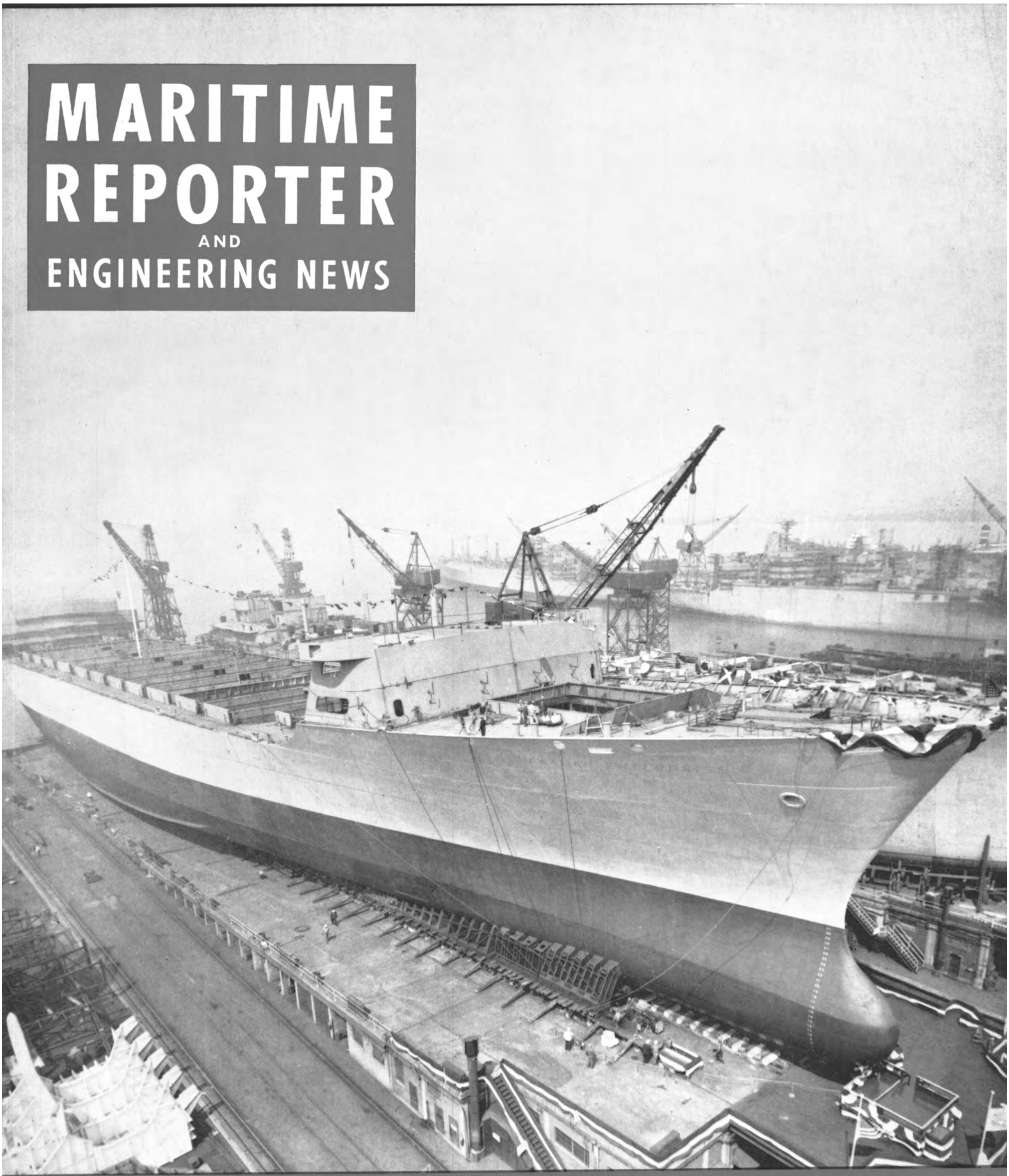
MARITIME REPORTER
AND
ENGINEERING NEWS



Bethlehem-Sparrows Point Launches World's Largest Containership

(SEE PAGE 6)

MAY 15, 1969

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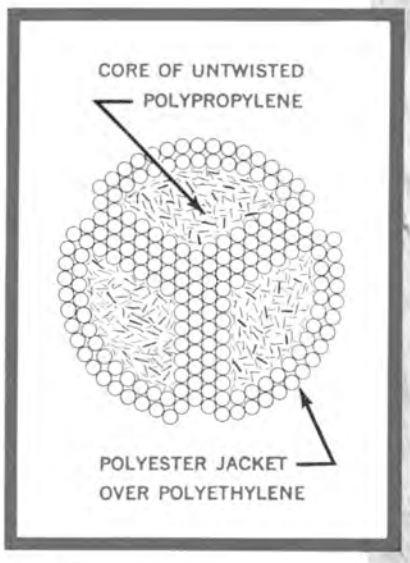

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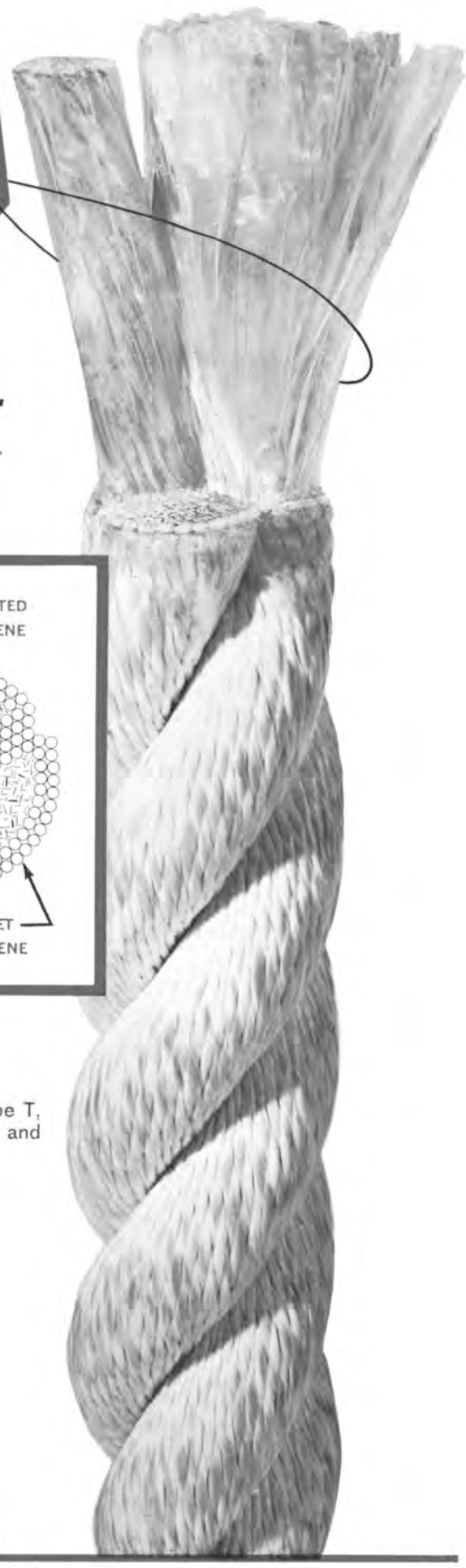

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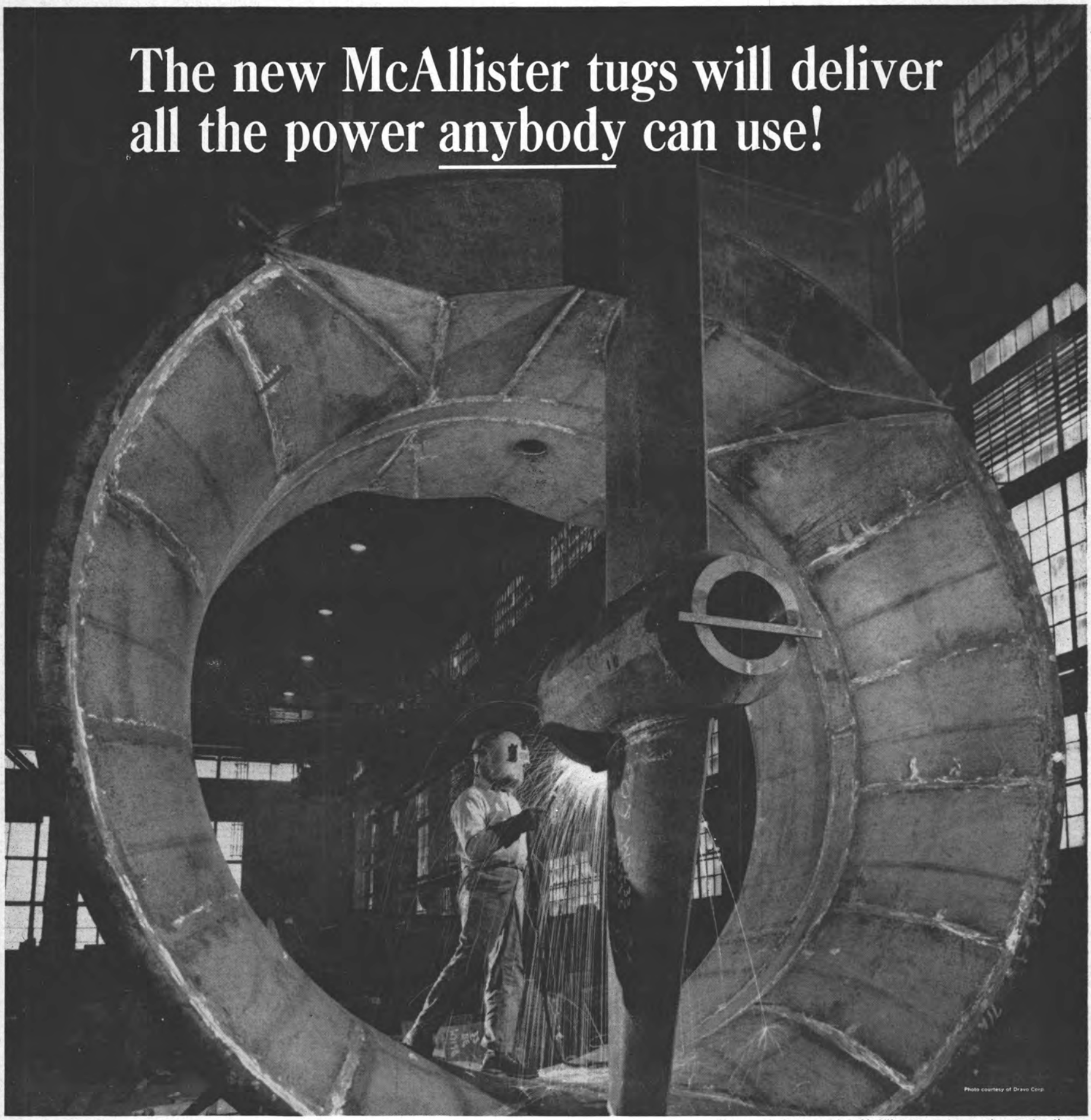

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Containership Bids Sought By U.S. Lines

United States Lines Company has requested shipyard bids to build up to six new containerships similar to those it has recently introduced in the North Atlantic. The previous ships were constructed by Sun Shipbuilding and Dry Dock Company.

Bids, to be opened in New York on June 2, must remain in effect at least 90 days, U.S. Lines prescribed, and if not acted on by then they will continue in effect until withdrawn by the shipyard.

Peterson Awarded Contract For Six Large Harbor Tugs

Peterson Builders, Inc., of Sturgeon Bay, Wis., was the successful bidder for the construction of six large harbor tugs of the YTB-760-class with a total price of $5,083,-500. Designated Hull Nos. 803 through 808, each tug will have the following dimensions: an overall length of 109 feet, a beam of 29 feet, and a depth of 16 feet 3 inches. They will be powered with a 2,100-bhp single diesel and will operate at a draft of 13 feet 10 inches.

American Ship Submits Low Bid For FPF-107

American Ship Building Company, Lorain, Ohio, recently submitted the lowest bid to the Navy for the construction of a patrol escort craft, FPF-107. The bid by American Ship was $5,458,655. The patrol craft will be built for a foreign country under the Military Assistance Program.

Triple-Screw River Towboat To Be Built By Marine Welding

Marine Welding & Repair Works, Inc., of Greenville, Miss., is building a triple-screw river towboat for undisclosed interests. To be powered with 5,000-total-bhp diesels, the towboat will have the following dimensions: 140 feet in length, 30 feet in beam and 10 feet 6 inches in depth.

NSSC Awards Marinette Barge Contract

The Naval Ship Systems Command has awarded a $10,465,438 formally-advertised, fixed-price contract to Marinette Marine Corp., of Marinette, Wis. for eight (YRBMs) repair, berthing and messing barges (N00024-69-C-0299).

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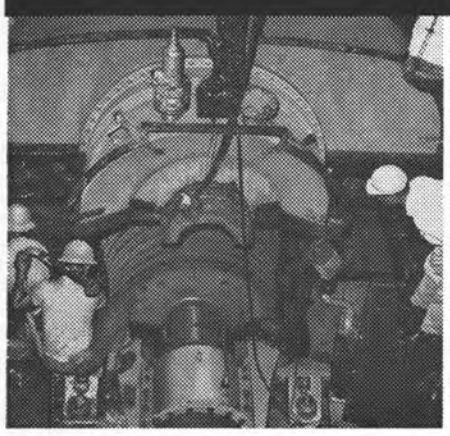

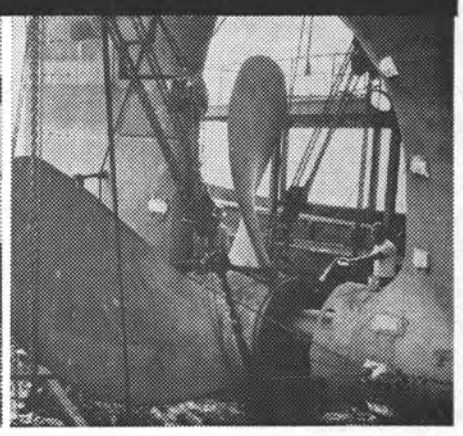

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World's Largest Containership Launched By Bethlehem-Sparrows Point Yard

Mrs. Daniel K. Inouye, wife of the senator from Hawaii, holds a bouquet of roses just prior to christening the 34,700-ton-displacement vessel, Hawaiian Enterprise. With **Mrs. Inouye** are, left to right: **Daniel M. Mack-Forlist,** general manager of the yard, **Stanley Powell Jr.,** president of Matson, and **Daniel D. Strohmeier,** vice-president, Bethlehem Steel Corporation, in charge of shipbuilding.

The largest containership in the world, first of two being built for Matson Navigation Company, by Bethlehem Steel Corporation, was launched recently at Bethlehem's Sparrows Point, Md. shipyard.

The Hawaiian Enterprise, 34,700-tons displacement, was christened by **Mrs. Daniel K. Inouye,** wife of the senator from Hawaii. The ship is named in honor of Matson's first steamship, the Enterprise, which, in 1902, was the first vessel in the Pacific to burn oil instead of coal.

The Hawaiian Enterprise, the largest dry-cargo vessel ever built by Bethlehem, will have a capacity of more than 1,000 of Matson's 24-foot containers and the unique ability to carry efficiently and interchangeably containers of all standard sizes.

Designed by Matson to be the optimum vessel for their intermodal freight service in the Pacific, the Hawaiian Enterprise and her sistership, now under construction at Sparrows Point, will be powered by 32,000-hp geared steam turbines, which will drive the vessels at a normal speed of 23 knots.

The Hawaiian Enterprise is 719 feet overall with a length between perpendiculars of 677 feet. Its molded breadth is 95 feet and its molded depth 54 feet. Design draft will be 31 feet.

The vessel has a bulbous bow to enhance its sea-keeping qualities. The bridge is forward and the machinery aft.

Matson Lines are pioneers in the container service and have converted most of their ships to this service. The design of the Hawaiian Enterprise and her sistership is a culmination of the experience of Matson over the last ten years in the container field.

The ship will carry 560 containers below deck and 456 on deck when piled three high, including 152 refrigerated containers.

The arrangement of No. 1 hold will provide for the carriage of general cargo and tanks are provided to carry about 5,000 tons of molasses. Officers and crew will be quartered in modern, well-appointed rooms which are completely air-conditioned. The latest in navigation and safety-at-sea equipment is provided. There are no passenger accommodations.

The vessel is equipped with centralized control which provides control of the main engines from an air-conditioned control room. The system also includes bridge control and monitoring of shaft speed and direction.

The ships are being built under a $40-million contract, which is the largest signed by an unsubsidized U.S. shipping line for dry-cargo vessels with a U.S. yard since before World War II. The contract calls for delivery of the Hawaiian Enterprise in December and the second vessel is scheduled for delivery in March of 1970.

The Sparrows Point yard now has building, or on order, four 37,500-ton tankers, two chemical carriers of the same class, two ammunition ships for the Navy, three 61,000-ton tankers, three 69,000-ton tankers and the two Matson vessels. In addition, it will construct the forebody for a sulfur carrier.

Following the launching, **Daniel M. Mack-Forlist,** general manager of the yard, was the host at a luncheon in honor of the sponsor.

Zigler Low Bidder For Stern Trawler

With a price of $958,000, Zigler Shipyards, Inc., of Jennings, La., is the apparent low bidder for the construction of a 131-foot 2-inch stern trawler for Boston Fish Market Corp., of Boston, Mass. The Maritime Administration, Washington, D.C., received bids for this trawler on April 9; delivery has been stipulated at 400 calendar days.

N.Y. Port Engineers Given Insight Into DOD Planning For Sealift In 1970s

Officers and author at the April meeting of the Society of Port Engineers were, left to right: **Louis V. Minett,** papers committee chairman; **Paul Farr,** secretary-treasurer; **M.J. Zubkoff,** author; **George J. Mortensen,** vice-president; **Mathew Carroll,** assistant chairman of the papers committee and a sponsor of the paper, and **William J. Muir,** member of board of directors and a sponsor of the paper.

The Society of Marine Port Engineers, New York, Inc. held its April meeting at the Coast Guard Base on Governor's Island. The well-attended meeting heard an interesting paper entitled "Studies on Merchant Marine Requirements in the Seventies" presented by **Maurice J. Zubkoff,** president, Research Associates Incorporated of Silver Springs, Md.

During the dinner meeting **William J. Muir,** a member of the board of directors, presented Prof. **J. Foody,** New York State Maritime College, a plaque in recognition of his 17 years of service to the Port Engineers Society.

Mr. **Zubkoff's** firm has been engaged in analyzing the effectiveness and costs of the Department of Defense of alternative sealift postures in the 1970-1980 time frame. The author stated: "The Secretary of Defense is an advisor on national maritime policy and, through the Navy, formulates and implements complementary policies to ensure the fulfillment of DOD sealift requirements.

"The ability of the potential fleet resources to meet a group of postulated sealift requirements under current U.S. maritime policy and two alternative suggested policies has been examined. The consequences of following a realistic set of projected break-bulk and dry-bulk ship construction programs were assessed in terms of their performances, costs and responsiveness. The effects of concurrently maintaining alternative levels of participation in foreign trade were determined. Relative costs of chartering on the open market to meet various proportions of the lift requirements were made.

"The methodology relies upon several computerized transportation network simulations developed at Research Associates Incorporated for the performance and cost evaluations. The measures of effectiveness include a system productivity index, system cost, time to achieve the sealift requirement, and productivity-cost ratio.

"The work to date has been useful in assessing the relative capabilities of several ship designs, the relative merits of certain design features, managerial control proposals, and proposed ship construction schedules."

W. F. Muir, (left) director of technical services and inspection of Gulf Oil Corporation's Marine Department and past president and chairman of the board of the Society, and a former colleague of Doctor **Foody,** presents the plaque on behalf of the Society to Doctor **Foody** (center) with **Paul S. Farr,** secretary-treasurer of the Society assisting.

St. Louis Ship Cuts Up Barges For Delivery

Two 100-foot by 26-foot by 6-foot 6-inch sand and gravel barges were recently completed at St. Louis Ship's (Division of Pott Industries Inc.) yard in St. Louis, Mo., and then each barge was cut up into four sections for delivery by truck to Pacific, Mo. At the Pacific site the barges were re-assembled on the bank of the Meramec River and launched.

This unusual method of barge delivery and assembly was requested by the Basic Materials Company of St. Louis due to varying river and bridge clearances.

St. Louis Ship also recently delivered a specially designed sulphuric acid barge to The Valley Line Co., also of St. Louis. The barge is of double skin construction and has extra heavy plating in way of the cargo tanks. Dimensions are 200 feet by 35 feet by 12 feet with a capacity of approximately 1,600 tons at 9 foot 0 inch draft.

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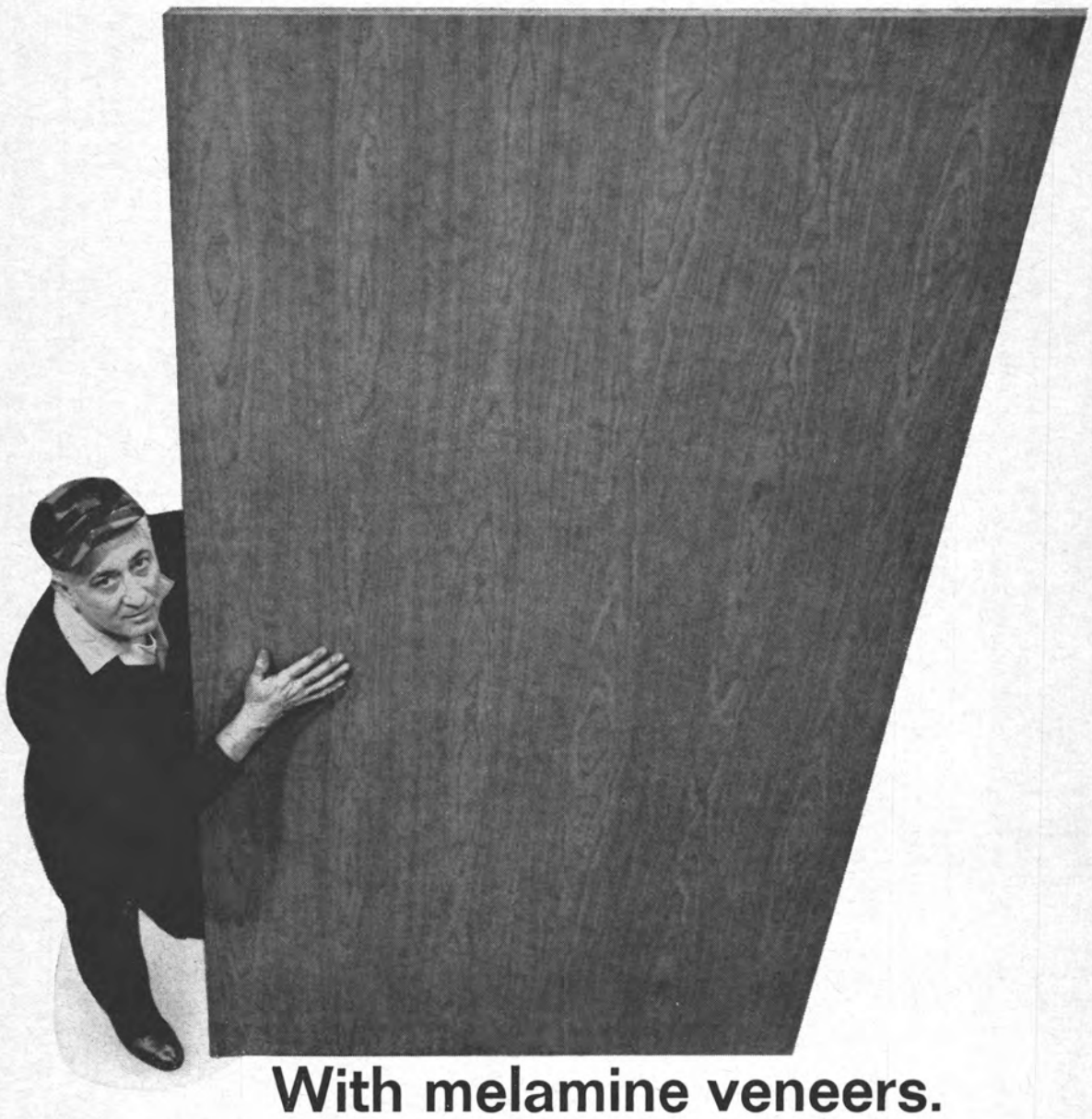

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New England Section Reviews Marine Uses Of Ferro-Cement

Authors of the paper on the marine application of ferro-cement presented before the New England Section, SNAME, left to right: Lt. Comdr. **J.F. Collins** and Lt. **J.S. Claman,** both Navy students at Massachusetts Institute of Technology.

At a recent meeting of the New England Section of The Society of Naval Architects and Marine Engineers, held at A. D. Little Inc., Cambride, Mass., a technical paper was presented by Lt. Comdr. **J. F. Collins,** USN, and Lt. **J. S. Claman,** USN, both naval students at the Massachusetts Institute of Technology, entitled "Ferro-Cement for Marine Applications—An Engineering Evaluation."

Robert L. Evans, Section chairman, introduced Capt. **Marvin Gluntz,** USN (ret.), SNAME secretary, who remarked of the tremendous Society growth in recent years, not only in membership but also in the content of routine periodicals and special technical publications. He also congratulated the New England Section for its recent growth and interesting meetings. A nominating committee consisting of **Roger Luke,** chairman, Dr. **Alfred A. H. Keil** and **Frank Wood** was appointed by Mr. **Evans** to select nominees for Section officers for next season.

The authors advised that the use of ferro-cement, a composite material made up of portland cement mortar and wire mesh has received considerable treatment in the trade journals recently. Tracing the use of the material for boats of more than a century ago to the start of modern usage by an Italian architect in the 1940's, the paper reviews not only history but fact and development in recent years. The technical treatment of brittleness, complete with formulae and test results was followed by development of the experimental determination of engineering properties such as modulus of rupture, compressive strength, tensile strength, shear strength, panel bending, moduls of elasticity, fatigue, impact and a summary of the experimental findings. A short section covered the subject of surface protection and weathering effects. The paper concluded with a description of tests recently performed at M.I.T. and a description of an actual floating barge, designated BARF-1 for barge, auxiliary reinforced ferro-cement, which was constructed and tested during the summer of 1968. General dimensions of the barge were 22 feet long by 13 feet wide by 3 feet deep by 10 inches draft. The presentation concluded with a motion picture presentation covering the barge construction methods, test methods and eventually of the barge floating in water.

The paper concluded with a discussion of thoughts for the future. The many advantages of ferro-cement, its adaptability to many conditions, and some of the properties now being actively explored by commercial firms attest to its envisioned usefulness, not only for nautical usages, but many others.

An extensive bibliography (21 titles) with direct or indirect application to the material and an appendix containing tables of data calculations are included at the end of the paper.

Copies of the paper are available from the New England Section editor, **Albert P. Wickham** at the Quincy Division of General Dynamics, Quincy, Mass.

Hendy Orders From Bethlehem Fourth 69,800-Dwt Tanker

Hendy International Company and Bethlehem Steel Corporation have reached agreement covering the construction at Bethlehem's Sparrows Point, Md., shipbuilding yard of a fourth 69,800-dwt tanker.

This tanker, scheduled to be completed in 1972, will be employed by the Standard Oil Company of California in its West Coast operations.

An earlier agreement between Hendy and Bethlehem, announced last August, covered three tankers of similar design and size. These will be in the Alaskan and West Coast service, and are scheduled for completion in 1971. Two will be employed by Atlantic Richfield Company, and one will be used by the Marathon Oil Company.

All four tankers will fly the American flag. They will be of Bethlehem's advanced bridge-aft design, with overall length of 810 feet, breadth of 105 feet and depth of 57 feet. Their breadth will permit transit of the Panama Canal if such service is desired.

To be powered by geared steam turbines developing 20,000 shp, these single-screw ships will have service speeds of better than 15 knots. They will be equipped with Bethlehem's Centralized Control System, permitting direct control from the bridge of ahead and astern power and speed.

The Bethlehem Sparrows Point yard also has on order from the Hendy organization a 34,000-dwt multi-product tanker which will be used by PPG Industries Inc. to transport chemicals from a new PPG complex in Puerto Rico to East and Gulf Coast ports of the U.S. This American-flag tanker is scheduled for delivery in 1971.

Also under construction or on order at the Bethlehem Sparrows Point shipyard are three 61,400-dwt tankers, four 37,250-dwt tankers, another special chemical products tanker, which like the PPG chemical carrier, is based on an adaptation of the yard's 37,250-dwt tanker design, two 719-foot, 34,000-dwt containerships for Matson Navigation Company, two ammunition ships for the U.S. Navy, and one forebody for the conversion of a T-2 tanker to a molten sulphur carrier.

In February this year, Bethlehem announced plans for the expenditure of more than $15-million to construct a huge shipbuilding basin at the Sparrows Point yard. This new facility, which will exceed 1,000 feet in length, will give the yard the capability for building tankers ranging to more than 200,000-dwt in capacity. It is scheduled for completion late in 1970. This basin will complement five existing shipways at the yard which are capable of handling ships up to 830 feet in length.

Pacific Tow Boat Appoints Officers

The Pacific Tow Boat Company of Everett, Wash., has appointed **R. Hallanger** general manager. Mr. **Hallanger** has served with the company since 1946 and has been a vice-president since 1967.

Pacific Tow Boat also named **Gail Layman** as vice-president and office manager, as well as assistant secretary-treasurer; **Elliot Brown,** assistant manager; **Sam Steadman,** chief dispatcher, and **Roland Halvorson,** port captain.

Pacific operates a fleet of 13 tugs on Puget Sound and in southeast Alaska.

Ingalls Shipbuilding Launches Mormacstar— Third Roll-On/Roll-Off And Container Ship

Mrs. William T. Moore Jr. champagne-christens the containership Mormacstar during the vessels launching at Pascagoula, Miss. Others participating in the ceremonies were, from left: **Miss Susan Roosevelt,** maid of honor; **Ellis B. Gardner,** senior vice-president of Litton Industries and president of Ingalls; **Andrew E. Gibson,** U.S. Maritime Administrator, and Mississippi Lieutenant Governor **Charles Sullivan.**

The third ship in a series of four Sea-bridge class containership being built for Moore-McCormack Lines was launched on April 11 by Ingalls Shipbuilding division of Litton Industries. Christened the Mormacstar, the 602-foot, 16,280-dwt ship is one of the first U.S. vessels specifically designed to handle roll-on/roll-off and containerized cargoes.

Mrs. William T. Moore Jr., wife of the vice-president of Moore-McCormack Lines, sponsored the $15-million ship. **Miss Susan Roosevelt,** sister of the sponsor, was maid of honor.

Principal speaker at the launching was **Andrew E. Gibson,** Maritime Administrator. It was Mr. **Gibson's** first public appearance since assuming his new post.

In his address, Mr. **Gibson** reviewed the policy statements issued by the **Nixon** administration with regard to the U.S. merchant marine. The basic theme of this policy is that "there is full recognition of the importance of seapower as it relates to the nation's welfare." The speaker then expanded on this policy by stating that the President has "appointed a team which is in full accord with these (President's) views. Secretary of Commerce **Stans** told the Senate Commerce Committee that it was his avowed purpose and intent to implement the statements of the President for revitalizing the American merchant marine."

Calling upon labor and management to unite behind a sound program which the administration is developing, the speaker stated that the merchant marine is not being studied because "it has almost been studied to death." Also, Mr. **Gibson** advised that they are not "questioning its vital role as an instrument of national policy" or viewing it solely from the defense aspect. "There can be no question," he said, "that every effort will be made to provide a merchant fleet of which this nation can be proud."

The 602-foot containership Mormacstar slides into the river after christening at Ingalls Shipbuilding division of Litton Industries.

Following the launching, the launching party toured the Mormacsea, the first ship of the Seabridge class which was nearing completion and has subsequently been delivered.

Insurance Requested From MarAd For Barge

Construction Aggregate Corp., Chicago, Ill., has applied to the Maritime Administration for construction and mortgage insurance to help build a 505-foot-long hopper, dredger barge with a cargo capacity of 10,000 gross tons.

The non-propelled craft is expected to cost $6-$6½-million. The mortgage coverage was put at about $4-million.

The dredge-barge will be 75 feet wide and will have a draft of 31 feet six inches. It is to be self-loading and self-unloading.

First Paceco-Mohr Dredge In U.S. Ordered

The Santa Clara Sand and Gravel Company, Sunol, Calif., has awarded Paceco, Alameda, Calif., a contract for the first Paceco-Mohr floating grab dredge for sand and gravel production in the United States.

This is the first to be built since Paceco was named exclusive U.S. licensee for the manufacture of the Mohr line of dredging systems originating in West Germany and in use in western Europe for more than 60 years. It is scheduled for delivery late this year.

The popularity of these dredges is attributed to their greater economy and efficiency over dragline, bucket and, in some cases, hydraulic systems; and their cost is nearly half that of comparable conventional equipment.

A luffing jib-type dredge for loading conveyors, the new dredge will have a maximum capacity ranging from 285 cubic yards per hour at a depth of 33 feet to 160 cubic yards per hour at 132 feet. Because it will be equipped with an automatic control system, the dredge can, under normal conditions, be operated unattended except for starting and stopping.

Paceco has designed, fabricated and marketed dredges and dredge accessories since 1923.

AEIL Names Esposito And Sturtz Treasurer And Controller

Michael J. Esposito has been elected treasurer and **Richard S. Sturtz** will replace him as controller for American Export Isbrandtsen Lines, **Manuel Diaz,** president of the steamship line, announced.

Mr. **Esposito** joined American Export Isbrandtsen Lines in 1963 as assistant treasurer and assistant secretary after serving 23 years with Isthmian Lines. He became AEIL's controller in 1966.

A graduate of Fordham University, he served as an Army officer in the European theatre during World War II.

Mr. **Sturtz** is a graduate of the City College of New York and is a certified public accountant in the State of New York. For four years after graduation he was associated with a firm of certified public accountants and then moved to Orion Shipping and Trading Company as senior accountant. He was later comptroller of Starboard Shipping Corporation for five years before joining Grace Line where he rose to the position of assistant treasurer. Before moving to AEIL in 1968 he served as vice-president and treasurer of Pittston Stevedoring Corporation.

Pacific Northwest Section, SNAME, Reviews Random Analysis Methods For Vibrations

Principals at the Pacific Northwest Section, SNAME, meeting in Portland, Ore. were, left to right: **Michael J. Markey,** Section chairman; **Bertel Lundgaard,** discusser; **Edward C. Lind,** chairman of the Columbia River Area; **Robert E. Clautice,** author; **Sherwood Gautice,** discusser, and **Ward E. Squires,** Section vice-chairman.

The Pacific Northwest Section of The Society of Naval Architects and Marine Engineers' recent monthly meeting was hosted by the Columbia River Area group. Prior to the dinner meeting and technical session, the group toured the Portland facilities of the Progress Electronic Co. of Oregon, Inc.

The technical paper, entitled "Random Data Analysis—A Design Aid for Ships," was presented by **Robert E. Clautice** of the Progress Electronics Company. The paper gives an introduction to the complex methods of analyzing vibrational and accoustical noise that may impair the utility value of structures. Three means of analyzing random vibration acoustic data were given. Mr. **Clautice** explained the importance of determining the vibration path. Time correlation analysis can be used to determine the major paths of vibration and to accurately measure the effects of design changes in the vehicle structure, the speaker noted.

During the business session of the meeting, **Lester Rosenblatt,** national membership committee chairman and president of M. Rosenblatt and Son, Inc., New York naval architects and marine engineers, spoke briefly on the Society's membership.

British Petroleum Will Order 80,000-Dwt Tankers In U.S.

The British Petroleum Co.'s (BP) annual report noted that the firm was going to place orders for two 80,000-dwt tankers in the United States.

The report also announced that "for our activities in the United States, a considerable amount of U.S.-flag shipping will be required for the movement of oil from south Alaska to the U.S. mainland."

BP, the report goes on, is also contributing $2-million to an experiment due to take place this summer in which the U.S. tanker Manhattan, after undergoing suitable modification, will conduct ice trials in the arctic. The result will help to establish the practicability of movement through the Northwest Passage from north Alaska to the Atlantic.

In his statement to the stockholders, BP's chairman **Eric Drake** stressed the company's progress in the United States as being of prime importance.

"There has been two significant developments," says Mr. **Drake.**

"One is the discovery of oil in our Prudhoe Bay acreage in Alaska. This is an area of some 96,000 acres wholly owned and operated by our subsidiary company in the United States, BP Oil Corporation. As we have said it will be some time before the potential of the well can be assessed and our holdings in the area can be evaluated, but the news is encouraging."

"The other is our entry into the U.S. market on the eastern side of the country by the purchase of certain marketing and refining assets formerly owned by Sinclair Oil and Atlantic Richfield, and now held by BP Oil Corporation."

Mr. **Drake** goes on to explain that even if the evaluation of the find in Alaska confirms expectations it will be three years before the oil reaches the market.

"For instance, a pipeline 800 miles long in which we have a share must be laid; a marine terminal must be constructed, and U.S.-built tankers must be obtained. In the meantime, we shall be consolidating and improving the interests we have taken over in the east, which include some 9,700 retail outlets, two large refineries, a share in a pipeline and many important installations, the price of $400-million being payable over the years 1972 to 1977."

Blount Marine To Build Puerto Rican Ferry

Artist's conception of first of four 3,000-hp auto/passenger ferries for operation in the Caribbean area.

Blount Marine Corporation, Warren, R.I., has announced the signing of a contract with Carib Star Line, Inc., of Santurce, Puerto Rico for the first of four 3,000-hp, 132-foot, auto/passenger ferries to operate in the Caribbean area.

Designed by Blount Marine, the 20-knot vessel will be propelled by four Blount POWR PODS (Trade Mark). Two of the pods will contain twin contra-rotating propellers capable of absorbing 1,000 hp each and two will have single propellers and contain steering rudders.

On inter-island runs without vehicles, the vessel will carry up to 500 passengers.

The hull will be constructed of steel and the superstructure of aluminum alloy.

Operations are scheduled to begin in October, 1969.

Norfolk Naval Shipyard Receives $20-Million Project

The Navy has assigned a $20-million project to the Norfolk Naval Shipyard, Portsmouth, Va., for alterations on and repairs to the aircraft carrier America (CVA-66). The work involved on this project is expected to take 10 months for completion.

Newport News Shipbuilding built the America in 1965; this is the first major overhaul job on this aircraft carrier.

Martinolich Building Offshore Fishing Boat

Peterson & Nes has contracted Martinolich Shipbuilding Corp., Tacoma, Wash., to build an offshore fishing vessel. To be equipped with a 585-bhp single diesel engine, it will have the following dimensions: 87 feet by 25 feet by 13 feet.

Burton To Build Oil-Well Supply Boat

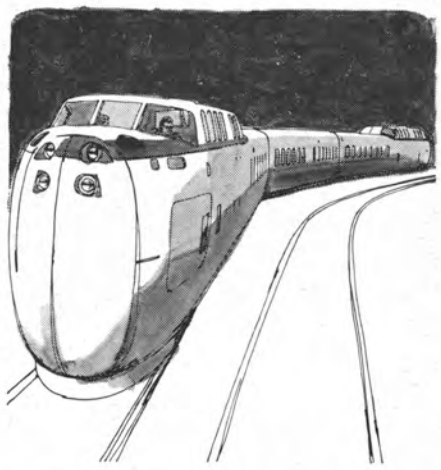
Dearborn Marine, Inc., has contracted Burton Shipyard, Inc., Port Arthur, Texas, to build an offshore oil-well supply boat. Designated Hull No. 458, it will have the following dimensions: 165 feet by 38 feet by 13 feet and will be equipped with 1,700-total-bhp diesel machinery.

You name it... Western Gear will design, build and deliver it!

Pictured below are just six examples of our Heavy Machinery Division's complete engineering-manufacturing-testing capabilities. ☐ Have you any problems that require complete mechanical systems and large precision machinery? We have the team and the tools to solve them—and we'll schedule the time it takes to find the solution. ☐ Our broad background and experience covers such varied industries as marine, transportation, steel, petroleum, communications, and science. From conceptual design to manufacturing, field installation and testing, look to Western Gear's Heavy Machinery Division. Write today for your free brochure. Western Gear, Heavy Machinery Division, Everett, Washington 98201.

western
GEAR CORPORATION

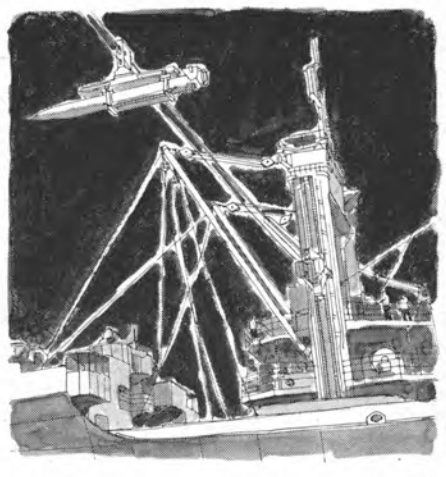
The Navy's first new sub-rescue/deep ocean salvage ships—250' long catamarans—will have an intricate recovery system designed and built by Western Gear.



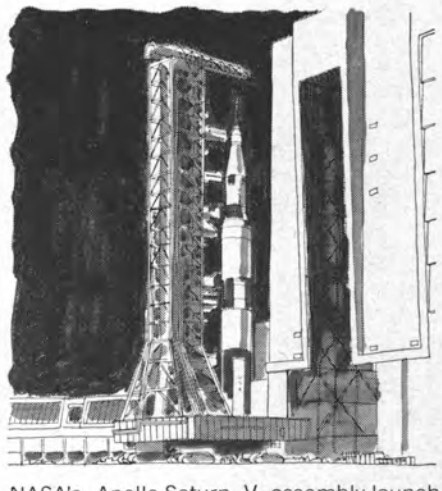
Western Gear designed and built the mechanical drive systems for United Aircraft's TurboTrains. In recent tests on the Boston-New York run the "commuter train" hit speeds up to 160 mph.

Western Gear is building and erecting two of the world's largest telescopes—to be installed in Chile and at Kitt Peak, Arizona.

For Bethlehem and other steelmakers we supply continuous casting machinery that eliminates several steps in the conventional steel making process.



Fast Automatic Shuttle Transfer (FAST) is a system we built for the Navy. It transfers missiles between ships at speeds up to 900 feet per minute—yet lets them arrive with less than 2 G's shock!



NASA's Apollo-Saturn V assembly-launch facility at Merritt Island, Florida, is the world's second largest building. Its opening/closing doors are 40 stories high, weigh 450 tons, and were manufactured and installed by Western Gear.

The Thomson Crane System

R. A. Hardin and J. E. Henriot*

During recent years much thought has been given to the design of ships and dry-cargo-handling systems. For maximum efficiency and economy, these systems are designed for specific cargo and trade routes and as such they lack flexible cargo-handling systems to serve other trade routes or tramp service.

The purpose of this paper will be to discuss a new dry-cargo crane system now in use throughout the world by numerous shipping lines desiring flexibility of cargo capacity and handling. This crane was developed by **John S. Thomson,** of Greenock, Scotland, some 15 years ago. They are manufactured in Scotland and built under license in several European, South American and Far East countries.

The first four Thomson cranes were fitted in 1964 aboard the MV Yamatada Maru, owned by the Yamashita Shinnihon Lines. Nine new vessels of this company are being fitted with Thomson rigs. Several other Japanese and Far East shipping companies have been outfitted with Thomson cranes, as well as Canadian, Australian and New Zealand ships. Brazilian shipyards have recently placed orders for Thomson cranes to be installed on 24 new ships. Cargo capacity of these cranes range from 5 to 60 tons. Proposals are currently underway to furnish 70- and 100-ton capacity Thomson systems for new construction in Scandinavia. To-date, no Thomson crane system has been installed on an American-flag carrier, however, a 30-ton Thomson crane or equal has been specified for seven MarAd Design C6-S-85-a/b ships to be built by Ingalls Shipbuilding Corporation for American President Lines and Farrell Lines.

Thomson cranes are adaptable to cargo loads ranging from 3 to 120 tons. For the purpose of illustration we will describe a 30-ton-capacity system.

The basic 30-ton Thomson ship crane system is made up of a rotating-luffing boom; cargo, luffing and slewing winches; wire-rope blocks; and cargo-hook assembly. The boom is stepped at the base of the ship's kingpost, with rope blocks secured to the kingpost cross member. A general arrangement for the 30-ton Thomson crane system is illustrated in Figure 1.

The base of the 61-foot by 22-inch-diameter tubular steel boom is fitted with a swiveling trunnion. The trunnion is equipped with Timken tapered bearings and mounts on a base about 3 feet high. The trunnion base contains crane motion limit switches and electric-cable junction box. The head end of the boom is fitted with a fabricated steel jib. Two 24-inch-diameter fixed sheaves are mounted on the jib tip and four 18-inch-diameter fixed sheaves are located near the middle of the jib. These sheaves are for cargo hoist lines and are mounted on anti-friction bearings. Two 16-inch-diameter, swiveling, roller bearing cargo blocks are located on the jib wings for cargo hoist lines. The boom is rated to handle 30 tons including spreader and rotator at a 58-foot radius when topped 25 degrees above horizontal and at a 15-foot radius when topped 76½ degrees above horizontal.

Nine 16-inch-diameter, swiveling, roller bearing cargo blocks are furnished for mounting on the ship's kingpost. One double-sheave block for cargo hoist line is mounted on the lower center side of the kingpost cross member. Six single sheave blocks are located across the face of the kingpost cross member for topping lines. Two single sheave blocks are located approximately 5 feet below the kingpost top on port and starboard posts for slewing lines.

One 50-hp and two 100-hp single divided-drum, electric winches handle the cargo, topping and slewing lines of the Thomson crane. The cargo and topping winches are rated to pull about 20,000 pounds at 140 feet per minute and the slewing winch is rated to pull about 6,000 pounds at 200 feet per minute. The winches are driven by 50 hp and 100 hp d-c motors with disc brakes. Winch motors are powered with dual-type motor-generator sets with 440-volt, 3-phase, 60-cycle, a-c drive motors, dual d-c generators, motor starters, push-buttons and stepless generator and winch motor controls. Each set of winches is furnished with two master control stations for port and starboard kingpost mounting. Each control console is fitted with a master switch for cargo winch control and a joystick-type master switch for topping and slew winch control.

A single continuous cargo line is reeved onto a split drum winch. One end of the line overwinds from one side of the winch drum through one sheave of the double kingpost block over a jib sheave, down through a load block sheave, up over a jib sheave and tip sheave, down through a load block sheave, up over and across the jib wing sheaves, back down to a load block sheave, up to a jib tip sheave, across a jib sheave and down to a load block sheave, returning to a jib sheave, back to the kingpost block and returns to the opposite side of the split cargo winch drum.

To provide a 4-part cargo lift, the upper double sheave block is unshackled from the cargo block and secured back to the base of the boom. The spacing of the boom jib head and jib wing sheaves spreads the cargo fall lines between the boom head and cargo hook in both longitudinal and transversal directions. The wire spread provides anti-pendulation and rapid damping characteristics to the cargo hook and load. Tendency to sway in either plane is resisted by tension in the cargo fall co-planer "V"s.

Two divided drum winches are also used for the crane topping and slewing falls. A single continuous line is carried by each winch for port and starboard sides of the system. One line overwinds from one side of the split topping drum through swiveling kingpost blocks, around fixed boom head sheaves in six part reeving and back to the slewing winch. The opposite side is reeved identically. Wire rope goes onto the split slewing drum, overwinding to one side and underwinding to the opposite side.

Boom luffing is then accomplished by taking up or paying out on the two-part luffing lines. The geometric relationship between the topping and slewing lines gives an inherent stability to the boom. At low luff angles and high slew angles, the rigging thrust tends to cause the boom tip to rise. To provide boom stability, the outboard slewing line sheave is located on the kingpost some 3 to 5 feet lower than the axis of the topping line kingpost sheave. The boom is slewed by rotation of the split slewing drum with one line taking in and the other paying out. For light loads, two topping pendants are unhooked from the boom jib and secured to the deck below the kingpost. Topping speed is effectively increased one-third for light loads.

To facilitate cargo handling from either side of the ship, dual control stations are provided, one mounted on each kingpost.

A conventional lever type master switch controls the cargo hoist, while a joystick master switch allows independent or simultaneous control of the topping and slewing winches. With 250 hp on the three winches, the Thomson crane is capable of handling 12 to 15 thirty-ton loads per hour.

For the rapid and efficient handling of containerized cargo, a fully-powered spreader frame is an important auxiliary device for the Thomson crane system. Since the spreader and container are lifted by a cargo hook, a single point self-leveling spreader is a necessity for rapid and accurate positioning of containers.

The standard container-handling spreader is fitted with an electro-hydraulic power package consisting of a single speed, a.c., squirrel cage motor; fixed displacement hydraulic pump and solenoid operated control valving. Hydraulic power

(Continued on page 16)

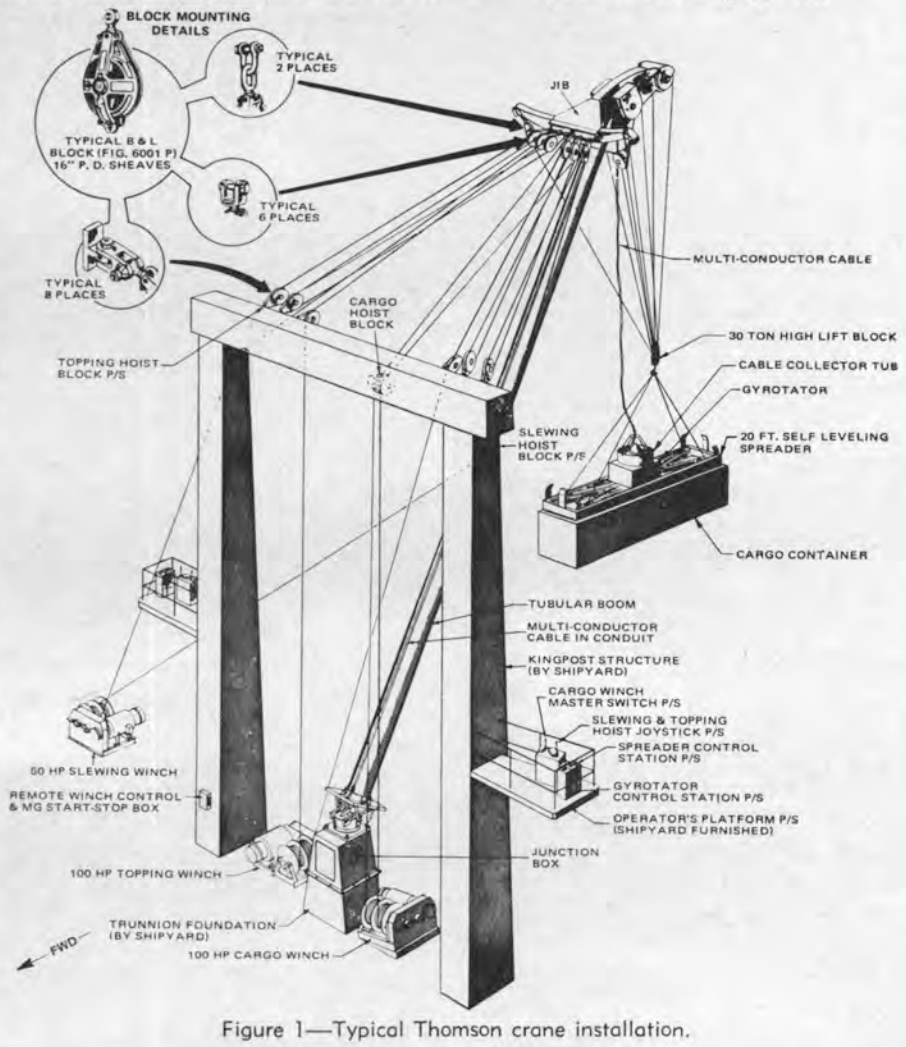
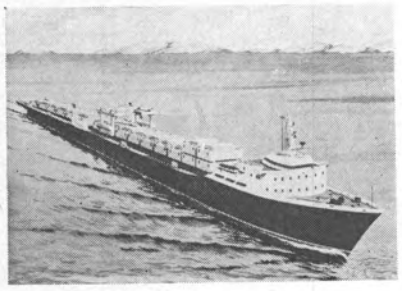


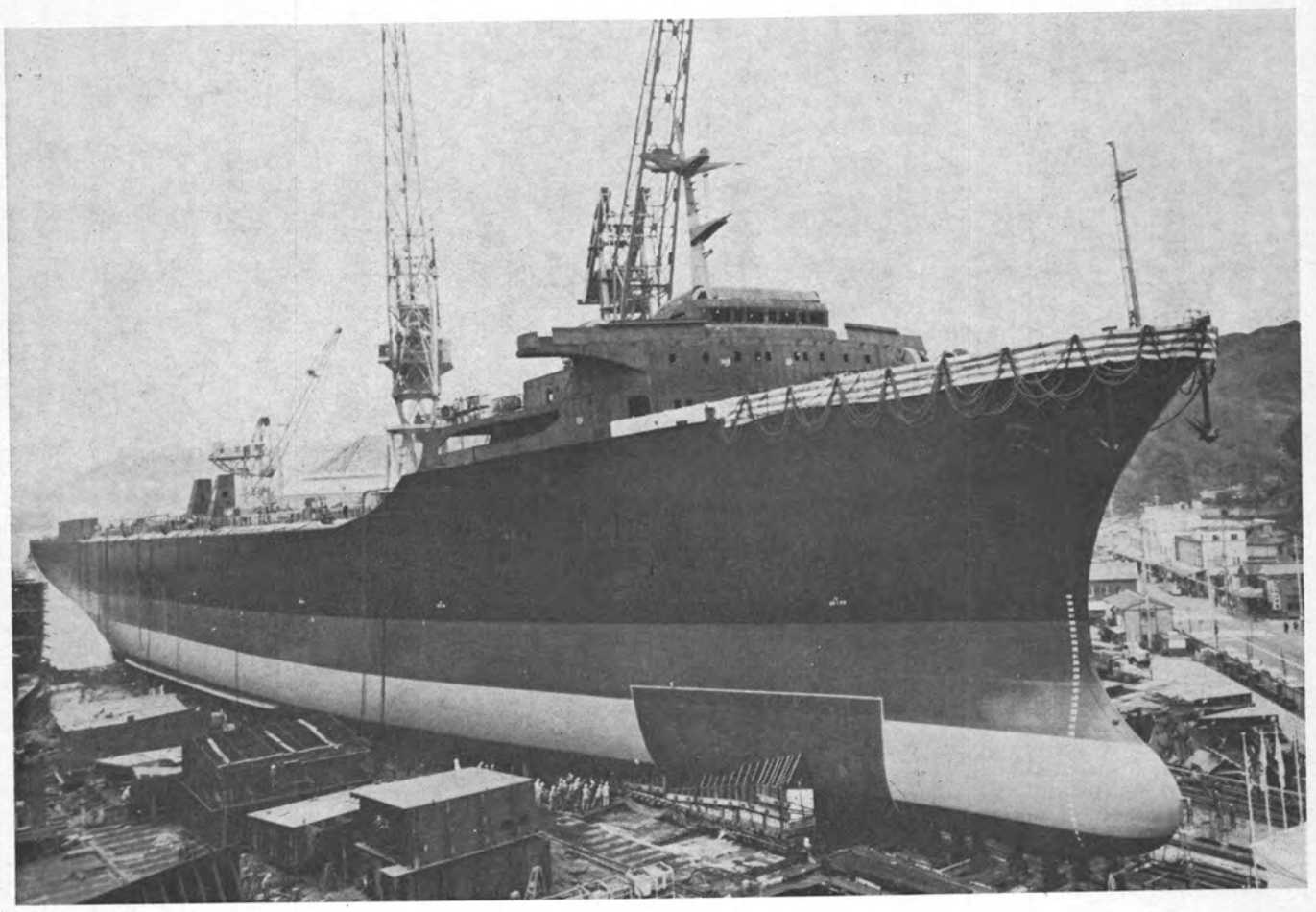
Figure 1—Typical Thomson crane installation.

*Mr. **Hardin** and Mr. **Henriot** of Skagit Corporation presented the paper condensed here before a recent meeting of The Pacific Northwest Section of The Society of Naval Architects and Marine Engineers.



LASH

CONSTRUCTION PROGRESSES



This is the world's first LASH ship.
It was launched in April and is scheduled
to be placed in operation this October.

The world's first LASH lighters
afloat at a fitting-out dock.

For all particulars, contact:

LASH SYSTEMS, INC. *SUITE 1414, 225 BARONNE ST., NEW ORLEANS, LOUISIANA, U.S.A.*

Thomson Crane

(Continued from page 14)

is used to actuate the spreader corner guide flippers and container twist locks. The self-leveling feature of the spreader is accomplished by reeving the four part wire-rope sling from a lifting ring, through sheaves located at each corner of the frame and deadened on hydraulic cylinder slide brackets. A multi-conductor cable for power and control circuits and cable collector brackets are fitted on the spreader. Control circuits are actuated from either the crane console or from a drop pendant station.

A container hanging from a single point spreader will tend to rotate and oscillate about the cargo hook due to boom rotation and wind loads. Tag lines, manned by stevedores, are currently used to stabilize and spot containers when handled by single point spreaders. Skagit Corporation has recently developed a gyro-stabilized rotating device which can be incorporated into a self-leveling spreader. With the gyro wheel rotating about a horizontal axis, it resists any effort of displacement above this axis, thus a spreader fitted with this gyrotator and carrying a container oriented along its longitudinal axis will hold this orientation even when the cargo boom is slewed or a wind load tends to rotate the container. By rotating the gyro cage, an opposite rotating force is induced in the spreader allowing accurate spot rotation.

Independent Petroleum Names DuSesoi V-P

Edmond J. DuSesoi

Benjamin Tyran, president of Independent Petroleum Supply Company (IPS), has announced the appointment of **Edmond J. DuSesoi** as vice-president of this company. IPS is a Natomas Company subsidiary handling petroleum sales and tanker activities for the Natomas Group. This includes the buying and selling of petroleum crude and products for their own account and acting as petroleum and tanker brokers for others. The firm's New York office is at 277 Park Avenue and other offices are located in San Francisco and London.

Mr. **DuSesoi** will continue as manager of IPS and vice-president of Natomas of Canada, Ltd. This company has petroleum storage and truck and marine terminal facilities in Quebec City.

Newport News Names Michaelian Manager Special Accounting

Charles T. Michaelian

Charles T. Michaelian has been named manager of the special accounting department at Newport News Shipbuilding and Dry Dock Co., Newport News, Va., a subsidiary of Tenneco Inc. The announcement was made by **E. J. Tanner,** vice-president finance and comptroller.

Mr. **Michaelian** has been a staff accountant in special accounting since he joined the shipyard in 1965.

A native of Jersey City, N.J., he graduated with honors from Pace College in New York City with a degree in business administration in 1952.

First employed by Arthur Andersen & Co., Mr. **Michaelian** held various accounting positions in New York and New Jersey before going into private industry.

Mr. **Michaelian** is a member of the American Institute of Certified Public Accountants.

Wilhelmsburger Moves U.S. Headquarters

Signalling the steady expansion of its activities in the American market, Wilhelmsburger of West Germany, manufacturers of heavy-duty plate-forming equipment, has moved its subsidiary, American Wilhelmsburger, to larger quarters in Orange, N.J.

At the new location, a suite of offices serves as headquarters for American Wilhelmsburger's sales and engineering service staff. From the Orange offices, the company's European-trained technicians can serve customers' needs in all parts of the country in the shortest possible time.

Wilhelmsburger supplies standard and custom-designed plate-forming equipment for shipbuilding and other heavy-plate fabricating industries around the world. Complete information on the various types of machines may be obtained by writing American Wilhelmsburger, 311 Reynolds Terrace, Orange, N.J. 07050.

Mobil Names Knepper Manager Gulf Coast

Mobil Oil Corporation has named **John T. Knepper** manager of Gulf Coast operations in their marine transportation department, effective July 1. Mr. **Knepper** joined Mobil Oil in 1947.

Tarr Named President Of Delaware Terminal

Robert J. Tarr

Robert J. Tarr, formerly executive vice-president and vice-chairman of the board of Luckenbach Steamship Company, Inc., has been named president and chief executive officer of Delaware River Terminal and Stevedoring Co., Inc., Pier 179 North, Philadelphia.

The joint announcement was made by **Edgar F. Luckenbach Jr.,** chairman and **Robert P. Levy,** vice-chairman and co-owners of Delaware River Terminal and Stevedoring Co., Inc., who stated they were fortunate in bringing to Philadelphia from New York one of the most qualified men in the country in ship and terminal operations, stevedoring and steamship agency activities.

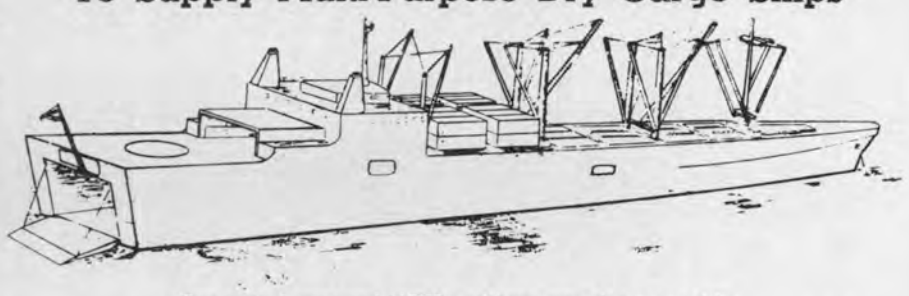
Mr. **Tarr** had been associated with Luckenbach for 32 years, starting as a teenager on the New York waterfront and rising through the ranks to become the number two executive in this 119-year-old family-owned company. He has also served as an officer and director of several other corporations.

A naval reservist for over 26 years, with the present rank of captain, Mr **Tarr** spent three years as an officer on active duty in World War II participating in the planning, assault and invasion of Normandy for which he earned the Bronze Star Medal with Combat V, the Navy Commendation Medal and other citations.

He has completed courses at Naval Reserve Officer Schools, including the Senior Reserve Officers Course at the Naval War College, and graduated from the Advanced Management Program at Harvard University as class president.

Commenting on his new position Mr. **Tarr** stated, "It would have been easy to remain secure in New York while expressing great optimism about the future of the Port of Philadelphia, but how much more meaningful to be here doing my best to help make it happen!"

MSTS Requests Expression Of Interest To Supply Multi-Purpose Dry Cargo Ships



Concept of proposed MSTS multi-purpose dry-cargo ship.

The Military Sea Transportation Service requested expressions of interest on April 19 from ship operators and owners in the building and chartering to MSTS multi-purpose dry-cargo ships. The prospective offerers were requested to respond by May 15.

MSTS has developed a conceptual design for this type of ship. The design is "ideally" suited to the needs of the Department of Defense, according to the announcement. Also, MSTS feels that the design concept also can be readily adapted to commercial needs, especially container operations.

It is planned that MSTS will institute a charter and build program utilizing this design concept as a basic ship for replacement of existing MSTS-controlled fleet tonnage. The number of ships contemplated for initial ordering or total number were not given but indications have been given that the program would eventually involve about 30 ships.

The design characteristics given for the design are: length overall —648 feet, length between perpendiculars—582 feet, beam—92 feet, depth—67 feet, full-load draft—30.7 feet, full-load displacement—31,960 tons, light ship weight—9,719 tons, speed—21 knots, crew —35, dry-cargo cubic (bale)—1,840,000 cubic feet, and cruising radius—12,000 nautical miles. The cargo-handling gear is to consist of two 120-ton booms, fourteen 20-ton booms and one 10-ton boom. A roll-on/roll-off deck area of 120,-870 square feet is provided. Also, the vessel will be capable of carrying 1,118 20-foot by 8-foot by 8-foot containers.

Vice Adm. **L. P. Ramage,** commander, MSTS, stated that "the devlopment of this program will proceed with due regard for continued MSTS support of commercial berth services. It is to be emphasized that this ship is designed to meet specific military objectives including requirements for operating under a variety of conditions, and rapid response. Accordingly, the ship possesses characteristics not normally available in commercial shipping."

MSTS requested responders to include comments in their expression of interest as to the possible contractural arrangements, such as, time or bareboat charters and on the proposed design with a view toward possible improvement.

Cargo Bureau Issues Container Stowage Manual For Shippers

In response to requests from the Maritime Administration and from a large number of shippers, the National Cargo Bureau has published a 24-page manual on the safe stowage of cargo containers for all types of transportation. The first copy of the "Shippers' Guide For Proper Stowage Of Intermodal Containers With Emphasis On Ocean Transport" was presented to Maritime Administrator **Andrew E. Gibson** by **Thomas M. Torrey,** president of the National Cargo Bureau and resident vice-president of the Insurance Company of North America, during the NCB's annual meeting at its headquarters in New York.

Capt. **Hewlett R. Bishop,** executive vice-president of the Bureau, said the booklet is designed to combat a steady rise during recent months in the incidence of serious damage reported by insurance interests to cargo and containers, many of which are loaded far from the seacoast in all countries of the world. Most of the incidents of damage could have been avoided if the men who loaded the containers had followed the simple directions contained in the "Shippers' Guide," Captain **Bishop** said. Distribution of the guide began immediately after the NCB's annual meeting. Copies of the booklet are available in quantities to shippers and others interested in container stowage at nominal costs from National Cargo Bureau, Inc., 99 John Street, New York, N.Y. 10038. A single copy may be obtained from the same address by sending a self-addressed, stamped (12¢ postage) number 10 envelope.

Association of American Railroads, American Trucking Association, Work Group on Surface Intermodal Container Systems of the Transportation Facilitation Committee of the Department of Transportation, American Institute of Merchant Shipping, American Institute of Marine Underwriters, including the United States Coast Guard, cooperated in preparing the guide, Captain **Bishop** noted. The manual contains guidelines which can be applied to loading all types of cargo into containers for rail and truck as well as marine transportation. However, the emphasis is on ocean transportation because of the violence of sea movements during storms.

In addition to covering the problems of stowing cargo into containers, the guide contains a section on dangerous and incompatible cargoes and includes a bibliography of sources for more detailed information on stowage, if needed.

Mr. **Gibson** was one of seven new directors elected to the National Cargo Bureau's board of directors at the annual meeting. The others were: **R. W. Berry,** vice-president of United Fruit Company; **W. B. Fowler,** president of American President Lines; **R. W. Hahn,** vice-president, Great American Insurance Co.; **R. A. Murphy,** director, Chubb & Son Inc.; **J. B. Ricker Jr.,** chairman, Marine Office-Appleton & Cox, Inc., and Capt. **A. P. Spidle,** vice-president, operations, Prudential Lines, Inc. Mr. **Torrey** was re-elected to his position as president. **G. C. Halstead,** president, Alcoa Steamship Company, Inc., was re-elected first vice-president, and Mr. **Murphy** was re-elected treasurer. Captain **Bishop,** executive vice-president and chief surveyor, and **Jerome P. Scully,** secretary, continue in their respective positions.

During 1968 the National Cargo Bureau performed an average of 3,000 inspections a month of ship and container stowage and of cargo gear. Continuing its activities as a forerunner in the field of maritime safety, Mr. **Torrey** said the bureau expended $31,000 last year in research and development. Part of this sum was for experiments conducted jointly with the Coast Guard and maritime industry which will result in a rewriting of Chapter VI on loading grain in the 1960 Safety of Life at Sea Convention.

The bureau continued to press other educational programs with the result that its self-study course in ship's stability has an increased enrollment. To date 207 have satisfactorily completed the course, Mr. **Torrey** reported, and 217 are enrolled. All the bureau's surveyors have completed the course and have been certificated.

Brochure Describes Atlas Products To Cut Maintenance

Products that provide fast, easy, economical answers to thousands of utility, transportation, marine, building, institutional and general industrial patching and repair jobs are described in Industrial Bulletin A-7 from Atlas Minerals & Chemicals Division, ESB Incorporated, Mertztown, Pa.

A selection of photographs illustrates the Atlas products in a variety of applications. The brochure lists package descriptions for each product.

Atlas products described include, Exide Epoxybond Putty, new stick-form epoxy that mixes like putty and hardens like steel to repair almost anything; Exide Mari-Crete, fast setting concrete for easy, high-strength patching and repair of concrete roads, bridges, curbs and other installations and Exide Epoxyglass, a 3- by 12-inch prepared fiberglass repair patch for low-cost permanent repairs of holes and damage in wood, steel, fiberglass, aluminum, plastic and masonry.

Also described is Exide Epoxybond Paste for jobs needing a relatively thin film and high bond strength; Exide Hi-Brasion Filler for repairs to resist heavy abrasion, cavitation and wear; Exide Polyhinge, an all-purpose, continuous thermoplastic hinge that never needs oiling, yet wont rust or squeak, and Exide Polycaulk, a permanently flexible one-part sealant for general indoor or outdoor use with standard caulking guns.

Paceco Names Thrane Industrial Eng. Manager

James C. Thrane

James C. Thrane has been named industrial engineering manager by Paceco, Alameda, Calif. In his new position he will be responsible for the company's proposal service group, planning and industrial engineering departments.

For three years Mr. **Thrane** has been assistant manager of operations for Paceco. He joined the company in 1946 as a machinist. Since then he has held positions as machine shop supervisor, chief estimator and estimating and planning manager.

Paceco designs and manufactures heavy steel equipment such as container and bulk-handling cranes, dredges, barges, tugs, and beach-loading vessels.

IHI-Brazil To Build Mammoth Repair Dock

Ishikawajima-Harima Heavy Industries, Ltd. (IHI) recently announced in Tokyo that it intends to build a giant construction dock in Brazil. The new facility will be a joint venture between IHI's Brazilian subsidiary and the Brazilian government.

The dock, estimated to cost between $6- and $7-million, will be capable of handling 300,000-dwt supertankers. Completion is scheduled for 1971. It will be the largest building and repair dock in Latin America.

Ishikawajima do Brasil Estaleiros was set up as a joint Brazilian-Japanese venture by IHI and the Brazilian government 10 years ago for building and repairing ships.

Isthmian Elects Three Vice-Presidents

A. T. DeSmedt, president of States Marine-Isthmian Agency, Inc., has announced that the company's board of directors has elected the following: **Gerald Schryver** as vice-president of United Kingdom, Continent, Mediterranean, Red Sea, South Africa and Persian Gulf services; **Walter J. Kilroy** as vice-president of project development, and Capt. **George Corke** as vice-president of Pakistan, India, Ceylon services. **Gordon E. Torrey,** assistant vice-president, was named manager of conferences and rates for all services.

Career Seminars Sessions Given At Kings Point By Leaders Of Shipping Firms

Representatives of shipping companies recently visited the 1969 graduating class of the U.S. Merchant Marine Academy, Kings Point, N.Y. to conduct three separate career seminars.

The shipping picture was presented in detail by officials from the East Coast, Gulf, West Coast and Alaska. Advantages were discussed in careers that featured container, dry cargo and tanker vessels, as well as the lighterage and barges of inland waterways and the U.S. Army Corps of Engineers.

Rear Adm. **Gordon McLintock,** Academy superintendent, welcomed the seminar groups to the Academy following luncheons held at the Officers Club. Comdr. **Charles Renick,** alumni officer and placement director, arranged the seminars.

The first classmen, who will receive their merchant marine licences, degrees and U.S.N.R. commissions on June 4, heard speakers in three separate sessions.

During the seminars, checks were presented to the Kings Point Fund by Capt. **Edmund Marcus,** for Gulf Oil Company and **Lewis J. Heroy,** for Reynolds Metal Company.

Second session of Kings Point Career Seminar, left to right: 1st row, **M. Schiebel,** Marine Transport Lines; Rear Adm. **Gordon McLintock,** superintendent, U.S. Merchant Marine Academy; **L.J. Heroy,** Reynolds Metals Co.; **J. Culbertson,** Cleveland-Cliffs Steamship Co.; rear, **Henry Clark,** Alaska Steamship Co.; **Thomas Murphy,** Marine Transport Lines; **R.C. Davis,** U.S. Steel; Capt. **F.K. Riley,** Farrell Lines; **Robert Kron,** Management & Shipping Transport, Inc.; Capt. **Bernard Murray,** Marine Transport Lines; **James Gaskell,** Cleveland-Cliffs Steamship Co., and **A.L. Edwards,** Chevron Shipping Co.

Kings Point Career Seminar Group at first meeting, left to right: 1st row, Capt. **P. Gellerman,** American President Lines; Rear Adm. **G. McLintock,** superintendent, U.S. Merchant Marine Academy; **D. Cameron,** Hudson Waterways Corp.; **L. Cirillo,** Gulf Oil Co.; 2nd row, **C.O. Tobey,** Mobil Oil Corp.; **R.A. White Jr.,** Texaco; Capt. **E. Marcus,** Gulf Oil Co.; Capt. **A.G. Fialcowitz,** American Export Isbrandtsen Lines; 3rd row, Capt. **F. Hearn,** Mobil Oil Corp.; Capt. **J.M. Farrell,** Waterman Steamship Corp.; **A. Bacols,** States Marine Isthmian Agency, Inc.; 4th row, **W.M. Gage,** Mobil Oil Corp.; **F.J. Rhatigan,** States Marine Isthmian Agency, Inc.; Capt. **E.J. McClafferty,** American President Lines, and Capt. **T.W. Merrell,** Texaco.

Third session of Kings Point Seminar Group, left to right: 1st row, **Mrs. Margaret Igoe,** U.S. Army Corps of Engineers-Philadelphia; Rear Adm. **Gordon McLintock,** superintendent, U.S. Merchant Marine Academy; **Thomas Jordan,** Sea-Land Service, Inc.; **H. Rosenbush,** Military Sea Transportation Service; 2nd row, **John Alban,** Poling Transportation Corp.; **Joseph Keegan,** U.S. Army Corps of Engineers-Philadelphia; **Harvey J. Borgen,** Humble Oil & Refining Co.; Capt. **Frank Hooper,** Humble Oil; 3rd row, Capt. **George Ryan,** Grace Line, Inc.; Capt. **Warren Leback,** Sea-Land Service Inc.; **Walter Staret,** U.S. Army Corps of Engineers-Philadelphia; 4th row, **Thomas J. McTaggert,** Humble Oil; **John Sexton,** U.S.A. Corps Eng.-Philadelphia, and **J.W. Tierney,** American Trading & Production Corp.

U.S. Yards Gearing Up For Upsurge In Orders

The nation's shipbuilding industry is investing hundreds of millions of dollars in facility upgrading and expansion programs in the belief that a large upsurge in merchant ship orders is inevitable in the years immediately ahead, according to an industry spokesman.

Edwin M. Hood, president of the Shipbuilders Council of America, appearing before the House Merchant Marine and Fisheries Committee, said his industry will have ample capacity to handle the enlarged shipbuilding programs when they materialize.

Mr. **Hood,** testifying on HR-4152, which authorizes $15.9-million to be appropriated for government-sponsored merchant ship construction in fiscal year 1970, spoke critically of the "starvation" levels of appropriations for such purposes during the past decade.

"The inadequacy of merchant vessel construction funds requested for fiscal 1970, embodied in the authorization bill, HR-4152, now before you, has been emphatically demonstrated by the testimony already presented by spokesmen for shipowners and ship operators. A measure of corroboration can be found in the 1968 Annual Report of the Maritime Administration: It is reported that some 35 American shipping lines, including both subsidized and unsubsidized operators, have indicated a collective requirement of 220 new merchant ships of all types during the five-year period 1969-1973.

"This total averages 44 ships per year. Taking into account the availability of 'carry-over' funds plus the $15.9-million in new money requested for FY '70, the Maritime Administration will only be able to enter into commitments for 10 ships in the coming fiscal year."

Mr. **Hood** told the committee that every major shipyard in the country is engaged in either a capacity-expansion or upgrading program. He said two yards doubled their capacity last year, two entirely new yards will be in operation next year and additional yards have plans to increase their output.

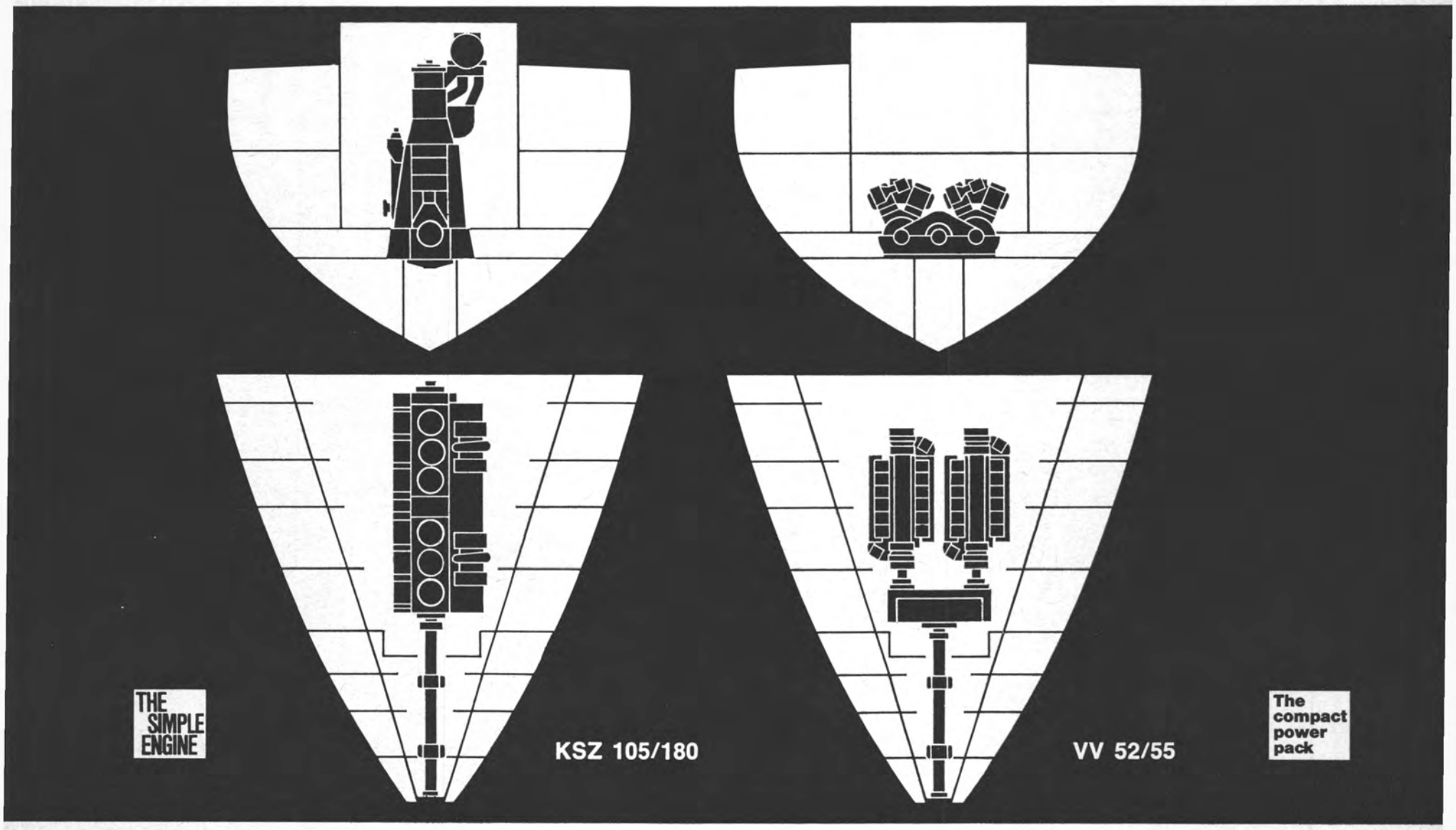
"The shipbuilding industry of the United States has invested more than $400-million in the last decade in new or improved facilities, and the plans to which I refer could involve a doubling of this expenditure should a major shipbuilding effort become a reality. All signs point toward continued heavy capital expenditures well into the 1970's. These investments, actual and prospective, reflect a confidence and faith that this nation will, in the years immediately ahead, restructure shipbuilding programs to deal realistically with the block obsolescence that has overtaken the merchant fleet as well as the naval fleet."

As a result of the facilities improvement programs, Mr. **Hood** said U.S. shipbuilders could, as a minimum, handle orders for an additional 35 to 40 merchant ships per year.

NSSC Issues Contract For Eighty Garbage Lighters To Nine Yards

Contract IFB N00024-69-B-0606 has been issued by the Naval Ship Systems Command, Washington, D.C., for the construction of eighty 124-foot YGN garbage lighters to the following nine yards: Atlantic Marine, Inc., Fort George Island, Fla.; Colberg, Inc., Stockton, Calif.; Gretna Machine & Iron Works, Inc., Harvey, La.; Marinette Marine Corp., Marinette, Wis.; Martinolich Shipbuilding Corp., Tacoma, Wash.; Twin City Shipyard, Inc., St. Paul, Minn.; Weaver Shipyards, Orange, Texas; Zidell Explorations, Inc., Portland, Ore., and New Bern Shipyards, Inc., New Bern, N.C.

Tomorrow's Diesels today



We can offer you the optimum solution to your propulsion problem – optimum also in terms of the future, regardless of whether this solution involves a slow-speed two-stroke engine or a geared layout incorporating a medium – speed four-stroke unit.

Two examples of marine propulsion:

1.: M. A. N. KSZ 105/180 – the simple engine (valveless), 1800 HP/metre of overall length. Even under 22 % overload, all values measured stay within permissible limits thereby proving the high reliability of this engine.

2.: M. A. N. RV and VV 52/55 – the compact engine, 130 HP/cubic metre of space required. This medium-speed heavy oil unit combines high output per cylinder with low weight and reduced space requirement.

M·A·N

ICHCA Studies The Radical Changes Developing In Bulk-Cargo Transportation

Bulk transportation is passing through a period of change that will have far reaching effect on ocean, coastal and inland transportation. This was the consensus of opinion expressed by the speakers at the recent International Cargo Handling Coordination Association's conference on bulk transportation held in New York.

While the container explosion has dominated the news in international transportation in recent years, another trend no less important has proceeded with much less publicity—this has been the "quiet" bulk distribution revolution. Based on this theme, the U.S. National Committee of ICHCA sponsored the symposium that brought forth some of the new developments in this field.

The symposium was opened by **A. T. DeSmedt,** president of the U.S. National Committee and president of Isthmian Lines, and **R. P. Holubowicz,** deputy chairman and a vice-president of Ingalls Shipbuilding Division of Litton Industries. Five technical papers were presented during the full-day session.

Hugh C. Downer, senior vice-president, Marcona Corp., presented the first paper, entitled "The Latest Technological and Economic Developments In Ocean Transportation." Mr. **Downer** traced the growth and changes in his firm since it started operations in 1954 to indicate the rapid changes in bulk transportation. As an example of the trend, he noted that when Marcona first started shipping iron ore from Peru to Japan, using 10,000-ton Liberty ships, the transportion cost was about $16 per ton. Now, with the large ore carriers of about 105,000 dwt, the cost to Marcona is about $3.75 per ton. Coupling the size increase with efficient ship designs which permit backhaul cargoes of oil, etc., the entire bulk transportation picture has changed.

He also described Marcona's new ships which are being built in Japan and detailed the economics of the proposed operation with them. Further, Marcona's research group has been investigating the use of other methods of carrying dry bulk cargoes. One such method is transportation in slurry form which permits rapid loading and unloading.

The second speaker was Dr. **A. T. Yu,** vice-president, operations, Robins Engineers and Constructors. Dr. **Yu** described several forms of modern bulk handling facilities both at ports and inland.

Phillip J. Maddex, engineering and management consultant, spoke on "Transportation of Bulk Ores and Minerals In World Markets." Mr. **Maddex** explained how the entire transportation system for shipping borax from Los Angeles to Europe was changed. This change involved the discarding of a bag method and going to a bulk method. In order to do this, the system was changed from mine to user with ships being a part of the system. In going from a bagged product to bulk included new ships. In order to make these economic, they were designed to carry Volkswagens to the U.S. on the return voyage.

Mr. **Maddex** said "Twenty to 80 percent of the landed cost of raw materials and minerals reflect the cost of transportation in some form. This monumental amount of money represents a very fertile area for savings, and we believe that insufficient efforts have been made in this direction."

"Total Systems Approach On Bulk Cargo—With Emphasis On Intermodal Operations" was the title of the fourth paper, presented by **Robert Farnsworth,** Matson Research Corporation. He spoke on the needs to tie all transportation together from source to user and the requirement to eliminate non-paying operations such as empty return voyages. In particular, Mr. **Farnsworth** stressed that one way to eliminate empty legs of a voyage was for the bulker to handle containers. He feels that this would be a natural and economic marriage.

L. Robert Folan, vice-president, Ohio River Company, presented a paper entitled "Case History—Integrated Transportation System—Inland Waterways." Mr. **Folan** described the barge operation recently instituted by his firm between Tampa and Louisiana. In this service the total systems approach was used for moving Florida potash to user for conversion into fertilizers.

Following the technical papers, a panel discussion was held with **Henry G. Hohorst** serving as moderator.

Super M.A.N. Engine Developing 32.000 HP Ordered For Bulk Ship

The largest M.A.N. engine so far was ordered by the Hamburg shipyard, Blohm & Voss AG, as the driving engine for a 145,000-ton bulk cargo vessel, which they are building for the "Frigga" AG Shipping Company, Hamburg. The new M.A.N. KSZ 105/180 type eight-cylinder, two-stroke engine was developed from the present series of cross-head engines. With the 1,150-ton super-engine having an output of 32,000 hp, the ship, which will be completed by the summer of 1971, will attain a speed of 16.1 knots. The engine will be turbocharged to the constant-pressure parallel injector-drive system.

To ensure easy and time-saving maintenance of this huge engine, despite the heavy individual parts, M.A.N. has developed special hydraulic tools and equipment to enable a considerable shortening of the time previously taken to maintain large-bore engines.

Steamship Accounting —A Useful Textbook For Company Officials

Thousands of volumes have been written in the area of accounting for manufacturing and merchandising industries, but very few publications have dealt with accountancy for the shipping industry. Now in "Steamship Accounting" by **Philip C. Cheng,** Ph.D., C.A., the subject is presented in comprehensive form dealing with the peculiar accountancy techniques, practices, and problems of the industry. It does not represent an attempt to catalog every conceivable financial and accountancy question in the industry, since it is believed that a comprehensive treatment of the more critical areas would be more useful and constructive. Several important special considerations and critical analyses are explored, with a discussion of the pros and cons of various suggested solutions and the author's views as to the best solutions.

The investigtion may frequently prove useful in the analysis of income tax problems ordinarily encountered by steamship companies. Since acceptable tax practices are not always consistent with good accounting principles, the results in this respect would sometimes be disappointing. Maritime industry taxation is somewhat unique and differs significantly from the taxation of subsidized steamship companies. The income tax problems are discussed as they arise throughout the book.

The coverage in this book encompasses the subject matter of both shipping operations and accounting and is designed to foster a better understanding of the relationship between the two. Emphasis is placed upon the application of accounting principles and accounting theory to the steamship business.

In the preparation of this book Dr. **Cheng** has had the cooperation of numerous individuals and firms in the shipping industry, and the U.S. Maritime Administration.

"Steamship Accounting" is published by Cornell Maritime Press, Inc., of Cambridge, Md., at $10.00 a copy and is available from or through, any bookdealer or nautical chart dealer.

N.Y. Section, SNAME, Advised Of Problems In Designing Boiler Forced-Draft Systems

Taking part in the New York Section meeting were, left to right: Front row, **R.P. Giblon,** author; **K.M. Shauer,** author; **M.D. Macpherson,** Section vice-chairman; **R.G. Mende,** Section chairman, and **I.H. Rolih,** author; back row, **W.I. Signell,** Section secretary-treasurer, and **H.J. Karsch,** Section papers chairman.

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers was advised at its April meeting, that the boiler forced-draft system merits more attention than it often receives. With this opening comment, **R. P. Giblon, K. M. Shauer** and **I. H. Rolih,** all with George G. Sharp, Inc., New York, naval architects and marine engineers, proceeded to detail combustion air requirements, fan sizing, draft losses and firing rates in a paper entitled "Design Considerations for Boiler Forced Draft Systems."

The authors pointed out that a margin must be included in the fan capacity and head, not because the designer is leaving room for error, but because non-standard operating conditions will be encountered. They recommended that the fan margin be set at 15 percent in capacity, after adding for leakages in the rotary air heater and the boiler casing. The margin in head was specified as 32 percent.

The paper also illustrates why the forced-draft system must be designed for the lowest practical pressure drop in order to limit the size of the electric drives. This assumes more importance as the size of ships' powerplants increases, since the fan drives are very likely to control the selection of generator size.

Another important conclusion given in the paper was that: "There is generally no economic drive to design the burner system for high turndowns in order to lower minimum firing requirements. This practice entails unnecessarily high draft losses through the burners at normal evaporation, unless dual-throat burners are applied. In general, lower draft losses at normal operation plus acceptance of increased steam dumping at stand-by is a more economical approach."

ARTUBAR—Articulated Tug/Barge System

For many years, various attempts have been made to develop a system of an articulated tug and barge. The increasing use of large barges, and the economic gains possible from transocean barge operations has provided an incentive for the development of a means to connect a tug and a barge which would permit relatively high sea speeds and positive control of the barge.

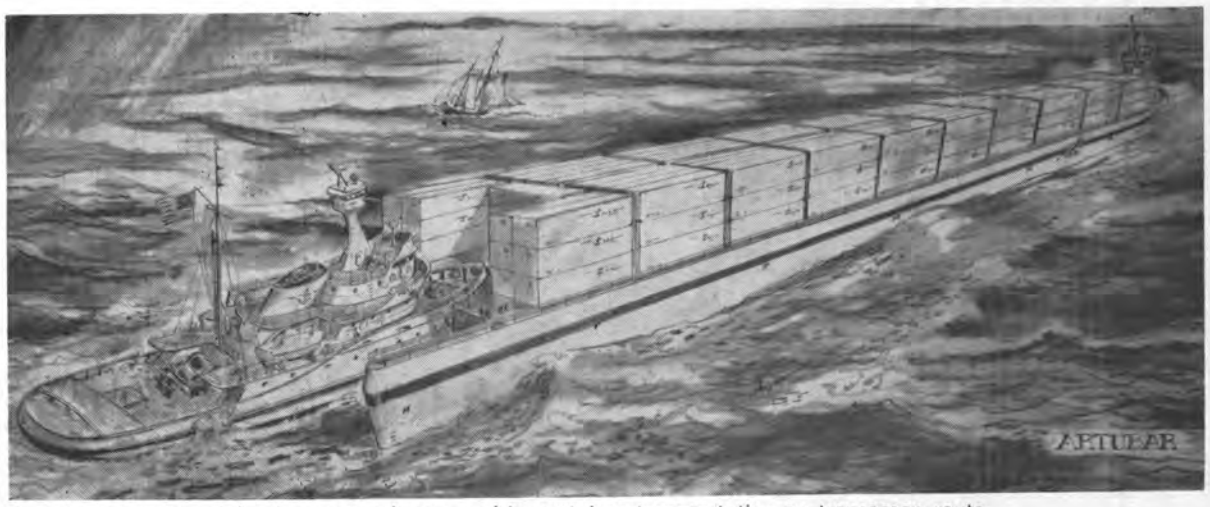
A system, called "Artubar," that may provide the answer to this problem, has been developed by Edwin H. Fletcher Associates, of Jacksonville, Fla., in conjunction with U.S. Freight Company. A large number of engineering studies and model tests have been made of this system and patents have been applied for. The Artubar system involves not only the tug but also the barge. The tug, which is a separate twin-screw, self-sufficient unit capable of towing, or other tug work, is fitted with hydraulically operated connective devices at the bow. The barge has a notched stern, extended stern wing walls, and a slot to receive the tugs connecting devices.

The Artubar connection, designed to accommodate changes in draft in the barge, acts as a shock-absorbing connection, as well as a fixed energy-absorbing connection. It can be remotely controlled from the tug or the barge and, most important, it can be connected or disconnected within a matter of seconds, even at sea, without any requirement for deck hands to participate.

Testing of the system has involved models 9 feet, 11 feet, 27 feet and in excess of 31 feet in length. These models have been tested in just about every conceivable type of sea to the practical limit of the testing tanks capabilities. Such tests have been run in European and U.S. model basin centers.

This testing program involved various configurations for the barge. Spoon bows and ship bows and fixed skegs and activated skegs were all tested, extending over a draft ranging from about five feet to 31 feet and speeds equivalent to 15 knots. It seems reasonable to the designer that even higher speeds are practical.

The designer feels that much can be done to improve the concept by designing the tug for this type of operation. So far, the testing has been done with conventional tug forms. All the effort has been concentrated on the barge to date. By developing a proper full ship's bow design, superior tracking has been achieved, resulting in greater speed, especially under adverse weather conditions. Directional stability has been obtained without the usual skeg losses and without a complicated arrangement of bow rudders, etc.



Artist's conception of Artubar system being used in container transportation on transocean route.

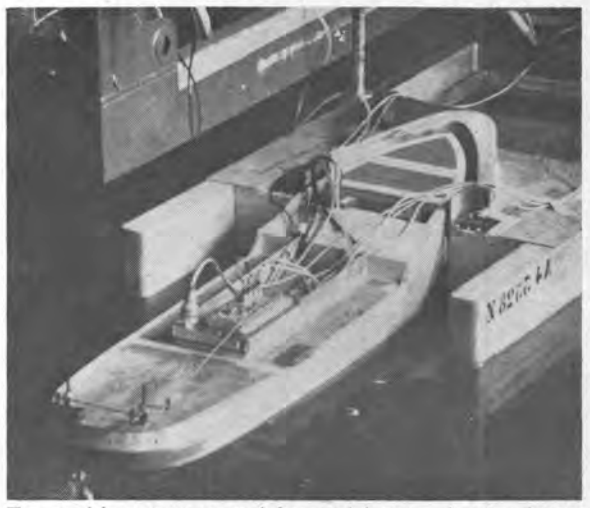
The design developed proves that speed-length ratios of 0.70 are economically realistic —a considerable increase over present ratios. Even higher speed-length ratios may be economically feasible, depending upon the type of barge, route, and cargoes to be carried.

In reference to disconnection at sea—when one stops to think of the configuration of the barge and tug, it is extremely simple and safe, regardless of the type of sea in which the unit is operating. In extremely heavy seas, the tug would adjust its course to head the barge directly into the sea. As soon as this course has been maintained, the tug would reduce power, retract the pins, and let the barge with its momentum pull ahead. The same could be achieved even in a heavy following sea. At all times a tow line can be connected so that if a tug and barge are disconnected at sea, the hawser could be run out and the barge taken under tow. Connecting the barge and tug at sea is also possible.

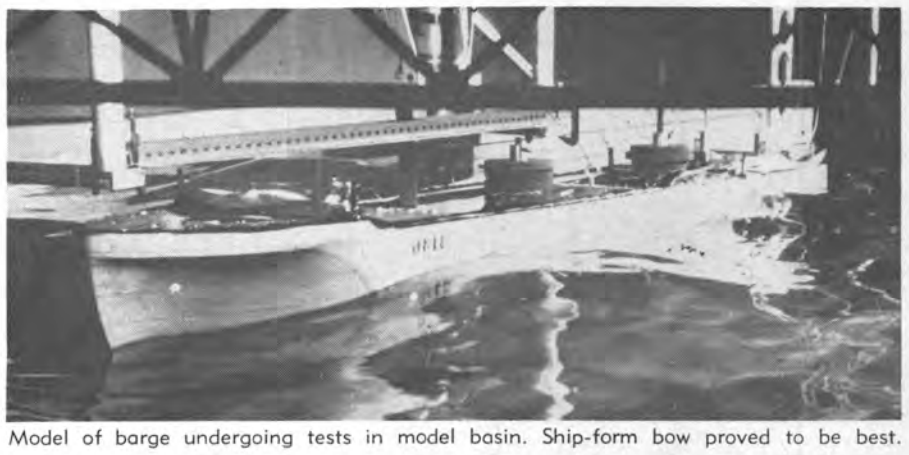
Analyses of offshore towing operations have been made, including reviews of the logs of individual vessels. The interesting point developed was that even in moderate seas a major reduction in speed was the rule. For instance, a large oceangoing tug in the 150-foot class, while towing a relatively light tow of approximately 5,000 tons displacement, the speed reduction was 10 percent for seas in the 4- to 6-foot range, and a reduction of 20 percent for seas in the 6- to 8-foot range. In one or two instances of seas in the 12- to 14-foot range, the speed was reduced 50 percent or more.

The Artubar concept has been tested in peak seas in the 23- to 26-foot ranges. Models have been tested in these seas with the forces recorded vertically and longitudinally. At no time did the tests indicate that a reduction in power was necessary due to either the articulated concept reaction in reference to pitching of the tug and barge and/or rolling of the tug and barge; nor were the forces ever beyond predictions used for the connecting pin design.

As in all concepts and new developments, there is a time and place for everything. The designer does not consider the Artubar concept a cure-all for all types of marine operations. It is a specialized development for offshore tug and barge operations at relatively high speeds and offers a potential reduction in operating costs. The advantages of the Artubar can only be properly evaluated by analysis of the operations for which it is intended.

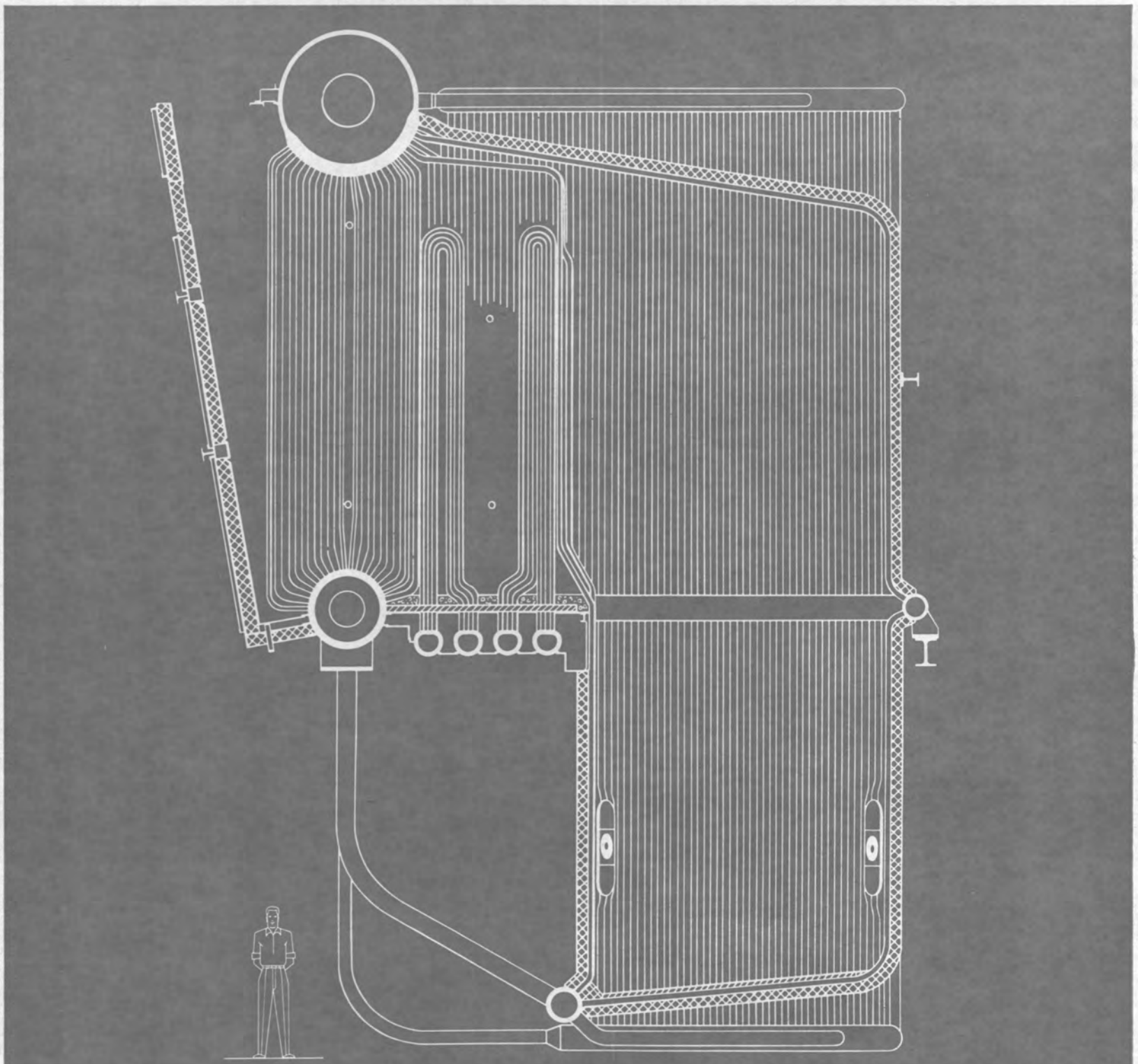

Tug and barge connected for model tests, showing barge wing walls and connection slots.


Model of tug with hydraulically operated connection extended just forward of house.


Model of barge undergoing tests in model basin. Ship-form bow proved to be best.

Designed for higher-horsepower ships

The C-E V2M-9 Boiler



C-E tangentially-fired V2M-9 boiler designed for three Texaco, Inc., 255,000 dwt tankers. One power boiler per vessel. Shipbuilder: Odense Steel Shipyard, Ltd., Denmark.

. . . provides greater boiler capacity with minimum deck space and maximum reliability.

The current trend in new construction toward mammoth ships presents a unique problem. The requirement is to retain conservative design practices and utilize minimum machinery flat-area while greatly increasing boiler capacity—and maintaining high reliability.

Vertical design minimizes stresses. The usual increase in furnace volume with the accompanying increase in boiler height tends to cause hazardous vibrations, especially in bottom-supported units. C-E engineers solved this problem by increasing furnace volume *downward,* while maintaining the efficient V2M-8 boiler configuration and size. This unique design with mid-span support greatly reduces vibration and minimizes thermal expansion stresses.

Short tube generating bank. The V2M-8 short tube convection generating bank is incorporated as an integral part of the V2M-9 boiler. This feature adds to the reliability and flexibility of the V2M-9. It permits rapid response to sudden maneuvering demands with minimum boiler upset. And there is no danger of a steaming economizer. This steam generating tube bank design virtually eliminates vibration-induced tube failures.

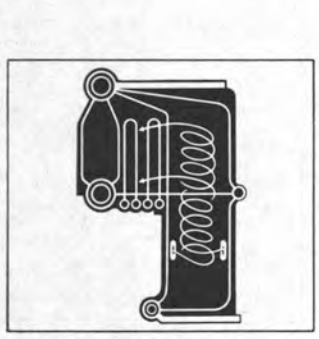
Coordinated firing systems. Reliable, high capacity firing performance in V2M-9 boilers is assured by coordination of the boiler and burner designs into an efficient firing system. Tangential firing, pioneered by C-E and now extensively used on land-based boilers, is another C-E innovation in marine applications. Burners are installed in all four corners of the furnace to provide a vortex pattern of flame utilizing the total furnace configuration. Low excess air operation is achieved with this arrangement. Where space conditions require, the furnace can be arranged for conventional horizontal firing. With either tangential or horizontal firing the V2M-9 is designed to operate efficiently with a wide range of fuel oils.

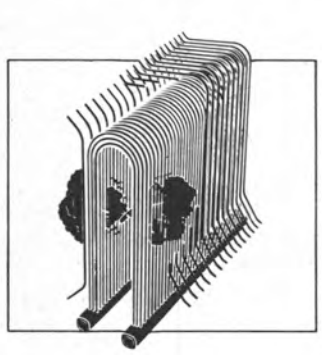
Vertical superheater. The C-E superheater arrangement greatly reduces slag accumulation and provides clear paths for efficient cleaning by retractable soot blowers. The C-E superheater is supported without the need for tube sheets or bulky castings. The wide space between loops allows free access to the fire sides for ease of inspection and maintenance.

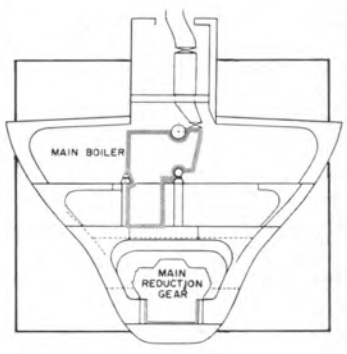
Welded-wall design. Developed by C-E for stationary boiler service in 1950, welded walls have been proven over years of actual operation. These gas-tight, fusion-welded wall panels eliminate high-maintenance conventional boiler casings, furnace refractory and soot leaks. They also afford a significant weight reduction.

Modern design. The V2M-9 does more than just answer the growing need for greater power in today's huge ships. It maintains C-E's high standards to assure maximum reliability in marine boilers.

For more information on C-E's V2M-9 High Capacity Marine Boiler and its application in today's modern ships, write the Marine Department, Combustion Engineering, Windsor, Connecticut 06095.







COMBUSTION ENGINEERING
PROGRESS FOR INDUSTRY WORLDWIDE

Trucking Firm Buys Control Of Pacific Far East Line

Leo C. Ross, president of Pacific Far East Line, Inc., announced in San Francisco that Consolidated Freightways, Inc. has signed a contract to purchase 472,550 shares of Pacific Far East Line common stock. The stock is to be purchased from Natomas Company and certain related interests for approximately $25-million cash. This represents approximately 51 percent of the outstanding shares of Pacific Far East Line stock.

Said Mr. **Ross,** "We have enjoyed our past association with Natomas Company and look forward to excellent relations with Consolidated Freightways in the future."

Mr. **Ross** also said that Consolidated Freightways has announced that they plan no changes in the management or the board of directors of Pacific Far East Line.

William G. White, chairman and president of Consolidated Freightways, said he does not foresee any legal barriers to the big trucking concern acquiring a majority interest in a shipping line. Mr. **White** also described the transaction as an "investment" in that no control will be exercised over Pacific Far East, which will maintain its same board.

Natomas, based in San Francisco, said it will continue to hold its controlling interest in American President Lines Ltd. and American Mail-Line. Last January, Natomas announced it was dropping plans to merge these two lines with Pacific Far East, citing an adverse decision by a U.S. court of appeals that invalidated approval by the Federal Maritime Administration.

Ralph K. Davies, Natomas chairman, said the company decided to sell its Pacific Far East interest to raise more capital for the development and expansion of the company's oil production interests in Indonesia. Natomas recently announced an oil discovery in offshore Java and the start of survey work in a second area offshore southeast Sumatra.

First Ore-Oil Carrier For World-Wide Group Ordered From NKK

Nippon Kokan Kaisha of Tokyo, Japan, has signed a contract with World-Wide Shipping Group (**Y.K. Pao,** governing director) for a 95,000-dwt ore-oil carrier. This contract represents the first combination carrier to join the rapidly expanding World-Wide fleet. Mr. **Pao's** New York agents revealed that negotiations for another vessel of this type were underway.

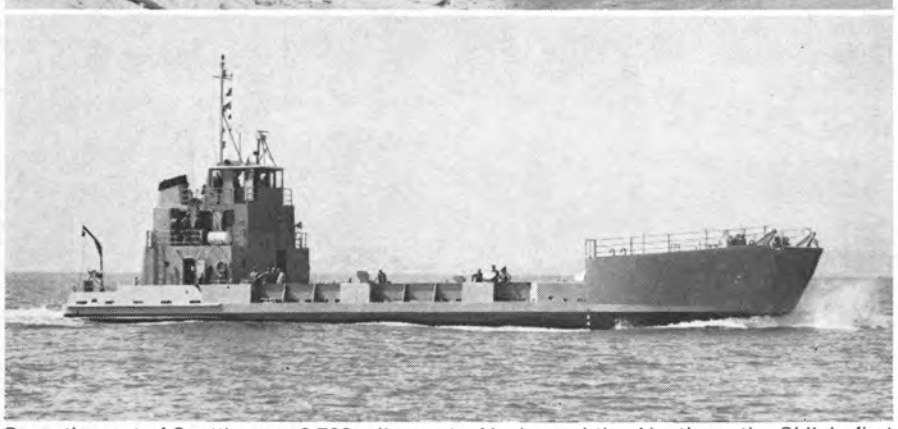
The new ship will have an overall length of 826 feet 10 inches, a beam of 124 feet 8½ inches, a depth of 69 feet 11 inches and a loaded draft of 49 feet 2½ inches. It will be classed by the American Bureau of Shipping.

Propulsion will be provided by one Sulzer 9RD90 diesel engine developing 20,700 bhp. The speed will be 15.5 knots at loaded draft and 18,630 bhp.

S.J. Garcia Joins Kersten Shipping Staff

Salvador J. Garcia has joined the chartering staff of Kersten Shipping Agency, 52 Broadway, New York, N.Y., it was announced by **Ewald Kersten,** president of the firm. Mr. **Garcia** was formerly with Skaarup Shipping Corp.

Mr. **Kersten** also announced the appointment of **Horst Decker** as vice-president in charge of chartering.



Operating out of Seattle on a 2,700 mile run to Alaska and the Aleutians, the Skilak, first of the Super-U vessels, carries freight and oil, lighters from ships offshore to the rugged beaches, and tows barges. She runs light at 8 knots, and has towed 1,000 ton barges at 6 knots (Below) The U. S. Navy has purchased 12 similar crafts in a military version.

PACECO's versatile Super-U (Utility) outperforms all comparable cargo-landing craft.

Since its initial launching in 1963, PACECO's Super-U has established outstanding performance records. This versatile beach loading, full ocean service vessel has twice the power, requires half the crew, can go anywhere in the world under its own power – and costs half as much as any comparable craft in its class.

The Super-U is available in four basic designs, based on vessel requirements. Overall lengths range from 125′ to 225′.

Commercial Beach Loading Super-U. Length, 125′. Service speed, 8.7 knots. Standard model is used as a freighter, tanker, towboat, lighter, or for carrying wheeled or tracked land vehicles. Loads or discharges on beach, alongside a pier or other ship.

Roll-on/Roll-off Beach Loading Super-U. Designed for container chassis cargo, the 125′ bow ramp model has a capacity for nine 36′ chassis. A 148′ bow and stern loading model, featuring a special tunnel deck house, has a capability for nine 40′ container chassis or other wheeled or tracked vehicles.

Low Profile Super-U. The 225′ bow ramp model has a 14 knot service speed with all the cargo capacities and operating capabilities of the Commercial Beach Loading model. As a military vessel, its special low profile deck house is compatible for operations with amphibious assault ships.

Containership Super-U. Six containerized cargo models are available. Lengths range from 125′ to 225′ with capacities from twelve 35′ containers to sixty 20′ containers. Service speeds range from 8 to 15 knots. Designs are available with ship bows or ramp bows, with or without cargo tanks, and with modified deck house (aircraft carrier type) for fore-and-aft container access. Containerships are also available with PACECO Shipstainer cranes for self-loading/unloading, or with PACECO Transtainers for container handling aboard ship.

The PACECO Super-U has proved itself as a rugged, versatile, high-capacity cargo/beach-loading vessel consistent with the greatest degree of cost effectiveness. For further information, write or call. A team of PACECO engineers is available for consultation.

PACECO
Marine Division

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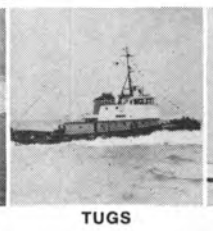
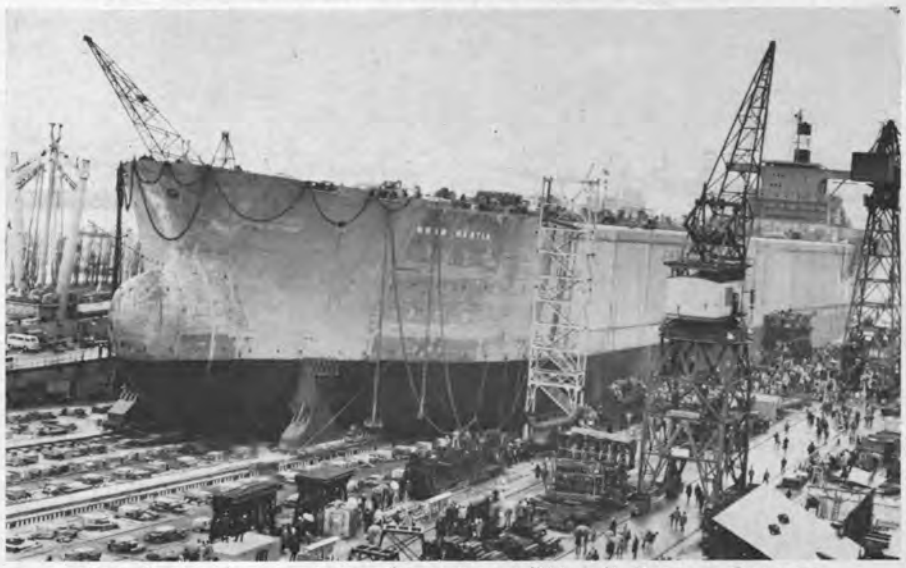
OFFSHORE PLATFORMS


BARGES


TUGS


FISHING BOATS

Launching Of 254,000-DWT Esso Scotia Sets Worldwide Record For A.G. "Weser"



Esso Scotia, shown entering the water at "Weser", Bremen, Germany, is the largest ship to ever be launched from inclined building ways.

A. G. "Weser" shipyard recently set two records — one for the world and one for Europe. The records were made with the launching of the 254,300-dwt tanker Esso Scotia.

The worldwide record was for the largest vessel ever launched from an inclined building ways. The European record set was for the largest ship ever constructed in Europe. Two sisterships to the Esso Scotia will also be constructed by "Weser" in the same manner.

The $17.5-million Esso Scotia has an overall length of 1,131 feet, a molded beam of 172 feet, a depth of 84 feet and a summer draft of 65 feet 3½ inches. Propulsive power is provided by a General Electric/A.G. "Weser" steam turbine developing 32,000 shp, which will give a trial speed of 16 knots. The 37-man crew will be accommodated in single-occupancy cabins.

Mrs. J. K. Jamieson, wife of the president of Standard Oil Company (New Jersey), christened the vessel.

A ship of this size could not be allowed to slide freely into the river because of its size and the width of the river. Hydraulic rams started the ship on its way down the building way. After traveling about 325 feet, four heavy anchors were dropped and sixteen 30-ton blocks, bound to the ship by chains, took hold and slowed the motion of the vessel. The hull as launched weighed 33,000 tons.

Esso has a total of 22 large tankers on order in European shipyards, including the three 254,000 tonners at "Weser."

Hydro Drive Names Hackenberger Director Of Engineering

Claus Hackenberger

Claus Hackenberger has been named director of engineering for Hydro Drive Corporation, **Langdon Simons Jr.,** president, has announced.

Hydro Drive is a Seattle-based firm specializing in the design and manufacture of marine propulsion systems.

Mr. **Hackenberger,** who earned a master's degree in engineering from the Goethe University in Darmstadt, Germany, was formerly with the Tacoma Boatbuilding Company, Inc. For six years he had been general manager of that firm's Oceanographic Machinery Division Northern Line.

Humble Oil Planning Construction Of Six Large Oil Tankers

An announcement was made recently by **T. J. Fuson,** general manager of the Marine Department, Humble Oil & Refining Co., Houston, Texas, that the company is planning the construction of six oil tankers, each of 250,000 dwt, for the transportation of crude oil from Alaska North Slope Reservoir to the East Coast of the United States. This project is dependent upon the success of the experimental voyage of the tanker Manhattan through the Northwest Passage this summer.

Gulfport Shipbuilding Lays Keel For World's Largest Oil Barge

Participating in Gulfport keel laying were, left to right: **E. Hurts,** representative, Moran Towing & Transportation Co., Inc., **E.A. Ray,** general superintendent, Gulfport Shipbuilding Corporation; **C.J. Picton,** vice-president, D.M. Picton, Inc.; **R. Rust,** hull erection foreman; **E.W. McCarthy,** executive vice-president and **E.W. Brown III,** president, Gulfport Shipbuilding Corporation.

Gulfport Shipbuilding Corporation, Port Arthur, Texas, under contract to Moran Towing and Transportation Co., Inc., New York, N.Y., recently laid the keel for construction of what the owner termed the world's largest oil barge.

With a capacity of 250,000 barrels of grade B petroleum products, (more than twice the capacity of the original T-2 tankers built during World War II) this barge when completed will measure 508 feet long with a beam of 89 feet 6 inches and a depth of 41 feet 3 inches.

The barge is basically divided into the following sections: forward and after peak compartments arranged for ballast, storage, windlass motor room, machinery space, fuel oil storage port and starboard and required cofferdams to segregate forward and aft machinery spaces from cargo tanks.

The towing notch will be 30 feet long on the centerline laid out to suit the tug deck plan contour with vertical walls.

Provisions will be made so all cargo tanks can be filled with salt-water ballast using sea chests, cargo piping and cargo pumps.

Loading and unloading will be from a central point near midships, through three manifolds port and starboard. Access to the machinery space and fore and after peaks will be through watertight hatches and vertical watertight door companionways aft.

The barge will be a complete independent unit with its own generating capacity.

Three large vertical deep-well cargo pumps with a capacity of 5,000 gallons per minute each will be used in handling the cargo.

The barge will be constructed in strict accordance with the rules and regulations of the United States Coast Guard and the American Bureau of Shipping and classed as a Maltese Cross A-1 Barge, Unlimited Ocean Service, Bulk Oil Carrier.

Boele's Shipyard, Holland, Builds Unique Ship

The DUPLUS—A Twin-Hull Vessel

An unusual twin-hull vessel has entered service in the North Sea. Called Duplus, the vessel was designed by **J. J. Stenger,** a naval architect with offices in The Hague; it was built by Boele's Scheepswerven en Machinefabriek N.V., Bolnes, Holland, and is owned by Netherlands Offshore Company. The vessel is classed by Bureau Veritas.

The Duplus was designed to perform underwater construction, oceanographic work, drilling, etc.

The unusual design incorporates a submarine-shaped underwater portion in each hull. As a result of this feature, the waterline plane of each hull is small and thus the complete vessel provides a very stable platform for working underwater. Connecting the two submarine-type hulls below the water at the forward and after ends are two wing-like transverse connections, similar to hydrofoils.

In order to work in deep water without anchoring, the Duplus is equipped with a dynamic positioning system. The vessel can be accurately maintained over a given spot on the sea bottom. Four Voith Schneider vertical-axis propellers have been mounted in the transverse connecting hydrofoil-type structure, two forward and two aft. Each propeller is driven by a 220-hp electric motor. The direction of thrust of the propellers is determined by a computer on the basis of inclinometer signals indicating the direction in and the distance over which the vessel has moved from the chosen spot. The inclinometer is fixed to a taut wire controlled by a constant-tension winch.

The navigation bridge is on the starboard side and the engine room superstructure is on the port side. A 75-ton gantry crane and a 20-ton revolving crane have been mounted so as to serve the 23-foot diameter center well and the work area on the after deck, respectively. With the aid of a 10-ton winch, a complete diving bell or any other heavy apparatus can be lowered through the center well in the deck.

Propulsion of the Duplus is provided by two Lips variable-pitch propellers in nozzles which are each driven by an 850-hp Heemaf electric motor. This total power of 1,700 hp enables the vessel to travel at a speed of eight knots.

Electric power is provided by two 1,500-hp Werkspoor diesel engines driving Heemaf generators. An auxiliary generator is driven by a 190-hp Kromhout diesel engine.

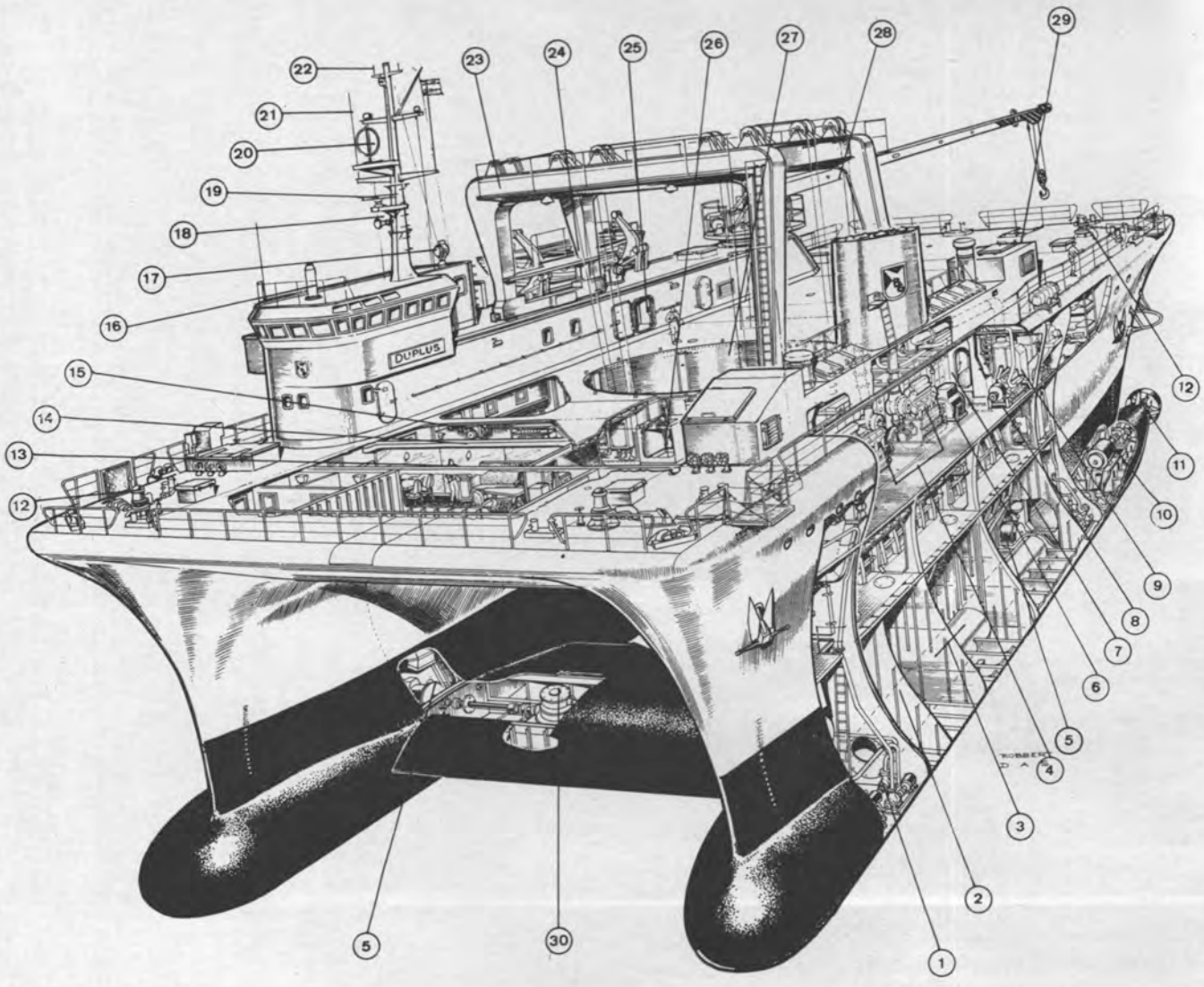
The Duplus met all requirements of Netherlands Offshore Company while on trials.

These three units take care of all the 3-phase, 450-volt, 60-cycle power requirements. There is also an emergency generator driven by a 24-hp Samofa diesel engine.

The overall dimensions of the Duplus are: length—131 feet, breadth—56 feet, depth—36 feet, and draft—17 feet.

The ship has accommodations for 24 men, a laboratory, a workshop and a decompression room.

Boele's shipyard built the Duplus in a floating drydock section in an unusual manner. The drydock was being built on the ways and at the same time the Duplus was being built in this drydock section. So when it came time for launching, the drydock section carried the Duplus with it into the water. Then the drydock was flooded and the Duplus floated off.



LEGEND

1 Pumproom
2 Ballast tank
3 Fuel-oil tanks
4 Main engines
5 Driving motors for V.S. propeller
6 Main generator
7 Switchboard
8 Aux. diesel generator
9 Steam generator
10 Main-propulsion motor
11 Variable-pitch propeller
12 Capstan
13 Messroom, crew
14 Laboratory
15 Constant tension winch for dyn. positioning
16 Magnetic compass
17 Searchlight
18 Foghorn
19 Radar scanner
20 Direction finder
21 Decca mainchain aerials
22 Decca Hi-Fix aerials
23 Gantry crane
24 Man overboard boat
25 Diving center
26 Inclinometer for dynamic positioning
27 Centerwell
28 Revolving crane
29 Main winch
30 Voith Schneider propeller

St. Louis Club To Celebrate AWO's 25th Anniversary At Luncheon On May 22nd

The American Waterways Operators, Inc., and The Propeller Club of the United States, Port of St. Louis, will jointly sponsor a luncheon in St. Louis on May 22 in observance of National Maritime Day and in celebration of the 25th anniversary of the founding of AWO in St. Louis in May, 1944. The announcement was made by **Braxton B. Carr,** president of AWO, and **Willard B. Fouts,** president of the St. Louis Propeller Club.

The luncheon celebration will climax a series of meetings of AWO directors, members, and committees. A mid-continent AWO membership meeting and navigation conference with officials of the Army Corps of Engineers and U.S. Coast Guard partipicating will be held during the afternoon of May 21. The Spring quarterly meeting of the AWO board of directors will be held the morning of May 22. All events will be held at the Chase-Park Plaza Hotel.

David A. Wright, president, National Marine Service Incorporated, St. Louis, is chairman of a special committee of AWO handling arrangements for the Association's anniversary celebration and joint arrangements with the St. Louis Propeller Club for the National Maritime Day celebration.

As part of the observance, winners of the 1968 Barge and Towing Vessel Industry Safety Contest, which is co-sponsored by the National Safety Council and AWO, will be honored and receive appropriate awards at the luncheon on May 22.

AWO represents the national interests of the barge and towing industry. The Association was incorporated in the State of Delaware on May 22, 1944. The first meeting of the membership of the Association was held in St. Louis on May 26, 1944.

Gotaverken Forms Subsidiary— Reassigns Top Management

Anders Linden

Erland Wessberg

Gotaverken has formed a new subsidiary company for the sale and design of products in the heat engineering fields, involving steam-raising plants for pulp mills, power stations and marine applications, heat exchangers, nuclear engineering components, equipment for environmental management applications, and so forth. The new subsidiary will intensify the activities hitherto pursued by Gotaverken's Boiler Department and which have widened steadily in scope in recent years. The manufacturing of boilers and other related products will continue mainly at Gotaverken's own engineering works.

The present deputy managing director of Gotaverken, **Anders Linden,** who is also head of the Gotaverken Engine and Heat Engineering Departments, will leave his present post on June 30, 1969 in order to become chairman of the board of the new subsidiary. Mr. **Linden** remains as the representative of Gotaverken on the board of directors for certain of the subsidiary companies and for United Diesel AB (UDAB) and Associated Cargo Gear AB (ASCA), the latter two companies being owned jointly by the major Swedish shipyards.

The principal executive of the new company, and its managing director, will be **Erland Wessberg,** while the present manager of the Boiler Department, **Per Wedel,** is appointed member of the board of the new company.

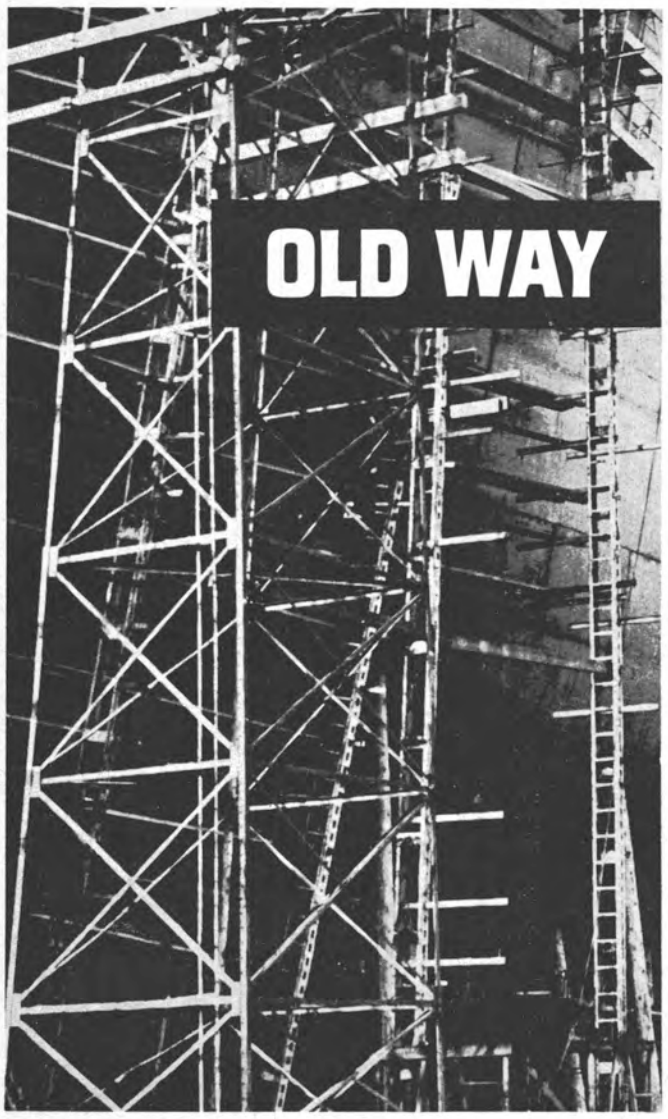
Mr. **Linden** will be succeeded as deputy managing director of Gotaverken by the company's financial director **Sven Mansson.**

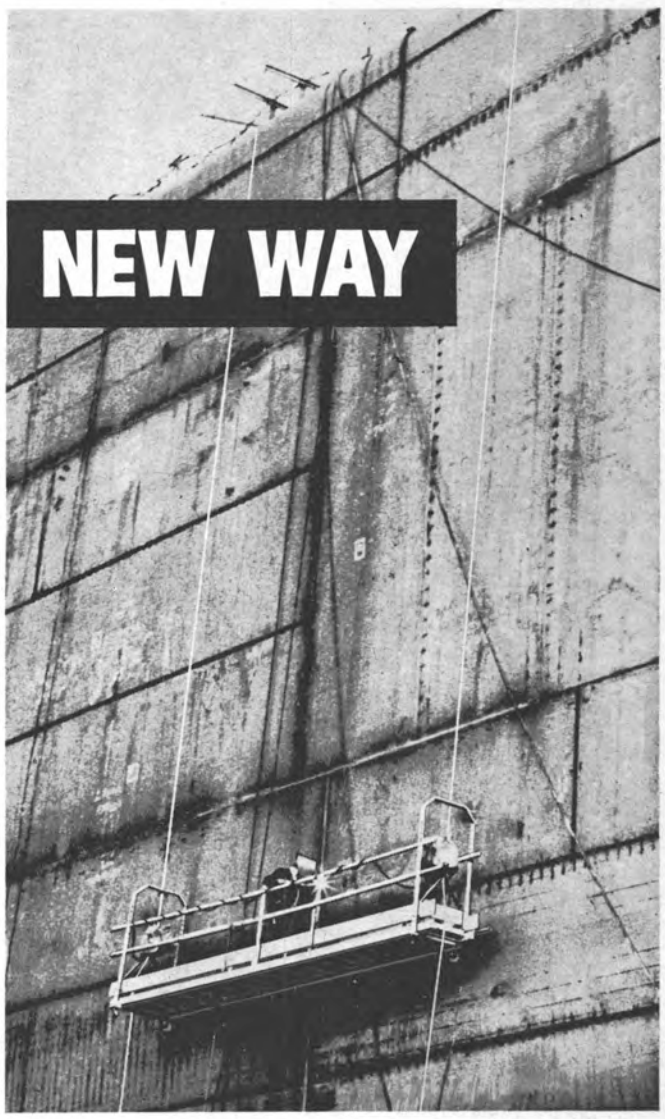
Other changes announced by Gotaverken are the appointment of the present resident director at Oresundsvarvet, Landskrona, **Ivar Norden,** as managing director of that subsidiary; while the yard manager at Gotaverken's City Yard in Gothenburg, **Karl-Eric Christianson,** has been appointed a director of Gotaverken. Mr. **Christianson** retains his present duties.

Gunnar Hellstrom has also been appointed as a director and will assume the role of manager for the Engine Departments. **Sven Bjorkenstam** has been appointed a technical manager and will assist the managing director of Gotaverken in matters concerning the affiliated companies and the investigation of new projects.

Equitable To Build Twin-Screw Tugboat

Equitable Equipment Co., Inc. was awarded a contract for the construction of a twin-screw tugboat by Andrew Martin, Inc., Galliano, La. To be equipped with twin 2,000-total-bhp diesels, it will be of the 95-foot standard design type. The tugboat will be named Rhonda Martin.





On-the-job comparison shows these advantages with Sky Climber Powered Scaffolding: Rigging and dismantling costs cut 93%...capital expenditures reduced 50% the first year. In addition to cost savings, safety was increased and supervision facilitated. Sky Climber also did away with shell or deck attachments as well as clutter around the dock. Results prove powered Sky Climber Systems are the modern approach to shipbuilding and maintenance. Because they climb wire ropes, a 24 ft. swing stage sets up in less than an hour...transfers in 15 minutes...moves men quickly and easily to perfect work levels with a simple lever control. Write for information on how shipyards around the world are modernizing with Sky Climber.

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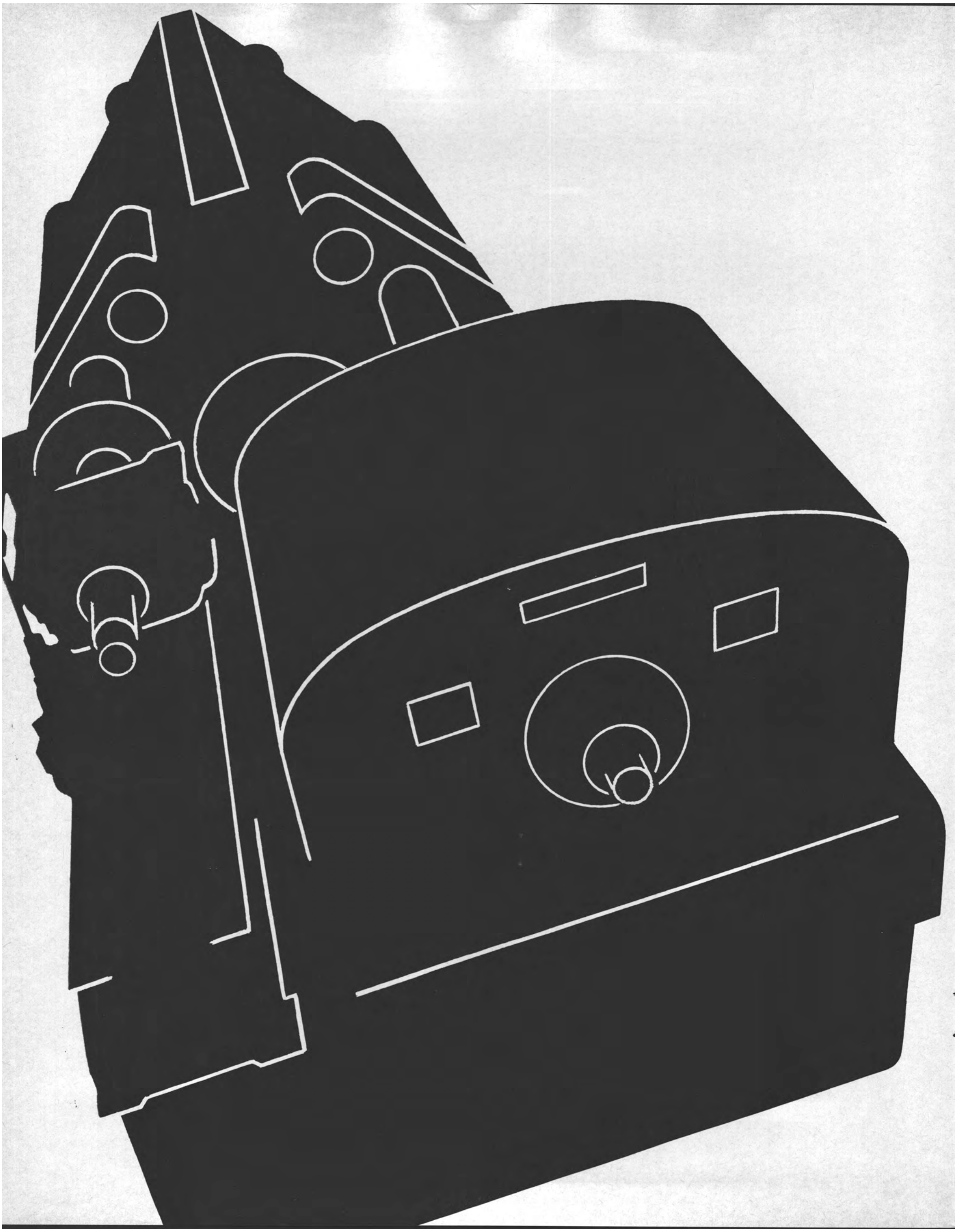
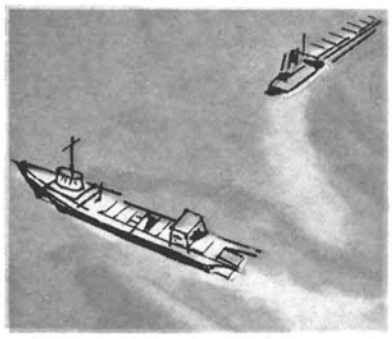
SKY CLIMBER SYSTEM SPECIALISTS PROVIDE SIMPLE ANSWERS TO DIFFICULT PROBLEMS





In 1968,
De Laval got the largest propulsion unit order placed by the merchant marine in recent years—11 sets of DLT-M main propulsion plants for new LASH vessels.

In 1969, De Laval offers DLT-M main propulsion plants in standardized designs to 46,000 SHP (and bigger...if you need them)

The same propulsion unit design that met the needs of the high-speed LASH vessels is now available in De Laval's DLT-M line of packaged main propulsion plants. The new line covers a wide range of sizes from 18,000 to 46,000 SHP. Larger units can be supplied where required.

The De Laval DLT-M main propulsion package consists of three major modules selected for optimum performance within the particular requirements of horsepower, torque and space.

The turbines are designed for modern regenerative cycles and meet the same high standards of performance and reliability for which all De Laval marine turbines have been known for many years.

Reduction gears are of two types—either articulated or the well-known De Laval locked-train design.

The condenser, which is constructed as an integral part of the turbine drive assembly, completes the total propulsion package.

For more information contact De Laval Turbine Inc., Turbine Div., Trenton, New Jersey 08602.

DE LAVAL

N.Y. Stock Exchange Approves Listing Of Seatrain Lines

The common stock of Seatrain Lines, Inc., has been approved for listing by the board of governors of the New York Stock Exchange. Trading of the shares is scheduled to begin on June 3, 1969.

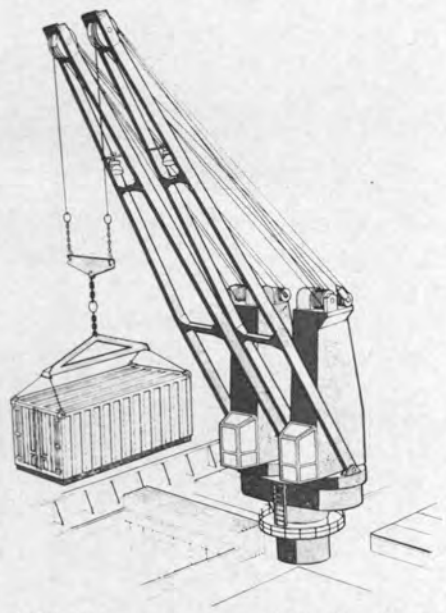
Seatrain is a worldwide operator of 45 containerships, oil and grain tankers and multi-purpose military cargo vessels. The company operates its own containerports in New York Harbor and San Juan, Puerto Rico; is currently building new containerports in Hawaii, California and the Port of New York, and recently leased a major part of the former Brooklyn Navy Yard which it plans to reopen as a shipbuilding complex.

Seatrain reported revenues of $87,988,618 for the year ended June 30, 1968, a gain of 42 percent compared with the prior year, and net earnings of $14,030,333, or $3.13 per share, up 108 percent from fiscal 1967. For the six months ended December 31, 1968, Seatrain's revenues totaled $47,884,433, compared with $41,383,603 a year earlier, and net earnings were $8,691,332 or $1.93 per share, compared with $6,393,531 or $1.43 per share.

Per share results were based upon average shares outstanding during each period. The board of directors has approved a 3-for-1 stock split to be distributed on or about May 23 to stockholders of record May 9, subject to the approval of shareholders.

The common stock presently is traded over-the-counter.

ASEA Demonstrates Tandem Crane Ability



ASEA Tandem cranes working together to handle a container.

In recent months ASEA's Mechanical Products Division, Helsingborg, Sweden, has successfully demonstrated their Tandem crane for a large number of shipowners.

This twin crane arrangement comprises two identical but separate deck cranes mounted on a common platform, which can rotate through 360 degrees. The cranes are Ward-Leonard-controlled, and totally enclosed except for the rope barrels. Standard features include a short tail radius and anti-collision protection.

The tandem arrangement affords the following operation alternatives: independent — working two holds fore and aft of the mount; independent—working the same hold from both sides of the ship, and tandem—with both cranes locked at a fixed slew angle, rotation taking place at the platform.

Each crane can be independently operated. In tandem, one crane functions as a slave unit, automatically following the motions of the master unit. Control can take place from either cab.

Essential for a twin-crane arrangement is an accurate method of synchronizing the luffing and hoisting motions of the two units. ASEA has adopted a system that has been used successfully for industrial applications and its suitability has been proven repeatedly on the test rig at the ASEA Helsingborg factory.

ASEA Tandem cranes to be supplied include twelve 2 by 11-ton sets for a British company, nine 2 by 12.5-ton sets ordered by a Yugoslavian yard for Norwegian owners, as well as eight 2 by 12.5-ton sets for ships to be built at a Japanese yard.

Texas Gulf Sulphur

needed a special floating, heating plant

...they selected America's largest inland shipbuilder

Texas Gulf Sulphur Company selected Jeffboat to build its new 212-ft. barge to process and superheat water for its new Frasch sulphur mine at Bullycamp, Louisiana. The power plant barge is fitted with six heaters, two boilers, plus pumps and control systems. Rugged Jeffboat quality-controlled construction meets or exceeds all regulatory agency requirements; assures years of heavy-duty service. Jeffboat is fully equipped and experienced to handle your special marine requirements, too—design, construction or repair. Call us. (812) 283-3551. Jeffersonville, Indiana 47130.

JEFFBOAT

A division of Texas Gas Transmission Corporation

Shrimp Boat Harbor Increases Dock Space Using Wood Piles Impregnated With Creosote

When the shrimp boats come in, and some 600 of them call at Brownsville, Texas, their home port, they now tie-up in a harbor recently expanded half again the size of the original facility.

A third basin, 400 feet wide, and with more than 3,600 lineal feet of dock space, has been added to the existing harbor. The facility now measures 2,100 feet by 1,740 feet overall with two 300-foot wide peninsulas in the center.

The expansion, according to **E. G. Lantz,** chief engineer for the Brownsville Port Authority, was initiated to better accommodate the servicing of deep-sea trawlers and handling of their steadily increasing catch of shrimp. Last year, trawlers operating from Brownsville reported a catch of more than 8¾-million pounds of the seawater delicacy, which was processed and shipped to all parts of the United States.

In enlarging the fishing harbor, Mr. **Lantz** said more than 1,000 creosote-treated wood piles were used for docks, ramps and a protection fender system. The piles, ranging in length from 30 feet to 45 feet, were supplied by the Houston, Texas plant of Koppers Company, Inc.

All of the wood structurals (southern yellow pine) were pressure-impregnated with 22 pounds of creosote per cubic foot of wood to render them impervious to decay and attack from marine borers, and to safeguard them from termites in the dock area above the water line. Pile driving contractors were Electrical Constructors, Houston, and Nunez Construction Company, Texas City.

The shrimp basin is located four miles east of the main harbor of Brownsville on a 17-mile ship channel linking the man-made port to the Gulf of Mexico. The channel connecting the basin with the ship channel is 100 feet wide and 600 feet long.

Worthington Forms New Pioneer Products Div.

Formation of a new unit, to be known as the Pioneer Products Division of Worthington Corporation, Livingston, N.J., has been announced by **C. F. Pratt,** vice-president-planning of Studebaker-Worthington, Inc.

Igor J. Karassik has been appointed president of Pioneer Products Division, which will be responsible for the innovation and development of new products not currently in Worthington's product line.

Mr. **Karassik** is a long-time employee of Worthington Corporation and is well-known as the author of three books and hundreds of articles on pumps and their application. In addition to his activity as president of Pioneer Products Division, he will continue as chief consulting engineer of Worthington Corporation.

The new division will be located on Route 10 in Livingston in a part of the plant of Wagner Electric Corporation. Both Wagner and Worthington are units of Studebaker-Worthington, Inc.

Furness Withy Announces Several New Appointments

T. A. Dromgool has been named president of Furness, Withy & Co. Ltd.'s agency division with headquarters in New York, according to **W. F. G. Harris,** resident director of the firm.

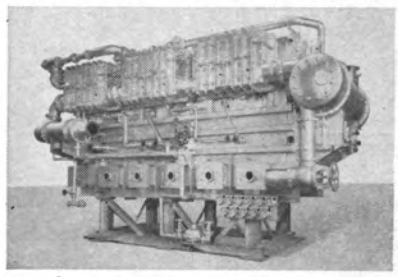
Other new appointments by the company include that of **Christie S. Larsen** as executive vice-president of the agency division. Mr. **Larsen** will continue to make his headquarters in New Orleans and will direct all activities in the Gulf area.

A. J. Dowers has been named vice-president. His primary responsibilities will be general agency services out of the Atlantic. Other changes involve the promotion of **T. Komats** as general manager, sales; **S. Levenstein** to manager, Manchester-Irish shipping, and **W. F. Latham** to manager, Blue Sea Line.

while you're waiting for the USS Nimitz

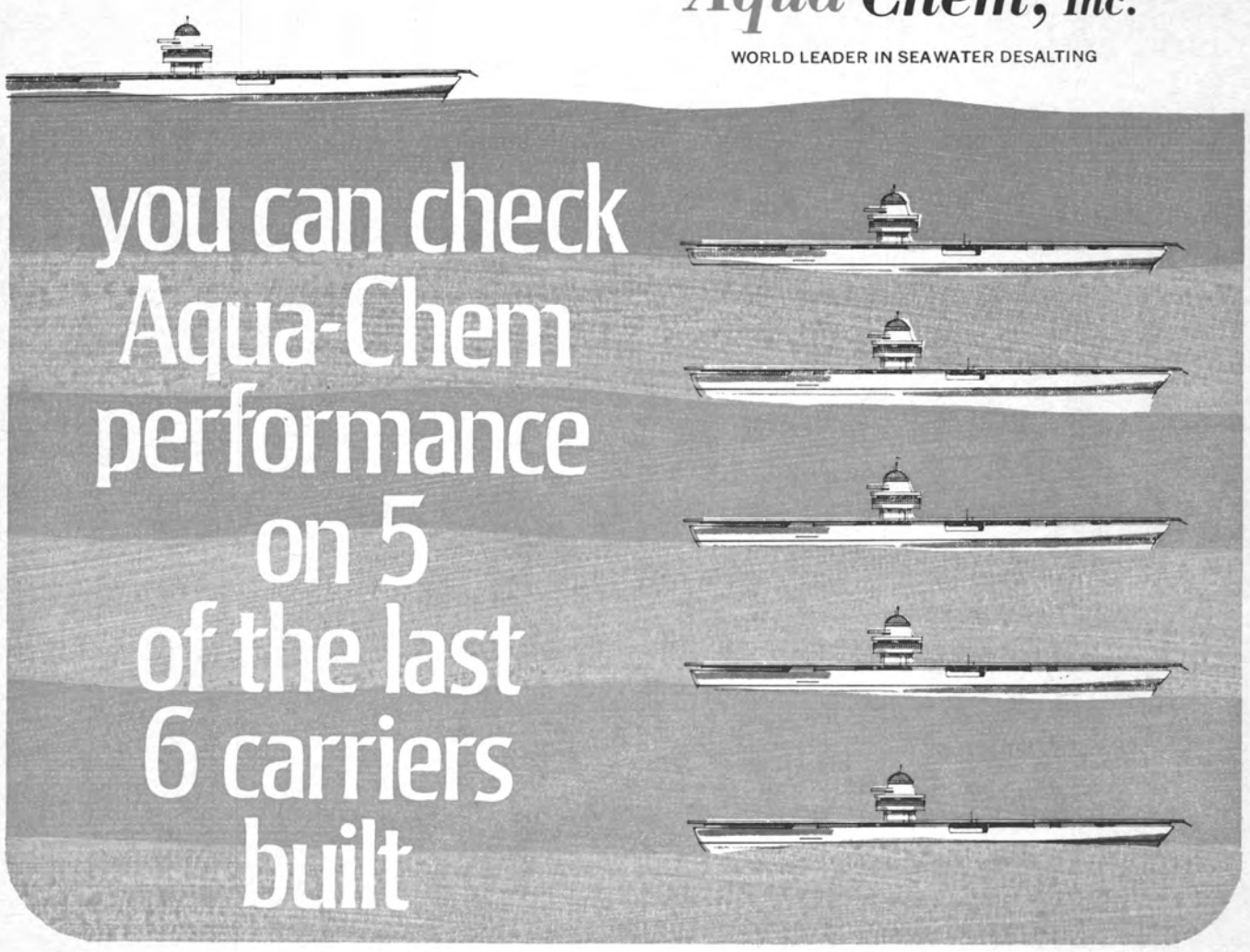
Twelve years ago four Aqua-Chem flash evaporators launched a new era in seawater desalting. Installed on the USS Independence, they were the first large marine units. They eliminated any need for feed treatment . . . for brine density control . . . fine spray nozzles . . . scale removal. All good reasons why Aqua-Chem flash evaporators also serve the Kitty Hawk, Constellation, Enterprise and John F. Kennedy. And why we're now building four 100,000-gpd units for the USS Nimitz.

Aqua-Chem's Davis Engineering Division is also aboard these carriers. In fact, most carriers built today take to sea with Davis fuel oil heaters, condensers, lube oil heaters, electronic equipment coolers and feedwater heaters. For more detailed information on Aqua-Chem's broad line of marine equipment, contact Aqua-Chem, Inc., Box 421, Milwaukee, Wisconsin 53201.



Aqua-Chem, Inc.

WORLD LEADER IN SEAWATER DESALTING



Chesapeake Section Holds Student Meeting At Annapolis

Two of the authors at the Chesapeake Section meeting discuss one of the papers with their superiors, left to right: Midshipman **Michael T. Smith,** USN, author, Capt. **R.W. King,** USN, head of U.S. Naval Academy Engineering Department, Ensign **Fred L. Ames,** USCG, and Rear Adm. **D.B. Henderson,** USCG.

Attendees at the March meeting of the Chesapeake Section of The Society of Naval Architects and Marine Engineers held at the U.S. Naval Academy heard two very interesting student papers. The first one entitled "Analog Computer Solution to the Dynamically Developed Forces at the Bow of an Icebreaker" was written by Ensign **F. L. Ames,** USCG, and Ensign **K. B. Allen,** USCG, while in their first class year at the USCG Academy. Ensign **Ames,** presented the co-authored paper which had as its purpose a workable analog computer solution to the dynamically developed forces created at the bow of an icebreaker ramming a virtually unyielding ice mass. The authors believe that their analog computer simulation provides the naval architect with a cheaper and faster method of designing certain parameters which affect the force provided in ice breaking without his having to resort to full scale or model testing. Such characteristics as length, beam, displacement, bollard thrust, and the angle of the bow measured from the waterline were investigated and their affect on the force available to break the ice observed.

The second paper written and presented by Midshipman **M. T. Smith,** USN, discussed holographic interferometry which has recently been shown to be an excellent tool for experiment stress analysis. Midshipman **Smith** discussed the stress problems associated with a glass deep submersible and demonstrated the advantages of holographic interferometry for solving these problems. Midshipman **Smith** also performed an interesting demonstration utilizing a laser to permit observable image reconstruction to illustrate his holographic technique.

Several interesting discussions were presented in Michelson Hall by the discussors and after a most enjoyable evening at the Naval Academy, the meeting was adjourned.

Ocean Machinery Relocates New York Sales Office

Ocean Machinery Corporation of Dumont, N.J., has announced the relocation of the company's New York City sales office from 50 Broad Street to larger quarters at 7 Dey Street, New York, N.Y. 10007. The new telephone number is (212) 349-5390.

According to **Howard L. Humphries,** president, the move was necessitated by the firm's expanding activities. The manufacturing and warehousing facilities will remain at 29 Aladdin Avenue, Dumont, N.J.

Ocean Machinery is known in the marine field for the repair, design and manufacture of auxiliary machinery for both deck and engine departments of oceangoing vessels.

Canadian Land-Bridge Advantages Listed

Canada has a number of advantages over the U.S. as a key segment in any land-bridge transportations link formed to connect the Far East with Europe, in the view of a top Canadian ocean transportation official.

Speaking before the Canadian Club at Victoria, B.C., recently, **H. A. Mann,** chairman of Canada's National Harbour Board, also said that Canada might prove to be the best link in the partial land-bridge concept, linking the East Coast of North America with the Far East or the West Coast and Europe.

Noting that Canada's West and East Coast ports are well-suited to the new land-bridge concept, Mr. **Mann** said that Canada has two major transcontinental railways connecting both coasts, serving large areas of the U.S. as well.

"The National Transportation Act passed by Parliament in 1967 considerably reduces the regulations under which our railways were operating before. This is of importance in a discussion of the Canadian land-bridge because the act allows the Canadian railways considerably more freedom in pricing than is available to their U.S. competitors," Mr. **Mann** said.

"It is also very interesting to look at a map and observe that all of Canada's major East Coast ports are closer to Europe than is New York and Vancouver is closer to Yokohama than San Francisco or Seattle," Mr. **Mann** said.

As a result of the declared intention of Canadian railroads to meet U.S. rail rates in Canadian dollars, the differential between the values of the two currencies favors a trans-Canada routing, Mr. **Mann** added.

A number of uncertainties regarding development of the land-bridge concept must be resolved, according to Mr. **Mann.** These include the possibility that the Soviet Union might become a routing factor, the attitude of the Japanese shipping industry and the growing capacity of air freight operations, he said.

Advent of the container in ocean transportation and the growing number of containerships joining the ocean fleet makes a re-examination of North American trade patterns likely, along with a similar re-examination of Canadian port administration and operations, Mr. **Mann** said.

Matson Using Mobile Units For Controlled Atmosphere Injection In Containers

Mobile units for injecting controlled atmosphere into Matson Lines' 24-foot refrigerated freight containers are being used by the Tectrol Division of the TransFresh Corporation in the Port of Oakland and the Port of Los Angeles.

The units move into the Matson container yards in Oakland and Wilmington, Calif., after the containers are received from customers, and the controlled atmosphere is applied before the containers are loaded aboard ship for Hawaii. This eliminates the delay of taking the containers to a fixed pulldown station.

Similar units are expected to be placed in service in Honolulu for fresh pineapple and papaya shipments.

Sewart Wins Contract For Patrol Boats

The Naval Ship Systems Command, Washington, D.C., has issued contract REP N00024-69-R-0608 (S) to Sewart Seacraft Division, Teledyne, Inc., of Berwick, La., for the construction of four 43-foot twin-screw patrol boats. Venezuela is to be the recipient of these vessels and she has indicated that they are to be supplied on a cash-sale basis.

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To transfer, circulate, boost, unload and feed. Design any type or size vessel. Commercial or naval. Colt Industries can provide total capability for all pumping requirements. Condensate. Bilge. Ballast. Hot and cold water. Fresh water. Evaporator. Hot well. Stripping. Fire. General service. For cargo handling, consider our Vertical Turbine Pumps. They require minimum deck space and have great flexibility to meet changeable operating conditions. High capacities shorten unloading time. Removable head simplifies service and repair. Deck-mounted or canned types available in sizes to 36″, and capacities to 25,000 gpm. For complete information on Colt Marine Pumps, write for our new capability bulletin M-1. Request information too on Colt Marine diesels, compressors, motors, switchgear, and sewage disposal units.

Colt Industries
Fairbanks Morse
Pump & Electric Division
3601 Kansas Avenue,
Kansas City, Kansas 66110

Gotaverken To Build Eleven

227,000-DWT Tankers

New Flat Section Shop Adds To Yard's Capacity. Single-Side Welding Used For Shell, Bulkheads And Decks.

Gotaverken's Arendal yard new flat section shop for one-side welding of plates.

Recently the first section of the lead ship in Gotaverken's series of 227,000-tonners was erected in one of the two building docks at Arendal. Thus, the yard has made a start on the run of no fewer than 11 such vessels which are on order for owners in Norway, Hong Kong, Sweden, the U.K. and Liberia, with deliveries extending into 1972.

The ships will have a length overall of 1,090 feet, breadth molded of 149 feet 7 inches and depth molded of 107 feet 4 inches. All will be powered by Gotaverken/Stal-Laval turbine machinery developing 32,450 shp.

Now that the first section of the lead ship—which is for Smedvigs Tankrederi, Stavanger—has been erected in the building dock, one can say that the Arendal yard has truly come into its own. The biggest ship previously built there, which incidentally is also the biggest yet built in Sweden, measured 120,000 dwt. Although Arendal was planned at a time when ships of over 200,000 tons seemed a relatively remote possibility, the production system can be smoothly adapted to the current series.

A new shop for flat sections, which was recently inaugurated and represents an increase in yard output capacity, will ensure the maintenance of short delivery times, even for these big tankers. The 800-foot-long building housing the new shop is aligned parallel with the materials flow through the existing shops. Together with machinery, roads, etc., the new shop involves the investment of over $3.5-million.

In comparison with traditional shipbuilding methods, the latest addition to Arendal is a conspicuously advanced facility. Very big hull sections are built on genuine assembly-line principles. Specialization has been carried to a high degree and all heavy work has been mechanized. The new shop thus represents a logical evolution of the Arendal concept of modern industrialized shipbuilding.


First 227,000 tonner starts to project from the hull assembly hall as sections are added inside the building.

The new shop is devoted entirely to flat sections. They comprise two or more strakes welded edge-to-edge and to which lengths of framing or stiffeners are welded. In shops further along the production line, these sections—shell plating, bottom, deck and bulkhead units—are assembled together with other components to form the major "cubic" hull sections.

Plate and sections are delivered by rail right inside the shop, all unloading and storage being under cover. At 14 functionally delineated work-stations the plates are first welded edge-to-edge in two, three or four strakes by means of automatic single-side welding. Certain flats are then turned 90° in the horizontal plane in readiness for the welding of stiffeners or frames by another automatic machine. The lengths of steel section are projected over the plates from the side by a special feeding station. All movement between stations is by roller conveyors. The only lifts involved are the placing of the plates on the conveyor at the first station and their removal at the end. The overhead crane which runs along the length of the shop is intended purely for the delivery of material to the welding machines.

The combination of single-side welding, which was a basic feature in the planning of the shop, and advanced mechanization probably makes Arendal's flat-section shop unique at the present. The application of single-side welding in this instance was developed by Gotaverken and ESAB.

Briefly, the system works as follows. The plates are located with the weld joint over a copper channel which is filled with welding powder. The entire arrangement comprising the copper channel and the plate-locating magnets is below the conveyor plane. Above this, the welding machine moves with its electrode and the weld is thus made from this side. Once the weld is complete the copper channel is lowered to a position at which slag is automatically removed and a new charge of powder applied. The entire process is fully mechanized and controlled from an operating console.

The arrangements in the existing shops and the building docks are fully adequate for the work associated with this size of ship. In fact, the current 227,000-tonners will be the first hulls to utilize all the rows of bottom blocks in the building docks and the first for which it will be necessary to employ more than one of the hydraulic rams which push the growing hull down the ways as new sections are added in the covered assembly shed.


In new workshop at Gotaverken's Arendal yard, profiles are welded to the plates by a fully automatic machine.

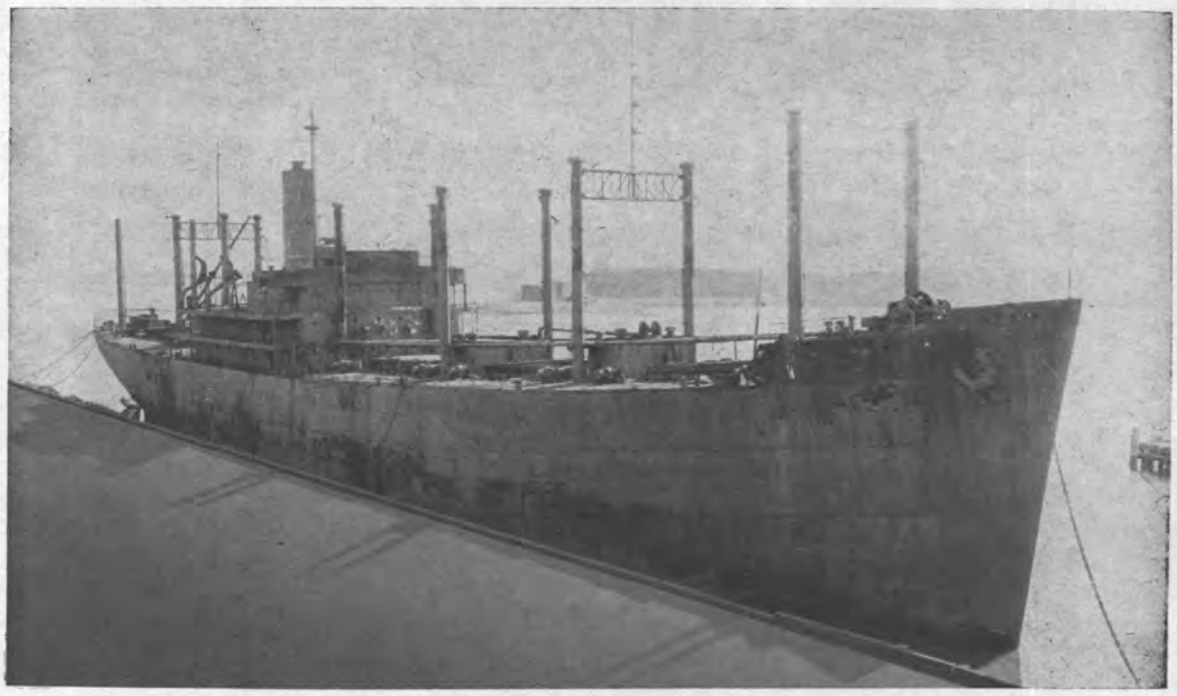
Although the production system remains largely unchanged and shipbuilding continues in accordance with the 'traditional' Arendal method, the latest series of ships will nonetheless involve certain novelties for the employees. A number of meetings have therefore been organized at the yard to ensure that all concerned, and particularly supervisory staff, safety officers and union representatives, are fully informed as to the future tasks.

The novel features are mainly due to the large dimensions of everything associated with the ships. The effects make apparent the necessity of resetting piece rates. After all, what passes for a bracket in a 70,000-tonner must be regarded for rate-setting purposes as a plate in the case of a 227,000-tonner. The keelson of a 70,000-tonner is less than 13 feet deep. In the new ships the same part is 23 feet deep.

In hulls of this size distances become so great as to introduce communication problems. A number of arrangements have therefore been made to assist access to the hull and movement within it. For example, 25-man lifts have been arranged for transport between the dock-sides and the upper deck, which will be 56 feet above quay level. A number of access holes will be cut in the deck and hull plating; and an additional lift will be suspended from the ship's counter and will remain in place until the completion of fitting-out. The result will be quicker movement in and around these big hulls than are normally expected in much smaller hulls.

It is planned to complete each of the new tankers within about 140 working days total building time. This means a potential output in excess of four ships of this size per year.

AP2/AP3 VICTORY C2/C3 NEW, US RECOND



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.

ALSO TAILSHAFT & RUDDER, KINGPOSTS, 16" PORTLIGHTS, BOOMS, DOORS, WINCHES, WINDLASSES, STEERING GEAR.

THIS IS JUST A PARTIAL LIST OF AVAILABLE MATERIAL!
INQUIRE ABOUT OTHER ITEMS YOU NEED

MATERIAL FROM MOORE-BUILT C-2 MORMACWREN – HULL 271

Specification class C2-S-B1—Maritime Commission Hull #1184. **Main Turbine Rotors:** HP & LP—HP serial 75382—LP serial 75363. ALSO, ALL MOTORS FOR FEED PUMPS, BILGE, CIRCULATORS, ETC.

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.

11 Units—Diamond Power Specialty Corp.—used with type FM-1220 coupling—2" tubes—Dialoy element—S1&S2—26 jets—12'6" OA—2x2 steel coupling.

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

ENTIRE LOT $450.00

SHIPS SERVICE AIR COMPRESSOR

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.

AP2 Victory Main Condenser Water Boxes

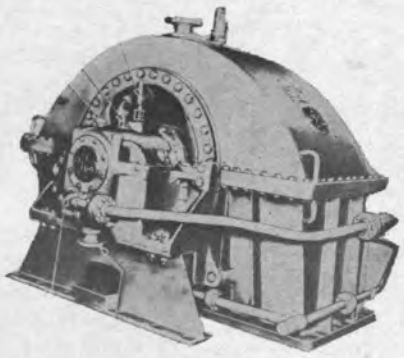
Mfg. by Graham—unused ABS and reconditioned ABS. Main condenser water boxes—AP3—Allis-Chalmers.

Aux. Condenser Water Box & Return Cover

Reconditioned ABS—Graham design—mfg. by Ross.

NEW AP2 VICTORY ENGI

6600 HP Main Propuls



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GENERAL ELECTRIC
Low Pressure Turbine $18,500
High Pressure Turbine $19,500

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For General Electric and Allis-Chalmers

ABS RECONDITIONED 66

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H.P. Turbine—complete—Serial 4A-1618—L

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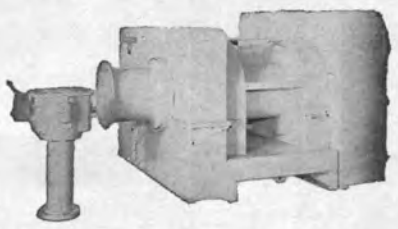
VICTORY SHIP UNIT WINCHES



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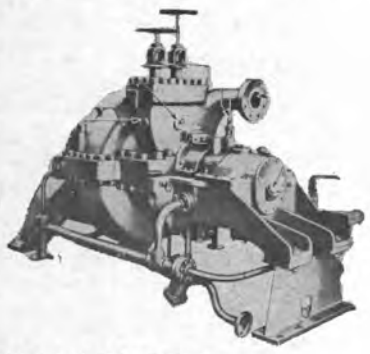

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ALLIS-CHALMERS
Low Pressure Turbine $17,500
High Pressure Turbine $18,500

LVES – $6750.00
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PULSION TURBINES
HULL 586—BUILDERS HULL 586
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NEW H. P. & L. P. FLEXIBLE COUPLING

NEW SPARE BLADING FOR WESTINGHOUSE L. P. TURBINE

C—Westing-
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FOR AP2
FORCED DRAFT BLOWERS–22-TD-18
Westinghouse—230 PSI—430° TT—back pressure 15 lbs.—normal capacity 8900 CFM—4.8" of water pressure. RPM 2875—9.6 HP—total steam 697—overload capacity—13,-700 CFM at 10.7.
WILL SELL FAN OR TURBINE SEPARATELY

MISCELLANEOUS PUMPS & PUMP MOTORS

DE LAVAL VERTICAL ROTARY MAIN LUBE OIL PUMP
10/15 HP—230 VDC—250 GPM @ 43 lbs.—980/1750 RPM. MOTORS: G.E. or Reliance.

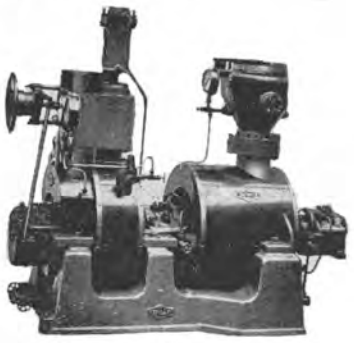
MAIN CIRCULATOR & MOTOR FOR AP2 VICTORY
Ingersoll-Rand 18VCM bronze pump—20" suction—18" discharge—vertical. Flanges opposite each other. Distance flange-to-flange 4'5". Suction bolt circle 25"—discharge bolt circle 22¾". Suction (20) ¼" holes—discharge (16) ¼" holes. PUMP WEIGHT: 5100 lbs. MOTOR: 5700 lbs.—Allis-Chalmers 75 HP—230 VDC—500/670 RPM—frame E-Bu-162—drawing No. 31099.

SPARE ARMATURE AVAILABLE FOR ALLIS-CHALMER MOTOR — WILL SELL PUMP MOTOR SEPARATELY.

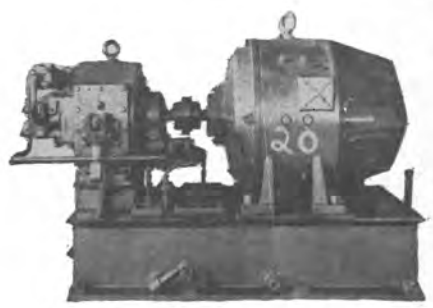
INGERSOLL-RAND 2VHM MAIN CONDENSATE PUMP
120 GPM—85 PSI—Pump only

Motors for Above
15 HP Motors and Terry or Coppus turbine drive.

INQUIRE ABOUT ANY UNLISTED ITEMS THAT YOU NEED



WEIR TURBINE-DRIVEN FEED PUMPS TMFP7
PUMP: 7000 GPH—585 PSI—1380 ft. head—5600 RPM. TURBINE: 480 PSIG—750°TT—exhaust 5 PSIG.



AP3 Steering Gear Pumps
Northern Hydraulic (variable stroke) and Hele-Shaw Hydraulic. **$1750**

Motors For Above Pumps
Reliance: 40 HP—230 VDC—147 amps—type T—900 RPM. **$1750**

BUY COMPLETE UNITS OR PUMPS & MOTORS SEPARATELY

3000 G.P.M. AP2 – AP3 BRONZE AUXILIARY CIRCULATOR

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.

COMPLETE WITH MOTOR STARTER

AUX. COND. PUMPS
Ingersoll-Rand 1-VHM—with 5 HP 230 VDC motor.
Will Sell Pump separately.

LUBE OIL STANDBY
Vertical Duplex—Worthington—7½x9x12.

FEED PUMPS
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

AP3 LARGE VICTORY MATERIAL

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.

SPECIAL FROM RIDGEFIELD VICTORY

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'.

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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

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WESTINGHOUSE MAIN MOTOR FIELD COILS

COMPLETE SET

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

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T2 RUDDER

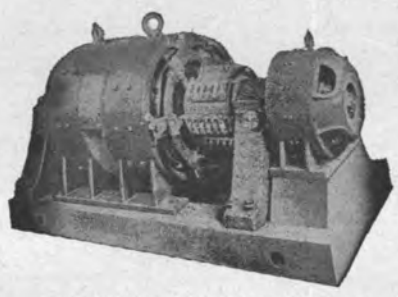
Reconditioned—ready to go.

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

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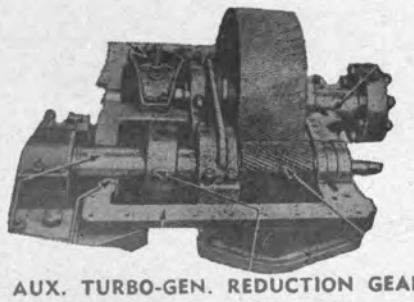
Emergency Generator Engine and Generator Parts

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.

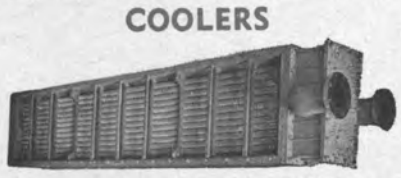


L G.E. AUX. TURBO-GEN. REDUCTION GEARS

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.

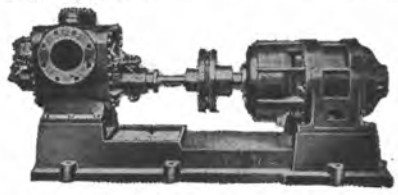
RECIPROCATING STEAM PUMPS

– 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 Electre-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

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• BAILEY BOARD COMPONENTS

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AWO Reports Upsurge In Industrial Plants On Inland Waterways

New industrial plant locations and expansions at water-oriented sites showed a sharp upsurge in the first quarter of 1969, reaching a growth rate unmatched since the third quarter of 1966, **Braxton B. Carr,** president of The American Waterways Operators, Inc., recently reported.

Production industries constructed, expanded, or announced plans to construct or expand 144 plant facilities along or adjacent to navigable channels during the first quarter of this year. This compares with 109 such facilities built or announced in the fourth quarter of 1968. The largest previous quarterly construction figure came in the third quarter of 1966 when 151 plant facilities were built or announced.

The AWO survey shows that 65 of the 144 companies which constructed or expanded or announced plans to construct or expand plant facilities along or adjacent to navigable waterways during the first quarter reported investment expenditures totaling $752,830,000.

The new industrial facilities or expansions listed in the AWO survey does not represent the total number of industrial developments along navigable channels in the first quarter. However, AWO seeks to make the listings as comprehensive as possible.

The AWO president said the first quarter figures indicate sustained interest on the part of management to take advantage of low-cost barge transportation (averaging three mills per ton mile) for handling bulk-loading commodities. He pointed out that while all of these industries may not use water transportation, the availability of commercial barge service and the effect this service has on the general freight structure is also a factor in plant locations along the nation's 25,380 miles of commercially navigable waterways. Additionally, he said, the availability of stable water supplies provided by navigation improvements attract industrial plant locations.

Terminals, docks and wharves led all other industries in new construction and expansions in the first quarter of 1969. The AWO survey shows that 45 terminals, docks and wharves were added or expanded during the quarter, representing 31.2 percent of all new waterside plant developments reported in the Association's survey for the period.

Analysis of the 144 waterside plants that were developed in the first quarter of 1969 show that in addition to the 45 terminals, docks and wharves, 40 were chemical plants; 19 were metal producing units; 12 were paper or paper producing plants; 11 were general manufacturing installations; five were petroleum facilities; four were rubber installations; three were grain facilities, and two were cement producing facilities.

Barnwell Industries Sells Drill Barge For $2,870,000

Barnwell Industries, Inc., Shreveport, La., has announced that the offshore drilling barge, Mr. Cap, has been sold for $2,870,000 to Drilling and Exploration Company of Delaware Inc., a Houston, Texas concern. A company spokesman said the proceeds of the sale will be used for additional development of the company's Canadian oil and gas properties, principally its Provost "A" Field in Alberta; to strengthen working capital, and for the reduction of bank loans.

This sale was made in furtherance of the company's previously announced plans to concentrate its efforts and resources on the development of its promising Canadian properties and for additional oil and gas exploration.

A. Johnson & Co. Relocates N.Y. Office

The A. Johnson & Co., Inc., agents for the Johnson Line, has announced that the firm has relocated to newer and larger quarters at 110 East 59th Street, New York City. The firm had previously been located at 21 West Street.

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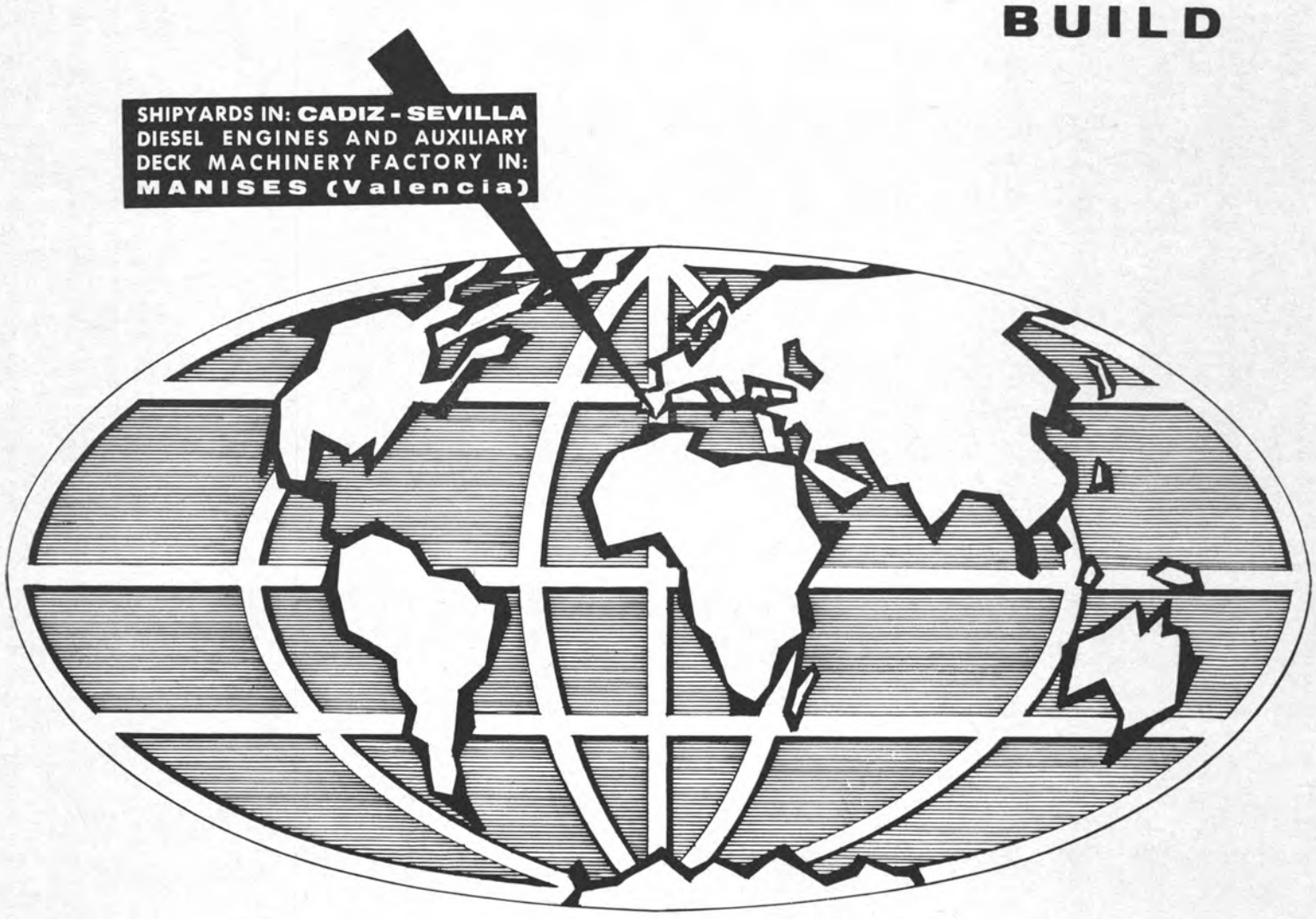

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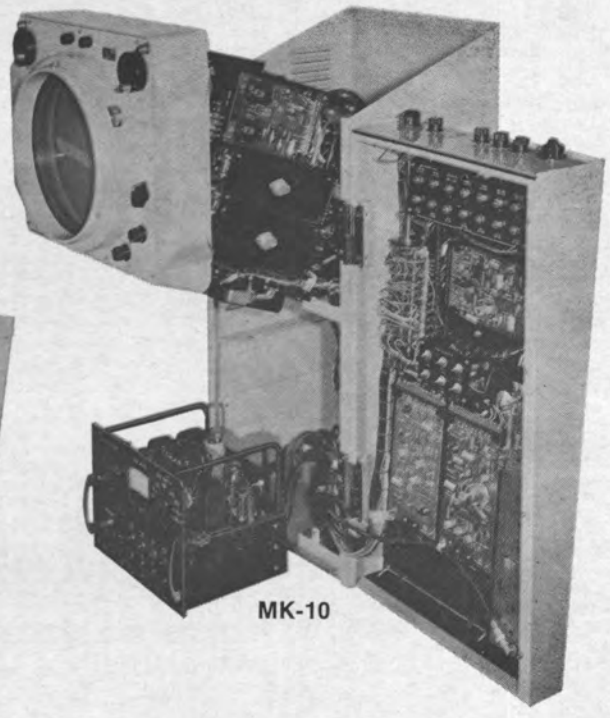
MK-10

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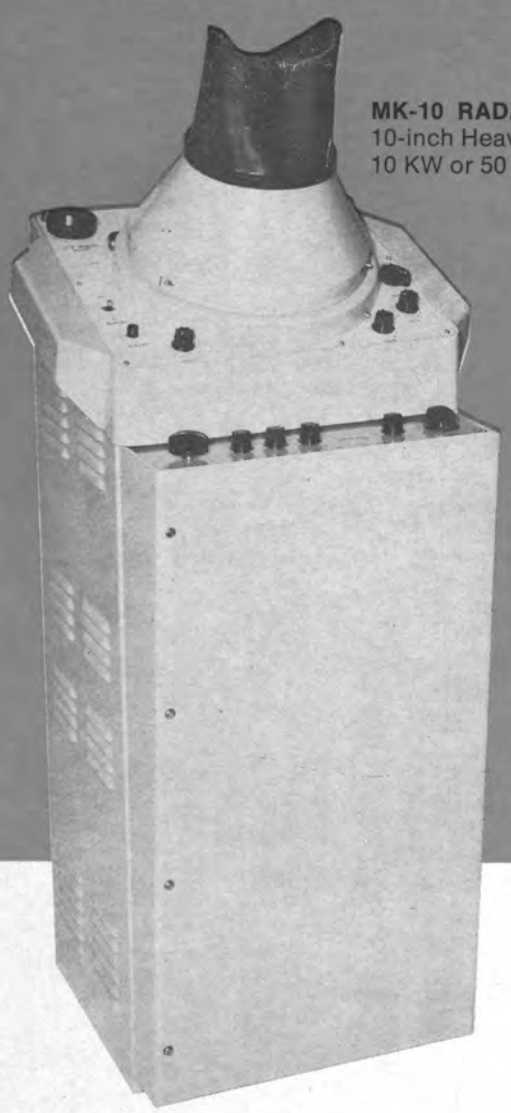

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Worldwide Salvage Firms Agree On International Joint Venture

Three of the world's leading salvage companies have completed a working agreement whereby they will offer salvage and marine engineering services on a worldwide basis, operating as an international joint venture. The three firms, with combined assets in excess of $30-million, are: Murphy Pacific Marine Salvage Company of the United States; Ulrich Harms G.m.b.H. & Co., of Hamburg, Germany, and Risdon Beazley Ltd. of Southampton, England.

Independently, each of these firms is the largest salvage company in their own country and will continue their own domestic operations. Combined they will form the world's largest salvage organization with operational headquarters at Southampton, England, and Murphy Pacific as management sponsor.

Equipment available will include powerful salvage tugs, the biggest fleet of salvage cranes in the world—lifting between 400- and 1,000-tons each—and a fleet of coastal and ocean recovery vessels.

Webb Alumni Sets June 14 For Homecoming And Meeting

The 1969 Webb Institute of Naval Architecture Homecoming has been scheduled for Saturday, June 14 at the Webb Campus in Glen Cove, New York.

Following the annual meeting, alumni, their wives and friends are cordially invited to gather for a reception and dinner. As in the past, the activities will be held outdoors on the terraces overlooking Long Island Sound.

The homecoming will again give alumni and their friends an opportunity to revisit the campus and inspect the past improvements and proposed new library wing with lecture hall. It will also permit the alumni and their wives to renew old acquaintances and meet with many of the students and faculty.

Webb alumni should also mark their calendar for Wednesday evening, November 12, 1969 for the Fall Banquet. The meeting will be held at the Hotel Warwick on the Wednesday evening preceding The Society of Naval Architects & Marine Engineers meeting, which has been rescheduled to Thursday and Friday only instead of the previous three-day schedule.

For further information, contact **Pete Bethge,** secretary-treasurer, Room 300, 20 Vesey Street, New York, N.Y. 10007, telephone (212) 732-7863.

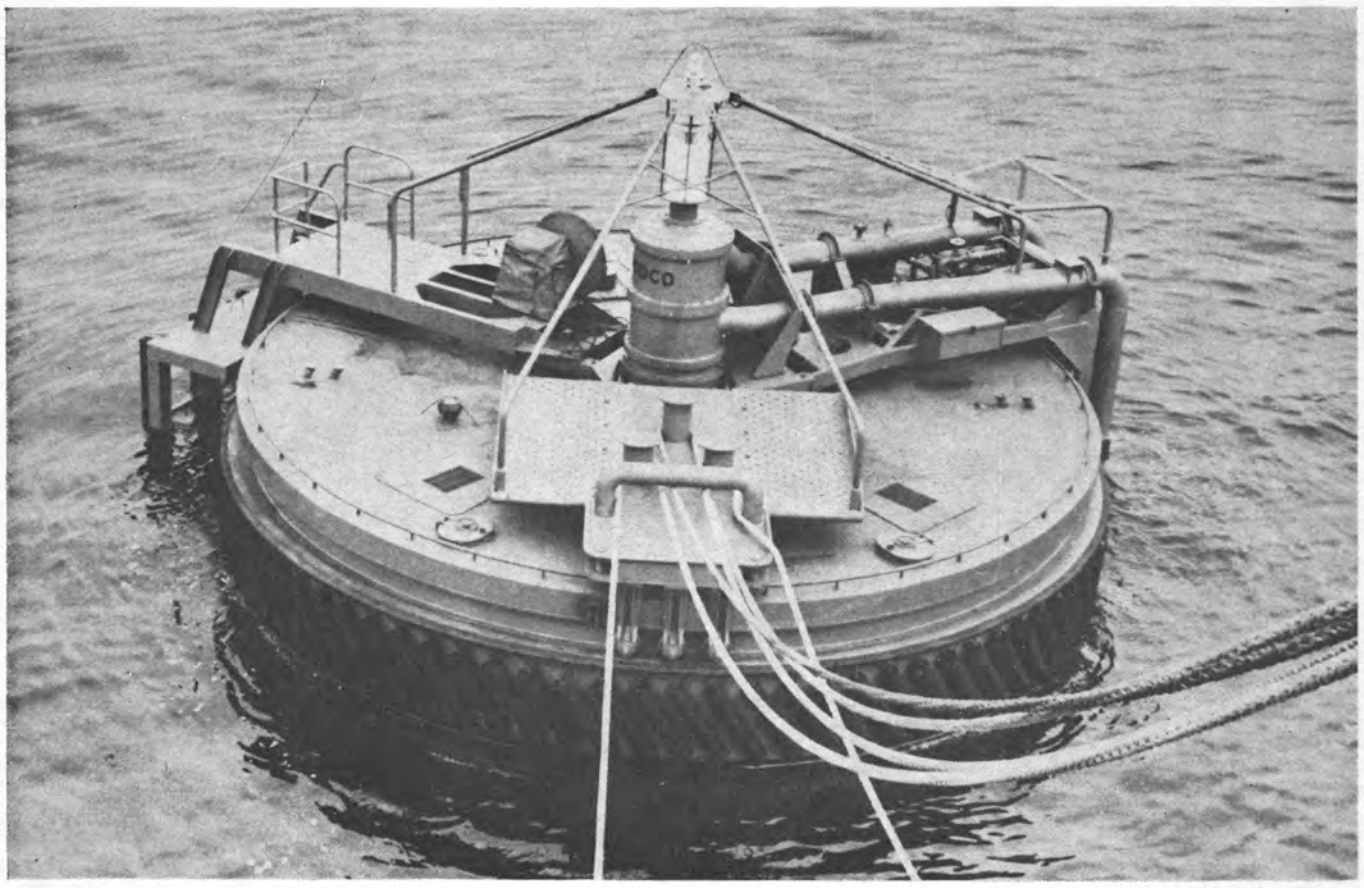
New Bern To Build Excursion Vessel

Bids for the construction of a 75-foot 6-inch passenger excursion vessel were received recently by Coast Engineering Co., naval architects, Norfolk, Va. New Bern Shipyards, Inc., New Bern, N.C., was awarded this contract at a price of $95,832.

This vessel is being built for Capt. **Robert Federico** and a completion date of July 1, 1969 has been set.

Three Shipping Firms Relocate N.Y. Office

Universal Shipping Corp., Retla Steamship Co., and International Overseas Transport Co. have announced that they have moved their offices to 1133 Avenue of the Americas in New York City. The three firms, which share quarters, were previously located at 95 Broad Street, New York.



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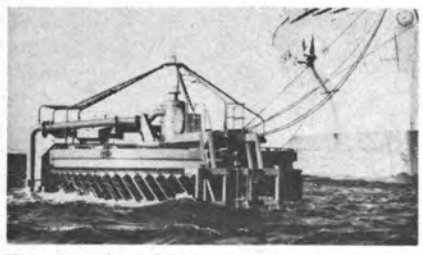

The Imodco SPM system provides a simple, economical solution to the problem of loading and discharging supertankers and other bulk liquid carriers which have already outgrown all but a handful of the world's existing port facilities. Securely anchored offshore, it permits cargo operations to continue under nearly all weather and sea conditions. Floating hoses, which

rotate about the SPM terminal with the tanker, connect the ship's cargo manifolds to the SPM. Other hoses connect the underside of the SPM to the submarine pipelines.

Among its many advantages, an Imodco SPM offshore tanker "sanctuary" permits complete freedom of movement in the approach and departure of supertankers, eliminating extensive maneuvering in congested

waterways. It overcomes restrictions imposed by narrow, winding and shallow channels and reduces or eliminates costly harbor development and subsequent continuing maintenance.

Imodco designs, constructs and installs SPM terminals capable of handling multiple fluid cargoes. This enables bulk liquid carriers to perform cargo loading, unloading, bunkering, deballasting operations simultaneously.

Since 1958, Imodco SPM terminals have been installed — or are currently being constructed and installed — at many locations throughout the world. For additional information, write or cable Imodco at any of the addresses below.

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Japanese Shipbuilding Practices Discussed At San Diego Section, SNAME, Meeting

Newly elected officers of the San Diego Section are, left to right: **John Angles,** chairman; **Charles Sinclair,** vice-chairman; **Thomas S. Hand,** secretary-treasurer, and **Guy M. Kanable, Manfred G. Krutein,** and **Robert H. Reisner,** executive committeemen.

The April meeting of the San Diego Section of The Society of Naval Architects and Marine Engineers featured a technical paper entitled "Japanese Shipbuilding Practices" by **John J. McQuaide** and **Kristian K. Christensen** of National Steel and Shipbuilding Company. Guests at the meeting included members of the Los Angeles and San Francisco Sections, SNAME, and San Diego Oceanographers, Marine Engineers and Naval Architects.

During the business portion of the dinner meeting, officers were elected for the coming season. **John Angles,** National Steel and Shipbuilding Company was elected chairman. The other officers elected were: vice-chairman — **Charles Sinclair,** San Diego naval architect, and secretary-treasurer — **Tom Hand,** Naval Ship Engineering, San Diego. **Gordon N. Carpenter,** the outgoing chairman, was presented a certificate issued by the Society's national headquarters for his leadership of the San Diego Section. The presentation was made by **Peter G. Trapani** of Scripps Institute of Technology, La Jolla, Calif.

Both authors of the technical paper have visited shipyards throughout the world. Mr. **Christensen** introduced the paper by stating, "During the last decade, Japan has taken an unchallenged lead as the world's foremost shipbuilding nation clearly outdistancing other nations.

"The advances in shipbuilding production by the Japanese shipbuilding industry since the middle of the middle of the 1950's have been quite astonishing. During the year 1955, for example, the Japanese yards launched 500,000 gt, accounting for only 10 percent of the total gross tonnage launched in the free world. In 1965, Japan launched 5.4-million gross tons or 44 percent of the world's total. In 1966, Japan launched a total 6.7-million gross tons or 47 percent of the world's total. In 1967, the corresponding figures were 7.411-million gross tons and 48 percent.

"It is obvious that figures of this magnitude should and have caused a lot of concern and bewilderment in shipbuilding countries throughout the world. Numerous study delegations have been converging on Japan during the last few years in attempts to find the reason or reasons for this unparalleled success story.

"Shipbuilding in Japan has more than a century of history and experience behind it to build on. Several of the yards in existence today were building engine-powered steel vessels long before the turn of the century.

"Before the second world war, Japan was a leading shipbuilding nation, but it's impact on the international shipbuilding scene is of a more recent date.

"World War II left the Japanese shipbuilding industry almost undamaged. But the peace treaty limited the construction of oceangoing vessels and prohibited the existence of a Japanese Navy. With the outbreak of the Korean War in 1950, the policy was revised and the allies lifted the restrictions against construction of oceangoing vessels. During this period, however, the Japanese shipbuilders had not been idle, but utilized the time to rehabilitate and improve their facilities and improve their technology. As a result of this effort, and helped by the shortage of available ways in the world's shipyards, the country started to move into the export market and obtained in 1951 export contracts for a total of 256,000 gt."

Taking part in the San Diego Section meeting were, left to right: **Gordon N. Carpenter,** retiring chairman; **Kristian K. Christensen,** co-author; **John J. McQuaide,** co-author, and **John Angles,** secretary-treasurer.

Mr. **Christensen** pointed out some factors which make the Japanese shipyards attractive to owners throughout the world which are: short delivery time, on-time delivery, low prices, good workmanship, and long-term low-interest financing.

"Employment in the larger yards has actually decreased during the past seven years while the output of tonnage has increased," the authors said. "This was due to modernization of the Japanese yards and the upgrading of the office personnel."

"Education plays an important part in the story of their success," he explained. "There are more college-trained office personnel than in the comparable size yards in the United States. The college trained also are found in the yard production workers which explains why the number of office workers has increased in the past seven years while the yard workers have decreased."

Mr. **McQuaide** commented that "their techniques of shipbuilding, such as erection and outfitting, are not new but very much like the Liberty ships which were built by Kaiser Shipyards during World War II — prefabricated blocks on the ground and put together like building blocks. It is nothing to lay the keel and launch a new supersize tanker in four months."

"Financing is the big key to the Japanese success in getting new ship construction contracts," said Mr. **Christensen,** "and in this field, the Japanese yards have until recently had the upper hand through the finance facilities of the government-sponsored Export-Import Bank of Japan."

"These credit facilities have given the Japanese shipbuilding industry a tremendously important advantage over his competitors in the rest of the free world; an advantage that cannot easily be over-estimated. It is not until recently that the governments in the major shipbuilding countries such as England, France, West Germany and Sweden have deemed it prudent to support their shipbuilding industries in a similar fashion, in a belated attempt to increase the competitiveness of their own shipbuilding industry on the international market."

Stal-Laval To Supply Reduction-Gear Sets For Johnson Ships

For the two combined car/bulk carriers of 26,700 dwt ordered by the Johnson Line from the Abo yard of the Wartsila group Stal-Laval has been given the order to supply the "heart" of the geared machinery — the twin-input gearbox. The total rating of the two Pielstick 14 PC 2V diesel engines is 14,000 hp at 520 rpm, and the service rating of 12,600 hp at 515 rpm corresponds to a propeller speed of 112.5 rpm. The gear also has a power take-off gear to drive an alternator of 1,000 kw at 1,200 rpm.

The gears are representative for a new range of standardized ship gears, developed by Stal-Laval and comprising single- and multiple-input gears within the 6,000-40,000 hp range. This means that the rating range covers medium-speed engines of 500 hp/cylinder, as well as engines of 1,000 hp/cylinder recently developed.

Principal particulars of the new design is a gear case of fabricated steel construction, wheel with forged gear rim welded to the hub plates and also forged pinions. The double helical teeth have an accuracy which complies with BS 1807-grade A1. Wheel and pinions are journalled in babbit-lined steel bearings. Metalastic couplings and Fawick clutches are employed between engines and gear. The thrust bearing for the smaller gears is situated ahead of the gear and is of "semi-separate" design, which means that the thrust collar is bolted to the wheel shaft while the thrust-bearing casing is fitted to the foundation of the ship's hull with a flexible sealing towards the gear case. The bigger gears have a separate thrust bearing astern of the gear. The gears are supplied complete with lubricating-oil system, where the components are put together to a unit, situated in connection with the gear. A maneuvering system for the clutches is also included.

The main gear can be completed with power-take-off gears for alternator and cargo-oil pump drive. The gears, primarily or secondarily driven can be of built-on or free-standing design, the last for example for alternator drive from the "free" end of the engine.

Dravo To Design And Build Towboat For Ohio Barge Line

Ohio Barge Line, Inc., Pittsburgh, Pa., has awarded a contract for the design and construction of a 5,000-hp towboat to Dravo Corp., Pittsburgh, Pa. The towboat will have dimensions of 168 feet by 40 feet by 11 feet and will be powered by two 2,500-hp marine turbocharged, aftercooled engines driving through reverse-reduction gears. Delivery of the vessel is scheduled for December.

An idle SS Delta Argentina gathers no green.

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MARINE FUELS AND LUBRICANTS

Island Tug To Build World's Largest Self-Loading, Self-Dumping Log Barge

Comparison of Island Tug's present log carrier, Island Yarder, which is considered today's world's largest, with the new log carrier, shown in black silhouette, which will be built this year at Yarrows Limited, Vancouver.

Already the operator of the largest self-loading self-dumping log barge in the world, the Island Yarder, Island Tug & Barge Limited, Vancouver, B.C., Canada, a member of the GenStar Limited group of companies, formerly Sogemines Limited of Montreal, has announced that it will build another barge of the same type capable of carrying almost twice the 11,000-ton load of its present log carrier. It will be named Island Forester.

The new barge will carry more than 20,000 tons of logs, equivalent to over 4 million board feet. The announcement of its construction heralds a new $7-million tug and barge construction program, following hard on the heels of a $4-million program launched in 1965.

The new vessel will principally serve the transportation requirements of logging camps in the Quatsino Sound and Queen Charlotte logging areas, under a long-term agreement with Rayonier Canada, (B.C.) Limited.

The new barge, which is 450 feet long, 96 feet wide and 27 feet deep, was designed by Vancouver naval architect Robert Allan Ltd. and has undergone extensive testing at the model tank facility in Hamburg, Germany.

The barge will be fitted with two huge log-loading cranes, each with a boom 115 feet in length, as compared to the Island Yarder's 80-foot booms, and will carry three powerful boom boats as compared to two carried by the Island Yarder.

Tenders were received from shipyards in Vancouver and on the East Coast, as well as from overseas. A contract will be awarded to Yarrows Limited of Victoria for delivery at the end of 1969.

GM Diesel-Powered Towboat Robin Rose Runs Shuttle Service On Gulf Coast

The entire power requirements for the Robin Rose were designed and supplied by Stewart Stevenson. The boat can push three 200-foot light barges at 10½ miles per hour and 8 miles per hour loaded.

A unique towboat powered by a new GM Detroit Diesel engine that combines power with versatility has been placed in Gulf Coast Intra-coastal Canal service by Parker Brothers Company in cooperation with Stewart & Stevenson Services, Inc.

The craft, officially named Robin Rose, was built at the Parker Brothers Shipyard, Houston. The entire power requirements were designed and supplied by Stewart & Stevenson, the world's largest distributors of diesel engines.

A spokesman for Parker Brothers reported the boat has performed "extremely well" since it was put in service early last November. The new 12V-149 GM Detroit Diesel engines which power the boat combine compact durability, minimum weight and maximum economy and still meet the increasing demand for higher horsepower. The Robin Rose engines are rated up to 800 hp.

The boat can push three 200-foot light barges at 10½ miles per hour and eight miles per hour loaded. Robin Rose is operating between Houston and Corpus Christi and makes a round trip between these two cities in approximately 50 hours.

The GM Detroit Diesel engines in the boat turn four-bladed propellers that are 72 inches in diameter and have a 48-inch pitch. The boat is also equipped with a Lufkin ROS 1612 marine reverse reduction gear with a 5.4:1 ratio.

For her auxiliary power needs, the boat has Stewart & Stevenson 36 D 40 generator sets. These sets are powered by 371 GM Detroit Diesel engines complete with Stewart & Stevenson switch gears.

The Robin Rose is 75 feet long, 26 feet wide and 8 feet deep. She is also equipped with four flanking rudders, two for each wheel. These rudders allow for positive control of the vessel and make it possible for the boat to turn sharply and maintain control of its barges in rough weather.

Ingalls Expanding To Handle Sub Repairs

The Ingalls Shipbuilding Division of Litton Industries is equipping its Pascagoula, Miss. shipyard so that it can handle submarine overhauls. The announcement of these plans were made by **Earl R. Hammett,** senior vice-president of Ingalls, before a meeting of the Southern Interstate Nuclear Board held recently in Biloxi, Miss.

Mr. **Hammett** stated that the first phase of this expansion project is underway and will be completed this year. This work involves the construction of a graving dock and the necessary support shops. Two submarines are scheduled for overhaul within a year.

Raytheon Issues Marine Electronic Products Brochure

Raytheon's line of marine electronic products for navigation, communication and safety is detailed in a new folder available from the company.

Described are 10 radiotelephones ranging from compact, pre-tuned models to VHF/FM and single sideband sets, nine Fathometer depth sounders of indicating and recording types, three radio direction finders, two loud hailers, compact radars, and a loran receiver, depth alarm, fume alarm, automatic pilot, and sailboat speedometer.

Data for each product includes principal features and suggested retail price.

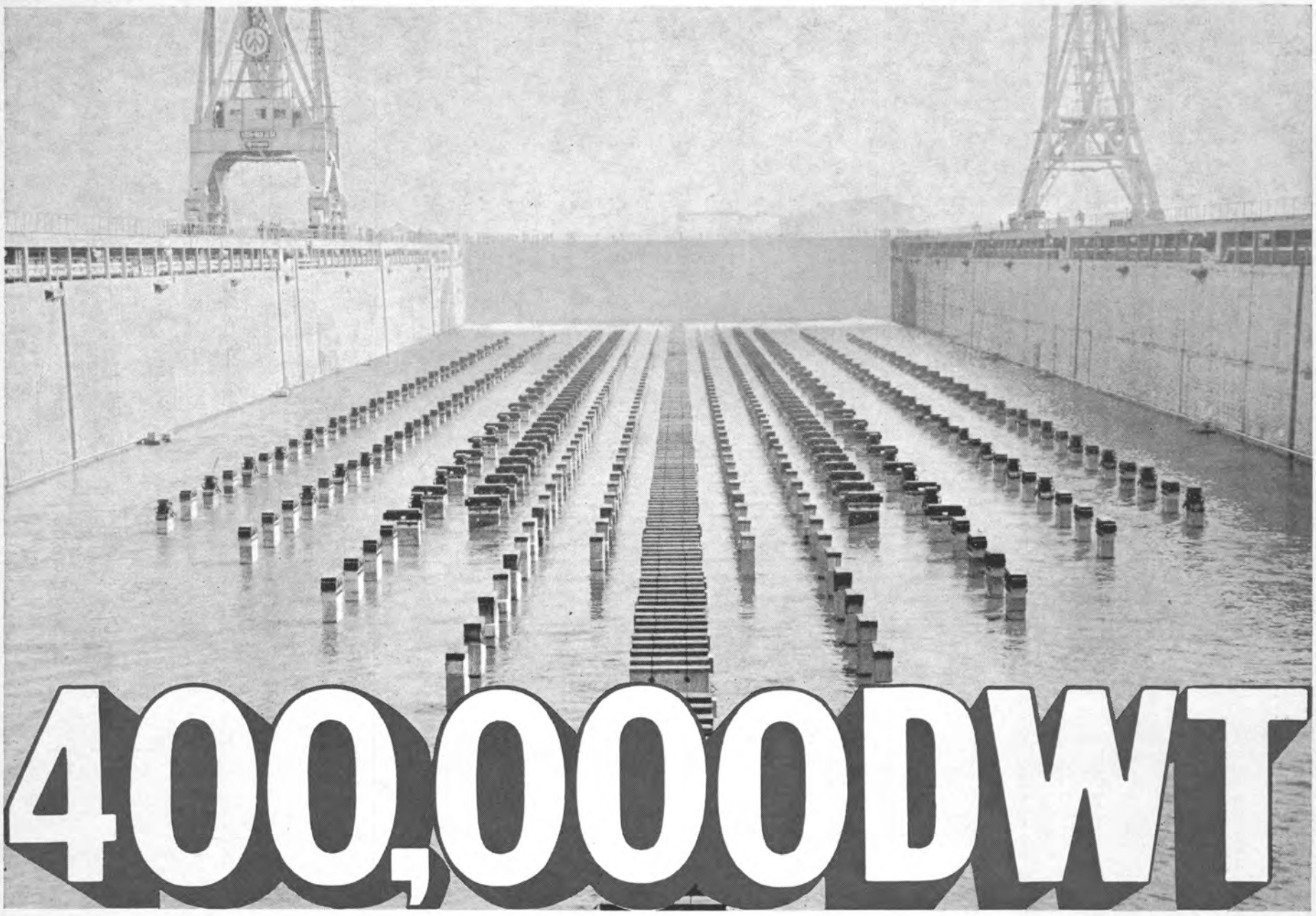
The all-products folder is available free from Raytheon Marine Products Operation, 213 East Grand Avenue, South San Francisco, Calif. 94080.

Capt. Reese To Head Eastern Operations For Pacific Maritime

William A. Keefe III, managing director and chief engineer of Pacific Maritime Consultants, Inc., has announced the appointment of Capt. **John D. Reese Jr.,** USN (ret.) as director, Eastern Operations, for the firm.

PACMARC, 4976 Marlborough Drive, San Diego, Calif., is a consulting firm specializing in marine engineering, naval architecture and naval design projects. The firm also performs hull and machinery surveys and plans marine salvage operations.

The Eastern Operations, which will be headed by Captain **Reese,** has its offices at 240 Glen Avenue S.W., Vienna, Va.



400,000DWT

Now ready to build 'em bigger, better, faster...SAKAI SHIPYARD

The capacity of our Sakai Shipyard has been vastly increased with the completion last October of a new 400,000 DWT dock. It can easily accommodate the largest ships afloat today. The dock measures 380 meters in length, 62 meters in width and 12.5 meters in depth and is equipped with the latest facilities for ship repair.

With our other 250,000 DWT dock, the Sakai Shipyard has been constructing mammoth tankers of 200,000 tons and more at the rate of 4 to 5 a year.

The new dock gives us more latitude to work and doubles our efficiency. We can now build ships bigger and better for you on shorter notice.

HITACHI ZOSEN

HITACHI SHIPBUILDING & ENGINEERING CO., LTD.
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Overseas Offices: London, New York, Düsseldorf, Hong Kong, Oslo, Belgrade

IMAS 69 London Presents Full Schedule OF Technical Papers And Other Activities

The International Marine & Shipping Conference, scheduled to be held in London, England from June 10 to 20, offers a unique opportunity to meet many of the men behind the new developments in the marine industries. The technical meetings have been divided in such a way that an individual can follow his line of interest completely without jumping between symposiums. The technical papers are of such quality that they will help keep the individual up-to-date on advances being made in the marine industry.

Apart from the technical meetings, ancillary activities will form an important part of IMAS 69. There will be visits to some of Britain's leading companies and research organizations. Every effort has been made to ensure that the time not devoted to the technical business of the conference will be as enjoyable as possible. An extensive social and sightseeing program has been prepared for those attending the meetings and for their wives.

The schedule in summary form for the technical meetings is:

June 10—Official opening ceremony.

June 11 — Morning session will deal with ship operation and management and main propulsion machinery. The afternoon session will cover electrical engineering and ancillary shipboard services.

June 12—Sessions will be held dealing with ship operation and management, main propulsion machinery (gas turbines and miscellaneous), electrical engineering and ancillary shipboard services.

June 13—The morning session will discuss ship design and construction and dry docking and repairs. The afternoon session will cover materials and control engineering.

June 16—Sessions will be held dealing with main propulsion machinery (medium speed diesels), ship design and construction, materials and control engineering.

June 17—The morning meetings will cover ship types of the future, and education, training and manning. The afternoon session will deal with miscellaneous craft and ocean engineering.

June 18 — All-day sessions will discuss ship types of the future, main propulsion machinery (direct-drive diesels), miscellaneous craft and ocean engineering.

June 19—Marine safety, and cargo handling and stowage will be discussed in the morning and afternoon sessions, plus education, training and manning in the afternoon.

June 20—The sessions will cover main propulsion machinery (boilers and steam turbines), propellers, sterngear and shafting, and dry docking and repairs.

The papers being presented during these technical sessions have been prepared by leading authorities in the United Kingdom, from nearly all European countries, Japan and the United States.

For those not attending any of the technical sessions, inspection trips and tours have been scheduled to operate concurrently.

The Institute of Marine Engineers organized IMAS 69 in collaboration with the Royal Institution of Naval Architects and assistance from the Chamber of Shipping of the United Kingdom and the British Shipping Federation Ltd.

Soros Names Koman Vice-President

Bela Koman

Soros Associates Incorporated has announced the appointment of **Bela Koman** to the position of vice-president. Mr. **Koman** was formerly chief structural engineer of the Frederick Snare Corporation, a marine design and construction company. Since joining Soros Associates, Mr. **Koman** has participated in the engineering of an artificial off-shore island for bulk handling in Brazil, various ore shiploading facilities and other port installations.

Soros Associates Incorporated of 575 Lexington Avenue, New York, N.Y., is a consulting engineering firm specializing in the design of bulk material handling systems, and marine terminals. The firm has received the 1968 First Prize for Engineering Excellence in Civil Engineering from the New York Association of Consulting Engineers for the design of Port Latta, an open sea marine terminal in Tasmania. The firm also received an award in 1969 for the engineering of the Texas Gulf Sulphur bulk terminal in Morehead City, N.C.

Portable Light Names Chicago Distributor

The Portable Light Company, Inc. has appointed J. G. Peterson and Company, 6408 So. State Street, Chicago, Ill., stocking distributor for their line of commercial searchlights.

The Peterson organization will maintain a large representative stock and will service boatyards, towboat companies and barge line customers in sections of Illinois, Wisconsin, Missouri, Iowa and Minnesota.

Portland Repair Firm Expands To Better Serve Marine Industry

Joseph M. Schmader

Joseph M. Schmader has been named president and treasurer of Marine Repairs, Inc., of Portland, Maine. He was formerly service administrator of International Equipment Company, a subsidiary of Damon Engineering, Inc., of Needham, Mass. Mr. **Schmader** attended Cambridge Junior College, Parsons College and Boston University. He has also attended numerous workshop seminars on customer relations and the service industry. An ardent sailing enthusiast, Mr. **Schmader** has sailed extensively in New England waters and is the recipient of numerous nautical awards.

Mr. **Schmader** brings to Marine Repairs management skills and financial interests for continued growth and expansion at their new quarters consisting of over 20,000 square feet of floor space at Union Wharf in Portland, Maine. Docking space is available to handle vessels up to 300 feet in length with a draft up to 25 feet.

Franklin R. Nadeau, founder and former president, has been named executive vice-president. Mr. **Nadeau,** a stationary chief engineer, will now concentrate on managing production and ship repairs.

Allan Kjos-Hansen has been named vice-president, sales and service. Mr. **Kjos-Hansen,** a retired lieutenant commander engineer, Royal Navy Reserve, is also Royal Norwegian vice consul State of Maine.

Donald Grey Lowry of the law firm of Jensen & Baird of Portland, has been named clerk and corporate counsel. **Roger Labranche** of the CPA firm of Peat Marwick Mitchell & Co., of Portland has been named account supervisor.

Marine Repairs now offers around-the-clock, fast marine service for all vessels using the ports of Portland, Wiscassett, Searsport, Sandy Point, Bucksport, Brewer, Maine, and Portsmouth, N.H. Experienced bilingual personnel, engineers, technicians and skilled craftsmen are available to handle every repair on ships visiting these ports.

The new facilities of Marine Repairs, Inc., under the direction of Mr. **Nadeau** in Portland, include a diesel engine department, a steam turbine department, a pipe and sheet metal fabrication department, a complete marine electrical department, a marine refrigeration department, a hydraulic and oil power department, a machine shop for both standard and metric machining to manufacture bearings, gears, pistons, pump parts and any other non-standard items requiring the closest tolerances.

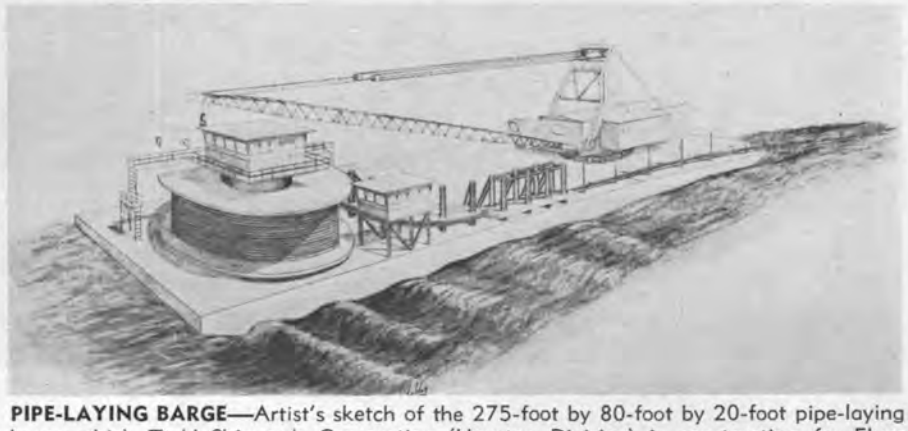
A new inventory control system has been installed to permit rapid location of parts in inventory as well as known sources of supply. Marine Repairs carries one of the largest inventory of marine parts in New England and provides around-the-clock service.

California Standard Places Foreign Orders For Four Supertankers

Standard Oil Co. of California has announced that it has ordered four supertankers in the 250,000-plus-ton class for its international trade. This boosts the company's international orders to 11 vessels.

O. N. Miller, chairman, said two 251,000-ton vessels will be built at Rotterdam, the Netherlands, while two 261,000-ton supertankers will be built at Nagasaki, Japan. The four ships are to go into operation in 1971.

California Standard is scheduled to take delivery this month of the first of six 210,000-ton supertankers for its foreign service built at shipyards in Sweden and Japan, the company said. Another supertanker currently under construction will be acquired on long-term charter, the company added.



PIPE-LAYING BARGE—Artist's sketch of the 275-foot by 80-foot by 20-foot pipe-laying barge which Todd Shipyards Corporation (Houston Division) is constructing for Fluor Ocean Services, Inc. This unique barge will feature a 79½-foot-diameter pipe reel having the capacity to lay over 3½ miles of 12-inch diameter pipe in one loading. The barge will have air-conditioned quarters for 44 persons.

AIMS President Tells House How To Get More Ships Now

An industry-wide survey, conducted recently by the American Institute of Merchant Shipping (AIMS) to determine the number of ships and the amount of construction differential subsidy (CDS) funds needed to build them, revealed a total of 82 vessels costing $1,193,-500,000 are urgently needed by 19 companies for fiscal year 1970.

The survey's results were made known by AIMS' President **James J. Reynolds** in testimony before the House Committee on Merchant Marine and Fisheries, conducting hearings on H.R. 4152 to authorize appropriations for certain maritime programs. AIMS is comprised of 39 companies owning 539 ships totaling 7,552,000 dwt or 70 percent of all active privately owned tonnage registered under the U.S. flag.

Mr. **Reynolds,** deploring the neglected state of the aging American merchant marine, said the CDS appropriation request for fiscal 1970 of $15,918,000 was "nothing less than a national tragedy."

The 82 ships requested by the industry in the AIMS survey—which Mr. **Reynolds** said was incomplete as all company returns were not in — would cost the government $652,-425,000 in construction funds, estimated on a 55 percent world market price differential. The ship types listed in the survey by both subsidized and unsubsidized operators totaled 24 containerships, 31 bulk carriers, nine LASH barge systems, one tanker and 17 major conversions.

Mr. **Reynolds** said AIMS realized that the heavy federal financial drain for the Vietnam war and other commitments made it virtually impossible for the Administration to agree to a $652,425,000 shipbuilding appropriation, especially since President **Nixon** had sent to the Congress a reduced fiscal year 1970 budget. The AIMS' president, therefore, offered alternate methods of ship financing to permit a major new shipbuilding program to begin immediately. "Our shipyards presently have record peacetime order books and the period from contract signing to delivery is between two and three years," Mr. **Reynolds** said. "Thus, ships authorized by the Committee will not be delivered to their owners until mid-1972 or early 1973."

Mr. **Reynolds** outlined three possible ways to spread the cost over a period of years so as to reduce demands on the fiscal 1970 and 1971 budgets.

1. "Authorizations for new contract obligations could be separated from appropriations," he said. "This would permit authorization for MarAd to enter into new contracts for a large number of ships in fiscal 1970. The actual appropriations to pay the CDS costs of these vessels would be related annually to estimated actual expenditures required to meet progress payments. A procedure similar to this is used in the case of naval ship construction.

2. "Another possibility would be to authorize the Maritime Administration to enter into construction contracts with shipyards under which the government would contract to pay the total CDS cost in equal installments over a period of ten years. The shipyards could then take these contracts to the banks and borrow money to finance immediate construction. Under this proposal owners would pay their full share of costs during the construction period.

3. "A third possibility would be to reduce progress payments from the present 95 percent to 75 percent of the value work actually completed, with the final 25 percent of the government's share of construction costs being paid the year after the ship is delivered. Under this plan, the owner would continue the present practice of making 95 percent progress payments. This latter proposal would place some burden on the yards but it would appear that this would be more than offset by the large volume of new work and the benefits that they would ultimately receive from the federal shipyard subsidy program."

Mr. **Reynolds,** pointing out that the rapid deterioration of a U.S. merchant fleet comprised mostly of World War II vessels constitutes a national crisis, warned: "A delay in authorizing CDS funds for these ships will not simply postpone revitalization of the U.S. fleet for another year. It may permanently reduce its size and competitive posture."

Mr. **Reynolds** outlined four myths "to be put to rest" regarding the U.S. merchant marine and national maritime policy.

Myth One—Cost of the Vietnam war and social needs of our economy preclude increased maritime appropriations. "A nation with a budget of almost $200-billion and a gross national product of over $800-billion can certainly afford one-half or three-quarters of a billion dollars a year to sustain its essential maritime industry," Mr. **Reynolds** said. "A failure to provide this minimum level of support would border on national irresponsibility." He also called the fiscal 1970 Administration request for about $16-million for merchant ship construction, and the $187-million for construction of three Fast Deployment Logistic Ships for the Navy, as unrealistic budget priority.

Myth Two—That the cost of operating subsidies is spiraling upward out of control. "In fact," Mr. **Reynolds** explained, "the increase in total net operating differential subsidy payable during the last five years has been only 10 percent ($203,487,000 in 1964 and $220,853,000 in 1968). This is certainly less than the average increase in costs in the United States during the five-year period." He said he did not wish to leave the impression that wage increases in the past five years were only 10 percent; that they have been substantially higher, and that it is essential restraint to be used by the unions in future wage demands. "If future wage increases are held to reasonable levels so that U.S. ships can reap the competitive advantages of our new technology, there is good prospect for substantial increase in the size of the fleet," he stated.

Myth Three—That the Merchant Marine Act of 1936 has failed and, accordingly, there is a need for an entirely new merchant marine program and philosophy. "The simple fact is that where this Act has been applied and effectively administered, it has been eminently succesful," Mr. **Reynolds** stated.

"A principal objective of the Act," he said, "was the establishment by U.S.-flag lines of a sound capital base to permit regular replacement of ever-more-expensive ships." "The Act," Mr. **Reynolds** noted, "was successful in this respect, as witnessed by the strong capital position of the presently subsidized lines which have built 177 new ships since 1957." Mr. **Reynolds** urged that the administration of the Act be improved and that its benefits be extended to unsubsidized liner operators and to tramps and bulk-carrier operators.

Myth Four—That the companies subsidized under the Merchant Marine Act of 1936 have extremely profitable operations. "The fact is," Mr. **Reynolds** stated, "the return on investment for subsidized lines has been very low (2.9 percent in 1967). In many years the companies' stockholders would have been better rewarded if they had simply put their money into tax exempt government securities rather than in the risky and cyclical steamship business."

Mr. **Reynolds** stated that H.R. 4152 could constitute an important first step by the 91st Congress toward rebuilding the fleet, which can only be achieved when all segments of the industry and labor join forces to work together. In his brief tenure as AIMS' president, he had concluded that "hopefully all, but certainly most of the operators, and I believe the unions, are ready to assist in the development of realistic programs in the national interest."

American Trading Promotes Hempelman To New Post

Harry H. Hempelman has been promoted to the post of superintendent engineer of the ship operations of American Trading and Production Corp., according to a report by the New York office of the company. Mr. **Hempelman** has served with American Trading for some 20 years and handled various other activities prior to his new function.

American Trading and Production is a diversified firm that includes ownership and operation of five U.S.-flag tankers.

Weser Receives Order For Large Bulk Carrier

According to reports from Germany, **Ernst Russ,** a Hamburg shipowner, has placed an order with A. G. "Weser" for a new 138,700-dwt bulk-carrier to be delivered in early 1971. The ship is to be powered by a 26,000-hp engine which will give the vessel a service speed of 15.8 knots.

A. G. "Weser" now holds three orders for bulkcarriers in the 135,000 to 150,000 dwt range, the report added.

Zigler Low Bidder For Stern Trawler

The Maritime Administration has reported that the Zigler Shipyards, Inc. of Jennings, La., was the low bidder for construction of a 131-foot steel stern trawler for the Boston Fish Market Corp. of Boston, Mass. The bid, in the amount of $958,000, was made on the basis that the vessel would be delivered to the owner within 400 calendar days.

Halter To Build Twin-Screw Tugboat

Halter Marine Services, Inc., of New Orleans, La., has been contracted by George Engine Co., Harvey, La., for the construction of a twin-screw tugboat. Desiganted Hull No. 225, and to be powered with 1,700-total-bhp diesel engines, the tug will have the following dimensions: 85 feet by 26 feet by 12 feet 6 inches.

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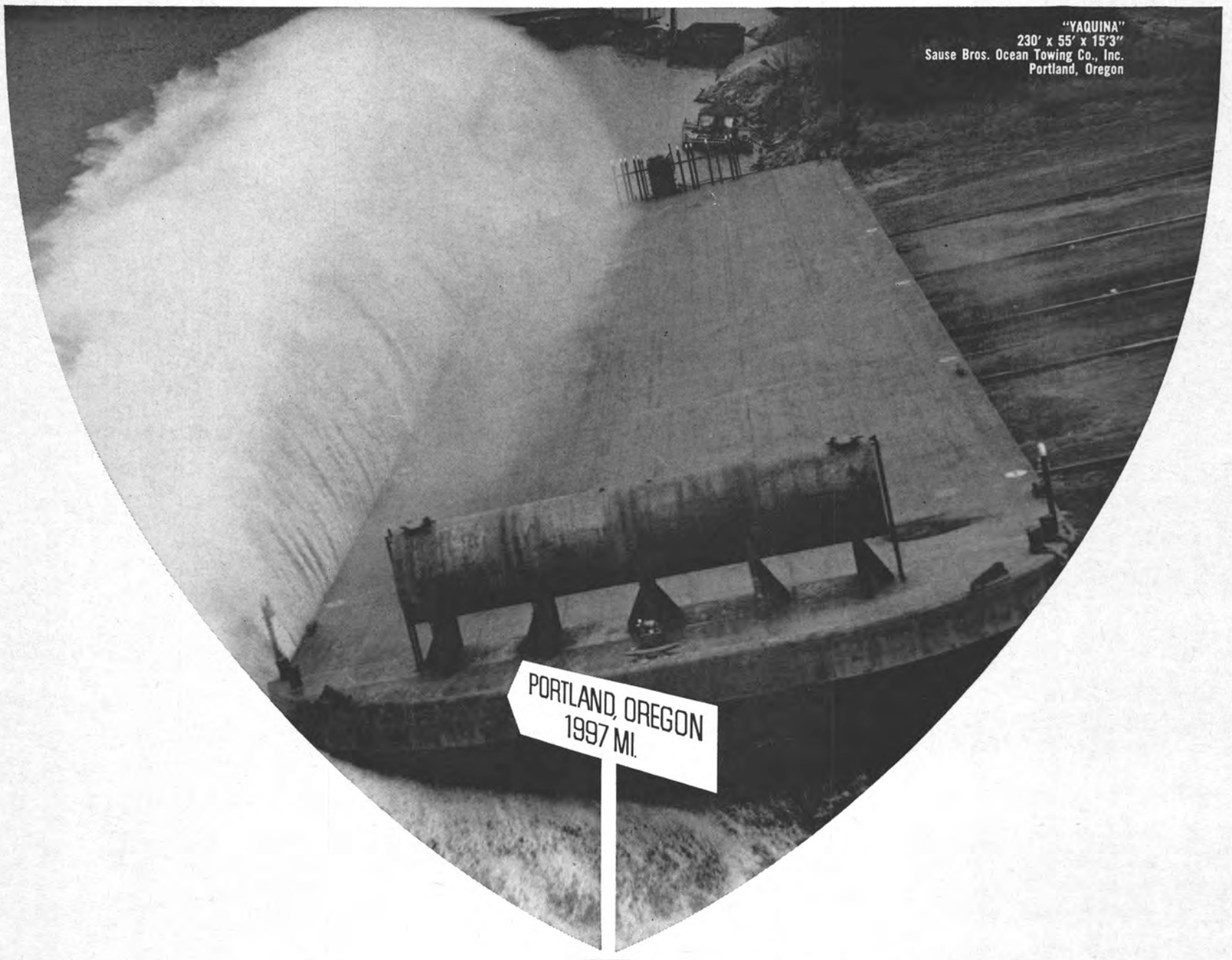
Look for the NABRICO-built "YAQUINA" from Mexico to Canada on the coast and up the Columbia River to the Dalles doing the job for a Class A Contract Carrier. This West Coast barge buyer didn't count NABRICO out because we're in Tennessee . . . we'll deliver their second ocean going barge, the "ALSEA", in September.

Let NABRICO show you how close we are to meeting your next marine requirement.



"YAQUINA"
230′ x 55′ x 15′3″
Sause Bros. Ocean Towing Co., Inc.
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Dry Bulk Cargoes Carried In Slurry Form Offer Savings And Use Of Large Ships

The Marcona Corporation of San Francisco, in its efforts to reduce the cost of transporting iron ore has studied many methods of cargo handling. One of these methods, which is presently being used by the company, is the transporting of dry bulk commodities in slurry form.

The International Cargo Handling Coordination Association was advised by **Hugh C. Downer,** senior vice-president of the Marcona Corporation, at its recent New York symposium on bulk transportation, cargo forms is a complex subject, and the Marcona Research and Development Department has been devoting a great deal of time to this particular phase of reducing transportation costs. Mr. **Downer** stated that as a result of these studies "I think it can be safely said that there are few normally dry-bulk commodities which, if required to be moved in heavy volume, cannot be moved in ships of entirely new types with the cargo in an entirely different form than we normally think of, with resulting savings in transportation costs."

He gave as a specific example, the movement of iron ore in slurry form. "Recently," continued Mr. **Downer,** "we have concluded two contracts covering the supply and delivery of one-million tons of Peruvian fine ore concentrate to new type steel mills being built in the United States, one each on the West and East Coasts. This material will be pumped into the ship in slurry form at approximately 70 percent solids and rapidly decanted to approximately 92 percent solids. Normal iron ore has a moisture content of 4 to 6 percent. On arrival at the discharge port it will be reconstituted to about 60-65 per cent solids and pumped ashore to a receiving pond. In Japan, where we have already delivered several slurry cargoes a new expression has been coined, C&F Pondo. Subsequently the material will be reclaimed from the pond by a cutterhead suction dredge and pumped into the plants where it will be pelletized and then subject to direct reduction. This reduced product will then be fed to electric furnaces for the production of steel.

"The overall operation will result in substantial savings in capital and operating costs at both the loading and discharging terminals, as compared with the conventional dry cargo-handling methods. Additionally, we are convinced that this technique will encourage the development and construction of smaller regional steel mills with less capacity than would be required for economical operation of a conventional plant and at considerably less capital cost per ton of annual capacity, as compared to the conventional fully integrated plant.

"Conventional dry-bulk ships are generally limited in maximum size by the capabilities of the shore receiving facilities. Size is also limited by restrictive structural requirements. The continuing increase in size of dry-bulk carriers, with resulting discharge of upwards of 125,000 tons at a single receiving port, has necessitated a concurrent increase in the rate of receiving such cargoes. We must now obtain at least 45,000 tons per day discharge and 4,000 tons/hour load. This requires not only tremendous berths with deep drafts but also expanded gantrys and exceptionally large clam buckets for digging the cargo from the holds.

"With the slurry concept of transportation, however, the multi-purpose bulk ship of the future will in effect be a tanker carrying petroleum products on one leg, slurried iron ore on the second leg, and slurried coal on the third leg. In the tanker configuration, coupled with the ability to stand offshore and pump the cargo through a submarine line, these new type vessels to carry so-called "dry cargoes" can be built in the same sizes as tankers presently being built or considered.

"Our studies have indicated that unless we utilize a completely different system (such as slurry) it will be extremely difficult to develop large, economical, self-discharging vessels handling the conventional dry-bulk commodities at the high discharge rates required to ensure rapid dispatch of vessels that cost $10,000 a day or more when in berth."

Mr. **Downer** advised the group that most industrial raw materials, such as coal, phosphates, and even sugar and salt, can be shipped slurry fashion. However, grains cannot be handled this way.

Clarifier-Coalescer For Lube Oil Removes Practically All Solids

Marine Moisture Control Company has introduced a new lube-oil clarifier-coalescer which the company says removes all free water and 99.99 percent of all sludge and solids to 3 microns positive. The removal of water and sludge is accomplished through filters. Water screen separators prevent carry-over water from returning to the system.

The MMC unit contains only one moving part. The company stated that it can easily be serviced and can be used in continuous operation. Model A1128, rated at 5 gpm, is virtually maintenance-free and is simple to install and operate. MMC also manufactures a ¾ gpm for generator sump clarification as well as a ¾ gpm stern-tube model for lubricated stern tubes.

For more information, write the Marine Moisture Control Company, Inc., 449 Sheridan Boulevard, Inwood, New York 11696.

N.Y. Maritime Exchange Elects New Officers

Charles T. Mattmann

The annual election and annual meeting of The Maritime Association of the Port of New York was held in April at the Maritime Exchange. **Charles T. Mattmann,** president, Netumar International, Inc. was elected to serve as president of the 95-year-old trade association for the coming fiscal year.

Other officers elected were as follows:

For term of one year: vice-president—**John D. Kerr,** vice-president, Calmar Steamship Corp., and treasurer—**Thomas M. Torrey,** resident vice-president, Insurance Company of North America.

Directors for two years: **Edward J. Barber,** president, Barber Steamship Lines, Inc.; **W. C. Brodhead,** vice-president of Transportation, Marine Transportation Division, Gulf Oil Corporation; **James A. Farrell Jr.,** chairman of the board, Farrell Lines, Inc.; **Walter R. Gheradi,** director, Chubb & Son, Inc.; **John T. Gilbride,** president, Todd Shipyards Corporation; **Cortland D. Linder,** president, Kerr Steamship Co., Inc.; **Walter E. Maloney,** partner, Bigham, Englar, Jones & Houston; **Christian J. Mohn,** resident director for North America, Norwegian American Line, and Adm. **John M. Will,** USN, (ret.), chairman of the board and director, American Export Isbrandtsen Lines, Inc.

The Maritime Association of the Port of New York, commonly known as "The Maritime Exchange" is the principal source of shipping intelligence in the United States and, more particularly, at the Port of New York. During the past year, over 65,000 telephone inquiries were processed concerning vessel itineraries, statistics, ownership or agency, ship sales, casualties and numerous other shipping intelligence matters.

Slide-Rule Computer Determines Ship's GM

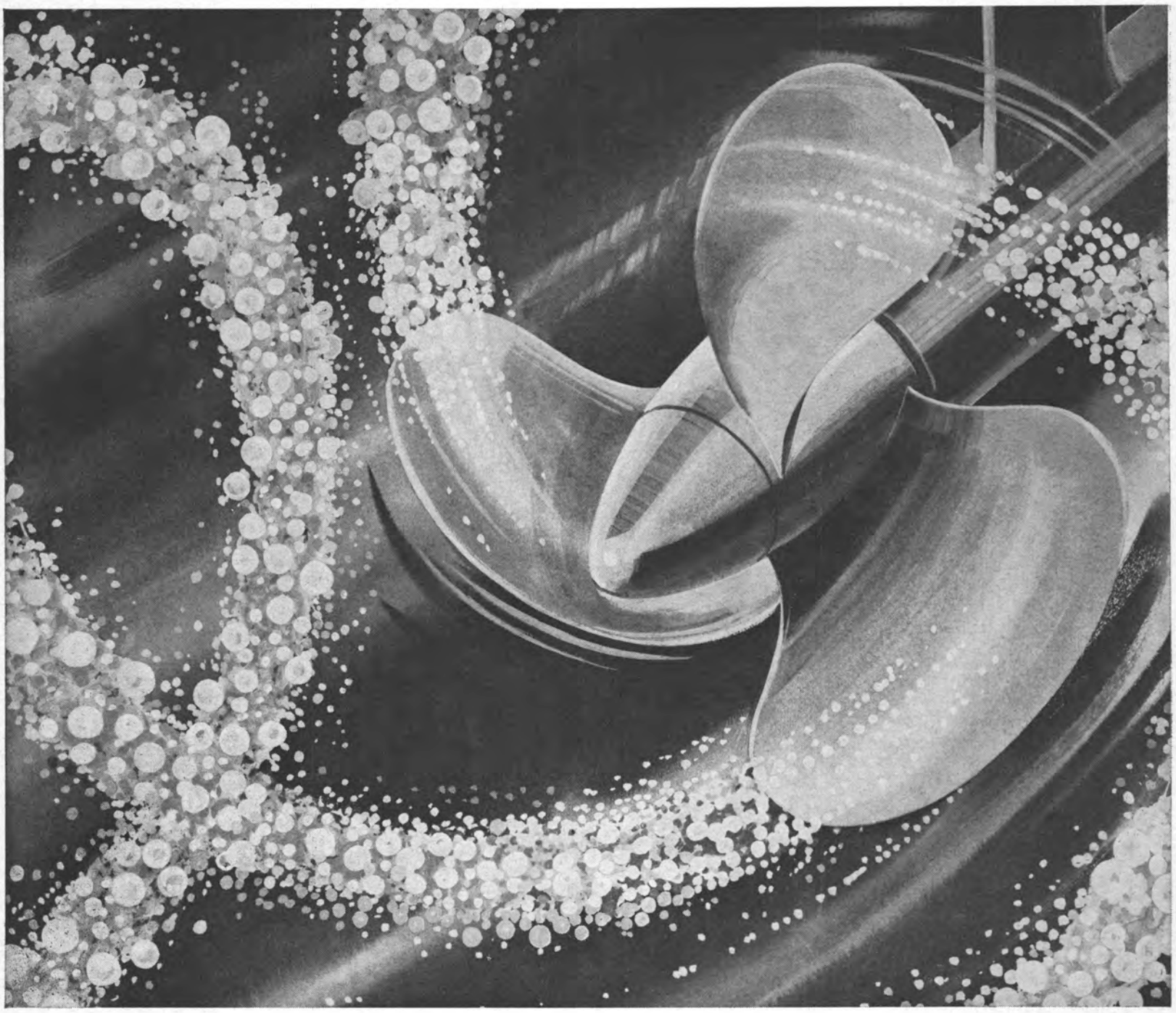
A new, simple, rotary slide-rule computer has been developed by American Hydromath Company for determining the approximate available metacentric height (GM) of a ship from its natural period of roll.

The natural period of roll can best be measured in fairly calm water during the ship's diminishing roll oscillations after a single disturbance. In a seaway, it is often hard to tell if the roll oscillations are natural or forced, or a mixture of both. Therefore, it is necessary to compare measurements taken at different times and to be sure that the measured period is not the period of encounter of more or less regular waves.

The GM Reckoner was designed to be used as a check on the accuracy of Stabilogauge indications and of long hand calculations of GM. Scales range from 0.5 to 10 feet for GM; from 50 to 185 feet for beam, and from 6 to 40 seconds for period of roll.

More information may be obtained from American Hydromath Company, 2020 Jericho Turnpike, New Hyde Park, N.Y. 11040.

SUPER ORE CARRIERS WILL CUT COSTS—Artist's conception of Bethlehem Steel Corporation's new $50-million ore pier complex now under construction at Sparrows Point, Md., compares super carrier that will bring in ore after the pier has been completed in 1971 with typical vessel calling on the plant today. The super ore carrier is 1,040 feet long and has a 160-foot beam. Today, a typical ore ship unloading at Sparrows Point is 760 feet long with a 102-foot beam and carries 52,000 tons. The super carrier could bring in 125,000 tons at the present channel depth of 42 feet. The proposed 50-foot channel for Baltimore harbor would allow it to bring in 160,000 tons, at costs more comparable to those enjoyed by many foreign producers. European and Japanese steel producers, in bringing in their raw materials, are already taking advantage of the inherently more economical super carriers.



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The special BJ/Borg-Warner developed rubber compound used in the fluted liner will stand up under all fresh or salt water conditions. On time delivery—every time—is a must at BJ. Custom-engineered bearings for all size shafts or special material requirements are also available. But satisfied customers are the final judges of our bearings—and they are turning BJ into the big name in bearings.

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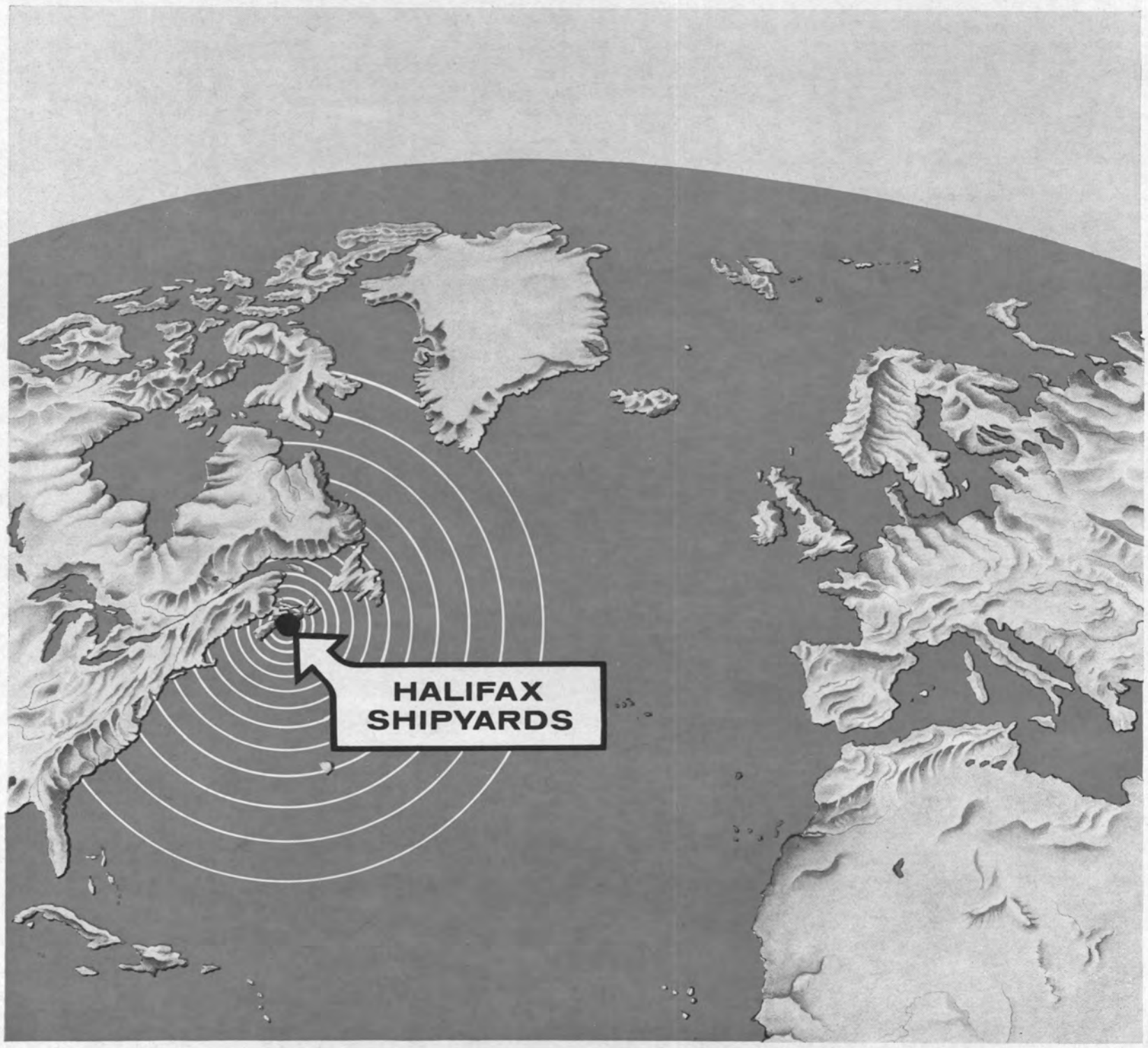

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HALIFAX SHIPYARDS DIVISION

Halifax, N.S., Canada

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Newport News Promotes Via, Seward And Bonnett

G. Guy Via

George M. Bonnett

G. Guy Via Jr. has been named manager of ship repair sales at Newport News Shipbuilding and Dry Dock Co., a major component of Tenneco Inc. The announcement was made by **L. C. Robertson,** vice-president for ship repairs.

Mr. **Via** was previously assistant manager for estimating in the department. **D. B. Seward,** formerly assistant superintendent in the steel hull division, will succeed him in that position. **E. E. Jaeger** continues as assistant manager for sales.

Succeeding Mr. **Seward** as assistant superintendent of the steel hull division, will be **George M. Bonnett,** according to an announcement by **R. S. Plummer,** general manager.

Mr. **Via** joined Newport News as an estimator in ship repair in 1947, after graduating from the University of Michigan with a degree in naval architecture and marine engineering. In January, 1966 he was named assistant manager of the department.

A naval officer during World War II, he served three years in the Pacific on the destroyer Smith (DD-378), the last 15 months as chief engineer. He was engineering inspector on the staff of commander destroyers Atlantic Fleet when the war ended in 1945.

A native of Newport News, Mr. **Via** is a member of The Society of Naval Architects and Marine Engineers, National Defense Transportation Assn., and the American Society of Naval Engineers. He served as president of the Newport News Propeller Club in 1962-63. He is also a member of the board of directors of the Newport News Savings and Loan Assn.

Mr. **Bonnett** received his B.S. degree in chemical engineering from City College of New York in 1940. He joined the shipyard in 1946. He worked in the hull design, research and atomic power divisions until 1962, when he was named associate engineer in the welding engineering and radiography department. In January, 1966 he was appointed nondestructive test engineer, the position he held until his present appointment.

Mr. **Bonnett** is a member of the Propeller Club, the American Society for Nondestructive Testing, and the Engineers Club of the Virginia Peninsula. He is the author of several technical papers on nondestructive testing.

American Ship Shows Large Rise In Earnings

The American Ship Building Co. has announced an earnings increase of more than 150 percent for the six months ended March 31, 1969, and 25 percent for the quarter ended on the same date.

For the first fiscal six months, the Lorain, Ohio-based company showed earnings of $0.49 per share compared to $0.19 per share for the same period in 1967-68. Second quarter earnings were $0.35 per share compared to $0.28 in in 1968.

NKK Uses World's First Shipboard Computer System For Strength Calculations

Highly successful 100-day test operation of Cargo Comp, reportedly the world's first shipboard computer system for performing various calculations of vessel strength, has been announced by Nippon Kokan, Japan's only integrated shipbuilder-steelmaker.

Hiroo Ikematsu, the company's New York naval architect, said the system, developed jointly by NKK and Oki Electric Industry Co., Ltd. of Tokyo, performed all assigned functions during the 100-day voyage of the 97,580-dwt ore/oil carrier, Kohfukusan Maru, which began in October 1968.

Manufacture and sale of the system are being conducted by Oki Electric.

Cargo Comp employs a digital computer for calculating various factors such as hull longitudinal strength, trim, stability, draft, displacement and deadweight to enable optimum loading and maintain vessel trim under varying sea conditions.

The test unit was ordered by Mitsui O.S.K. Lines, owner of the ore/oil carrier which was delivered in June, 1968.

Mr. **Ikematsu** said the system's versatility and simplicity eliminates the need for operation by specially trained personnel. All system handling during the 100-day test was controlled by second and third mates. During the voyage, the total of 3,367 calculations completed required only 2,015 minutes, or slightly over 30 seconds per calculation.

Most important of the many calculations were those for hull longitudinal strength. This involved determination of bending moment and shearing force at 14 transverse bulkhead points. Various conditions were programmed into the calculations including sagging and hogging both at sea and in sheltered waters.

L. Smit's Salvage Subsidiary Increasing Fleet Capability

The fleet of W. A. van den Tak's Salvage Co. Ltd., a subsidiary of L. Smit's International Tug Service of Rotterdam, Holland, is being increased by two oceangoing salvage vessels and a crane vessel. These units have been recently ordered in Holland.

The 2,300-gt diesel-electric, self-propelled, seagoing crane vessel features a sheerleg type crane with a lifting capacity of 800/1200 tons. The owners say that this unit will be the biggest of its type in the world. Four tackles (two of 250 tons and two of 150 tons) will give the vessel a lifting capacity of 800 tons with a spread of 33 feet. It will be further equipped with four deck tackles with a combined lifting capacity of 600 tons.

The new unit is designed in such a way that, except for the lifting of sunken vessels, it will be suitable to remove wrecks, quay walls, dams, moles, etc. For removing obstacles from a channel, the unit is fitted with a dual wreck gripper. Both shackling wires of the gripper will be connected to the 250-ton tackles, so that apart from the gripper's own weight of 100 tons, an additional effective 400-ton pull can be achieved. The gripper consists of two grippers which are independent of each other, but can be operated simultaneously.

The crane vessel, which is being built by Rotterdam Drydock Company, has a length of 197 feet, a breadth of 78 feet and a depth of 17 feet. It will be propelled by twin variable-pitch propellers. A bow thruster is also installed for maneuvering. Following delivery in December of this year, it will proceed to Liverpool for removing wrecks in the Mersey River.

The salvage vessels consist of two units. One is 148 feet long and is propelled by two 740-hp diesel engines driving variable-pitch propellers. It will be equipped with 10-ton, 30-ton and 100-ton derricks and all the necessary equipment for complete salvage operations.

The other salvage vessel is smaller, having a length of 93 feet but similarly equipped as the larger vessel.

Van den Tak also has acquired a Mark IV diving system, designed by the Ocean Engineering Division of Reading & Bates Offshore Drilling Company, for salvage and bottom survey work.

It was also announced that the van den Tak organization has acquired the worldwide license rights for the use of the polystyrene spheres salvage method developed by **Karl Kroyer** of Denmark.

Big River To Build Two Oil-Well Supply Boats

Tidewater Marine Service, Inc., New Orleans, La., has contracted Big River Shipbuilding, Inc., Vicksburg, Miss., to build two offshore, oil-well supply boats. Each vessel will have dimensions of 165 feet by 38 feet by 13 feet and will be equipped with 1,700-total-bhp diesels.

Brent Ship Building Triple-Screw Towboat

Logan Charter Service, Inc., of Greenville, Miss., has awarded a contract to Brent Shipyard, Greenville, Miss., for the construction of a triple-screw towboat. To be named Hilman Logan, this boat will be powered with 4,800-total-bhp General Motors diesels and will have the following dimensions: 140 feet in length, 45 feet in beam and 11 feet in depth.

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No matter what you haul, there is a Dravo tank barge for you—single-skin, double-skin or independent tank. When your barge needs require special modifications like heating, cooling, pumping and pressurizing systems, we can customize exactly to meet your specifications. That's how we think at Dravo—in terms of your needs.

If you're interested in a tank barge, either custom or standard design, call Dravo in Pittsburgh 412 771-1200; New York 212 687-4417; New Orleans 504 522-1511; or St. Louis 314 726-6670. Or write Dravo Corporation, Marine Sales, Pittsburgh, Pennsylvania 15225.

Dravo

A company of uncommon enterprise

New Firm Buys General Cargo Ships From U.S. Lines

The United States Lines has released plans under which the firm will dispose of older general cargo ships. The line is selling eight C-2 freighters built during World War II to a newly formed company. This sale is part of U.S. Lines' long-range plan to concentrate on containership operation.

So far, the company has already sold the World War II-built American Leader and American Scout to newly formed American Leader, Inc., and is in the process of transferring title of six similar ships to the same owner.

American Leader, Inc., is headed by **Preston L. Sutphen Jr.** Operating manager of this firm is Capt. **William L. Howard.** The company is located at 17 Battery Place, New York, N.Y.

Actual operating company of the organization is Americargo, Inc., also a newly established firm.

The six other vessels in the transaction are the American Packer, American Miller, American Pilot, American Importer, American Forwarder and American Scientist.

According to the Maritime Administration, the vessels are selling from $300,000 to $400,000 depending on the year of construction.

All eight ships are now under time charter to the Military Sea Transportation Service and, Mr. **Sutphen** states, they will continue under MSTS charter.

E. J. Heine, U.S. Lines' executive vice-president, said that the transaction terms involve the ultimate change of names of the ships.

Mr. **Sutphen** has for many years been active in the brokerage and chartering business in New York. Captain **Howard** was formerly with U.S. Lines.

Some months ago **John J. McMullen,** president of U.S. Lines, indicated that he would like to remove a number of the company's older ships from the operating subsidy program of the Maritime Administration.

A condition of the sale, according to the Maritime Administration, is that the new owners have no corporate tie-up, direct or otherwise, with the original owners.

The U.S. Lines has already arranged the sale of five relatively new modified ships with considerable container capacity to Farrell Lines.

Last year, according to the Maritime Administration, the company's fleet numbered 38 vessels under the subsidy program, including the big passenger liner United States.

Oceanautic Appoints Melson Vice-President

Capt. Lewis B. Melson

Capt. **Lewis B. Melson,** USN (ret.), has been named vice-president of Oceanautic Manufacturing & Research Company, 9051 Blue Ash Road, Cincinnati, Ohio 45242, according to **Robert E. Levinson,** the firm's president.

Formerly associated with U.S. Navy Oceanographic research, Captain **Melson** will be responsible for the company's operations in its manufacture and marketing of new underwater tools and equipment.

Since joining the Navy in 1941, he held a variety of research and management positions. Captain **Melson** initiated and directed the first two Sealab experiments. His most recent assignments prior to leaving the Navy were as maintenance and repair officer for the Military Sea Transportation System in the Pacific.

Captain **Melson** holds a bachelor of science in civil engineering and a master of science in mechanical engineering degrees from Oregon State University. He is a graduate of the Navy's post graduate school in naval architecture and industrial management.

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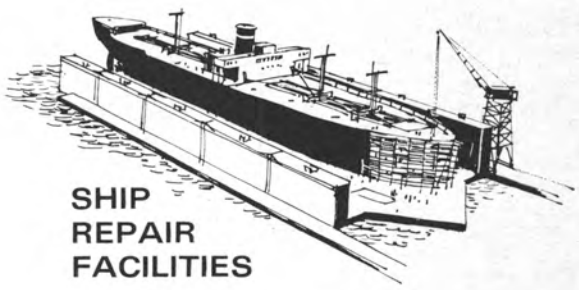

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4 drydocks to 22,000 tons
Baltimore Fort McHenry Yard
1 graving dock

NEW YORK HARBOR
Hoboken Yard
4 drydocks to 25,000 tons

BOSTON HARBOR
Boston Yard
3 drydocks to 20,000 tons

SAN FRANCISCO HARBOR
San Francisco Yard
3 drydocks to 22,250 tons

LOS ANGELES HARBOR
San Pedro Yard
2 drydocks to 22,000 tons

BEAUMONT, TEXAS
Beaumont Yard
1 drydock, 17,500 tons

SHIP-BUILDING FACILITIES

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Sparrows Point Yard
9 ways to 830 ft
Merchant ships, naval auxiliaries, and all types of special purpose vessels. Jumboizing and conversion.

BEAUMONT, TEXAS
Beaumont Yard
2 sidelaunching ways over 800 ft each.
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SAN FRANCISCO, CALIF.
San Francisco Yard
1 way for barges up to 550 ft.

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Staten Island, N.Y.
Propeller design, manufacture, reconditioning, and repair. Bronze, iron, and steel castings.

Dravo Launches 5,000-HP J. N. Philips— Most Powerful Towboat In Midland Fleet

The J.N. Philips, the most powerful towboat in the fleet of Midland Enterprises, Inc., is launched from the Neville Island shipyard of Dravo Corporation near Pittsburgh.

The most powerful river towboat in the growing fleet of Midland Enterprises, Inc., splashed into the Ohio River recently from the marine ways of Dravo Corporation's Neville Island, Pa., shipyard near Pittsburgh.

It is the first of two twin-screw, 5,000-hp vessels being built by Dravo for the Cincinnati-based inland waterways carrier. The second boat is scheduled for launching this month.

The 166-by-42-by-11½-foot vessel was christened the J.N. Philips. It is powered by two, 16-cylinder, turbocharged, aftercooled diesel engines with reverse-reduction gears and clutches.

It has Dravo-modified Kort nozzles, propellers, hull form, and steering and flanking rudders, all specially shaped and arranged in accordance with extensive model tank studies to assure high efficiency propulsion and maneuverability.

Both welded steel boats will be used by Orgulf Transport Company, a subsidiary of Midland Enterprises, for push towing of coal, phosphate and grain on the Mississippi River System. Three other towboats—the Elaine G., the Helen S. and the Harlee Branch Jr.—were built for Orgulf by Dravo during the past four years.

Including its other subsidiary, The Ohio River Company, Midland Enterprises operates a fleet of some 25 towboats and 1,000 barges.

Barge Construction

American Bridge Division (U.S. Steel Corp.), Ambridge, Pa., is to build two 1,500-dwt covered hopper barges for Ohio Barge Line, Inc. Designated Hull No. 3610 and 3658, each barge will measure 195 feet by 35 feet by 12 feet.

Big River Shipbuilding, Inc., Vicksburg, Miss., is to build five deck cargo barges for the Little Rock, Ark. branch of the Corps of Engineers.

Caruthersville Shipyard, Caruthersville, Mo., was contracted by Federal Barge Lines, Inc., St. Louis, Mo., for the construction of five 1,500-dwt covered hopper barges. Designated Hull Nos. 2569 through 2573, each barge will have the following dimensions: 200 feet by 35 feet by 12 feet.

Equitable Equipment Co., Inc. is to build a 2,000-dwt oil barge for Moore Terminal & Barge Co., Monroe, La. The barge will measure 200 feet long, have a 50-foot beam, and will be 11 feet deep.

Houston Contracting Co., Belle Chasse, La., is building a deck cargo barge for its own use. Designated Hull No. 5, it will measure 120 feet long, have a 38-foot beam, will be 7 feet deep and be of 800 dwt.

Jeffboat, Inc., Jeffersonville, Ind., was contracted by American Commercial Lines, Inc., Jeffersonville, to build six 1,500-dwt tank barges. Designated Hull Nos. 2237 through 2242, each barge will have the following dimensions: 195 feet by 35 feet by 12 feet 6 inches.

Kelso Marine of Galveston, Texas, is to build a bulk cargo barge for Ultramar Chemical Co. Designated Hull No. 35, it will have dimensions of 430 feet by 80 feet by 29 feet 6 inches, and will be of 8,500 gt and 16,000 dwt.

Lone Star Marine Salvage Co., Houston, Texas was awarded a contract by Dow Chemical Co., Dowell Division, Tulsa, Okla., for the construction of an 800-dwt deck cargo barge. Designated Hull No. 113, it will have the following dimensions: 123 feet by 40 feet by 10 feet.

Dravo Names Beer Chief Research And Development Engineer

Dravo Corporation, Pittsburgh, Pa., has announced the appointment of **William B. Beer** as chief research and development engineer in its Eastern Construction Division.

The division engages in a variety of heavy construction projects including navigation locks and dams, hydroelectric power stations, bridge substructures, docks, tunnels, shafts and mine development.

Mr. **Beer** joined Dravo in 1948 and most recently served as plant and research engineer in Eastern Construction Division. He was graduated from Iowa State College with a bachelor of science degree in mechanical engineering.

Mr. **Beer,** a registered professional engineer, is a member of the Society of American Institute of Mining, Metallurgical & Petroleum Engineers, the American Society of Mechanical Engineers and the Society of American Military Engineers. He is also a life member of the Iowa State University Alumni Association, Ames, Iowa.

LARGEST VESSEL EVER BUILT IN BALTIMORE—Congratulations are in order as the keel is laid for the largest vessel ever to be built in the Baltimore area. The keel for the 61,000-dwt tanker for Keystone Shipping Co. was laid recently at Bethlehem Steel Corporation's Sparrows Point shipyard. Attending the ceremonies were, from left to right: Lt. **Clifford Reeves,** USCG, Capt. **William A. Thurston,** Keystone owner's representative, **Daniel M. Mack-Forlist,** general manager of the yard, **Tom Brewton,** of the American Bureau of Shipping, and **S.F. Spencer,** assistant to Keystone vice-president.

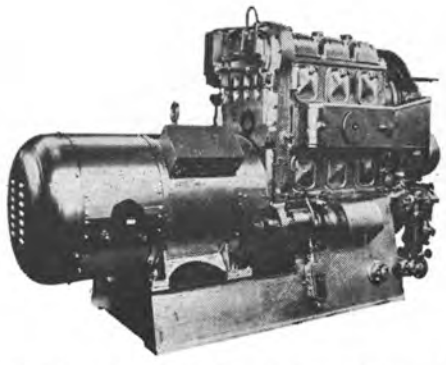
Fraser's Retirement Sparks Personnel Shifts At American Oil

George W. Fraser, manager of lake tanker and barge operations for American Oil Co., has retired after 33 years service, the company announced recently. He was succeeded by **Joseph W. Windhauser,** previously superintendent of marine operations at the company's Whiting, Ind., refinery. Mr. **Windhauser** was replaced by **Henry L. Price,** previously lake tanker and barge operations coordinator.

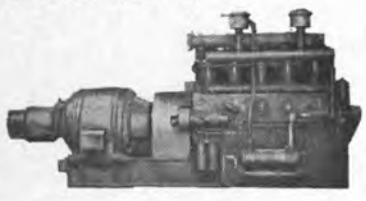
The company also announced that the headquarters for lake tanker and barge traffic was moved to Whiting from Chicago.

MARINE DIESEL GENERATORS

SUPERIOR, 10 KW, 120 Volts DC.
HERCULES, D00C, 10 KW, 120 DC, Radiator cooled.
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.

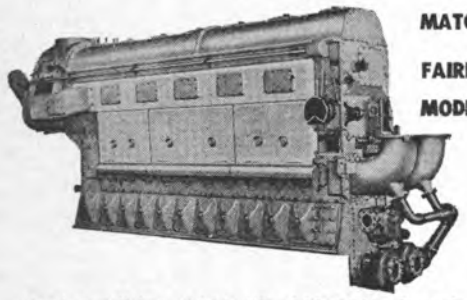
SUPERIOR, Model IDB-8, 100 KW, 450/3/60.

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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MODEL 38D8-⅛

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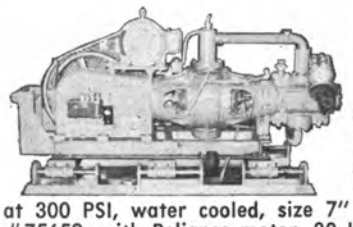
1 Starboard

Used condition, 1800 HP, 800 RPM, 2 cycle, 8½" bore, 10" stroke, Air Start. **Complete with Westinghouse Reduction Gears, 2.216:1 ratio—with hydraulic coupling.**

4—COOPER-BESSEMER, MODEL LS-8-DR
1300 HP, 277 RPM, direct reversing, turbo charged.

HYDRAULIC PUMPS (STEERING)
Hele Shaw, Type JLP 12, 1000 PSI, 850 RPM. Northern radial piston. Size 5430, 44 GPM, 1500 PSI, 850 RPM.

AIR COMPRESSORS



JOY
CLASS WG82
JOY Air Compressors Class WG82, 2-stage rated 100 CFM at 300 PSI, water cooled, size 7" x 3⅜" x 7", Typical Shop #75652, with Reliance motor, 30 HP, 220/440 AC/3/60.

SULLIVAN, 60 CFM, 110 PSI, with 15 HP Motor, 440/3/60.

INGERSOLL-RAND, 150 CFM, 600 PSI, Model 75, with Westinghouse Motors, 75 HP, 230 DC.

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.

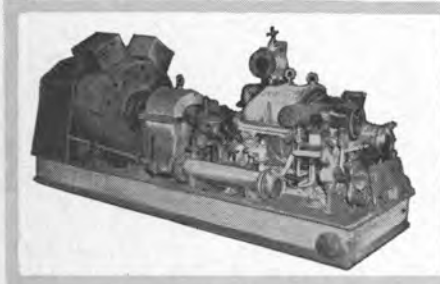
STEAM AIR COMPRESSORS
Westinghouse Air Brake Company, Size 11 x 11 x 12, Vertical, rated 66 CFM at 100 PSI (2 available).

REDUCTION GEARS . . .

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

WESTINGHOUSE, 2.216:1 ratio, with hydraulic coupling; as used with 1800 HP, 800 RPM Fairbanks-Morse engine—Starboard.

FALK REDUCTION GEARS . . . Port and Starboard, interchangeable with T-3 Tanker Gears, Falk No. 148-300. Also interchangeable with Falk Gears on A051 Class Tankers (14 ships). Also on A097 to A0100 Tankers. Gears are available as complete assemblies and/or rotating elements in sets. Gears offered with a current inspection report of condition by a representative of Falk Corporation.



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.

TURBINE GENERATORS

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

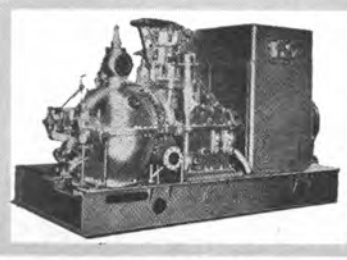
WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, driving on same comman shaft a 250 KW Generator, 440/3/60, and a 90 KW Generator, 125 Volts DC.

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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Save over new replacement costs as shown in the **"Typical Price"** listing below . . .
26" x 48"—4 dog type $ 60.00 ea.
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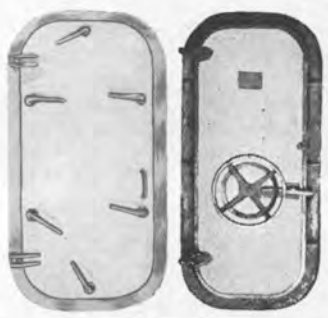

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AC PUMPS—Horizontal Centrifugal

2—Goulds, 2000 GPM, 470' head, Size 8x10, with Westinghouse Motors, 350 HP, 2300/3/60.

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

USED, GOOD QUALITY . . . SAVE!

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

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.

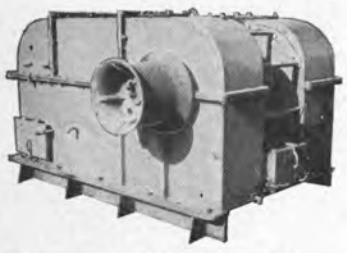
3—Hesse-Ersted, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

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.

$195.00 each

CAPSTAN WINDLASSES

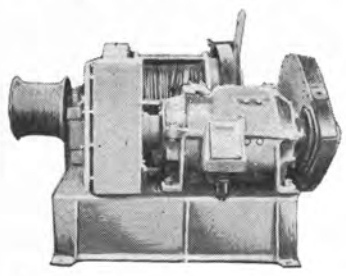
Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1¼" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

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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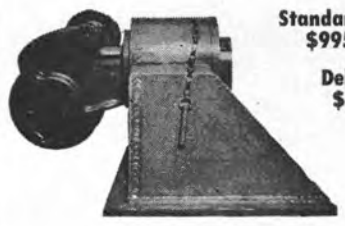
Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

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.

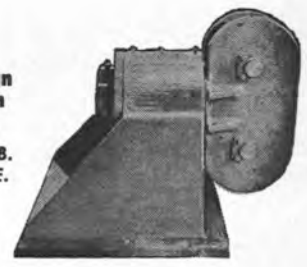
Dependable and Ruggedly built to perform consistently year after year with minimum maintenance.



Standard Design $995 each

Deluxe Design $1250 each

Model Design $1350 each



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SPECIAL MARINE ITEMS

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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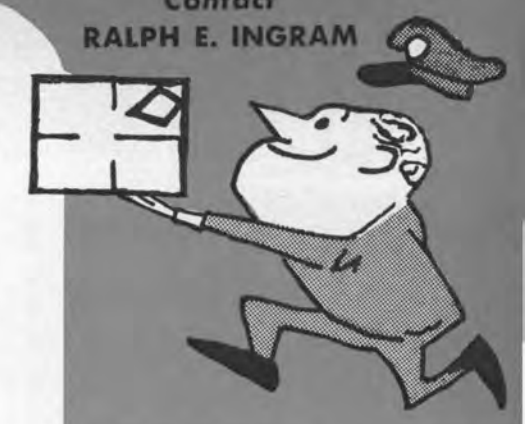

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LaDel, STURTEVANT etc.

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

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Size A¼	**@ $160 each**
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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 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

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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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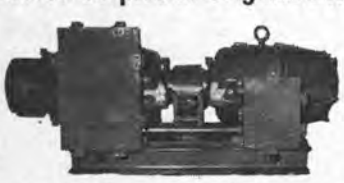

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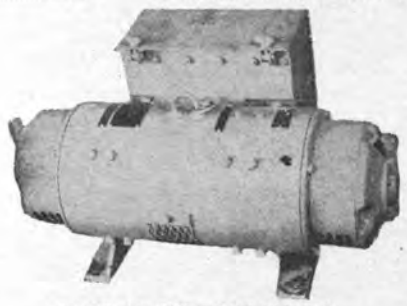

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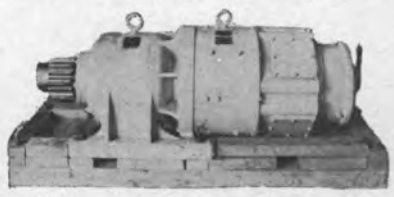

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$190.00 PER BANK

Also inquire about other sizes: 10 KVA/20 KVA/25 KVA/37 KVA

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BATTERIES
NEW SURPLUS BARGAIN

Heavy Duty, 8 volts, 500 amps, 13¾" Wide, 27¼" long, 18" high. Weight in case, 488 lbs.

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New Watertight Doors

FOR IMMEDIATE DELIVERY

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

SIZES:
26" x 48"
26" x 57"
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Complete Solo Shell Units
12,000 Gal/Day - Low Pressure

TYPICAL UNIT

Griscom Russel—still aboard "African Enterprise" and "African Endeavor". Solo Shell—two effects in one unit. Complete with all pumps and 230 volt DC motors, salinometer, etc.

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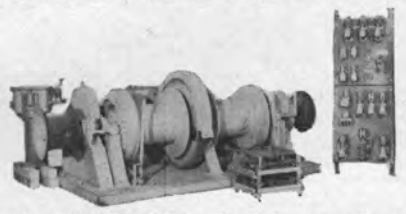
3 TON CLYDE
DOUBLE DRUM WINCH



Driven by 10 HP—115 volts DC motor & controls —complete—drums declutchable.

$2250.00

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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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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

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MARINE FAIRLEADS

$1175

Model 623—for 1¾" wire. 23" Sheave—shank opening 9½"—4500 lbs.—BASE: 37" long—50" wide—throat 11".

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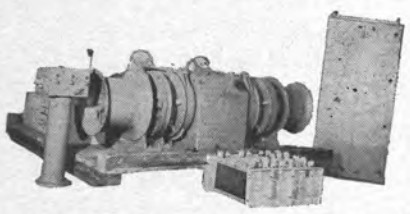
NEW - UNUSED

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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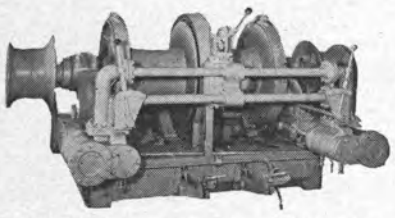
7 x 10 CLYDE DOUBLE DRUM

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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NEW Navy surplus, 6 x 19, HC, galvanized
15/8" x 290' open socket each end, $150 ea.
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1¼" x 100' $25; 1¼" x 50' $15; 1¼' x 10' $5.00 ea.

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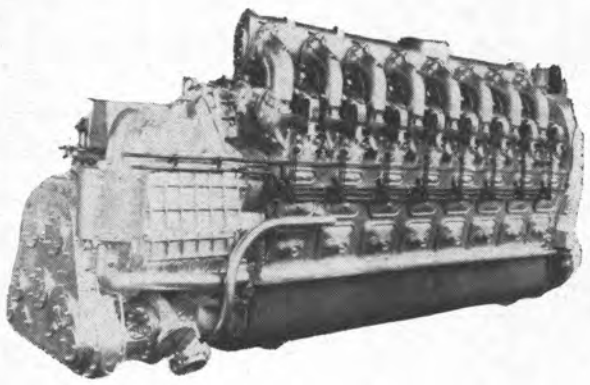
— We're Moving —
GENERAL MOTORS



16-278A DIESELS

1700 HP @ 750 RPM

Large Quantity to Move

COMPLETE INSPECTION INVITED

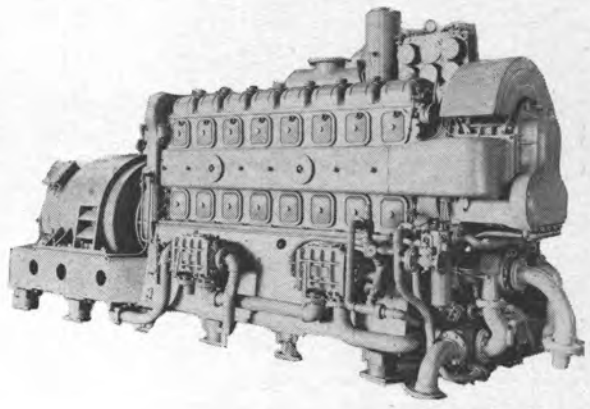
PRICE ~~$9750~~ ?

8-268A DIESELS

500 HP @ 1200 RPM

DRIVING
240 KW 3/60/440
GENERATORS

COMPLETE!
ALL ACCESSORIES



3-268A DIESELS — 150 H.P. @ 1200 RPM

DRIVING 100 KW 3/60/440 GENERATORS
COMPLETE — ALSO D.C. UNITS AVAILABLE

MANY OF THESE ENGINES HAVE BEEN MODERNIZED WITH THE LATEST TYPE PARTS

COME MAKE ANY INSPECTION YOU WISH

All Equipment is Priced to Move!

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BARGE MOUNTED REVOLVING CRANE 50-Ton capacity, Barge dimensions: 57' wide x 190' long.
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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.

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14" & 16"
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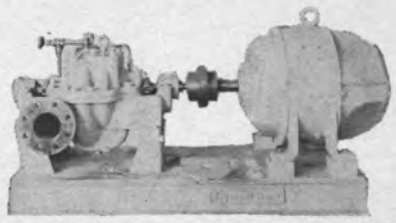
MARINE PUMPS - FIRE - BILGE - GENERAL SERVICE



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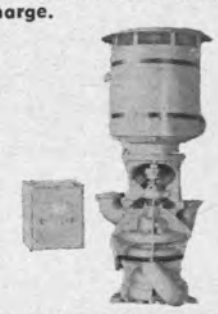
2-Stage 300 GPM @ 339 ft. Mfg. by Gould & Ingersoll-Rand. Bronze—5 x 4—50 HP 230 VDC —2500 RPM—with magnetic starters—reconditioned.

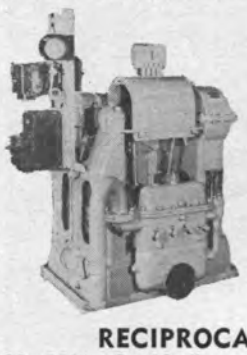
NEW ALL-BRONZE BUFFALO PUMP
Fire & General service—550 GPM @ 30 lbs.—14.5 440/3/60 motor—built for USN.

MOORE C2 AUXIL. 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.



MOTOR DRIVEN RECIPROCATING BILGE PUMP WITH AIR DOME

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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NEW 7" RADIUS PANAMA CHOCKS
(Meet Panama Regulations)
With Extended Legs For Welding To Deck

Clear opening 10" x 14" — 7" radius — with extended legs for welding to deck. Use as double or single bow chock. OAL 28" on base — OAW 14" — OAH 27¾" — Cast Steel.

IMMEDIATE DELIVERY FROM STOCK

BULWARK-MOUNTED CHOCKS
for curved or flat plate
7" RADIUS—14" x 10" opening

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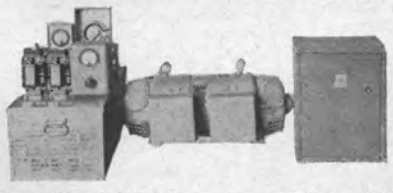
NEW — UNUSED 3.5 K.V.A.—2.97 KW
GENERAL ELECTRIC
MOTOR GENERATOR SETS



G.E. Type CG-21ACR in a single frame. MOTOR: 5 HP—115 V.D.C.—38 amps—3600 RPM. GENERATOR: 3.5 K.V.A.—2.97 KW—115 volts—1 phase—60 cycle—30.4 amps—model 5LY128A5. DIMENSIONS: 30¾" long x 14" wide x 12¾" high. Includes magnetic motor starter—Westinghouse 115 V.D.C.—size 3DC—class 6311-S31—push button station. Voltage regulator: type CG-23ACE———weight about 800 lbs. each. 2 Boxes of spare parts.

230 VOLT D.C. ALSO AVAILABLE:
Exactly as above, except input is 230 volts DC.

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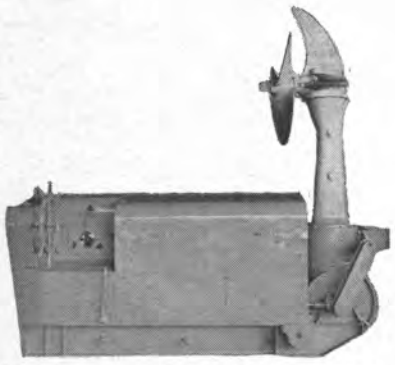
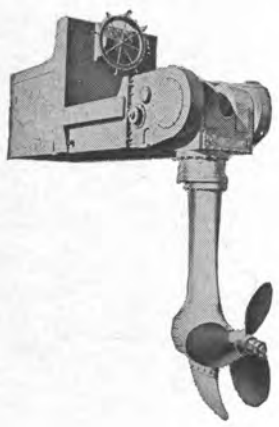
MURRAY & TREGURTHA
DIESEL PROPULSION UNITS
JUST ARRIVED — 7 UNITS



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.

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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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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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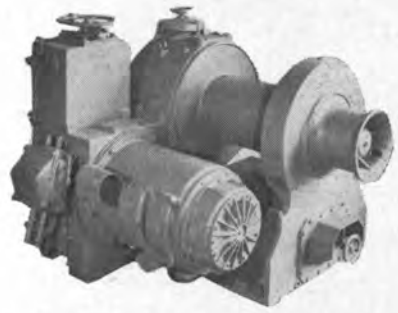
SPECIAL WINCH OFFER



10 A.E.G. Unit-Type Winches—with all controls attached to winch. In very good condition—removed from vessel run for only 1 year. 3-Ton capacity—25 H.P.—230 volts D.C.—Priced to sell!!

$1850 EACH

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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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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.

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

DOORS—Watertight—Bulkhead
Blue Water Marine Supply, Inc., 2102 69 St., P.O. Box 9156, Houston, Texas 77006
Overbeke-Kain Co., 209 Aurora Rd., Bedford, Ohio 44014
Walz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

ELECTRICAL EQUIPMENT
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

FITTINGS & HARDWARE
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 290-T, New York, N.Y. 10016
Reef Industries, Inc., P.O. Box 23221, New Orleans, La. 70123

MACHINE SHOP—TROUBLE SERVICE
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

MARINE ELECTRONIC NAVIGATION EQUIPMENT
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.

MARINE EQUIPMENT
Beaver Tool & Machine Co., P.O. Box 94717, 525 S.E. 29th St., Oklahoma City, Okla. 73109
Brazos Engineering, a div. of Metallic Bldg. Co., 4625 Holmes Road, Box 14240, Houston, Texas 77021
Godelius, 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
Keuffett 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
Sky Climber Inc., 17311 So. Main Street, Gardena, Calif. 90247
Vokes Filter Div. (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221
Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029

MARINE FURNITURE
Bailey Joiner Co., 115 King Street, Brooklyn, N.Y. 11231
Rex Cabinet & Linoleum Co., 531 23rd St., Union City, N.J. 07087

MARINE INSURANCE
Adams & Porter, Cotton Exchange Bldg., Houston, Texas

MARINE PROPULSION
The Buehler Corp., 9000 Precision Drive, Indianapolis, Ind. 46236
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
Mathers Controls, Inc., 902 N.W. Ballard Way, Seattle, Wash. 98107
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

MARINE RADIO COMMUNICATIONS EQUIPMENT
Collins Radio Co., M/S 416-118, Dallas, Texas 75207
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
Commercial Radio Sound Corp., 652 First Avenue, N.Y., N.Y. 10016
Crandall Dry Dock Engineers, Inc., 238 Main St., Cambridge 42, Mass.
Cushing & Nodstrom Inc., 50 Trinity Place, New York, N.Y. 10006
Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011
M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228
Christopher J. Foster, 17 Battery Place, New York, N.Y. 10004 14 Vanderventer Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
W. R. Henderson & Co., 3611 Revere, Houston, Texas 77006
Morris Guralnick, Associates, Inc., 74 New Montgomery St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
L. K. Homyer, Box 408, Corona Del Mar, California 92625
James S. Krogen, 1460 Brickell Ave., Miami, Fla. 33131
Littleton Research and Engineering Corp., 95 Russell Street, Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
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
Rudolph F. Matzer & Associates, Route 1 - Box 314 D, Jacksonville, Fla. 32211
John J. McMullen Associates, Inc., 17 Battery Pl., New York, N.Y.
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Gunnar Nelson, 2185 Lemoine Ave., Ft. Lee, N.J. 07024
Pearlson Engineering Co., Inc., 2825 Oak Ave., Miami, Florida 33133
Research & Design Corp., 17 Battery Place, Suite 1227 New York, N.Y. 10004
Philip L. Rhodes, 369 Lexington Ave., New York, N.Y. 10017
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 45 Second St., San Francisco, Calif.
Sanders & Thomas, Inc., 1st-Federal Bldg., Pottstown, Pa. 19464
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
George Slifer, 1422 Lakewood Rd., Jacksonville, Fla. 32207
Philip F. Spaulding & Associates, 65 Marion St., Seattle, Wash. 98104
R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235

Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
Transcaribbean Shipping & Trading Corp., Panam Docks, Isle Grande, P.O. Box 564, San Juan, P.R. 00902
H. Newton Whittelsey, Inc., 17 Battery Pl., New York, N.Y. 10004

OIL PURIFIERS—Repair
Norse Electric Mfg. Co., Inc., 57-59 Commerce St., Bklyn, N.Y. 11230

OILS—Marine—Additives
Esso International Inc., Esso Bldg., 15 West 51 St., New York, N.Y.
Gulf Oil Trading Co., 1290 Ave. of the Americas, New York, N.Y.
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.

PLASTICS—Marine Applications
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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Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
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

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Frigitemp Corp., 329 Herzl St., Brooklyn, N.Y. 11212
York Corp., Grantley Road, York, Pa. 17405

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American Mfg. Co., Inc., Noble & West Sts., Brooklyn, N.Y. 11222
Cating Rope Co., 309 Genesee St., Auburn, N.Y. 13022
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

RUBBER PRODUCTS—Dock Fenders, Hose, Life Preservers
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

RUDDER ANGLE INDICATORS
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

SEALS
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
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
Atlantic Gulf & Pacific Co. of Manila Inc., 45 Muelle De La Industria, Manila
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.
Getaverken American Corp., 39 Broadway, New York 6, N.Y.
Greignard 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
Maryland Shipbuilding & Drydock Co., P.O. Box 537, Baltimore, Maryland 21203
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
Southern Shipbuilding Corp., P.O. Box 1089, Slidell, La. 70458
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
Zigler Shipyards Inc., P.O. Box 492, Jennings, Louisiana 70546

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
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Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

STEAM GENERATING EQUIPMENT
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E. I. Dupont De Nemours & Co., Inc., Textile Fibers Dept., Wilmington, Delaware

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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., Mall 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

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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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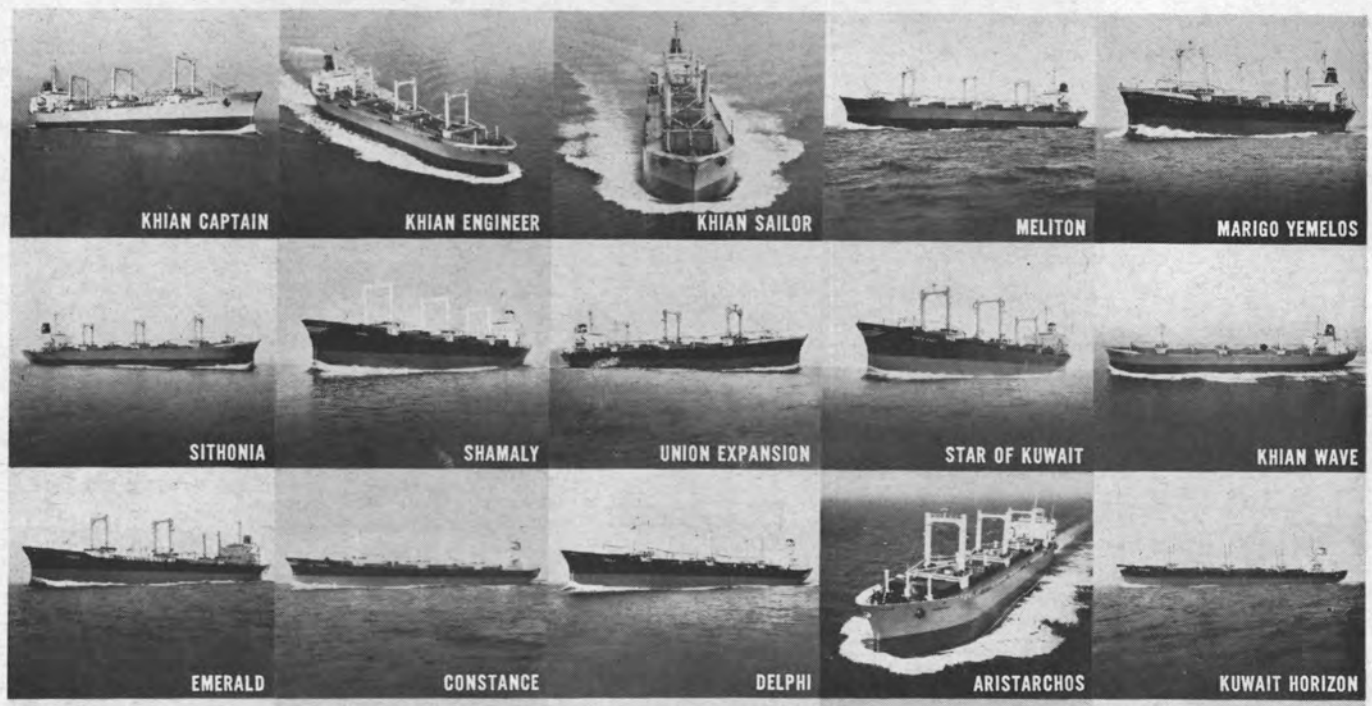

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We'll deliver our 21st order very soon. We still have 31 more orders to fill. But we'd like to have 100 more orders to fill. Yours, maybe?

Have you, for instance, contemplated the economical advantages of these mass-produced, multi-purpose dry cargo vessels?

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Best of all, IHI has adopted a standard design for the **FREEDOM vessel** and is passing on shipbuilding savings to customers. Today we're launching on a building berth a **FREEDOM vessel** every 23 days—on schedule.

If the **FREEDOM vessel** idea appeals to you, we have an interesting presentation for you. Please contact the IHI office nearest you.

Particulars:

LPP: abt 440 ft
Bm: abt 65 ft
Dm: abt 40.5 ft
dm: abt 29.635 ft
Deadweight: 14,800LT
Service speed loaded, no sea margin
13.6 knots
Trial speed (ballasted)
15.8 knots
Bale Capacity: 653,000 ft^3
Grain Capacity: 704,500 ft^3

Ballast capacity (seawater): 4,550LT
Main engine: IHI-SEMT 12PC2V
MCR 5,130 PS×500rpm
NOR 4,540 PS×480rpm
Daily heavy fuel consumption: 18.2 tons
Crusing range: 14,000 Sea miles

Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan IHI

HEAD OFFICE: New Ohtemachi Bldg., 2-4 Ohtemachi, Chiyoda-ku, Tokyo 100, Japan Tel: Tokyo (270) 9111 Telex: TK 2232 (IHICO) Cable Address: "IHICO TOKYO"
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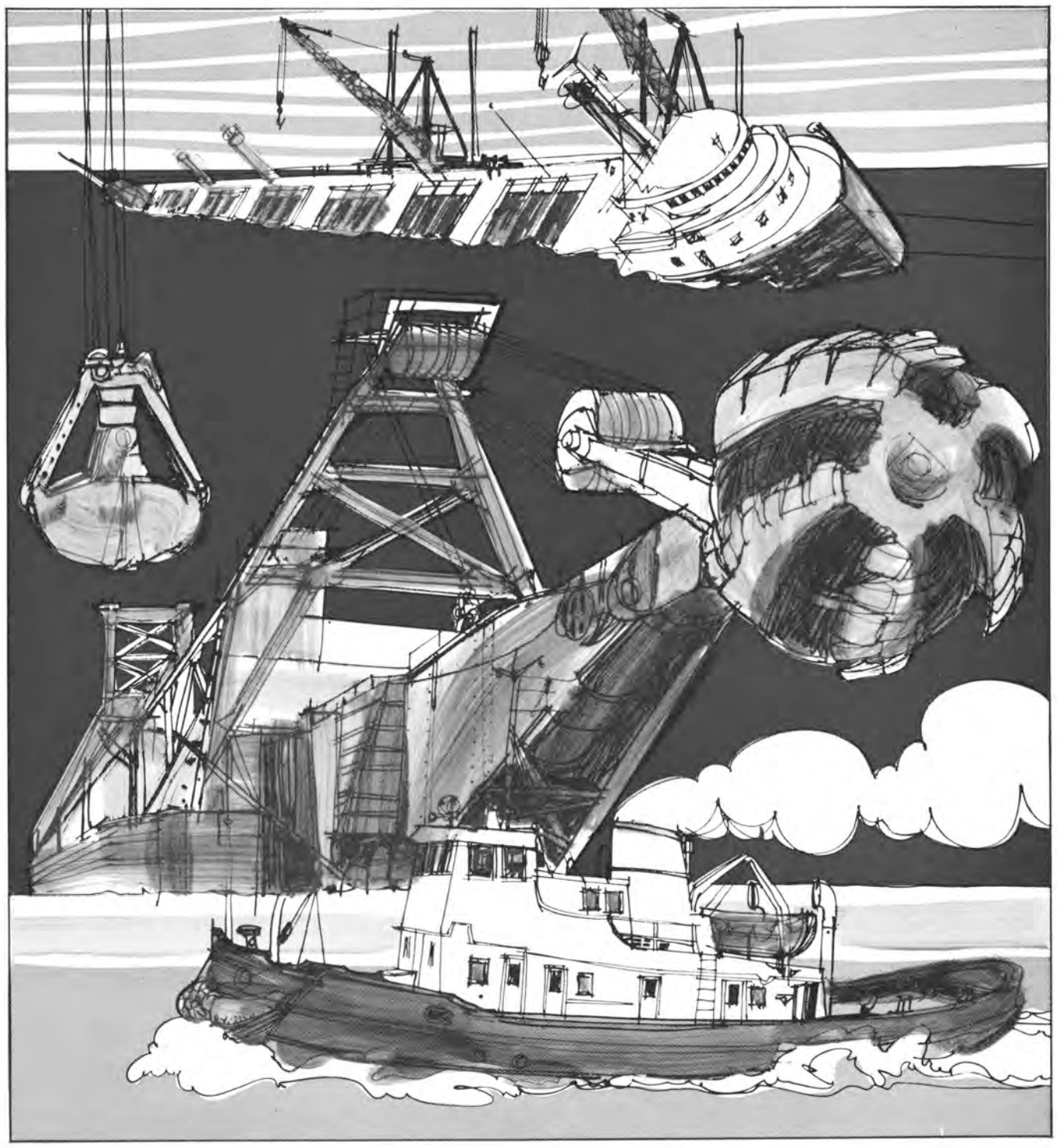
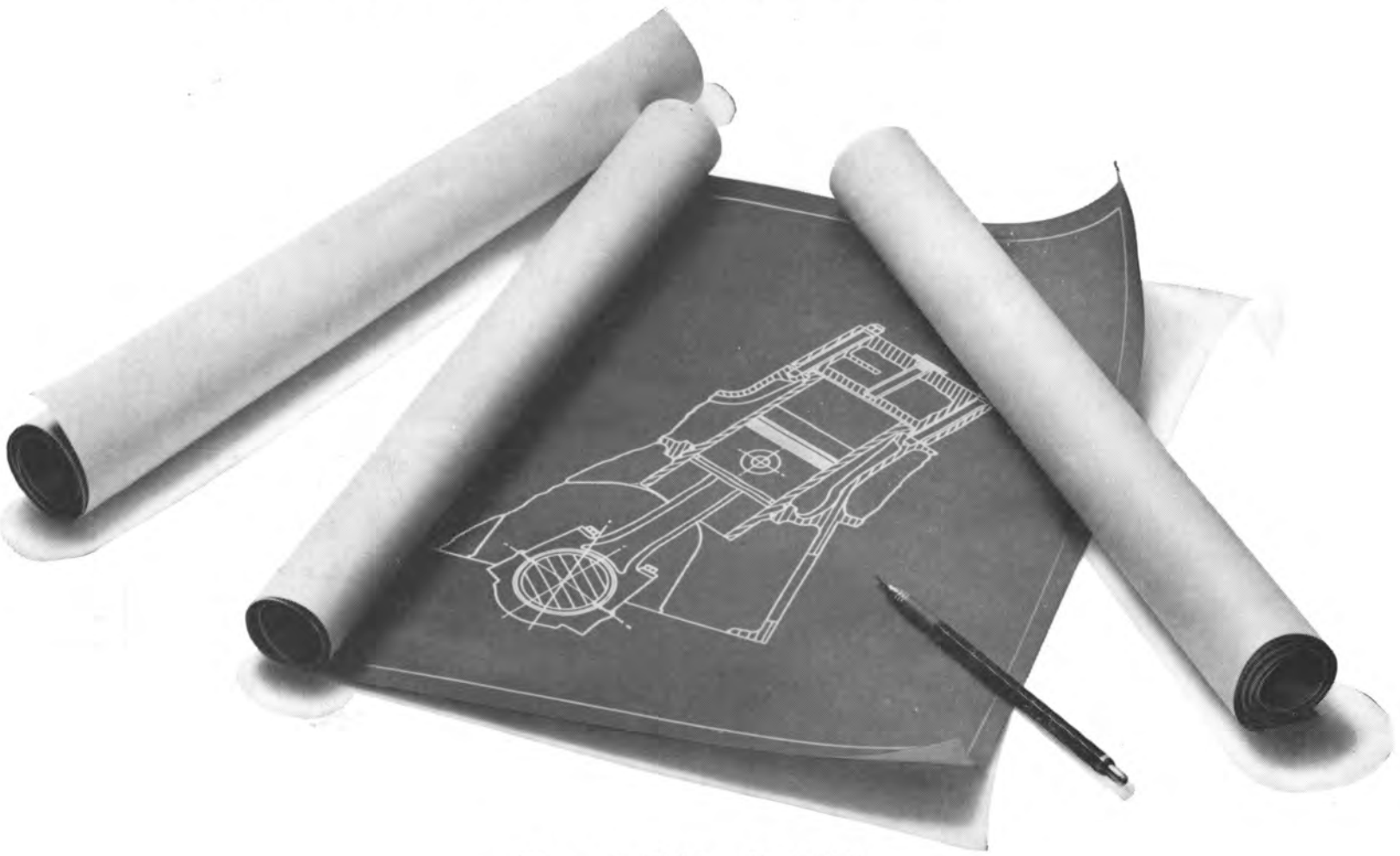


They're just off the drawing board.



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