine Works, 2100 N. Albina Ave., Portland, Ore. 97227
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Astilleros de Cadiz, S.A., Zurhono 72, 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. 28560
Bender Ship Repair, Inc., 265 So. Water St., Mobile, Ala. 36602
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885
Brewer Dry Dock Co., Mariners Harbor, Staten Island, N.Y.
Ira S. Bushey & Sons, Inc., 764 Court St., Brooklyn, N.Y. 11231
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.
Equitable Equipment Co., Inc., 410 Camp St., New Orleans, La. 70130
Furness-Smiths Dock (Trinidad) Ltd., P.O. Box 893, Chaguaramas Dockyard, Port Chaguaramas, Trinidad, West Indies.
Gotaverken American Corp., 39 Broadway, New York 6, N.Y.
Groignard Shipyards, P.O. Box 829 Colbert, Marseilles, France.
Halifax Shipyards, Ltd., P.O. Box 640, Halifax, Nova Scotia, Canada
Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.
Hitachi Shipbuilding Co.,25 Nakanoshima2-chomeKitaku,Osaka-Japan
Ishikawajima-Harima Heavy Industries Co., Ltd., 50 Broad Street New York, N.Y. 10004
Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla.
Jeffboat, Inc., Jeffersonville, Ind. 47130
Kawasaki Dockyard Co., 8 Kaigan-dori, Ikuta-ku, Kobe, Japan
LISNAVE, P.O. Box 2138, Lisbon, Portugual
Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
Lone Star Marine Salvage Co., 7200 S. Harbor Drive, Houston, Texas 77001
Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047
Mitsui Shipbuilding & Eng. Co., Ltd., Nihonbashi-Muromachi, Chuo-ku, Tokyo, Japan
Nashville Bridge Co., P.O. Box 239, Nashville 1, Tenn.
National Steel & Shipbuilding Corp., San Diego 12, Cal.
Newport News Shipbuilding and Dry Dock Co., Newport News, Va.
Nippon Kokan Kabushiki Kaisha, 2, 1-chome, Otemachi, Chivoda-ku, Tokyo, Japan
O.A.R.N. (officine Allestimento e Riparazioni Navi) Genoa, Italy
Pacific Coast Engineering Co., P.O. Drawer 6, Alameda, Calif. 94506
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J.
Puerto Rico Drydock and Marine Terminals, Inc., P.O. Box 2209, San Juan, Puerto Rico 00903
Rodermond Industries, Foot of Henderson St., Jersey City, N.J. 07302
L. Rodriquez Shipyard, 24 Molo Norimberga, Messina, Italy.
St. Louis Shipbuilding—Federal Barge, Inc. 611 East Marceau, St. Louis 11, Mo.
Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan
Tampa Ship Repair & Dry Dock Co., Inc., P.O. Box 1277, Tampa, Florida 33601
Terrin Agency, Inc., 17 Battery Place, New York, N.Y. 10004
Todd Shipyards Corp., 1 Broadway, New York City
Vare Corp., Equipment Systems Div., 516 Sylvan Ave., Englewood Cliffs, N.J. 07632
Vickers Ltd., 222 London Rd., St. Albans, Herts, England
Wiley Mfg. Co., Port Deposit, Md.
Wyatt Industries Inc., Port Houston Shipyard Div., P.O. Box 3052, Houston, Texas 77001
SHIP MODELS
Boucher-Lewis Precision Models, Inc., 36 E. 12 St., N.Y., N.Y. 10003
SHIP STABILIZERS
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 7 Dey Street, New York, N.Y. 10007
John J. McMullen Associates, Inc., 17 Battery Pl., N.Y., N Y. 10004
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
STEAM GENERATING EQUIPMENT
Combustion Engineering, Inc., Windsor, Connecticut 06095
STEVEDORING
M. P. Howlett, Inc., 415 32nd St., Union City, N.J.
Luckenbach Steamship Co., 120 Wall St., New York 5, N.Y.
SWITCHBOARDS
Hose McCann Telephone Co., Inc., 524 23rd St., N.Y. 10011
SYNTHETICS
E. I. Dupont De Nemours & Co., Inc., Textile Fibers Dept., Wilmington, Delaware
TANK CONTAINERS
Fruehauf Trailer Div., Fruehauf Corp., 10940 Harper Ave., Detroit, Mich. 48232
TOWING—Lighterage, Transportations, Barge Chartering
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Curtis Bay Towing Co., Mercantile Bldg., Baltimore 2, Md.
G & H Towing Company, 509 Texas Building, Galveston, Texas 77550
Henry Gillen's Sons Lighterage, 140 Cedar St., New York, N.Y. 10006
James Hughes, Inc., 17 Battery Pl., New York, N.Y.
Jackson Marine Corp., P.O. Box 1087, Aransas Pass, Texas 78336
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y.
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
P. F. Martin, Inc., Mail Bldg., 325 Chestnut St., Philadelphia, Pa.
Moran Towing & Transportation Co., Inc., 17 Battery Place, N.Y.
Nickerson Marine Towing Co., 1670 Southeast 17th Street, Ft. Lauderdale, Fla. 33316
Red Star Towing & Transportation Co., 500 Fifth Ave., N.Y. 10036
L. Smit & Co., 11 Broadway, New York 4, N.Y.
Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002
M. & J. Tracy, Inc., 1 Broadway, New York, N.Y.
Turecamo Coastal and Harbor Towing Corp., 1752 Shore Parkway, Brooklyn, N.Y.
Vancouver Tug Boat Co., Ltd., 10 Pemberton Ave., No. Vancouver, B.C., Canada
VALVES AND FITTINGS—Hydraulic—Safety Flanges
Hooper Valve & Engineering Corp., 24th St. & Virginia Ave., Newport News, Va.
Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn 31, N.Y.
Hydrasearch Co., Inc., Riva Rd., Annapolis, Md. 21401
Marine Moisture Control Co., 39 Redfern Ave., Inwood 96, L.I., N.Y.
Mechanical Marine Company, 45-15 37th St., Long Island City, N.Y.
Todd Products, Div. of Todd Shipyards Corp., Halleck St., Brooklyn, N.Y. 11231
VAN CONTAINERS—Insulated, Refrigerated, General Commodity
Fruehauf Trailer Div., Fruehauf Corp., 10940 Harper Ave., Detroit 32, Mich.
WEATHER ROUTING
Weather Routing, Inc., 90 Broad St., New York 4, N.Y.
WIRE ROPE
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., Bethlehem, Pa. 18018
DiMattina Supply Co., 59-61 Seabring St., Brooklyn, N.Y. 11231
United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230
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TURBO-GENERATORS, SHIPS' SERVICE—Worthington Turbine, 340 K.W., 5 Stage 6097 R.P.M. Turbine, 440 P.S.I.G., 740 Deg. F., Westinghouse 90 K.W.D.C. Generator, 125 Volt, 1200 R.P.M. and Westinghouse A.C. Generator 187 K.V.A., 240 Amps, 450 Volts, 1200 R.P.M. Reduction Gear Ratio—5:081.

TURBO-GENERATORS, AUXILIARY— Westinghouse Turbine, 440 P.S.I., 740 Deg. F., 7288 R.P.M., Westinghouse 100 K.W., D.C. Generator, 240/120 Volts, 416 Amps, 1800 R.P.M.

MOTOR GENERATOR SET—Westinghouse, consisting of; 1—5 H.P., 3/60/440, 1700 RPM Induction Motor; Driving 1—1.2 K.W., 125 volt D.C. SK Exciter, and 1 Rototrol Rotating Regular.

GENERATOR—Crocker Wheeler Co., Size 121-SL-6, 100 K.W., 3/60/450, 1200 RPM, 160 Amps, 125 KVA.

MOTOR—Reliance, Type AA Induction Motor, 100 H.P., Cont. Duty, 820 RPM, 3/60/440.

TRANSFORMER—Westinghouse Single Phase, 450 Volt Primary, 117 Volt Secondary, 60 cycle, Type AVR, 15 KVA.

TRANSFORMER—Westinghouse, Single Phase, Type AVR, 450 Volt Primary, 230 Volt Secondary, 60 Cycle 37.5 KVA.

WINCHES, CARGO—Lake Shore Engineering Co. UNIWINCH, Type VB, Model 21, single speed double drum, line pull-7450 lbs. at 220 Ft. per min., Allis-Chalmers D.C. motor, 50½ H.P., 230 Volts, 180 Amps, Cutler Hammer marine brake.

WINCHES, CARGO—Lake Shore Engineering Co. UNIWINCH, Type 4-B, model 12, two speed, single drum, single line pull—7450 lb. at 220 Ft. per min. and 14,440 lbs. Allis Chalmers D.C. motors, 50½ H.P., 230 Volts, 180 Amps.

WINCHES, CARGO—Lake Shore Engineering Co. UNIWINCH, Type VB, Model 11, single speed, single drum, line pull—7450 lb. at 220 Ft. per min. Allis Chalmers D.C. motors, 50½ H.P., 230 Volts, 180 Amps.

WINCHES, LIFE BOAT—Welin., Gravity Type B.W.B., with vertical marine D.C. motor, 1550 R.P.M., 25 H.P., 230 Volts, 91 Amps., Model 55A620.

WINDLASS, ANCHOR—American Hoist and Derrick Co., Type No. 27, 2 Wildcats, 2 Warping Heads handles two 11,000 lb. anchors, chain size 2¼" with D.C. Motor, 70 H.P., 230 Volts, 253 Amps, G.E. Magnetic Brake.

WINDLASS, STREAM ANCHOR—Hesse-Ersted, Type: combined vertical capstan & windlass, machinery below deck, handles one 4000 lb. anchor, D.C. Motor, 35 H.P., 65 R.P.M., 230 Volts.

PURIFIER, LUBE OIL—Sharples Corp. **Type:** M-67-28, 8N39, Speed, 15,000 R.P.M. Wagner Elect. Corp. A.C. Motor, 1 H.P., 3/60/440, 3500 R.P.M.

DIESEL ENGINE—Buda, Mod. No. 6LD468, 6 cylinder, 4½ x 5½ 1850 RPM, 100 BHP.

REFRIGERATING COMPRESSOR—General Electric Co., Type CM 1002H, Four Cylinder, 510 RPM, 4" x 4". Wagner motor; 15 H.P., 1750 RPM, 195 Amps, 3/60/440.

AIR COMPRESSORS—Sullivan Machinery, Type EA, V Belt Driven, 60 C.F.M., free air, 880 R.P.M., 110 lb. disch., Press, Wagner Motor, 15 H.P., 1750 R.P.M., size: 4½" x 4½".

HELESHAW HYDRAULIC PUMP—(Electra-Hydraulic) American Eng. Co., size: JLP 12, 850 RPM, 1000 PSI, Wagner Motor, 3/60/440, 25 H.P., 34 Amps, 870 R.P.M.

MAIN CONDENSATE PUMPS—Vertical Centrifugal Motor Driven, Allis Chalmers, Type SSC-V, 3" x 1½", 68 G.P.M. Wagner A.C. Motor, 7.5 H.P., 1750 R.P.M., 114 Ft. total Hd.

AUX. CIRCULATING PUMPS—Vertical Centrifugal Motor Driven, Dayton-Dowd Pump, 8"x10", 1150 RPM, type CSLHV, 5 P.S.I. suction, 15 P.S.I., disch., 22.4 Ft. head. Wagner Motor, 10 H.P., 3/60/440, 1600 R.P.M.

FUEL OIL SERVICE PUMP—Quimby Vertical Rotary, Motor Driven Screw Pump, Size 2½" x 1½", Capacity 10/6 GPM, Disch. Press 350 PSI, 1150 RPM. Wagner Motor; 6/3 H.P., 3/60/440, 1160/575 RPM.

SALT WATER CIRC. PUMP—Lombard Governor Corp., 85 G.P.M., 2" Suction, 2" Discharge, 30 lbs. Press, Star Electric Co. motor—3/60/440, 5 H.P., 1800 RPM.

BOILER FEED PUMP—Wilson Snyder, Vert, Simp., 95 GPM, 10"x7"x24", 4" Suction, 3" Discharge, 440 lbs. steam press @ 500°F.

FIRE & SANITARY PUMP—Wilson Snyder, Vert. Simp. 400 GPM, 14" x 12" x 12", 5 lbs. suction press, 100 lbs. disch. press., 150 PSIG @ 435°F.

BILGE PUMPS—Wilson Snyder, Vert, Simp., 410 GPM, 10" x 12" x 12", 6 lbs. Suction Press., 30 lbs. discharge.

GENERAL SERVICE—Wilson Snyder, Vert. Simp., 330 GPM, 10" x 12" x 12", 5 lbs. Suction Press, 35 lbs. discharge.

FRESH WATER PUMP—Wilson Snyder, Vert, Simp., 100 GPM, 10" x 7" x 12", 4 lbs. suction press., 80 lbs. discharge pressure.

FUEL OIL TRANSFER—Wilson Snyder, Vert. Simplex, 150 GPM, 14" x 10" x 12", 5 lb. suction, 150 lbs. discharge.

FIRE PUMP—(Handy-Billy), Johnson Motor Co., Model P-500E, 500 G.P.M., 4500-5000 R.P.M., 100 P.S.I.

FORCED DRAFT FAN—Buffalo Forge Co., 5000 CFM, 1800/1200 RPM, Wagner Motor 5/2.2 H.P., 1750/1160 RPM, 3/60/440.

FORCED DRAFT FAN—Buffalo Forge Co., 6000 CFM, 1800/1200 RPM, Wagner Motor, 5/2.7 HP, 1160/870 RPM, 3/60/440.

FORCED DRAFT FAN—Buffalo Forge Co., 8000 CFM, 1800/1200 RPM, Wagner Motor, 7.5/4.2 H.P., 1160/870 RPM, 3/60/440.

FORCED DRAFT FAN—Buffalo Forge Co., 12,000 CFM, 1160 RPM, Wagner Motor, 12.5/7 H.P., 1160/870 RPM, 3/60/440.

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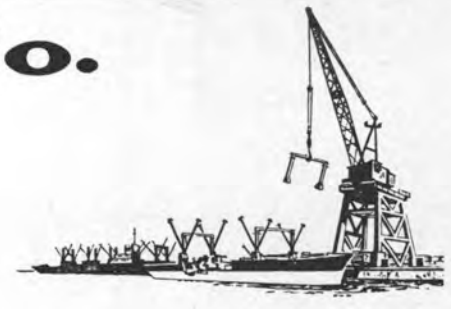

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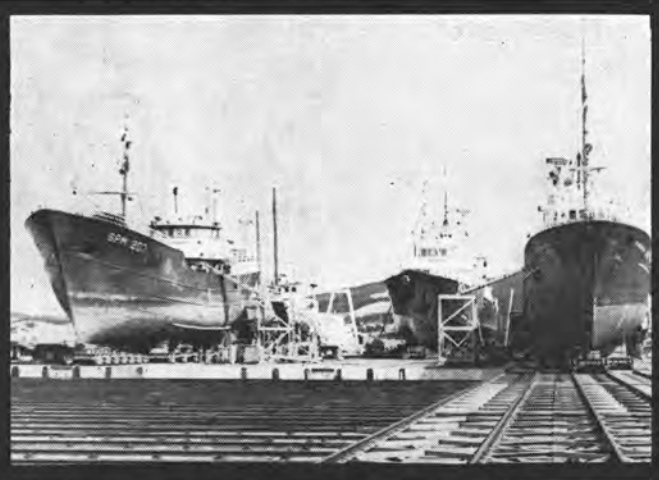

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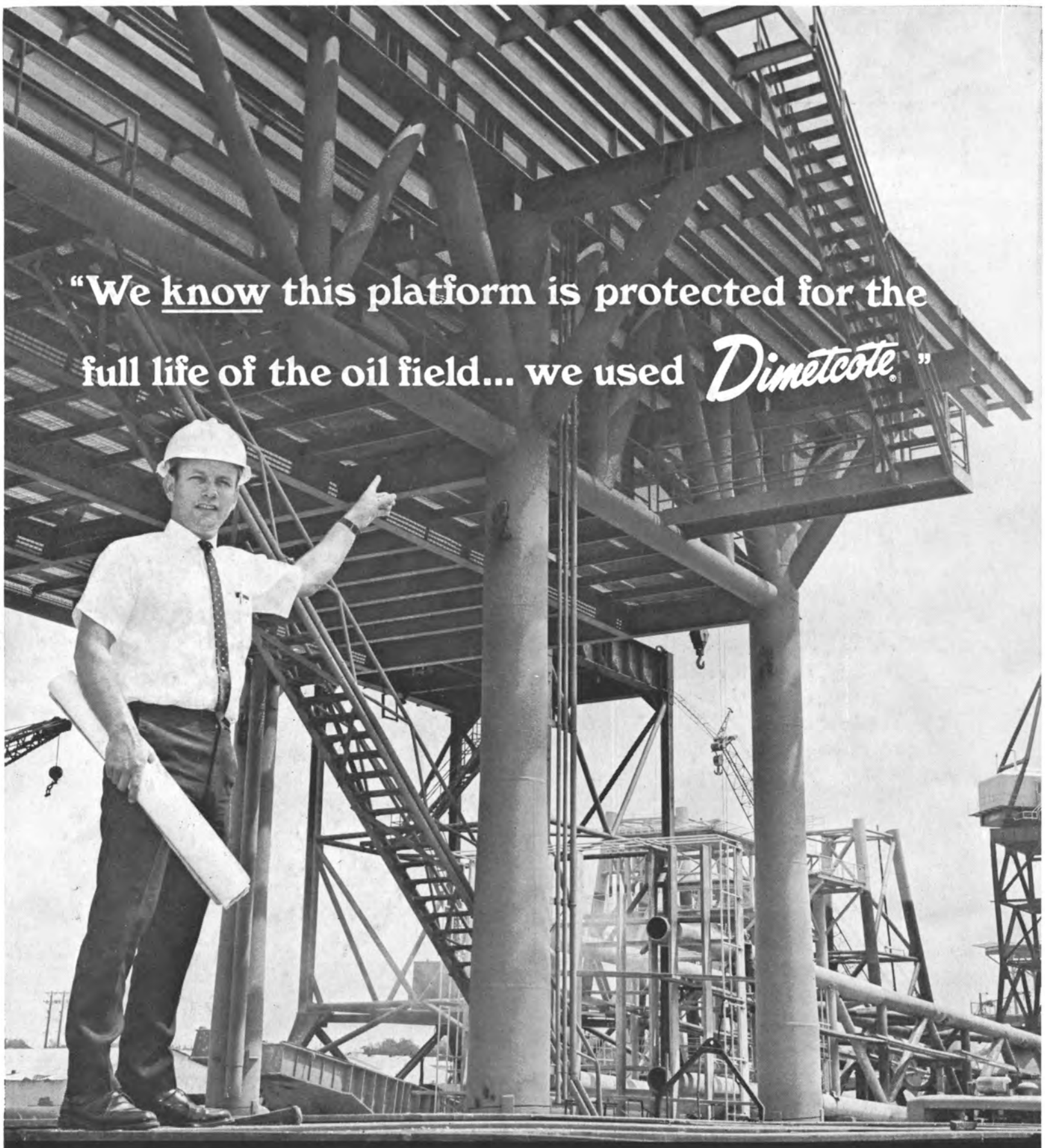

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