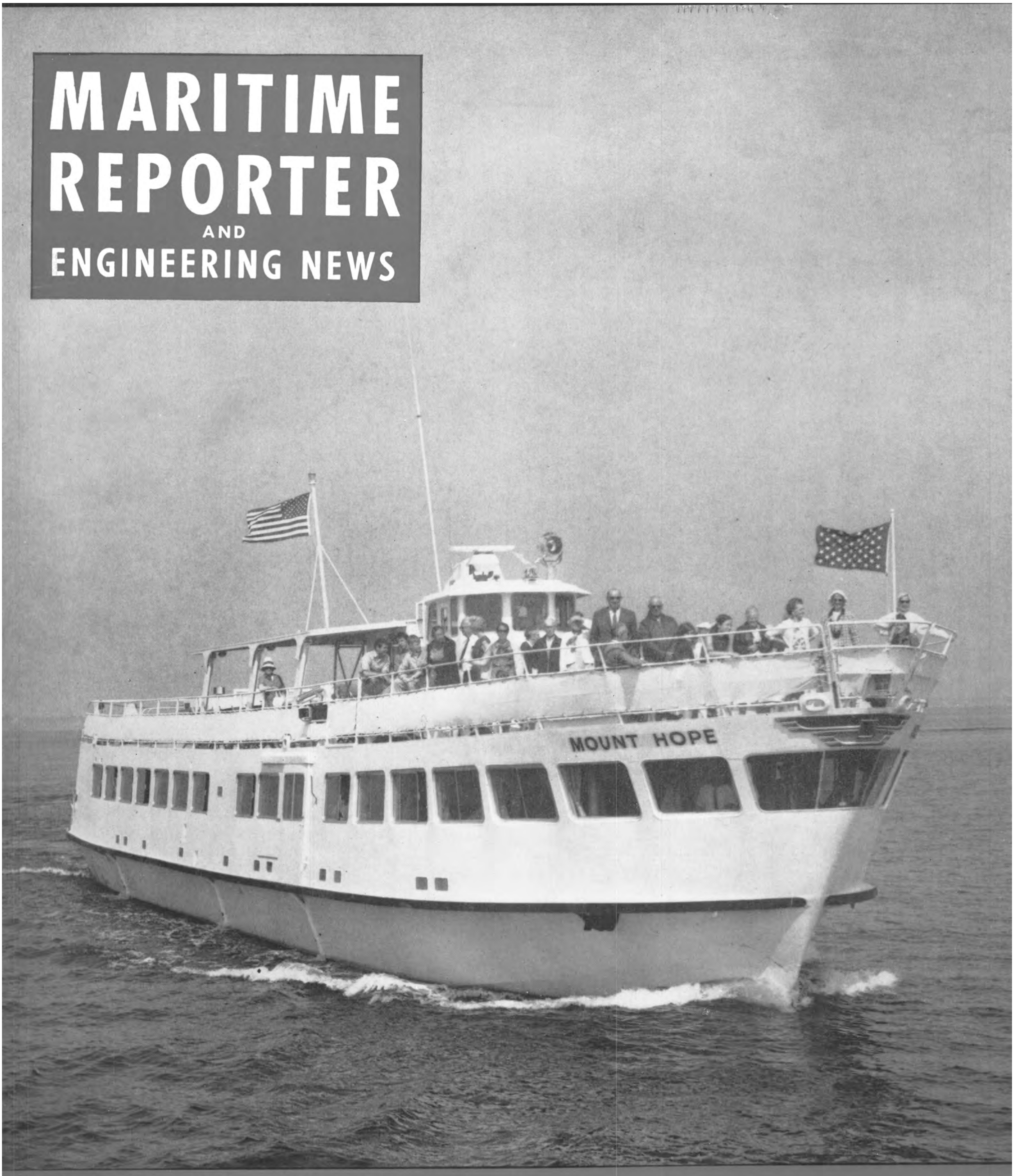
MARITIME
REPORTER
AND
ENGINEERING NEWS



Floating "Motel" Mount Hope Built By Blount To Tour Inland Waterways Of U.S. And Canada

(SEE PAGE 6)

AUGUST 1, 1969

Steady she goes with Gulf.

The SS American Lancer, 32,000 d.w.t., first of the "Lancer Class" containerships. Owned and operated by United States Lines, her load capacity is almost 1200 containers. Her maiden voyage was from New York, May 20, 1968. Gulf supplied Harmony Oils for her turbines. Gulf stands ready to do the same for your ships. For highest quality marine lubricants and fast, efficient bunkering service, wherever your port of call, call Gulf.

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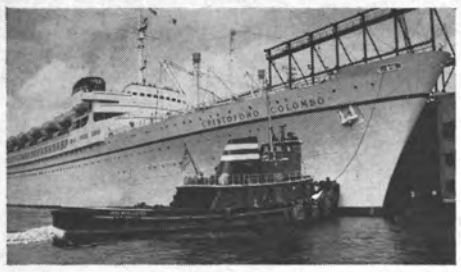
GULF OIL TRADING COMPANY, NEW YORK, N. Y., U.S.A.



Cristoforo Colombo discovers the new McAllister.

Docking and undocking now faster, more efficient than ever.

The newest addition to the McAllister fleet, the 3160-hp Kort-nozzle tug "Jane McAllister," is shown here undocking the pride of the Italian Line, "Cristoforo Colombo." The "Jane's" flanking rudder system gives her a powerful edge in manuverability that pays off in speed, economy and safe conduct of the ship.

The "Jane" is only one of four new powerful tugs that are swelling the McAllister fleet. Supertugs for superships. So, whatever your harbor movement needs, including tug and barge transportation, why not discover for yourself the new McAllister?
McAllister Bros. Inc., 17 Battery Place, N.Y. 10004.

Mac has the knack.

Coast Guard Awards Avondale Contract For 378-Foot Cutters

The Ogden Corporation has announced that its subsidiary, Avondale Shipyards, Inc. has received an order from the Coast Guard for two 378-foot high-endurance Coast Guard cutters.

The contract price was approximately $27,000,000 and delivery is scheduled for October and December of 1971.

It was further stated that Avondale has previously built nine similar vessels and that the two new ships represent the tenth and eleventh units in a continuing production series.

Burton To Build Oil-Well Supply Boat

Burton Shipyard, Inc., Port Arthur, Texas, is to build an offshore, oil-well supply boat for Caspary-Wendell, Inc. Designated Hull No. 459, the boat will measure 160 feet by 38 feet by 13 feet and will be equipped with 2,250-total-bhp diesel machinery.

Jakobson To Build Twin-Screw Tugboat

Jakobson Shipyard, Inc., Oyster Bay, L.I., N.Y., was contracted by Terminales Maracaibo, C.A., to construct a twin-screw tugboat. Designated Hull No. 445, the tugboat will measure 92 feet 9 inches (BP) by 28 feet by 14 feet 4 inches and will be equipped with 2,250-total-bhp diesels.

Farm Subsidy Aids U.S. Merchant Marine

The United States merchant marine industry will collect about $87-million in Government subsidies this fiscal year for carrying foreign aid shipments of surplus American farm products, an Agricultural Department report indicates.

The subsidy grows out of the fact that cargo rates on United States ships—except for scheduled liners—are about double the rates charged by foreign ships.

A 15-year-old law, the Cargo Preference Act, requires half of all aid shipments to move in the costlier United States-flag vessels when they are available at normal United States-scale rates.

The extra shipping costs caused by "cargo preference" in moving farm products under the Food for Peace Program were compiled by the Agriculture Department in a report published by the Senate Appropriations Committee.

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The Blackburn lash barge rigging system, including winches, cable fasteners and cleats are now being installed by leading companies on their first fleet of lash barges. This system has been proven to be safe, fast, efficient and economical.

After many years of barge line experience, we have designed our winch and fastener button for fast, efficient makeup of cargo barges. With the Blackburn system, 50% or more of normal makeup time using conventional equipment can be saved and rigging cost can be cut in half.

Blackburn equipment uses a minimum amount of cable without the need of eyes in either end. The winch is easy to release or take up, and surplus cable slack can be taken up or let out through this fastener button fast and easy. The winch and fastener button are designed for 1" or 7/8" cable. The cable is easy to fasten or remove from winch or fastener button. The winch is equipped with a padeye and "U" bolt that needs no doubler. The winch has a fabricated steel base that can be welded in a fixed position if desired. The winch is coated for corrosion protection against salt water and has a remarkable braking system that allows automatic slacking without removing cables when loading or unloading rigged barges.

For more detailed information and specifications about this Blackburn rigging equipment write or call today.

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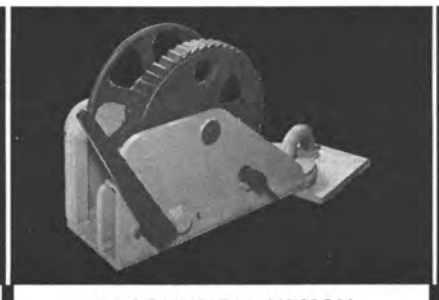
BUTTON
High-load carrying button designed to keep cable from coming off from loaded to light barges.



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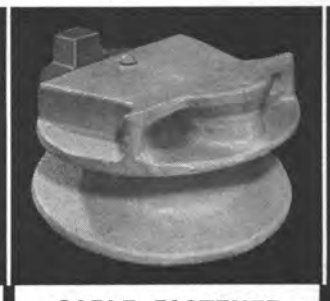
21" high, 12" wide and 42" long including padeye • Line pull of 20,000 lb. • Designed for 1" or 7/8" cable • Made of fabricated 3/4" steel plate.



CABLE FASTENER
Designed for three leads 1" or 7/8" cable • Cable can lead in any direction • Removable wedge eliminates the need for eyes.

CLEATS
High-load carrying cleats • Both our 24" and 36" cleats are designed for two wraps of 1" cable while using line at the same time.

Floating "Motel" Mount Hope

Blount Marine Built Cruise Vessel, Now In Service, Provides A New Dimension For U.S. And Canadian Travelers

Passengers are once again following the water route up the Hudson River and across New York state via the Barge Canal, but in luxury beyond the imagination of the early frontiersmen. The 1969 travelers are aboard an air-conditioned, cruise vessel designed and built by Blount Marine Corporation of Warren, R.I. This New England waterfront town has been identified with shipbuilding since the earliest days of the republic.

The new 110-foot boat, the Mount Hope, was commissioned May 19, 1969, and commenced her first cruise on June 8. Her destination was Montreal sailing via Long Island Sound, Hudson River, Erie Barge Canal and Lake Ontario. She returned via the Richelieu River and Lake Champlain.

The Mount Hope has many new features among them the ability to beach and project a ramp to shore. Passengers may go between boat and beach by the unique bow ramp without getting their feet wet. The same method of landing may be used in visiting tropical islands next winter.

There are at least 17 other new wrinkles on the Mount Hope which make her unordinary, all carefully planned by the builder and the American Canadian Line, Inc., which operates the craft on rivers, lakes and waterways of both countries.

Vista-view windows (patent applied for) specially developed for the Mount Hope, wrap around the bow of the boat and along her sides to give guests a panoramic view of romantic settings so significant in the development of both the United States and Canada.

Quiet sailing is a Mount Hope asset. The entire craft is carpeted, including companionways and each of the 20 staterooms. Noise and vibrations from the engines and galley have been reduced to a minimum. Twin 250-hp General Motors 8V71 engines operate belt-driven propellers through power pods. There are no long drive shafts to vibrate and engines are mounted in the stern on rubber in an acoustically treated engine room. Galley and crews' quarters also are in the aft section of the vessel.

Bright, pastel shades used in the ship's decor are softened by variegated green carpeting and deep green upholstered lounge seats. The dining room can be converted into a 100-seat theater and the ship has been chartered for use as a floating concert hall for one weekend this month.

For passengers pleasure during cruises, the lounge has a piano, stereophonic equipment and color television. Fifty persons may be served in the dining room from an all-electric galley.

Optional arrangements for single or double berths are available in each of the staterooms. Each also has a vanity, individual shower and head, a porthole and an emergency hatch. The rooms are not large but adequate since lounge and dining room are comfortable for leisure-time activity.

A stern ramp attached by hinges to the transom of the Mount Hope folds down to almost water level to provide a swimming platform. The promenade deck is partially covered by a canopy.

The most interesting cruise is the vessel's longest, a 5,000-mile trip to be made in September. The 33-day tour will start in Warren, go down Long Island Sound, up the Hudson River and through the Erie Canal to Buffalo. The Mount Hope will cruise across Lakes Erie, Huron and Michigan to Chicago.

From the Windy City, she will make her way through the Illinois Waterway to the Mississippi River and down that famous river to New Orleans, then along the Gulf Coast to the Okeechobee River to Florida, by which she will cross the lower part of that state. The ves-

(Continued on page 8)

Inland cruise vessel Mount Hope leaves on first trip.

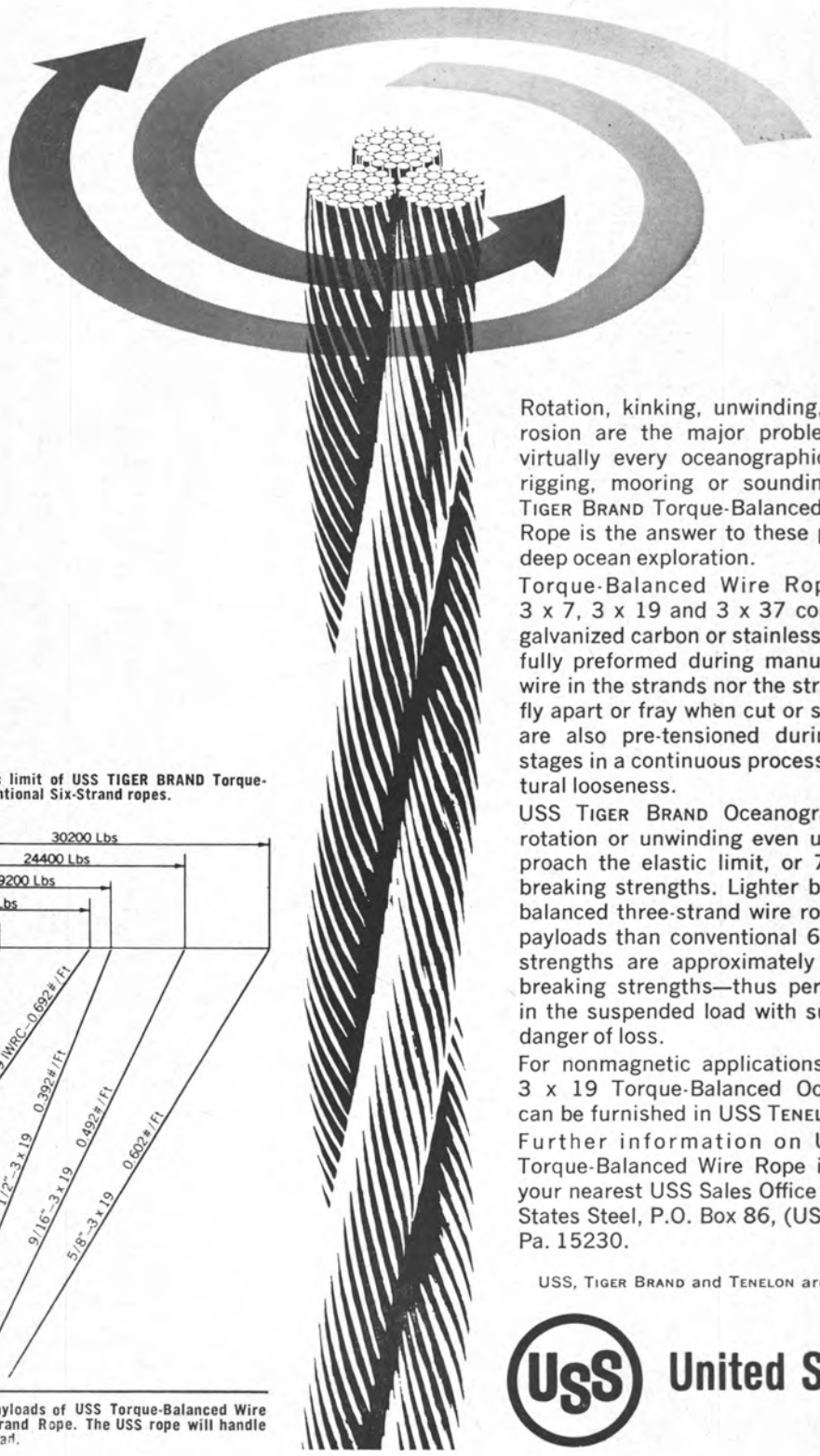
Mrs. **Edna Kent,** artist, standing by her painting of the original Mount Hope which was presented to the new vessel at the commissioning ceremonies. **Luther Blount,** president of Blount Marine Corporation is on the left and **H. Cushman Anthony,** cruise director, American Canadian Line Inc., is in the center.

Looking forward in vista-view lounge.

Looking aft in well-appointed lounge.

Dining area, looking aft, seats 50 people.

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



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

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

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

For nonmagnetic applications, USS TIGER BRAND 3 x 19 Torque-Balanced Oceanographic Ropes can be furnished in USS TENELON Stainless Steel.

Further information on USS TIGER BRAND Torque-Balanced Wire Rope is available through your nearest USS Sales Office or by writing United States Steel, P.O. Box 86, (USS 5445) Pittsburgh, Pa. 15230.

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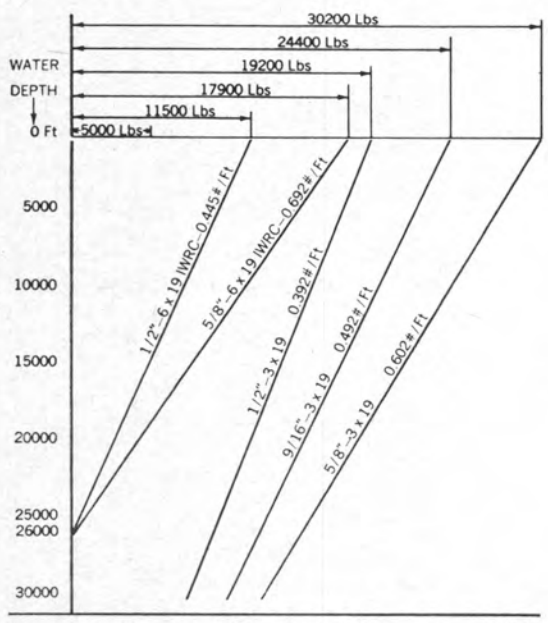
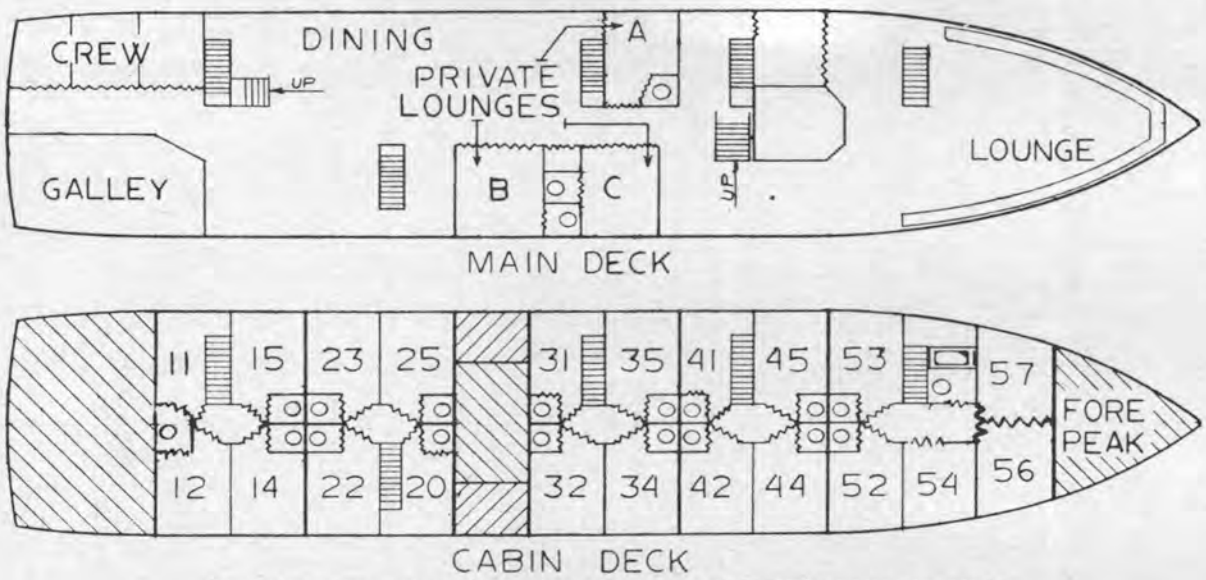
Comparative values for elastic limit of USS TIGER BRAND Torque-Balanced Wire Rope and Conventional Six-Strand ropes.



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

United States Steel



Deck plan arrangements of Mount Hope show how the vessel is compartmented.

Mount Hope—

(Continued from page 6)

sel will return to its home port up the Atlantic Intracoastal Waterway via Norfolk, Annapolis and New York.

The first of seven 12-day trips began June 8 with a cruise around a triangle course including the Hudson River, the Erie Canal and the St. Lawrence River.

The unique design of the Mount Hope was dictated by the courses she will follow. Her size was limited by the dimensions of the century-old Chambly Locks, into which she fits with a 6-inch clearance all around.

Her upper deck canopy can be folded down on the deck and her pilothouse is mounted on a pantograph so it can be lowered from 24 feet to clear the 15½ foot height of the low Erie Canal bridges.

Mount Hope in lock at Whitehall, N. Y. on maiden run down the Champlain Canal.

Although the vessel has an approved carrying capacity of 149 passengers, a maximum of only 42 will be carried on cruises longer than six days to assure complete comfort.

MA Sponsors Industry Meeting To Study Long-Range Program For Research And Development

The first large-scale maritime research and development conference held in this country was convened on July 7 by **A. E. Gibson,** maritime administrator, U.S. Department of Commerce. The three-week conference, held at the National Academy of Sciences Summer Study Center at Woods Hole, Mass., brought together high-ranking representatives from all segments of the maritime industry to consider a long-range program for the agency. **Marvin Pitkin,** assistant administrator for research and development, served as coordinator for the conference.

Specific projects and priorities were discussed. Prominent among the proposals considered were those involving advanced nuclear and non-nuclear ships, cargo-handling systems, intermodal transportation, navigation and communications systems, and fleet management systems.

"The goal of the conference," according to Mr. **Gibson,** "was to chart the direction government-sponsored research in the commercial marine field will take during the next five years.

"The recommendations of the conferees—all recognized experts in their fields—will play a crucial role in determining the future development of the American merchant marine.

"This development, coupled with the Nixon Administration's maritime program—will be vital in determining the American fleet's competitiveness on the world shipping market."

The maritime administrator also noted that the program instituted under guidelines developed by this conference would add significantly to this nation's store of advanced marine technology. Using this as a framework, the Maritime Administration will develop a firm five-year program of specific projects and priorities.

MSTS Signs Agreements For Shipping Services With 24 U.S.-Flag Lines

The Military Sea Transportation Service has entered shipping and container agreements which will result in payments to 24 U.S.-flag ship operators of an estimated $222-million between August 1, 1969 and June 30, 1970.

Vice Adm. **Lawson P. Ramage,** MSTS commander, said the agreements cover worldwide sealift of approximately 6,820,000 measurement tons of military cargo on foreign trade routes during fiscal year 1970. Comparable contracts for the 1969 fiscal year, which ended June 30, amounted to $170-million, MSTS said.

Awards were made on the basis of offers received in response to MSTS requests for Proposal No. 400, issued early this year.

Carrier rates accepted by MSTS will be effective for 11 months, beginning August 1.

Transportation services provided by the 24 steamship operators under the provision of the award include movement of cargo in conventional breakbulk lots and in carrier-owned containers. Agreement provisions also include sealift of government-owned containers on commercial ships should it be necessary.

To be considered for receipt of an award, each carrier was required to commit one or more ships for military use in event of a need for emergency shipping. Ships called-up under this agreement would be time-chartered by MSTS in accord with terms set forth in sealift augmentation agreements which were part of the awards.

Maritime Arranging For Implementation Of SIS Program

The Maritime Administration is receiving industry proposals to implement a shipboard information system (SIS).

The program has been developed as a tool to provide accurate, timely information on work performed aboard ship under the direction of the Shipboard Information System Development Group, an industry-government advisory organization.

The Maritime Administration wants to have a one year evaluation of the program by having actual data acquisition by one shipping company on each of the East, West, and Gulf coasts. Maritime will share up to 50 percent of the project cost, with a maximum of $35,000 per contractor. Each contractor is to implement SIS in each of at least three ships in his fleet.

The objective of the SIS is to provide information to management and labor on the nature of the work performed aboard ship and its cost. It is also directed toward identification of maintenance and repair activity on individual vessels and fleet-wide, for the purpose of improving maintenance procedures, reliability of installed equipment, and future design of similar equipment.

Through the shipboard use of standard recording forms and coding system, MA explained, the nature and extent of work performed by each man is recorded daily in sufficient detail for pay roll, management-labor negotiation, and analysis purposes. It will also permit recording of action taken, causes, and equipment and systems involved in maintenance and repair work performed aboard ship. The system is designed for transfer of recorded information into data processing storage, for flexible data retrieval and analysis.

Preliminary testing of the SIS demonstrated that cost of implementing and using the system per ship voyage was relatively small and could be met by improved cost control made possible through use of the system.

The report of the Maritime Transportation Research Board, "Shipboard Information System, Vol. 1—Project Summary and Conclusions and Vol 2—Instruction and Coding Manual," can be obtained from the National Academy of Sciences, Washington, D. C. The "Maritime Administration Maintenance and Repair Data Processing and Evaluation System" may be obtained from the Maritime Administration, Washington, D. C. 20235.

Dr. David J. Doust Forms Marine Consulting Firm With Offices In Montreal

Dr. **David J. Doust** has announced the formation of Central Design and Drafting Ltd., with offices located at 276 St. James Street, West, Montreal, Canada.

This new organization of naval architects, and marine consultants provides a full range of marine consulting services on an international basis both for Canada and the United States and eight other countries, in Europe and the Far East.

Services include ship design and marine systems engineering, technical and economic evaluations of marine transportation requirements, and research and development studies for ship owners, shipbuilders and associated marine organizations.

Dr. **Doust,** president of Central Design and Drafting Ltd., was for many years with the Ship Division of the National Physical Laboratory, UK and until recently vice-president and technical director of Messrs. G. T. R. Campbell (International) Ltd.

The giant barge of 15,000 long tons capacity, shown under tow, was designed specifically to solve a bulk transportation problem and has proved to be a sound investment. Automated safety features coupled with careful design for the requirements of the service have achieved efficiency and economy of operation.

The tug is a Moran 3500 h.p. unit, one of many in the Moran fleet available for such specialized towing. It's the right tug for the job at hand. And that's the reason Moran can serve you better and save you money. By selecting the right tug the job is completed on schedule at the lowest possible cost.

Whatever your transportation needs—for petro-chemicals, iron ore, limestone, lumber, pulp, fertilizer, coal, cement or other bulk commodity—Moran can deliver it economically from market to market, coast to coast, country to country. We have the equipment or we'll design the equipment to do the job. And, most important, there's no charge for the know-how Moran has acquired during a century of experience.

You expect more when you call...

The Man from Moran

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17 Battery Place, New York, N.Y. 10004

Gulfport Building Twin-Screw Tugboat

Gulfport Shipbuilding Corp., Port Arthur, Texas, will build a twin-screw tugboat for Humble Oil & Refining Co., Houston, Texas. Designated Hull No. 726, it will have the following dimensions: 158 feet by 40 feet by 25 feet 2 inches and will be equipped with 7,000-total-bhp diesels.

NAVOCEANO Appoints Dr. Olson Scientific And Technical Director

Dr. **Boyd Olson** has been named scientific and technical director for the U.S. Naval Oceanographic Office, Suitland, Md. Dr. **Olson,** who has been with NAVOCEANO since 1948, has been acting director for these functions since mid-1967.

As scientific and technical director, he will act as the senior advisor on scientific and technical matters to the commander of the office. In this position, he also directs the scientific and technical activities of the civilian employees, 25 ships, and four aircraft that make up the largest oceanographic organization in the world.

Dr. **Olson** received a BS degree from Brigham Young University, an MBA degree from Howard Business School and a PhD degree in physical oceanography from Oregon State University. He belongs to the American Geophysical Union, the Research Society of America and the Arctic Institute of North America.

Dravo Corp. Appoints E. A. Mevissen To Head Equipment Engineering

Ernst A. Mevissen

Dravo Corporation, Pittsburgh, has announced the appointment of **Ernst A. Mevissen** as chief engineer, equipment engineering in its Engineering Works Division.

The division designs and markets a wide variety of materials handling, steelmaking, marine and other equipment.

Mr. **Mevissen** joined Dravo in 1955 and most recently served as assistant chief engineer. He earned a degree in mechanical engineering from The State College in Constance, Germany.

USCG Names Murphy Chairman Of SSC

Charles P. Murphy

The U.S. Coast Guard announced in Washington, D.C., the designation of Rear Adm. **Charles P. Murphy** as chairman of the Ship Structure Committee (SSC).

Admiral **Murphy,** chief of the Office of Merchant Marine Safety, succeeds Rear Adm. **D. B. Henderson** who has retired after 33 years in the Coast Guard, the last two as chief of the Office of Engineering.

Formed during World War II to solve the problem of fracture of welded merchant ships, the SSC now conducts an applied research program of measuring hull loads at sea, developing better ship design information and improving materials for hull construction.

The SSC is sponsored by the Coast Guard, Navy, Maritime Administration, and the American Bureau of Shipping. The Ship Research Committee of the National Academy of Sciences acts as technical advisor to the SSC.

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And we're good providers.

Our customers' ships get the full service they demand. And deserve.

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The trained technical representatives. The bulk delivery of lubricants. The technical literature. The lube analysis facilities.

Your lady of the sea is in good hands with Essomarine.

ESSO

FUELS AND LUBRICANTS

Breit Eng. To Design Special Test Barge For Thrustmaster

Hydro-Vac, Inc., Greenville, Ala., has commissioned Breit Engineering Inc., of New Orleans to design a special purpose barge to house a 48-inch Thrustmaster bow-steering unit, for use on the Intracoastal Waterway.

Capt. **Scott Chotin,** long associated with the introduction of modern innovations in river towing equipment, will place the unit in operation between New Orleans and Houston for a complete evaluation of performance and value to the industry.

The completed unit will be perfectly matched to the bow of the tow whether loaded or light, so that both units will operate as a fully integrated package.

Powered by a 12V-71 Detroit Diesel, it is expected to effectively control the maximum tow permissible on that route, and to provide a 60 degree swing per minute throughout a speed range of 0 to 12 miles an hour.

Combining talents to produce a simple and positive pilothouse radio control are: Motorola Communications and Electronics, Automatic Switch Company, Morse Controls and Willings Detroit Diesel, Inc.

Seatrain Lines Names Arwood To Top Post For European Services

John Arwood

Seatrain Lines, Inc. has named **John Arwood** vice-president and general manager of European services for its Container Division, it was announced by **Howard M. Pack,** president.

The company will enter the North Atlantic service with fully containerized vessels in the late fall of this year.

Prior to his appointment, Mr. **Arwood** was general manager of domestic services for Sea-Land Service, Inc., and has worked extensively with containerized shipping in the domestic United States, Europe and the Far East.

Mr. **Arwood** is a former president of the New York Chapter of the American Institute of Industrial Engineers and is a life member of the National Defense Transportation Association.

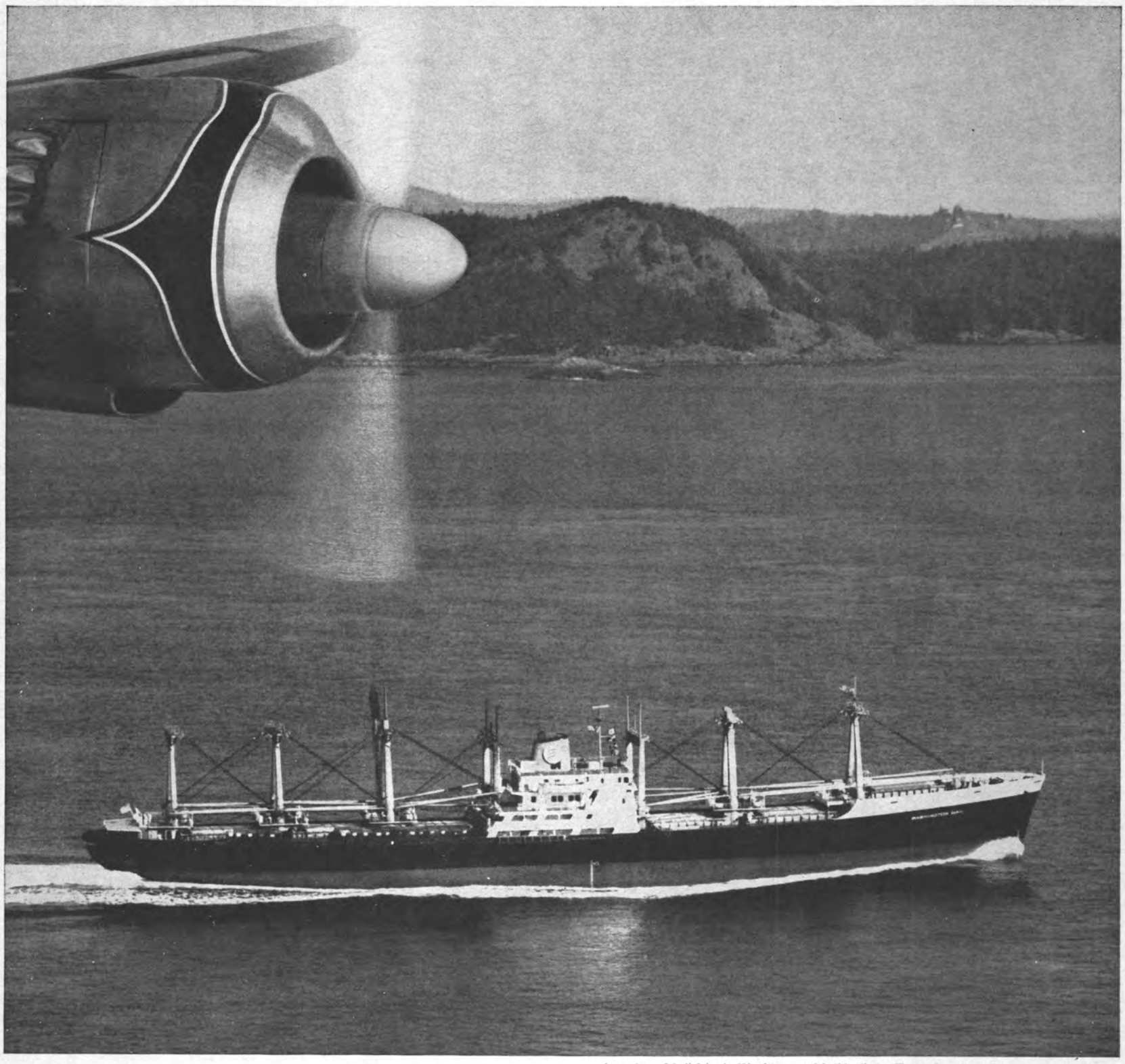
Gulf Oil Trading Names E. L. Peck

E. L. Peck

E. L. Peck has been appointed manager, International Marine Sales, Western Hemisphere, Gulf Oil Trading Company, with the responsibility of all marine sales in North America and Latin America. He will be located in the New York office of Gulf Oil Trading Company, a wholly owned subsidiary of Gulf Oil Corporation.

Mr. **Peck** joined Gulf Oil Corporation in 1943 in New York as a sales engineer for New York and Connecticut. In 1950 he was promoted to assistant district manager, direct sales, for the New Haven, Conn., sales office.

He transferred to New York City in 1955 and was named marketer, industry and transporation sales, in the then New York Sales Division. In 1963, he was transferred to Gulf Oil Trading Company and promoted to supervisor, East Coast sales. In 1967 he was advanced to coordinator, international marine sales.



American Mail Line's *Washington Mail* built by Todd, Los Angeles

Why is air freight called "shipping?"

It's no mere sop to tradition that anything carried by air (or any way) is spoken of as "shipping." The word persists because *ships* persist in being the major movers where the greatest weights and distances are involved. As in international trade...or military shipments overseas. Of all material needed in Vietnam, for instance, more than 95% is ship-delivered. It was 99% in World War II. And in Korea, 98%.

Wartime or any time, ships are literally life-and-death important to a nation on an island continent and far from self-sufficient: Of 77 strategic materials needed, we must import 66. Yet—here's the shocker – nearly 95% of our imports and exports are carried by foreign ships.

That's a ratio fraught with risk. A risk no other nation elects to take. Smaller ones, like West Germany and Sweden, are building more than double our new merchant tonnage. Russia is taking delivery of 8 ships for every one America builds.

Unless we build more ships in U.S. yards, we really can't be sure of getting more ships—or shipping—when we may need them even more than now.

Todd is doing something about it. For instance, the recent expansion of drydock facilities at our San Francisco yard capable of handling any size containership in today's Pacific trade. Executive offices: One Broadway, New York, New York 10004.

TODD
SHIPYARDS CORPORATION
SHIPYARDS: Brooklyn • New Orleans • Galveston
Houston • Los Angeles • San Francisco • Seattle

Ship Docking Tug Launched By Star For Vancouver Tug's Growing Fleet

Vancouver Tug's newest member in its large fleet, the La Salle, is launched at Star.

The latest addition to the growing Vancouver Tug Boat Company Ltd. fleet was launched recently by the builders, Star Shipyard (Mercer's) Ltd., New Westminster, B.C., Canada. It was christened La Salle by **Mrs. C. B. Beaton,** wife of Vancouver's superintending engineer.

This 71-foot 3-inch tug was designed specifically by Cove, Hatfield and Company Ltd. of Vancouver to operate most efficiently as a ship-docking tug as well as a close-range barge yarding tug. It has a beam of 23 feet 10 inches and a draft of 13 feet 1 inch. Propulsion is provided by a Deutz SBA-12M-528 diesel engine developing 1,440 bhp at 900 rpm. The engine drives a KaMeWa controllable-pitch propeller through a Western reduction gear, Model 180-MGV-160, with a three to one reduction. The propeller operates in a steering nozzle designed by the naval architects and built at Star Shipyard.

"This ship will be as safe as the men who sail her," said Capt. **J. C. F. Stewart** as he spoke at the La Salle launching.

Special features included in the design are: a fully automated engine room to give 16-hour unattended operation — Kobelt single-lever pneumatic controls to operate the c-p propeller are located at three operating stations; the Burrard hydraulic ship-handling winches forward and aft are controlled from two stations, including remote disengagement of the towing winch; vented keel to assist in maneuverability when ship-docking, and heavy rubber fenders throughout.

Wilford Arsman, general manager of Simpson Maxwell Company, supplier of the main engine, is shown presenting **Mrs. C. B. Beaton** with a launching memento.

Auxiliary electric power is supplied by the main 40-kw General Motors generator set and the 30-kw General Motors standby generator set. The hydraulic steering gear was supplied by Wagner and the anchor windlass by Burrard.

Capt. **J. C. F. Stewart,** president of Vancouver Tug spoke at the launching. In his talk, Captain **Stewart** stressed the part safety-of-operation played in the design of the tug. He said: " a great deal has been said about safety at sea, and I want to tell you that this ship is as safe as the men who will sail her . . . We as owners recognize our responsibilities to the men who go down to the sea in ships as do the majority of our competitors and we try at every possible level to make our tugs safe for the work they do, and for the men who work in them, and have evolved a continuing series of instruction and discussion with our masters so that this end may be achieved."

MSTS Awards Contract For Container Sea Lift To Sea-Land Service

The Military Sea Transportation Service has announced the award of a new container agreement to Sea-Land Service Incorporated which will result in payment of an estimated $469-million per year between July 10, 1969 and June 30, 1971.

The agreement, in effect, a continuation of a previous arrangement, covers sealift to approximately 1.6-million measurement tons per year of dry and refrigerated cargo between the United States Pacific Coast and the Republic of Vietnam.

The contract was negotiated on the basis of an offer in response to a MSTS request for proposals No. 401, issued early this year.

The new award will result in expansion of the "highly effective through container service inaugurated in July 1967 by Sea-Land in conjunction with MSTS," MSTS Commander Vice Adm. **Lawson T. Ramage** said.

Under the agreement cargo will be transported in containers from factories and terminals in the United States to front line troops in Vietnam without enroute re-handling.

Expanded service under the agreement will provide transportation capability about equal to 25 World War II cargo ships.

Blue Star Line Orders Third Containership For Europe-U.S. Trade

Blue Star Line has ordered a third containership from Bremen Vulkan Schiffbau, Bremen, Germany for trading between the Pacific Coast of North America and Europe via the Panama Canal.

The 16,000-dwt ship, which will carry 800 standard containers at a service speed of 21½ knots, follows an order for two similar vessels placed with the same shipyard in April.

Delivery for the new ship is scheduled for early 1972.

PAC Appoints DePue Cargo Coordinator

James E. DePue

James E. DePue of Bainbridge Island has been appointed cargo coordinator, Alaska services, for Pacific Inland Navigation Company, Inc., (PAC) Seattle-based tug/barge company with operations in Alaska, Vietnam, and on the Columbia River.

Mr. **DePue's** first assignment will be to coordinate PAC's shoreside operations with Arctic Marine Freighters, a joint venture transporting 70,000-tons of equipment and supplies from Seattle to Alaska's oil-rich North Slope.

Mr. **DePue,** a graduate of the U.S. Merchant Marine Academy in New York, served with the Navy as a navigator before becoming involved with the maritime industry in San Francisco and Seattle. He joined Sea-Land Service upon inauguration of their service to Anchorage, Alaska, specializing in cargo handling, and also has been associated with Kimbrell Transportation, Inc., and Boyer Towing Company's Southeast Alaska Freight Service.

Albina To Build Twin-Screw Towboat

Hawaiian Tug & Barge Co., Honolulu, Hawaii, has contracted Albina Engine & Machine Works, Inc., Portland, Ore., to build a twin-screw towboat. Designated Hull No. 414, the vessel will have the following dimensions: 113 feet 8 inches by 32 feet by 16 feet 8 inches and will be equipped with 5,332-total-bhp diesels.

FIRST OF THREE OBO SHIPS—The 71,060-dwt ore/bulk/oil carrier Eliane was delivered recently at Hitachi Zosen's Innoshima Shipyard to her owner, Global Bulk Carriers Inc. This 792-foot 7½-inch vessel is the first of three sisterships ordered by Global and will be placed in Persian Gulf to Japan service. It is equipped with chemical tank-cleaning devices as well as with Butterworth. Propulsion is provided by an 18,400-hp Hitachi B&W diesel engine. It is classed by the American Bureau of Shipping.

Thomas Nicoll Joins Fairbanks Morse As Senior Project Eng.

Thomas Nicoll

Thomas Nicoll has joined Fairbanks Morse Power Systems Division, Colt Industries as senior project engineer (marine), it was announced by **W. M. M. Fowden Jr.,** chief engineer of the large engine operation. Mr. **Nicoll** will handle application engineering for 38A20 marine diesel engines and will report to **H. D. Eglin,** manager of systems engineering and contract administration.

Mr. **Nicoll** was formerly with Marine Consultants and Designers in Cleveland, where he was a project engineer. His training was received in Scotland at Caledon Shipbuilding and Engineering Co. He also served at sea as an engineering officer for Alfred Holt & Co.

Mr. **Nicoll** is an associate member of The Society of Naval Architects and Marine Engineers and of the Institute of Marine Engineers.

Bulk Services Names E. Molstad President

Bulk Services Inc., 155 John Street, New York, N.Y., has announced the appointment of **Egil Molstad** as president of the company. The firm is one of the associated companies of Fretheim-Naess Chartering Inc.

Mr. **Molstad,** who has been serving in the ship chartering business in New York since 1952, was previously associated with Hansen & Tidemann, Inc., also of New York.

Atlantic Richfield May Build Oil Refinery At Machiasport, Maine

The Atlantic Richfield Company announced recently in Portland, Maine that it had taken on option on 3,500-acres of land in Machiasport as a possible site for a refinery.

Louis M. Ream Jr., Atlantic executive vice-president, said at a news conference that the refinery would be constructed primarily to process domestic crude oil.

He said ARCO immediately would begin a study to determine the feasibility of construction of a 100,000-barrel-a-day or larger refinery on the northeastern Maine coast.

Mr. **Ream** said the one-year option was obtained from the St. Regis Paper Company, owner of the site. It is six miles from the nearest shoreline and 12 miles northwest of deep-water facilities the State of Maine proposes to construct in Machiasport.

He said Atlantic "will not seek special oil-import exceptions in connection with the proposed new refinery." He added, however, "if a competitor succeeded in obtaining special oil-import privileges for a northern Maine refinery, Atlantic Richfield would seek to put itself on an equal competitive footing."

By this comment Mr. **Ream** was referring to the Occidental Petroleum Corporation, which has had an application pending for nearly a year to build a refinery in Machiasport. This refinery would be in a proposed foreign trade zone and would have a special oil-import quota.

In June, Atlantic World Ports applied to the government for an oil-import quota for the Machiasport Zone. This firm is not connected with either of the other two.

One thousand of the 3,500 acres under option would be required for a refinery and the option for the remainder would be made available to the State of Maine, if it were needed for creation of a foreign trade zone.

Mr. **Ream** said that the refinery proposed by his company would cost more than $150-million. It would employ 350 persons and support personnel in other companies would multiply that figure by several times.

General Dynamics Launches First Ship To Make Full Use Of New Facilities At Quincy

The United States Navy replenishment fleet-oiler Kansas City, "first graduate of a new school of shipbuilding," was christened on June 28 at the General Dynamics shipyard, Quincy, Mass.

The 659-foot Kansas City is the first ship whose construction has made full use of all the new shipbuilding innovations and facilities placed into operation since General Dynamics acquired the shipyard five years ago.

More than 5,000 persons watched **Mrs. Harry Darby,** wife of a Kansas City, Kansas industrialist and former United States senator, christen the new ship and send it sliding down building ways into the Fore River.

United States Congressman **William J. Randall** of Independence, Mo., whose Fourth Missouri District includes a portion of Kansas City, was the principal speaker.

After her christening, Kansas City was moved to an outfitting pier for completion of equipment installation and testing. She will be delivered to the Navy in early 1970.

Kansas City, whose keel was laid April 18, 1968, occupied her building position for 14 months, compared to the 21 months and 24 months of two predecessors (Wichita and Milwaukee) in the replenishment fleet-oiler class.

Six key developments that speeded construction of Kansas City include:

1. The Autokon System, which provides computerized lofting of ships' lines and computerized production of punched tapes to direct machines that automatically cut steel plates into desired shapes.

2. A new assembly line that has brought speed and efficiency to production of stiffened steel panels, the basic element of the units that comprise a ship.

3. An automatic shot blast facility in which units weighing up to 75 tons are thoroughly cleaned for painting in minutes rather than hours; also, a paint spray building in which the units are painted under climatically controlled conditions. The two give the Quincy division an all-weather cleaning and painting capability.

4. An assembly area for building units up to 150 tons in weight and as large as 90 by 41 by 33 feet. This new capability has allowed a reduction in the number of units per ship in the Kansas City from 360 to 225. By the time the sixth ship of this class is built, the number of units will be down to 193.

5. The pre-outfitting of units with nearly all piping, wiring, ventilation and small machinery before they are erected as part of the ship.

6. Use of low-power lasers for structural alignments and installation of propellers, propeller shafts and other heavy equipment. The lasers result in a significant advance in accuracy and consequently provide great savings in time and costs.

Sea-Land Names Hamilton Executive Vice-President

William B. Hamilton Jr. has been appointed executive vice-president, administration, Sea-Land Service, Inc., according to an announcement by **M. R. McEvoy,** president of Sea-Land Service. Mr. **Hamilton** assumes responsibility for finance, information systems and personnel.

Mr. **Hamilton** started with Sea-Land Service in 1967 as vice-president-controller. He was elected vice-president and treasurer of McLean Industries, Inc., parent holding company of Sea-Land in May, 1968, in which capacity he still continues. He was previously affiliated with the Chicago Rawhide Manufacturing Company as vice-president-finance. A graduate of Vanderbilt University, he is a member of the American Institute of Certified Public Accountants, Financial Executives Institute and past chairman of the Methods and Procedures Committee of the National Accounting and Finance Council.

Sea-Land Service, subsidiary of McLean Industries, a wholly owned subsidiary of R. J. Reynolds Tobacco Company, is a containerized freight service with 41 vessels serving 31 ports throughout the world.

KING INSPECTS SHIPYARD—H.M. **King Gustaf Adolf** of Sweden recently visited Gotaverken in connection with a visit to Goteborg. He took a very keen interest in the Arendal yard, where the 86-year-old king studied the workshops and docks for more than one hour, and was shown among other things the hulls of two 227,000-ton tankers now being built at Arendal. The king is shown with Gotaverken representatives, **Nils Svensson,** managing director, **Hilding Nielsen,** former managing director and member of the board and **Alf Skanberg,** manager of the Arendal yard.

Just a gentle reminder:

Perolin is worldwide marine distributor for "Ethyl" CI 2.

It's the fuel oil chemical that has effected dramatic improvements and savings in operations of an increasing number of tankers and freighters over the years.

After logging many thousands of miles on bunker fuel plus CI 2 for four years, these vessels reported:

- greatly reduced fireside deposits
- faster and easier boiler cleanups
- reduced downtime
- less smoke
- less soot blowing.

Learn how easily and profitably you can cut your operating and maintenance costs by treating your fuel with this proven chemical. Just contact Marine Division, The Perolin Company, Inc., Empire State Building, New York, N.Y. 10001; phone (212) 947-8987.

Ethyl Corporation
Petroleum Chemicals Division

First High-Production Paceco Dredge Built And Launched In Tampico, Mexico

Mexican Naval Shipyard launches first high-production dredge.

A Paceco Pacer, the first 16-inch dredge with capacity to produce 1,200 cubic yards per hour, was launched recently at the Mexican Naval Shipyard in Tampico. Built for the government of Mexico, it is also the first dredge to be built in that country. The hull and housing structure were fabricated by the naval shipyard. Paceco, a division of Fruehauf Corporation, Alameda, Calif., supplied the design and machinery.

To achieve the high production capacity, the new dredge was equipped with a jet-stream pump system. It is the first new dredge to be designed with a jet-stream system to increase production at normal digging depths. In 1960 two dredges were built by Paceco with jet-stream systems to dig at abnormal depths of 225-feet below the Volta River for the government of Ghana, Africa.

Of portable design, the dredge can be disassembled for easy shipment and reassembled at different sites to provide greater use of the dredge. Power aboard the dredge consists of 1,500-hp on the main pump and 420-hp on the auxiliary engine.

Worldwide Orders For Ships May Pass 100-Million Ton Mark

The total deadweight tonnage of ships on order will soon pass the 100-million-ton level, according to the British publication Fairplay International Shipping Journal. This forecast is based on the publication's most recent survey of the order books of shipyards which shows 93,903,015 tons on order. This figure is up some 5-million tons over the previous quarter which ended on January 31 this year.

Due to the changes in size and types of ships, Fairplay has broken down tanker orders into two groups—vessels of 150,000 tons and over and ships under 150,000 tons. For the larger ships, the publication shows 216 vessels, totaling 48,940,890 tons, on order. In the smaller category, the report lists 394 ships of 11,066,823 tons.

The other modification in listing separates bulk carriers into ore-oil ships and ore-oil-bulk vessels. There were 89 ore-oil ships, totaling 10,599,415 tons, on order as of the end of April and 12,632,156 tons, 382 ships, in the latter group.

FIRST OF A NEW CLASS— Equitable Equipment Company, Inc., New Orleans shipbuilder, has delivered the 65-foot offshore water taxi, Joseph O, to Crew Transport, Inc., Golden Meadow, La. It is the first in a new class of water taxis designed and built by Equitable Equipment Company. The Joseph O has an overall length of 65-feet with a beam of 17-feet 3-inches and a loaded draft of four-feet. Primary propulsion is by two General Motors 12V71 turbo-charged and heat exchanger-cooled diesels with 2:1 reduction and reverse gearing. The new boat has a top speed in excess of 28 miles per hour and cruises in excess of 25 miles per hour at 2,000 rpm. The water taxi is U.S. Coast Guard certificated to carry 49 passengers for hire up to 100 miles offshore, and is built to American Bureau of Shipping requirements. It is centrally air conditioned and heated.

Richard L. Harris Joins Consulting Firm as VP

Richard L. Harris, a public relations executive of United States Lines for more than 16 years, has resigned to become a vice-president of the Thomas J. Deegan Co., Inc., management consultants.

Mr. **Harris,** who won the Distinguished Service Cross, Silver Star and Bronze Star as an Army officer in World War II, joined the freight department of United States Lines in 1945, and in 1947 was named assistant manager of the American Pioneer Line, an affiliate. In 1951 he was assigned to the advertising and publicity department for promotion of the passenger liner United States, which then was nearing completion.

Donald Newell Named AMF Beaird President

Donald Newell

Donald Newell has been named president and general manager of AMF Beaird, Inc. of Shreveport, La., it was announced by **Richard C. Yount,** vice-president and petroleum services group executive of American Machine & Foundry Company, of which the firm is a subsidiary. He succeeds **Joseph LaBarbera,** who has resigned.

AMF Beaird, Inc. is a major manufacturer of capital equipment for the oil, gas, chemical, transportation and defense industries including rail tank cars, "Maxim" silencers, LP-gas equipment, and contract items.

Mr. **Newell** has been general manager since 1963 of General American Transportation Corporation's plate and welding division in Chicago. From 1959 to 1963 he was regional manager of the Birmingham, Ala. plant of Pittsburgh-Des Moines Steel Company after six years in a similar capacity with the Hammond Iron Works in Birmingham before it merged with Pittsburgh-Des Moines.

He was in charge of building the Provo, Utah plant of Keyes Tank Company in 1949 and until 1953 served as a Keyes vice-president, and manager of the Provo facility.

He attended Western Michigan College prior to World War II, during which he served as a first lieutenant and pilot in the U.S. Air Force. He resumed his studies at the University of Wyoming after the war and was graduated in 1948 with honors as a bachelor of science in civil engineering.

Mr. **Newell** is a registered civil engineer in Alabama and a member of the American Society of Civil Engineers.

White Superior Appoints Miller Vice-President

Martin H. Miller

The appointment of **Martin H. Miller** as vice-president of manufacturing for the White Superior Division of White Motor Corporation Industrial Group, Springfield, Ohio has been announced by **A. F. George,** president of the division.

In his new position, Mr. **Miller** will have responsibility for all phases of plant and foundry operations. For the past 15 years he has served as assistant to the president and manager of manufacturing.

Mr. **Miller** joined the firm in 1934, before it was acquired by White Motor Corporation, and advanced through the accounting department to the position of division controller prior to his association with the division's manufacturing activities.

SEMI-CONTAINERSHIP SINGAPORE PRIDE was recently delivered by Sumitomo Shipbuilding & Machinery Co., Ltd. at its Uraga, Japan, shipbuilding yard to her owners, Malaysia Marine Corporation. The 492-foot, 13,599-dwt ship is the fourth ship applying the "semi-submerged ship theory" to be constructed at the Uraga yard. Powered by a Uraga-Sulzer 9RD76, 14,400-hp diesel engine, the ship attained a speed of 22.99 knots on trials. Service speed is given as 19.5 knots. Cargo gear consists of 22½-ton booms rigged on the Ebel system. The Singapore Pride is classed by the American Bureau of Shipping.

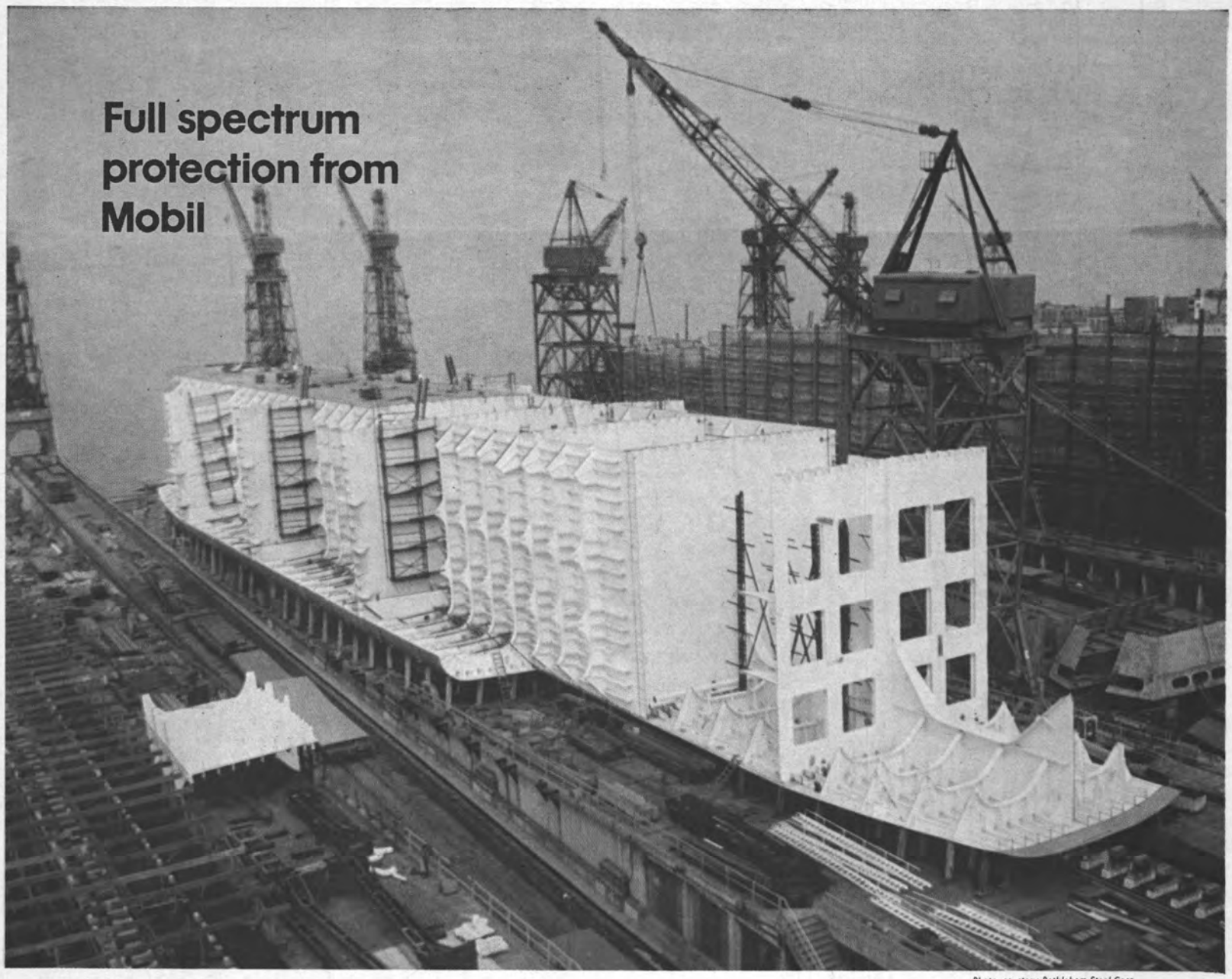


Photo courtesy Bethlehem Steel Corp.

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

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

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

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

For details on Sovapon Tank Coating Systems, write today!

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Capt. Thomas Small Was There 73 Years Ago And Again Today —Official Poe Lock Opening

Standing at the wheel of the Str. Philip R. Clarke, flagship of U.S. Steel's Great Lakes Fleet, Capt. **Thomas Small** demonstrates for **George H. Ashby,** master of the Clarke, how he steered the Colgate Hoyte through the first Poe Lock at Sault Ste. Marie in 1896.

For Capt. **Thomas Small,** history repeated itself. On August 4, 1896, 23-year-old **Thomas Small,** wheelsman, guided his whaleback ore steamer, Colgate Hoyte, through the first Poe Lock at Sault Ste. Marie, Mich.—the first commercial vessel to pass through the lock which had been dedicated a day earlier. Now, 73 years later, Capt. **Thomas Small,** who will be 96 on his next birthday, was standing on the bridge of the Str. Philip R. Clarke as it passed through the new Poe Lock during dedication ceremonies on June 26.

In a new uniform, Captain **Small** stood just outside the pilothouse with **George H. Ashby,** master of the Clarke, as the 647-foot ore carrier—one of the newest in U.S. Steel's Great Lakes Fleet—glided through the new 1,200-foot, $40-million lock. And in a pocket of that uniform, the captain carried his master's license, reissued to him this past June by the United States Coast Guard.

Sailing on a steel company vessel was nothing new to Captain **Small.** It was for the American Steel Barge Co., a fleet which became part of U.S. Steel in 1901, that Captain **Small** first sailed in 1896. And for the next 43 years, he served as wheelsman, deck officer or skipper on 14 vessels in the steel company's fleet.

Retirement from U.S. Steel on New Year's Day 1939 did not mean retirement from the bridge of Great Lakes vessels, however. For the next 22 years, the captain skippered for a number of fleets.

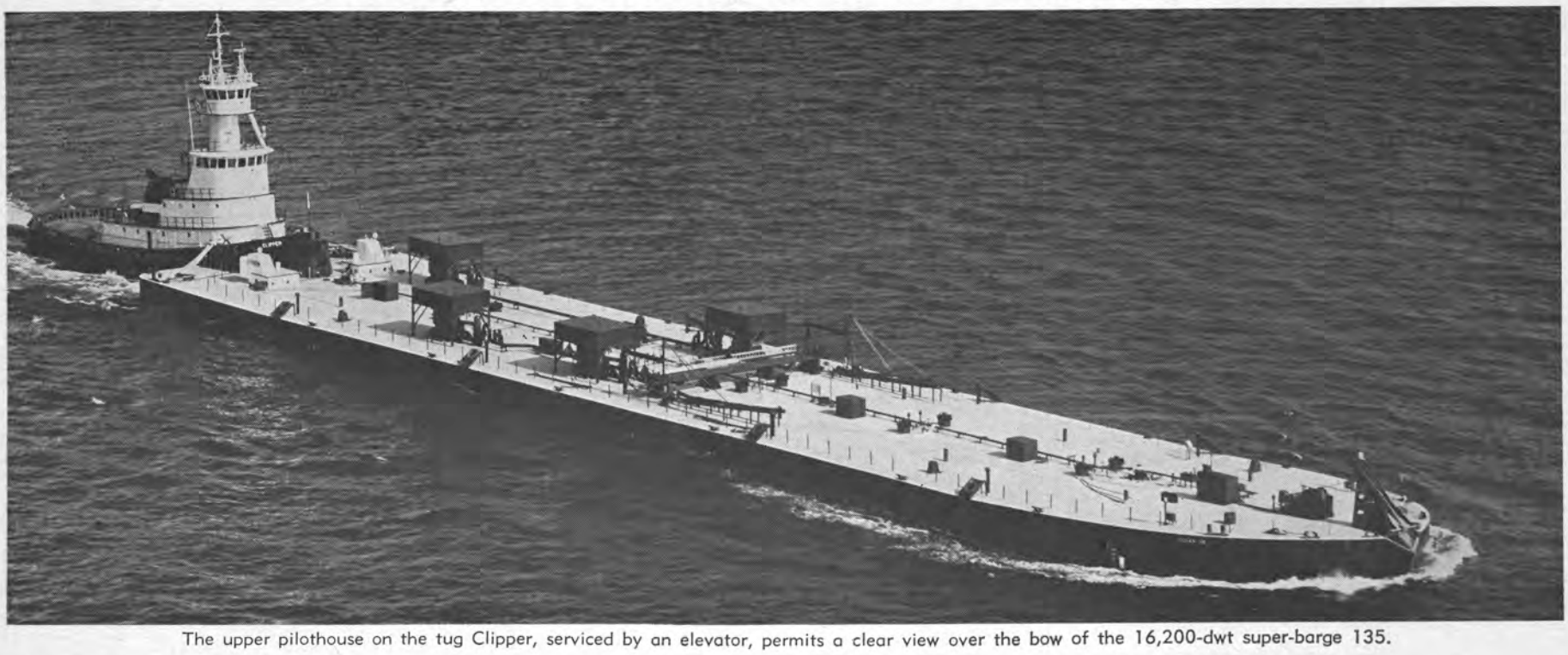
National Marine Requests MarAd Mortgage Insurance For Towboats and Barges

Mortgage insurance on six 30,000-barrel petroleum barges and three 1,350-hp towboats has been requested from the Maritime Administration by subsidiaries of National Marine Service Inc., St. Louis, Mo. NMS Chemical Corporation asked for Title XI mortgage insurance on three, Intercity Barge Co., Inc., on two and Asphalt Barge Corporation on one. The three towboats are to be built for Asphalt Barge.

The unmanned barges' construction cost was said to total $1,585,455 with the push-type towboats adding another $922,999 to the total. The mortgage insurance sought from the Maritime Administration would represent about three-quarters of the construction cost.

The St. Louis Shipbuilding Division of Pott Industries, Inc., St. Louis, Mo., will build the barges and Main Iron Works Inc., Houma, La., will build the towboats.

Interstate Oil Transport Company's Fleet Now Totals 56 Vessels



The upper pilothouse on the tug Clipper, serviced by an elevator, permits a clear view over the bow of the 16,200-dwt super-barge 135.

In one day the fleet of Interstate Oil Transport Company of Philadelphia, Pa., was increased by the addition of five units—two tugboats and three barges. These bring the firm's fleet to 56 vessels consisting of three small tankers, 20 tugboats and 33 barges. Shown above is the new petroleum superbarge Ocean 135 being pushed across the Gulf of Mexico by the new 135-foot, 5,600-hp tugboat Clipper at a speed in excess of 10 knots. The Ocean 135 was christened by **Mrs. Charles Conrad Jr.** (see cover and feature in July 15 issue Maritime Reporter and Engineering News). The photo on the left shows **Mrs. Adrian S. Hooper,** wife of the president of Interstate Oil Transport, christening the tug Clipper. The photo on the right shows **Mrs. Patricia Moss,** sister of astronaut **Charles Conrad Jr.,** christening the new 2,200-hp, 105-foot tug Defender. At the same time that these three vessels were being christened, Interstate Oil Transport accepted delivery of a chemical specialty barge and a 24,000-barrel coastwise tank barge. The tug Clipper with Ocean 135 will operate exclusively as a team in the trans-Gulf service delivering petroleum products to Tampa, Fla. on a regular schedule.

Tropical Shipping Awards Contract For Containership For Florida-Nassau Run

Tropical Shipping & Construction Co., Ltd. of Nassau, Bahamas, has awarded a contract to Buesumer Werft G.m.b.H., Buesum, West Germany, for the construction of a containership. It will be capable of carrying 116 twenty-foot containers in cellular holds. The design is such that the vessel will also be able to carry 35-foot and 40-foot containers with a height of 8 feet 6 inches.

The new ship will have an overall length of 277 feet 5 inches. As an open shelterdeck vessel, it will have a draft of 12 feet, a deadweight capacity of 1,160 tons and a speed of 15 knots. As a full scantling ship, it will have a draft of 16 feet 5 inches, a deadweight of 2,360 tons and a speed of 13½ knots.

The main propulsion unit will be a German manufactured M.A.N., 2,300-hp diesel engine operating at 900/275 rpm. The vessel will also be equipped with a KaMeWa variable-pitch propeller and bow thruster.

The vessel, which will enter into Tropical Shipping's regular service between Florida and the Bahamas, marks a further expansion of the company's trade in this area.

The transaction between Tropical Shipping and the German shipyard was concluded through Brandtship International, Inc., New York.

Capt. Conrad Appointed Dean And Comdr. Anthony Librarian At Maine Maritime Academy

Capt. **Edward E. Conrad** has been named dean and head of the Academic Department, it was announced by Maine Maritime Academy.

Captain **Conrad** served in the U.S. Navy for 28 years before retiring in 1966. During that time (1962-64) he was director of the Atomic Energy Division, Office of the Chief of Naval Operations, Washington, D.C., and from 1964-66 he was director of long range studies, Institute of Naval Studies, Cambridge, Mass. Since 1967, Captain **Conrad** had been an assistant professor at New England College, Henniker, N.H.

Captain **Conrad** received his BS degree from the U.S. Naval Academy; MS in nuclear engineering from the U.S. Naval Postgraduate School; LLB from LaSalle University School of Law; MA in political science from Boston University, and will receive his PhD in political science from Boston University this summer.

The Academy also announced that Lt. Comdr. **Kenneth H. Anthony** has been named as librarian.

From 1947-52, he taught at Fishburne Military School and Fairfax Hall Junior College. He also served as an Episcopal clergyman from 1945-69.

Commander **Anthony** received his BS degree from Heidelberg University; BD from Virginia Theological Seminary; did graduate work at the University of Chicago, and also earned a master of library science degree from the University of Maine.

Ralph Thayer Joins Associated Container

The appointment of **Ralph N. Thayer** to a senior managerial position in the container shipping firm, Associated Container Transportation (U.S.A.), has been announced by the company. Mr. **Thayer** joined ACT (U.S.A.) on July 8.

Mr. **Thayer** has been heavily involved in shipping and traffic for the past 15 years with the Dow Chemical Company in Midland, Mich. He has served as foreign traffic manager for the firm since 1966. Mr. **Thayer** holds a bachelor's degree from Marietta College and a master's degree from the University of Wisconsin.

ACT (U.S.A.) is a consortium comprised of Blue Star, Cunard-Port and Ellerman lines, all of whom presently operate conventional cargo service between North America and Australia/New Zealand. In February of this year, the consortium opened a New York office to establish a new container service for this route. Four ships, each with a capacity of 1,100 containers, are now under construction for ACT (U.S.A.), and the service is scheduled to begin in early 1971.

Dillingham Corp. Completes Acquisition Of West Coast Tug And Towboat Companies

Dillingham Corporation based in Hawaii, has announced the completion of the acquisition of Foss Launch and Tug Company and Pacific Tow Boat Company, both based in the state of Washington. The purchase of the two firms, which are primarily engaged in towing operations in Puget Sound, Alaskan waters and the Pacific Ocean, was made for 808,133 shares of Dillingham common stock.

Also acquired in the deal was a 60 percent equity interest in Pacific Towboat and Salvage Company, a Long Beach-headquartered contract towing and marine salvage company. Upon receipt of a favorable ruling from the Internal Revenue Service, Dillingham said it will acquire the remaining 40 percent in this Foss subsidiary for an additional 46,934 shares of Dillingham common stock.

Adm. Sonenshein Appointed Commander Of NSSC

Rear Adm. **Nathan Sonenshein,** USN, has been appointed commander of the Naval Ship Systems Command, according to a recent announcement from the secretary of the Navy. Admiral **Sonenshein** assumed his new position upon the retirement of Rear Adm. **Edward J. Fahy,** USN.

Admiral **Sonenshein's** most recent post was deputy chief for logistic support, Naval Material Command, with responsibilities for ship acquisition procedures.

Chemical-Petroleum Barge Launched By Wyatt Industries For McAllister Bros. Fleet

Newest addition to McAllister Brothers fleet, an 8,000-dwt chemical-petroleum barge, is launched in Houston.

A multi-purpose 8,000-dwt oceangoing barge, heater-coil equipped and coated inside and out, has been launched for McAllister Brothers, Inc., by Wyatt Division—U.S. Industries, Houston, Texas.

The interior coating enables the barge to carry corrosive petroleum products and chemicals. Its heating coils are used to speed the pumping of heavy oils and other high-viscosity materials. The capacity of the barge is 56,000 barrels. It is 309 feet long by 65 feet wide and 20 feet deep.

An American Bureau of Shipping class Star A1 oil barge, it is certificated by the U.S. Coast Guard for Grade A liquid products under 150°F. flash. It is fitted with two adjustable skegs that may be set in one direction for pushing and in another for pulling with a hawser. For pushing with a tug in narrow quarters, there is also a notch in the stern.

Part of McAllister's multi-million-dollar construction program emphasizing higher-powered tugs and jumbo barges, the new vessel joins a fleet of more than 200 others which the company operates in North American waters. McAllister Brothers, Inc., headquartered in New York, is one of the largest towing/transportation companies in the world.

First Offshore-Oil Directory Provides Complete Data For Rigs And Support Craft

The first annual "Offshore Drilling & Construction Contractor's Directory," just recently published, records a total of 457 offshore rigs, worldwide. The directory also lists a total of 126 major pieces of construction equipment (pipelaying and/or derrick barges) that are currently in use in the offshore oil industry.

The directory represents the first complete and accurate worldwide compilation of the firms and the equipment that make up the offshore oil-contracting industry. Over the past several years, the number of offshore rigs has been reported by various sources, all having a wide disparity in their figures. The offshore directory lists, in a special equipment appendix, 212 mobile drilling units, 70 tenders (of which only 32 have drawworks) and 213 fixed platform rigs. Of the mobile units, 107 are jack-ups, 52 are submersibles or semi-submersibles, and 53 are surface floaters (ship shape or barge shape.)

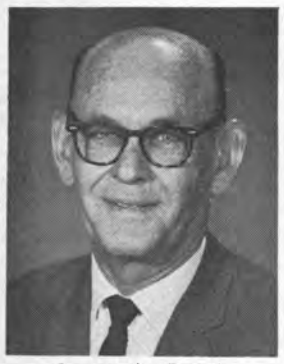
Other information in the directory, along with addresses, phone numbers, cable and telex addresses, and personnel and titles, includes: specifications of all equipment; a cross index listing equipment in various categories of working capabilities, and company histories which describe the financial structure, diversification, areas of activity, etc., of each company.

The 400-page directory is "Reader's Digest" size. It can be ordered by writing Ocean Oil Weekly Report, P.O. Box 7861, Houston, Texas 77007. The price is $15.00 each.

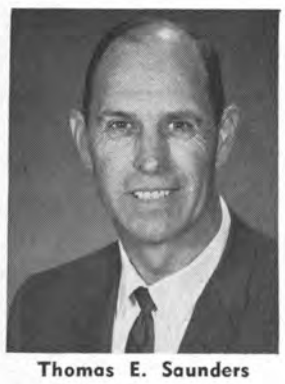
Newport News Announces Four New Appointments

Francis V. Daly

Robert A. Manley



James A. Bunch



Thomas E. Saunders

R. S. Plummer, general manager of Newport News Shipbuilding and Dry Dock Co., Newport News, Va., has announced four new company appointments. **Francis V. Daly** has been named manager of facilities and process engineering, **Robert A. Manley** was named to succeed Mr. **Daly** as manager of the welding engineering and non-destructive testing department, **James A. Bunch** has been named foreman for installation methods and procedures, and **Thomas E. Saunders** succeeds Mr. **Bunch** as foreman of the pipe department.

Mr. **Daly** has been manager of welding engineering and non-destructive testing at Newport News since 1958. In his new position, which was established with his appointment, he will be responsible for all activities of the shipyard's plant engineering and facilities divisions, as well as long range plant improvement and process engineering.

Mr. **Daly** is a 1936 graduate of Boston College. He joined Newport News Shipbuilding in 1940 as a staff engineer. He was named assistant welding engineer in 1956 and welding engineer in 1958. In 1962 he was given the added assignment of overseeing the company's nondestructive testing operations.

During World War II he was a staff sergeant with the U.S. Army Ordnance Corps and served for 2½ years in Iran, France and Austria.

Mr. **Daly** is the author of several authoritative technical papers on the subject of welding. He is a member of the Propeller Club, American Welding Society, The Society of Naval Architects and Marine Engineers and the American Society for Nondestructive Testing.

Mr. **Manley** a native of Quincy, Mass., worked as an apprentice at Bethlehem's Quincy Shipyard from 1948 to 1950. He served in the Air Force Reserve for 11 years and saw active duty in Korea.

After receiving a BS degree in industrial engineering from Virginia Polytechnic Institute in 1958, he joined Newport News Shipbuilding's welding engineering department. He was named a staff supervisor in 1961 and assistant welding engineer in January, 1968.

His memberships include the American Society for Metals, American Welding Society and the Propeller Club.

Mr. **Bunch** has served continuously in the pipe department since he joined Newport News as an apprentice in 1929. The department was known then as coppersmiths.

He was promoted to supervisor in 1936, assistant foreman in 1942 and foreman in 1955.

Mr. **Bunch** is a member of the Propeller Club.

Mr. **Saunders,** who served as assistant foreman since 1957, entered the shipyard's apprentice school in 1939. Upon completion of his training as a pipefitter in 1943, he was advanced to supervisor.

After duty in the U.S. Navy from 1944 to 1946, he returned to work in the shipyard's pipe department.

Mr. **Saunders** is a member of the Engineers Club of the Virginia Peninsula and the Apprentice Alumni Association.

Offshore Engineering Firm Formed By Mitsui Interests

S. Tanaka, president of Mitsui Shipbuilding & Engineering Co., Ltd., and **T. Mizukami,** president of Mitsui & Co., Ltd., have announced the formation of a joint firm for the development of offshore natural resources and other offshore projects. The new firm has been named Mitsui Ocean Development & Engineering Co., Ltd. (MODEC). Its address is P.O. Box 116, Kusumigaseki Building, Tokyo, Japan.

MODEC, according to the announcement, is intended primarily to furnish engineering and technical services to firms engaged in offshore development projects. The two organizing firms, together with other companies in the Mitsui group, will assist MODEC with the knowledge and experience they have gained in this field.

Father And Son Promotions Announced By Avondale

E. W. Dupont

Kenneth Dupont

Henry Zac Carter, president and chairman of the board of Avondale Shipyards, has announced the appointment of **E. W. Dupont,** former vice-president of Avondale's Bayou Black Division, as special assistant to the president in charge of foreign sales and promotion.

In a related move, **Kenneth Dupont,** former chief engineer of the Bayou Black Division, has been elevated to the position of vice-president and manager of Bayou Black.

Water Depth Under Dry Docks Maintained By Bethlehem Unit

A U. S. patent for desilting equipment which assists nature in maintaining a given depth in a waterway has been awarded to Bethlehem Steel Corporation, Bethlehem, Pa.

The accumulation of silt under dry docks and other deep draft installations has been a problem for years. The movement of silt in waterways is dependent on natural currents which must be of adequate velocity to maintain given depths. Often natural velocity is decreased by structures and other factors.

The patented equipment is designed to produce the required current velocity over a given area. It consists of a submerged electric motor and propeller mounted on a vertical column which extends from the pier deck to the depth to be maintained.

The column is rotated through an arc of 180 degrees for maximum coverage in the areas being protected. The desilting equipment runs intermittently and is timed to take advantage of natural currents produced by the tides.

This equipment is presently in use at Bethlehem's Hoboken, N. J., ship repair yard.

Inventor of the equipment is **Timothy E. Cummings,** construction engineer in Bethlehem's shipbuilding department. His invention has been assigned U. S. Patent No. 3,449,915.

Special Control Equipment Corrects Containership's List

Equipment which ensures that containerships stay on an even keel during loading and unloading has been ordered for 11 vessels at a cost of about $480,000 from a Scottish instrumentation manufacturer, Dobbie McInnes Ltd., Glasgow, Scotland.

This system of tank gauges and valve control equipment was first fitted to Associated Container Transportation's Act-1. Other vessels to be fitted with the system are seven being built at West German yards and three being built at British yards.

Keeping a containership on an even keel is essential for locating the containers accurately in the guides of the ships' holds. The gauges in the system control the pumps and valves which transfer ballast between tanks. The system can also be used to improve stability at sea and for gauging quantities of fuel in tanks.

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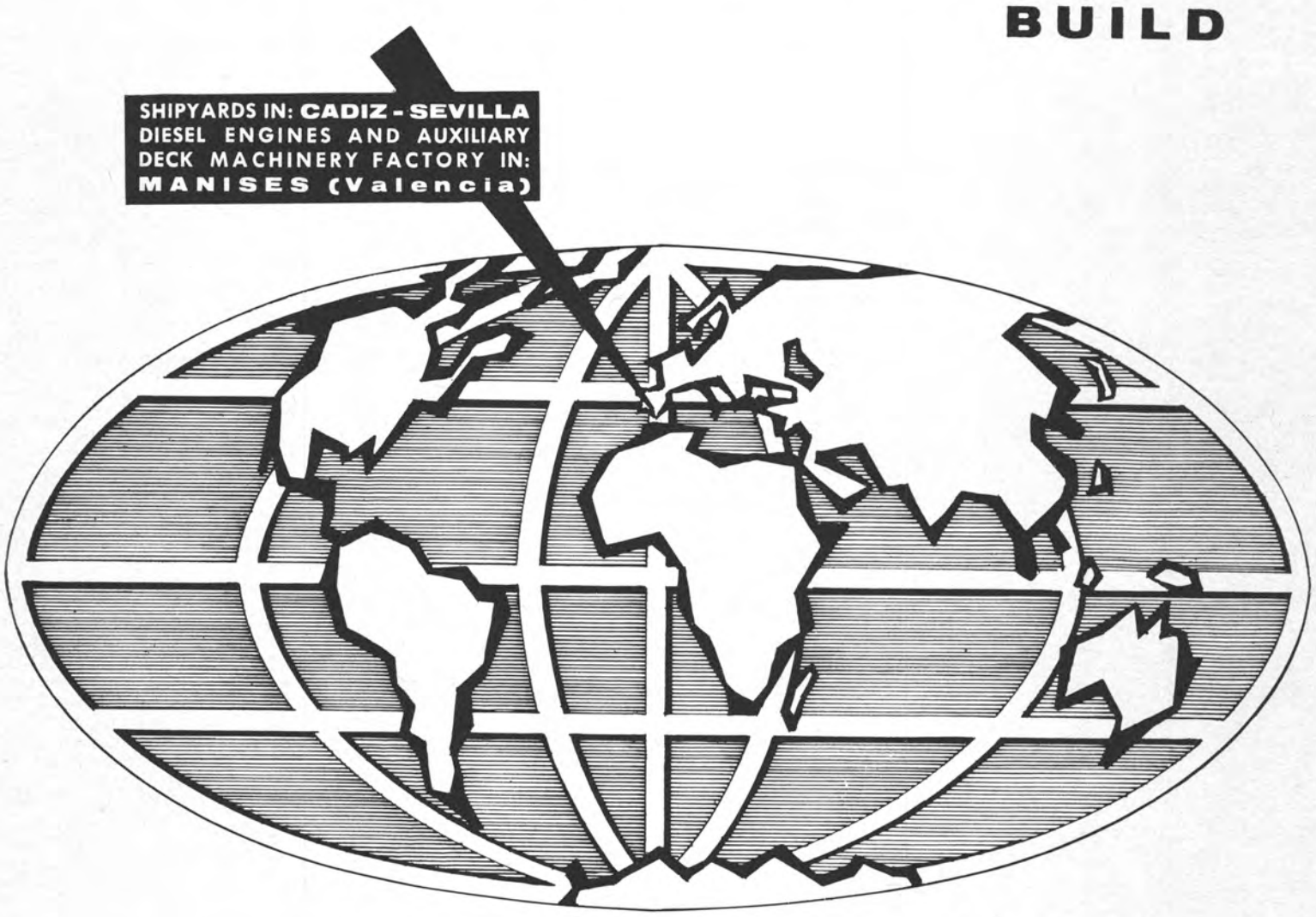
SPAIN

WE REPAIR BETTER BECAUSE WE

BUILD



MAIN PARTICULARS OF AVAILABLE DOCKS:

DOCKS:	FLOATING	DRY	DRY	FLOATING	FLOATING
For ships up to	120,000 Tons	60,000 Tons	15,000 Tons	7.000 Tons	5,000 Tons
Length of ships to be accommodated	896'6"	—	—	413'3"	344'6"
Length averall	—	777'4"	490'0"	—	—
Free breadth	1 37'9"	119'7"	82'0"	57'5"	45'11"
Draught	33'8"	—	—	18'4"	18'4"
Draught at high water	—	35'3"	26'0"	—	—
Lifting capacity	39,000 Tons (CADIZ)	— (CADIZ)	— (SEVILLA)	4,000 Tons (CADIZ)	2,000 Tons (SEVILLA)

SHOT BLASTING TANK CLEANING EQUIPMENT AND APPLICATION OF PROTECTIVE PAINTING ALL DOCKS ARE FITTED WITH STEAM, AIR, WATER, POWER AND TELEPHONE LINES.

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Dillingham Transfers Emerson To Albina

Parker C. Emerson has been transferred to Albina Engine and Machine Works' Engineering Department of the Dillingham Corporation. He is a naval architect and engineer who was formerly with the Oahu Railway and Terminal Warehousing Co. Ltd. He has also worked with Hawaiian Tug and Barge and Dillingham Corporation in Hawaii.

Prior to joining the Dillingham Corporation, he operated his own business in San Diego.

He is the designer of the Makahani and a 64-foot harbor tug both presently being built by Albina. He also designed the HTB-29, the largest barge ever built in Hawaii, for the Hawaiian Tug and Barge Company.

Holiday Inns Acquiring Southern Stevedoring To Aid Delta Lines

Holiday Inns Inc. and TCO Industries, which now control Delta Steamship Lines Inc., have announced plans to acquire Southern Stevedoring Company Inc. for slightly more than $1-million. Southern Stevedoring is privately owned by **B. Harris.**

Approval of the acquisition by the Maritime Administration has been requested because Delta is a subsidized line. According to the application, Delta will have its stevedoring performed at cost by Southern and will be reimbursed for any expenses or salaries of the line's employees which may be incurred in the general supervision of Southern after its acquisition.

H. O. Penn Appoints John R. Luersen Mgr. Marketing Services

John R. Luersen

H. O. Penn Machinery Company, Inc., Bronx, N.Y., has announced the appointment of **John R. Luersen** as manager of marketing services. H. O. Penn Machinery provides Caterpillar sales and service for New York, Long Island and Connecticut contractors. The company maintains facilities in the Bronx, Poughkeepsie, Tuxedo Park, New York and Newington, Conn.

In his new position Mr. **Luersen** will be responsible for Penn's advertising and sales promotions and expediting details of the marketing program. Prior to joining Penn's marketing staff, the new manager of marketing services was employed by Smith-Corona Marchant, Inc., as advertising-sales promotion coordinator in various product areas. He also held a similar position with Mack Trucks, Inc.

Mr. **Luersen** attended Cooper Union, New York, N.Y. and Pratt Institute, Brooklyn, N. Y. He served more than five years in the U.S. Army Field Artillery, and was discharged in May, 1945, with the rank of sergeant.

Bio-Oceanic Research New Consulting Firm Based In New Orleans

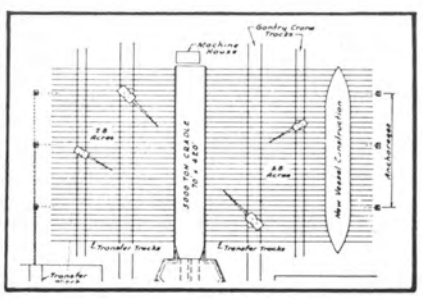
The formation of a consulting and research firm in the fields of marine science and biological oceanography has been announced by its president, Dr. **Merrill A. True.** The firm, Bio-Oceanic Research, Inc., 1600 Canal Street, New Orleans, La. 70112, has a staff of qualified environmental scientists.

The new consulting firm is offering onshore and offshore services in pollution evaluation and control, marine fouling studies, design and evaluation of sampling techniques and similar fields.

SPECIFY CRANDALL RAILWAY OR FLOATING DRY DOCKS

500 Metric Ton Railway
Dry Dock Belgian Naval Base,
Nieuport, Built 1957

500 & 1000 Ton Slipways at Ostend, Belgium. Built 1931. Rebuilt in 1946 after World War II.



5000 ton railway dock with side transfers at Sorel, P.Q. Operating since 1942.

38,000 ton floating dry dock; Chester, Pa.
Crandall-Type hull design reduced dead weight 800 tons

RAILWAY DRY DOCKS

- LOWER INITIAL FIRST COST
- LOWER OPERATION AND MAINTENANCE COST
- GREATER RELIABILITY WITH MAXIMUM SAFETY
- LONG OPERATING LIFE

Crandall railway dry docks with inclined tracks which fit natural shore conditions, thus eliminating costly dredging and the need of bulkheads.

These docks provide positive ship support at all stages of lift. Because ship positioning and all bilge block operations are controlled from the cradle, no piers are required. Crandall docks can be widened, lengthened and draft increased at relatively low cost. Transfer capability for multiple docking available.

Sonar pits, divided cradles and releasing keel blocks make naval ship docking much easier on a Crandall railway.

Crandall railway dry docks and transfers are available up to 12,000 tons.

FLOATING DRY DOCKS

- LOWEST DEAD WEIGHT AND COST
- EASE IN SELF-DOCKING AND MAINTENANCE
- LONGITUDINAL STRENGTH WITH SECTIONS SECURED TOGETHER
- TRANSFER OF SHIPS TO AND FROM SHORE

Crandall floating dry docks are designed with many modern features to reduce labor requirements and improve reliability. Among these improvements are wedge type releasing keel blocks, inclined sliding bilge blocks on short pedestals, vessel centering system, hinge connections between sections, ball and socket moorings, improved compartmentation for greater stability and very efficient waterways to minimize dead water.

Maximum lifting capacity with minimum displacement and draft is gained using only water ballast which is easily removable. Dock compartments are equipped with individual pumps which eliminate long suction lines and use of many valves for simplicity of control.

Crandall Floating Dry Docks are now available up to 70,000 tons with transfer capability.

Inquiries are invited for: Enlargement of floating dry docks, Restoration of old timber docks, New dry dock designs.

Proposals and estimates at no obligation. Write for Floating Dry Dock Brochure or Railway Dry Dock Brochure which include methods of determining vessel weights and load distribution.

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Sixth 326,000-DWT Tanker Delivered To Gulf—Four More To Be Built In Spanish Yards

The Universe Iran, sixth and last of Gulf Oil Corporation's series of Japanese-built 326,-000-dwt tankers, was christened recently at a sea berth in Nagasaki Bay. But already the Corporation is looking forward to the construction of four more tankers of this size—the world's largest—this time in Spanish shipyards.

Since the first of the 326's, the Universe Ireland, sailed September 27, 1968, on her maiden voyage to Bantry Bay, Ireland, three more have begun delivering crude for Gulf from Middle East oil fields to Europe. They have made ten round trips to date to deliver a total of 24,,000,000 barrels of crude.

The Universe Ireland and the Universe Kuwait each have completed four voyages, and the Universe Japan and the Universe Portugal one each. The Universe Korea, completed at Yokohama June 21, and the Universe Iran already are enroute to join them.

The first stage of Gulf's construction program for 326,000-dwt tankers was completed in brief but colorful ceremonies as Madame **Hushang Ansary,** wife of the Iranian ambassador to Washington, christened the Universe Iran from a floating crane festooned with red and white bunting.

Those attending the ceremony included Ambassador **Ansary,** making a homecoming visit to the country where he spent many years as a student and counselor to the Iranian Embassy in Tokyo; Iran's present ambassador to Japan, **F. Nouredin Kia;** officials of Nagasaki City and prefecture and representatives of Gulf Oil, Mitsubishi Heavy Industries, Ishikawajima Heavy Industries and National Bulk Carriers.

Mitsubishi and Ishikawajima each built three of the 326's. Mitsubishi delivered the Universe Iran to National Bulk Carriers, the owner, in July. Gulf will operate the vessels under long-term charter.

The Iran left immediately to join her five sisterships in ferrying 2,400,000 barrels of crude oil per trip from the Middle East to Gulf's 900,000-ton storage terminal on Whiddy Island in Bantry Bay. Among its various international operations, Gulf holds an interest in the Iranian Consortium.

The second phase construction program, in Spain, will produce ships some of which will be used to supply a refinery under construction at Bilboa, Spain, in which Gulf will have a minority interest. Gulf has other very large crude carriers under charter ranging from 210,-000 to 275,000 dwt from various companies.

In addition to the Bantry Bay terminal, Gulf is constructing a deep-water port and giant terminal at Heianza Island, Okinawa. When completed next spring, this will transfer crude from the 326's to feeder ships which will transport oil to Gulf customers and affiliates in Asia, including mainland Japan, Korea, Taiwan, Philippines and Hong Kong.

A contract recently was let for a similar storage depot and a refinery at Point Tupper, Nova Scotia.

When Gulf originally placed its orders for the six 326's in 1967, the biggest tanker in the world was the 209,302 dwt Idemitsu Maru. Though it was technically possible to build bigger tankers, most oil companies and ship operators agreed this was near the maximum at which a tanker could operate safely and economically. Then Gulf placed the largest single shipbuilding order ever made, for six vessels each one and one half times the size of the Idemitsu Maru.

Problems on a scale never before envisaged were overcome in storage, navigation, loading and unloading and safety facilities. With each ship measuring 1,135 feet in length, 175 feet in width and 105 feet depth, the 326's have a displacement six times that of the battleship New Jersey.

Crewman have reported that waves in a storm where winds registered force 9 merely bounce off the hull like breakers off a cliff.

Terminal facilities include a pumping system which can load or unload the tanks at the rate of 100,000 barrels per hour—almost 28 barrels per second—reducing turn-around time at each port to 36 hours or less. At an average speed of 15.7 knots, the vessels cover the 22,-000-mile round trip between the Middle East and Ireland in two months.

The 326's have proven that tankers of this size navigating around the Cape of Good Hope can transport Middle East crude oil to Europe at half the cost of shipment through the Suez in the 50,000 tonners which are the maximum size the Suez can handle.

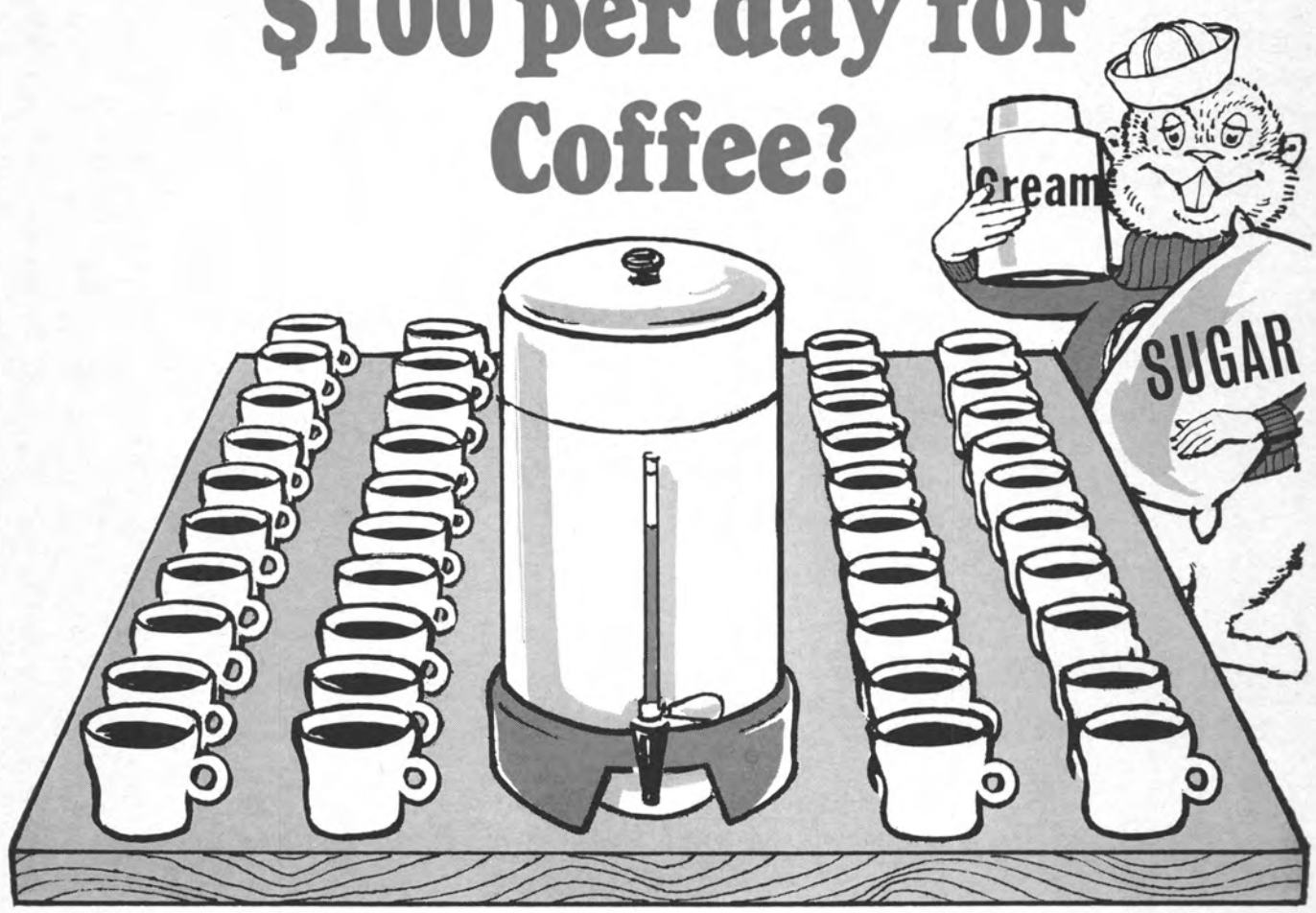
Furness Withy Makes New Staff Appointments

Following upon the sudden and untimely death of **W. F. G. Harris,** resident director of Furness Withy & Co., Ltd., N.Y., the following appointments have been made.

P. V. O. Evans, at present the resident director for Canada, has been appointed resident director for North America, thereby covering both Canada and the U.S.A. He also has been appointed chairman of the U.S.A. local board and president of the Administration Division and of the Stevedoring Division.

T. A. Dromgool has been appointed vice-chairman of the U.S.A. local board, and **D. L. Smith,** a member of the U.S.A. local board and vice-president of the Administration Division. Mr. **Dromgool** will continue as president of the Agency and Operations Division for the U.S.A.

$100 per day for Coffee?



For a 40-man crew to stand watch in the engine room to do the work of a TUGMONITOR.

No, we're not kidding. To do the work of one Tugmonitor you would need a 40-man crew in the engine room taking readings every second and they still couldn't do the efficient job of a Tugmonitor . . . and it doesn't take a coffee break.

Your solid state Tugmonitor automation system responds to pressures, temperatures, liquid levels and flow, voltages, current, rpm, or vibrations. It either recommends action to avoid a problem or takes action itself. The Tugmonitor is so foolproof it will report its own malfunctions. It doesn't prevent the trouble; it prevents the trouble from causing damage.

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ODECO Orders World's Largest Semi-Submersible Drill Rig From Mitsubishi Industries

Mitsubishi Heavy Industries, Ltd., recently received an order for what the shipyard calls the world's largest offshore semi-submersible oil-well drilling rig, Ocean Prospector, from ODECO International Inc., New Orleans, La.

The rig, to be constructed on four cylindrical lower hulls, with the two inboard hulls torpedo-shaped, will have 16 columns erected on these hulls. The living quarters, engine room and drilling deck are designed to be supported by these columns.

Measuring approximately 341-feet in length, 262-feet in width and 125-feet in height, the rig will have a drilling deck of approximately 262-feet by 187-feet in area. Weight of steel used for the construction of the rig will amount to 8,000 tons.

It will be equipped with a 2,800-hp propulsion system in each of the two torpedo-type hulls, and will be capable of self-navigating at a speed of 6 knots. It will also be equipped with four 105-hp anchor windlasses, and four 1,600-hp diesel generators. The living quarters will be capable of accommodating 66 persons.

The rig, with a drilling capacity of 26,000 feet, will be capable of drilling oil wells in continental shelves up to a maximum depth of 650-feet under water in a semi-submerged position.

After completion, which is scheduled for November, 1970, the rig will be engaged in oil-well drilling in Southeast Asia.

To date Mitsubishi has received other orders for seven offshore oil-well drilling rigs.

United Fruit To Transfer Three Ships To Dutch Flag

The Maritime Administration has approved the request of United Fruit Company to transfer to Dutch registry three 5,000-ton refrigerated ships, each over 22 years old.

The vessels will be transferred to Caraibische Scheepvart Maatschappif, United Fruit's Dutch affiliate, for continued operation as banana carriers and general cargo carriers in worldwide trading. They are the Santo Cerro, the Quisqueya and the Morazan.

In its application the company noted that it had lost $1-million last year in operating the small and relatively slow vessels. United Fruit also told the Federal agency that the vessels could no longer be economically employed under the United States flag.

The ships are the second group of three vessels, each to be transferred out of the fleet of 18 ships of that type built immediately after World War II.

Professional

Port Of Miami To Purchase Lummus Island In Move To Provide Container Port

A $6-million master plan for the growth of the Port of Miami was outlined by the port director, Adm. **I. J. Stephens.** The plan includes acquisition of additional land to expand the present Dade County port facility.

At a recent meeting of the Greater Miami Marine Council, Admiral **Stephens** explained that with the phenomenal growth rate in cargo alone the port will outgrow its present 300-acre Dodge Island site in half a decade. At the present time, handling approximately 600,000-tons of cargo, the port experts foresee a growth of 3.5 percent annually in cargo tonnage.

Included in the plan is the purchase of neighboring Lummus Island, located east of the port, which would provide the necessary 185 acres to expand the growing port facilities.

The Lummus Island site will provide space for major containerization facilities and four additional roll-on/roll-off platforms servicing a total of 16 ships. A fixed earth causeway constructed on pilings will connect the proposed port expansion site with accessible roadways.

A secondary deep-water channel will be needed to accommodate cargo vessels. Plans to change the present single span, two direction bridge, to a two span one-way bridge will conclude the mainland-to-port traffic facilities.

Five more transit sheds are being planned to house the staggering amount of cargo which will make the Port of Miami a major containerization center.

"Too many ports spend too much money on major containerization," Admiral **Stephens** said. "Not every port can be a major containerization port but we have the land available unlike other ports."

Not to be outdone by the cargo expansion, cruise facilities are expected to be a major part of the expansion story.

With passengers of cruise ships expected to number 1,400,000 by 1980, the port plans to provide additional terminal space and 15 berths.

The price tag for this farsighted expansion project lists $18-million fundable from the federal government and $7-million already acquired.

After the initial investment, the port can be self-sufficient by 1972, according to Admiral **Stephens.** This would make the port of Miami unique and initiate it as a top ranking world port, he added.

German Yard To Build Two More Containerships Powered By P&W Turbines

A West German shipyard will construct two additional fully-automated oceangoing cargo vessels, bringing to four the number of containerships to be built in that country to be powered by Pratt & Whitney Aircraft gas-turbine engines.

The four vessels will be the first general-cargo ships to use the quick-response, high-energy aviation-type gas turbines for primary power. Each P&WA FT4 Marine Power Pac will develop 30,000 shp and give the cargo vessels a better than 25-knot speed capability.

The four vessels will be built at the Rheinsthahl Nordseewerke yards, at Emden, Germany. Two of the vessels will be delivered in 1970 and the other two in 1971.

Each vessel will be approximately 800 feet long and displace more than 32,000 tons. The two P&WA FT4 gas turbines will drive the ship's controllable-pitch propellers through twin-reduction gears.

Pratt & Whitney Aircraft will also supply as a part of the Marine Power Pacs, enclosures (modules) which contain the gas generators and other engine room equipment. P&WA is also supplying the automated ship's propulsion control system including bridge controls. The automated equipment will enable the captain to run the vessels entirely from the bridge or from an air-conditioned machinery control room. The gas-turbine engines can be brought from a dead start to full power in less than two minutes.

While the cargo ships will be the first gas-turbine vessels of this type on the high seas, there are currently eight high endurance U.S. Coast Guard cutters of the Hamilton class in commission and one more on the ways and a military chartered cargo vessel — all using Pratt & Whitney Aircraft marine gas turbines.

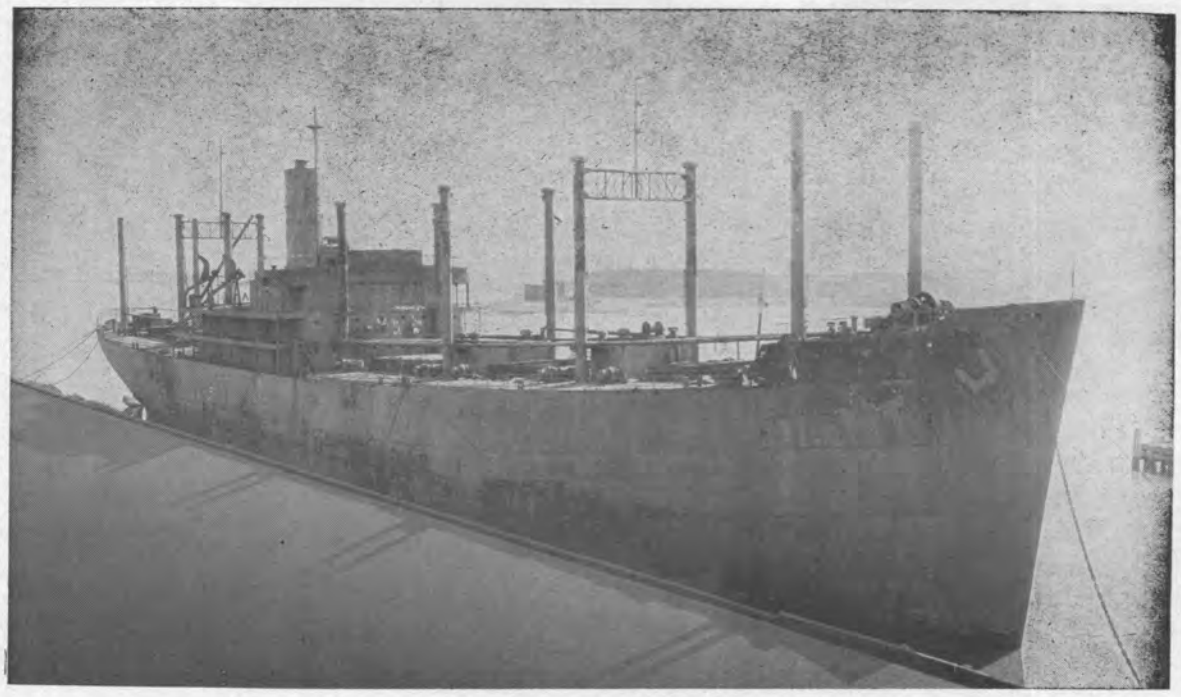
The roll-on/roll-off vessel, the Admiral William M. Callaghan, has been in service more than a year under contract to the U.S. Navy's Military Sea Transportation Service. The vessel has made 26 round-trip Atlantic crossings, carried more than 550,000 measurement tons and set a world's cargo-ship speed record crossing between New York and England at an average speed of more than 26 knots.

Adapted for marine service, the gas turbine's tremendous power spins a P&WA power turbine converting the hot gas energy to shaft power. Special materials and protective coatings are used to resist corrosion from salt-laden air. The FT4 engines can burn jet fuel, diesel and other heavy distillate fuels.

The FT4 is the largest of a series of marine and industrial powerplants developed by Pratt & Whitney Aircraft's Turbo Power & Marine Department. Other units range down in size to 480 hp. More than 400 industrial engines have been sold since 1960 for use in gas compression on long-distance natural gas lines, electrical power generation, chemical processing, and for marine propulsion.

The FT4 marine gas turbines have undergone exhaustive testing by both the U.S. Navy and the U.S. Coast Guard and are certified by the Coast Guard and the American Bureau of Shipping for marine service.

AP2/AP3 VICTORY C2/C3 NEW, US RECONDI



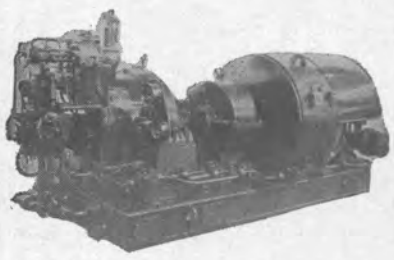
EQUIPMENT FROM MOORE DRYDOCK C-3 EX-MORMACSEA – HULL 197

MORMACSEA — Moore Hull 197 — some interchange with Federal Hull 198 — such as turbo generator sets. ALL EQUIPMENT AVAILABLE: 350 KW Turbo Generator sets—120/240 volts—Crocker-Wheeler generator driven by DeLaval turbine and gear—440#—740°TT—10,000 RPM/1200. Forced draft fans and motors—main circulators and motors—auxiliary circulators and motors—steering gear motors and pumps, etc.

KINGPOSTS — BOOMS — WINCHES — PROPELLER —TAIL SHAFT — 16" PORTLIGHTS

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

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

VICTORY AP3 TAILSHAFT

Isaacson Iron Works
Located Mobile

VICTORY AP3 RUDDER

Located Baltimore

VICTORY AP3 MAIN CIRCULATOR & MOTOR

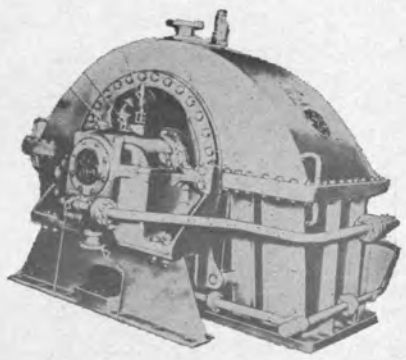
PUMP: 20 VCM—13,000 GPM—24.5 ft.—635 RPM. MOTOR: Reliance—100 HP—230 volts—360 amps—475/635 RPM — Lt. Compound — Frame 1050T — Vertical.

C3 PROPELLER BRONZE – 4-BLADE

21' 8" Diameter
21.669 Ft. Pitch
0.7 Radius

NEW AP2 VICTORY ENGI

6600 HP Main Propulsi



G. E
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ALL
CHALM
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COMPLETE TURBI

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

NEW THROTTLE VA
Schutte and

NEW H. P. AND L. P.
For General Electric and Allis-Chalmers

ABS RECONDITIONED 660

L. P. & H. P. MAIN PRO

FROM EX-MEDINA VICTORY—MARA
H.P. Turbine—complete—Serial 4A-1618—

FROM EX-SHEEPSHEAD BAY VI
H.P. Turbine—complete—Serial 4A-2264—

AP2 VI
WESTING
MA
REDUC
GE

Immediat
6000 SHP—R
ion 5410—L.P
— AB No. PA
Ex-Medina Vic
1620.

VICTORY AP3 EVAPORATOR-DISTILLER

Bell & Gossett — complete with brine and evaporator feed pump and motor—distillate pump and motor.

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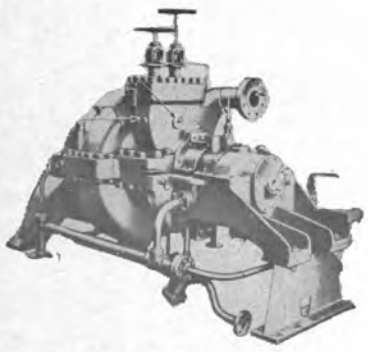
D AND IONED MACHINERY & EQUIPMENT

E ROOM EQUIPMENT

n HP & LP Turbines



RS

es

E ASSEMBLIES

ALLIS-CHALMERS

Low Pressure Turbine $17,500

High Pressure Turbine $18,500

/ES – $6750.00

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RBINE BEARINGS

abyrinth packing—diaphragms.

H. P. WESTINGHOUSE

ULSION TURBINES

HULL 586—BUILDERS HULL 586

Turbine—complete—serial 4A-1619.

TORY—OFFICIAL NO. 81752

Turbine—complete—serial 4A-2265.

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57 — from
/ serial 4A-

NEW H. P. & L. P. FLEXIBLE COUPLING
AP2—6000 H.P.

NEW SPARE BLADING FOR WESTINGHOUSE L. P. TURBINE
AP2—6000 H.P.

VICTORY AP3 FORCED DRAFT FANS

estinghouse—type 25—TD—18—19,000
F.M. at 10.7 inches static pressure.

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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 CONDENSATE PUMPS - MOTORS - TURBINES

AP3—2VHM—150 GPM—1650 RPM

AP2—2VHM—120 GPM

CHOICE OF TURBINE OR MOTOR DRIVES

15 HP MOTORS: Reliance—G.E.—Crocker-Wheeler

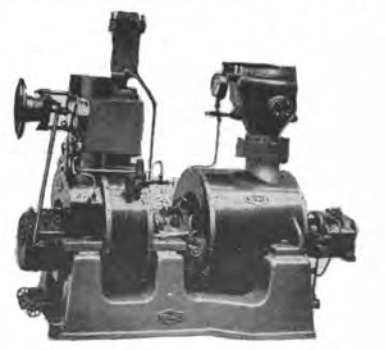
TURBINES: Coppus type TF5 and Terry

INQUIRE ABOUT ANY UNLISTED ITEMS THAT YOU NEED

MARINE FEED PUMPS

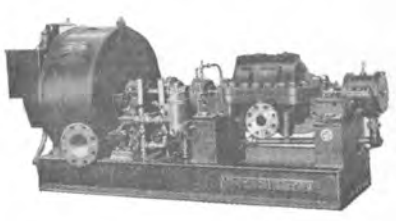
COFFIN MODEL F

Victory or T2, C3 etc.—control valve 1¼"—Form VI—constant pressure regulator—type C—150 HP—200 GPM—discharge pressure 575 PSI—7200 RPM—turbine 440 PSI 500°F—10 lb PSI exhaust pressure. Consumption 4280 lbs/hr—2 units available.



WEIR TURBINE DRIVEN FEED PUMPS TMFP7

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



MAIN FEED PUMPS

C2-S-J1—North Carolina—2 UQS-2—150 GPM @ 1465 T.D.H.—4000 RPM—115 H.P. Turbine. Form S2RM—Moore steam turbine—1½" steam inlet—440 lbs WP—750°F @ 10 lbs gauge. Water rate 26.8 lbs BHP/hr.

PACIFIC FEED PUMPS – TYPE JB – AP3 VICTORY

Horizontally split—diffuser type centrifugal. CAPACITY: 150 GPM @ 542 lbs or 1242' normal—185 GPM @ 600 lbs 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'.

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.

AIR COMPRESSORS

INGERSOLL-RAND

From C2-SAJ-1—Model 15B—type 40—5 x 5 and 4 x 4—60 C.F.M.—110 lbs.—15 H.P.—230 volts D.C.—55.7 amps.—1750 R.P.M.

SULLIVAN

AP3—7 x 4½ x 4½—60 C.F.M.—15 H.P.—230 volts.

A 300 KW VICTORY SHIP & C-2 GENERATOR ARMATURES

CROCKER-WHEELER

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

ALLIS-CHALMERS

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

WESTINGHOUSE

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

GENERAL ELECTRIC

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

C-2 ARMATURES

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

T2-SEA-1 TANKER MAIN STEAM & AUXILIARY EQUIPMENT

B MAIN TURBINE ROTORS

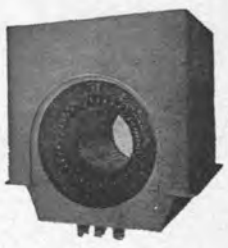
Large Turbine Rotors—Lynn

Large Turbine Rotors—Schenectady

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

C G.E. MAIN PROPULSION GENERATOR REVOLVING FIELD

G.E. reconditioned—June 1967



D G.E. MAIN GENERATOR STATORS

E

REWOUND WESTINGHOUSE MAIN PROPULSION GENERATOR REVOLVING FIELD

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

WRITE FOR COMPLETE INFORMATION

F WESTINGHOUSE MAIN GENERATOR STATOR WITH OR WITHOUT COOLER

G

WESTINGHOUSE MAIN MOTOR FIELD COILS

COMPLETE SET

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

H

T2 RUDDER

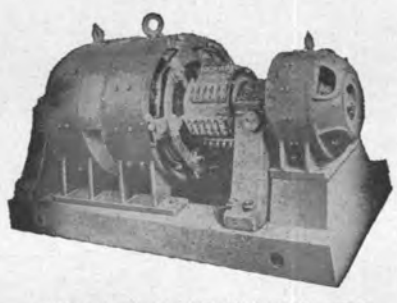
Reconditioned—ready to go.

T2 TAILSHAFTS

Reconditioned

PROPELLERS

T2 propellers



I WESTINGHOUSE EXCITER SETS

110 KW—28 KW—5 KW available

110 KW—32.5 KW—5 KW available

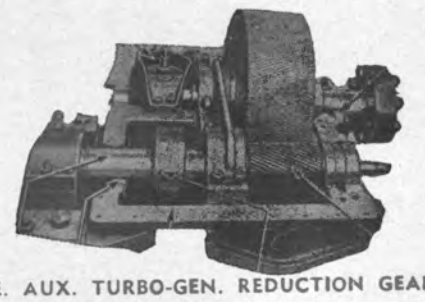
J

LORIMER

Emergency Generator Engine and Generator Parts

K MAIN CIRCULATING PUMP MOTOR

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



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

Bull gear & pinion. With ABS.

M WESTINGHOUSE AUXILIARY GENERATOR REDUCTION GEARS AND BEARINGS

COOLERS

N MAIN MOTOR AIR COOLER

Westinghouse—ABS—ready to ship

O MAIN GENERATOR AIR COOLER

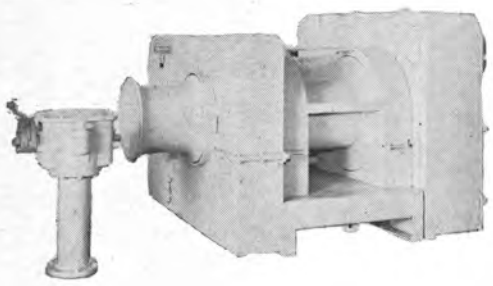
Westinghouse — reconditioned with ABS—ready to ship

P

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

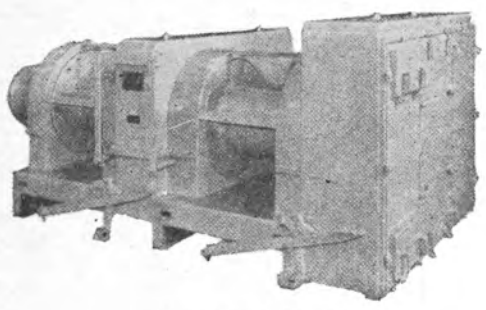
CARGO WINCHES, WINDLASSES & GENERATOR SETS

WINCHES



VICTORY TYPE UNIT WINCHES

50 HP—230 volts DC—Westinghouse, G.E. or Crocker-Wheeler. U-1, U-3 single speed—7450 lbs @ 223 FPM; U-2, U-5 double speed—19,000 lbs @ 96 FPM. We have both right and left hand. Send for flyer on these.



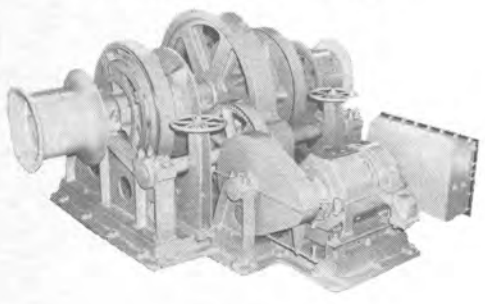
DOUBLE DRUM U-6 UNIT WINCHES

Double drum unit winch model U-6. DRUM: 16" diameter by 20" wide—with 28" flange. MOTOR: G.E. 50 HP — 230 volts — CDM — 1829 A.E.

AMERICAN ENGINEERING UNIT WINCHES

2 Full sets from "African Endeavor" and "African Enterprise." Winch duty: 7450 lbs at 223 FPM. MOTOR: G.E. 50 HP—230 volts DC—type CDM—1829 A.E.—181 amps—750 RPM.

WINDLASSES



NEW 2¼" McKIERNAN-TERRY

(2)—For 16,000 lb anchors—47½" center to center. 70 HP — 230 volt DC motors — with controls.

A.E.—2-7/16" WINDLASS

Made by American Engineering — from Ex-African "Enterprise" and "Endeavor". 65 HP —230 volts—234 amps.

HYDE #12 WINDLASS FOR 2 11/16" CHAIN

Built for Beth Quincy 29,000 ton class tankers. 12 x 14 wp 125-150 lbs—handle 16,500 lb anchors. Wildcat centers 4' 8". Completely reconditioned — new cylinders — new throttle valves—new piping.

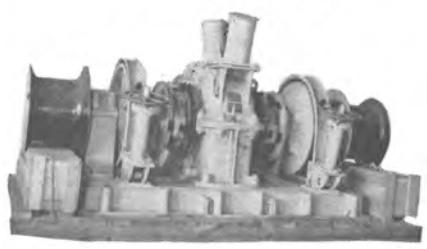
T-3 ANCHOR WINDLASS FOR 2⅜" CHAIN

American Engineering 13 x 14—handle two 13,000 lb anchors and 60 fathom chain at 35 FPM. Wildcat centers 6' 3".

T-2 WINDLASS FOR 2-5/16" CHAIN

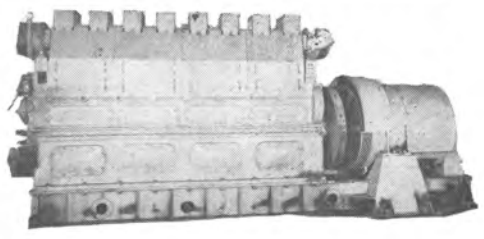
American Engineeirng type MALI-60-14—12 x 14—4' 8½" between wildcat centers.

UNUSED 1⅝" HEAVY DUTY LINK BELT WINDLASS



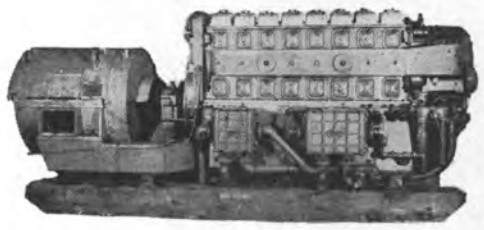
Below deck motor drive. Double Wildcat—driven by 50 HP—230 volt DC motor with vertical shaft and worm drive. Single speed—handles 7000 lb anchors and 60 fathoms of 1⅝" chain at 7 fathoms per minute. Wildcat centers 56". Complete with all controls and warping features. Total weight 27,500 lbs. With spares.

GENERATOR SETS



350 KW INGERSOLL-RAND DIESEL GENERATOR SETS

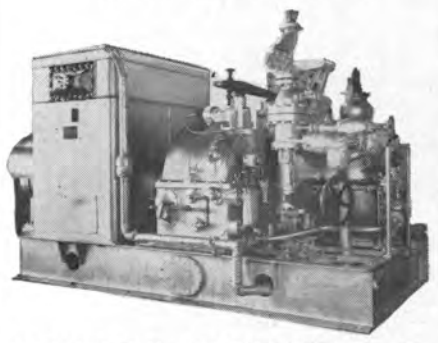
4 Available—engine type S—Ingersoll-Rand—1½ x 12—heat exchanger cooled—600 RPM. GENERATOR: General Electric—350 KW—120/240 volts DC—600 RPM. Complete with switchgear, coolers and air starting equipment.



290 KW DIESEL GENERATOR SET

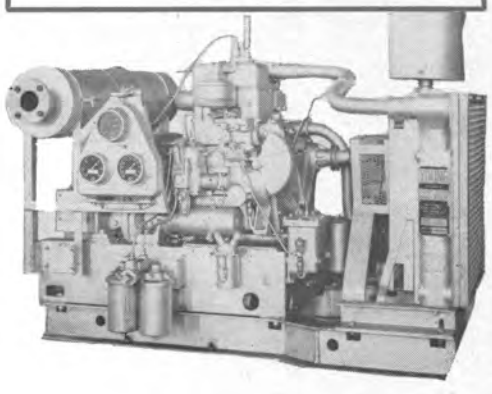
Westinghouse 290 KW generator—120/240 volts—1250 amps. ENGINE: GM 8-268A—6½ x 7—8 cylinder—1200 RPM.

G.E. 600 KW 440/3/60 TURBO GENERATORS



COMPLETELY RECONDITIONED BY G.E. SERVICE SHOPS WITH LLOYDS AND ABS CERTIFICATES

TURBINE: GE FN3-FN20 — condensing 6-stage — 525/565 lbs gauge. Super-heat 355/371 — 10033 RPM. GEAR: S-178—ratio 8.36:1—10033/1200. GENERATOR: 600 KW A.C.—type ATI—600 KW—750 KVA—450/3/60—1200 RPM—80% PF—totally enclosed—water cooled. EXCITER: 7½ KW—120 volts—62.5 amps—1200 RPM.



UNUSED 10 KW SUPERIOR DIESEL GENERATOR SETS

Radiator cooled units—120 volts DC—83.3 amps. ENGINE: Superior diesel model GAB-1—4½" bore—5¾" stroke—16 HP—equipped with Young radiator. Overall dimensions—57" high—57" wide—75" long.

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THE BOSTON METALS CO.

313 E. BALTIMORE ST. • BALTIMORE 2, MD.

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New York Office: 11 Broadway, New York, N.Y. 10004—(212) 943-2640

Deep-Sea Tug-Supply Vessel Christened At Burton Shipyard—For Zapata Service Fleet

Herculean Service, fully dressed, for christening ceremonies at Burton Shipyard.

With the traditional breaking of champagne upon her bow, the MV Herculean Service was formally christened recently at Burton Shipyard, Port Arthur, Texas, and added to the Zapata Marine Service fleet. **Mrs. Charlotte Bokenkamp,** wife of Reading & Bates' vice-president **D. G. Bokenkamp,** sponsored the vessel.

The Herculean Service is a radically new deep-sea tug-supply vessel designed specially for servicing the offshore drilling industry. This is the first triple-screw, three-engine vessel to be specifically designed for offshore tug-supply service.

Main propulsion is provided by three Caterpillar D399 marine diesel engines, each developing maximum 1,750 hp at 1,300 rpm. The 16-cylinder, turbocharged engines have Lufkin two-speed double reduction gears. Gear ratio is 5.8:1 in high gear, 7.1:1 in low gear and 7:1 in reverse. The three 104-inch by 84-inch stainless-steel propellers were fabricated by Avondale Shipyards.

Another new feature incorporated in the Herculean Service is a remote-controlled bow thruster. Powered by a 220-hp Caterpillar D333C marine diesel engine, this bow thruster adds extra maneuverability for extra safety and efficiency.

In addition to the triple screws and bow thruster, this vessel has one of the most modern hull designs in the industry. The all-steel welded hull has an overall length of 175 feet. Amidships depth is 15 feet. Breadth is 40 feet 8 inches.

Two Halliburton 1,025-cubic-foot tanks for dry-bulk mud transport are mounted below decks. A 400-cubic-foot per minute Gardner-Denver high-volume, low-pressure air compressor is installed for discharge of the dry-bulk mud.

With a cruising range in excess of 10,000 miles at 12 knots, the Herculean Service is capable of operating in any offshore area in the world. Diesel fuel capacity is more than 120,000 gallons. A maximum speed of 16 knots makes this vessel well suited for fast turnaround jobs.

The cargo deck, 133 feet by 38 feet, is clear for easy cargo handling even in rough seas. The stacks are forward, allowing increased unobstructed cargo space. For anchor handling, an "A" frame with 75-ton capacity spans the stern. A permanent stern roller also aids in handling large anchors.

A SMATCO towing and anchor winch is installed on the main deck aft of the forward house. Driven by a General Motors diesel engine, this double-drum heavy-duty winch is capable of carrying 2,400-feet of 2-inch wire line and 1,500-feet of 2-inch wire line. A single line pull on each line of 100 tons is available. The winch is remotely controlled from an aft station on the second deck.

Costing more than $1-million, the Herculean Service is the first of four new type vessels ordered from Burton Shipyards for Zapata Marine Service. All four are scheduled for service in 1969.

Zapata Norness Names R. E. Haine Director, Corporate Development

Robert E. Haine has been named director of corporate development for Zapata Norness Inc., Houston, Texas.

In his new post, Mr. **Haine** will be responsible for corporate relations planning and communications activities.

Prior to joining Zapata, Mr. **Haine** was manager of information services for W. R. Grace & Company, New York, N. Y. He previously worked for Shell Oil Company and Pacific Telephone & Telegraph in press-financial relations posts.

A former newspaperman, he is a graduate of the Missouri School of Journalism and the University of Notre Dame.

Zapata Norness is an international firm with principal interests in offshore drilling and marine services, shipping, construction and natural resources and is listed on the New York Stock Exchange.

Todd-Seattle Appoints Ward E. Squires As Assistant General Mgr.

Ward E. Squires

Todd Shipyards Corporation, Seattle Division has announced the appointment of **Ward E. Squires** to the position of assistant to the general manager. Mr. **Squires** graduated from the University of Michigan in 1951 with a bachelor of science degree in naval architecture and marine engineering.

After military service with the army and various marine engineering jobs with the Army Transportation Corps, Corps of Engineers, and the Puget Sound Navigation Co., Mr. **Squires** came to Todd-Seattle on June 15, 1951, and has been regularly employed with Todd since that date, including a four-year tour as chief engineer of Todd's Alameda Division after which he returned to Seattle as supervisor of the industrial department.

In his new capacity Mr. **Squires** will be in charge of the engineering and planning departments for Navy new construction, as well as special industrial projects and plant engineering. He is taking over the position previously held by **D. M. Surgenor,** who has been with Todd for 12 years, and is leaving for an executive position with a construction company.

Shell Oil Names Moffatt Marine Manager East Coast Sales

John T. Moffatt

John T. Moffatt has been named manager of marine sales for the East Coast of Shell Oil Company, New York. He was formerly national coordinator of inland marine sales.

Mr. **Moffatt** is a graduate of the New York State Maritime College and holds a chief engineer's unlimited horsepower steam license. Prior to joining Shell in 1955, Mr. **Moffatt** served in the U.S. merchant marine and in the U.S. Navy and is a commander in the U.S. Naval Reserve (ret.).

He is a member of the Propeller Club, The Society of Naval Architects and Marine Engineers, and is on the executive committee of the Alumni Association of the New York State Maritime College.

McDermott To Build Two Twin-Screw Tugboats

Crowley Launch & Tugboat Co., San Francisco, Calif., has contracted McDermott Shipyard, Morgan City, La., to build two twin-screw tugboats. Each tug will have the following dimensions: 127 feet 8 inches (BP) by 36 feet 8 inches by 19 feet 2 inches and will be equipped with 7,000-total-bhp diesels. They have been designated Hull Nos. 160 and 161.

10,000 hp on the way

These two towboats bring to five the total ordered from Dravo Corporation by Midland Enterprises, Inc., a subsidiary of Ohio River Company. The 5,000-hp vessels feature a new hull design and they are equipped with twin 9′9″ props housed in Dravo-modified Kort nozzles.

Dravo's research program, design capabilities and engineering skills assure you of the highest performance towboats available. For more information on Dravo-built vessels, contact Dravo Corporation, Marine Sales, Neville Island, Pittsburgh, Pennsylvania 15225.

Prudential Requests MarAd Approval Of Grace Purchase

Prudential Lines Inc. has filed with the Maritime Administration an application for approval in principle of its previously announced plan to buy Grace Line Inc.

The application included a letter of intent from Dillon, Read & Co., Inc., New York City, to arrange long-term financing to help Prudential repay loans from Chase Manhattan Bank and Marine Midland Grace Trust Co., also of New York City.

Chase and Midland were to share a $35-million loan and a letter of credit for $11.5-million to cover Prudential's purchase of Grace's common stock for $44.5-million. Prudential, under the plan will sell its assets to Grace for an amount equal to their fair market value with $10-million in cash and and the balance in Grace Line notes, the documents showed.

Grace has approximately 25 ships, including two passenger vessels, while Prudential is much smaller with but 10. However, Prudential has 11 big lighter-carrying vessels (LASH types) under construction.

Matson Appoints Erb To Key Freight Post

Herbert B. Erb

Matson Navigation Company has appointed Col. **Herbert B. Erb,** United States Army (ret.), to the position of freight manager of government traffic, it was announced by Capt. **C. E. McLanahan,** director of market development.

Colonel **Erb** formerly was commander of the Military Ocean Terminal Bay Area, Oakland Army Base, largest tidewater terminal in the U.S. In his new assignment, Colonel **Erb** will assist in developing Matson's through container service for military cargoes from the U.S. to Hawaii and the Far East.

Sperry Rand Transfers Brown To M&O Division

Robert B. Brown

Robert B. Brown has joined the Marine and Ordnance Division of Sperry Rand's Vickers Division as district sales manager of its Walpole, Mass. office. He will have responsibility for serving the divisions' customers in the New England states and New York state.

With eight years experience at Vickers, Mr. **Brown** is a former district manager of its Industrial Division offices in Grand Rapids, Mich. and Decatur, Ga., and also handled marine and ordnance applications in the southeast. He holds a BS degree in management engineering from the University of Vermont.

Jerome Slater Named CTI President

Jerome Slater has been named president of CTI — Container Transport International Inc. — to succeed **Thomas G. Newman,** who has retired, it was announced by **Bernard L. Schwartz,** president of Leasco Data Processing Equipment Corp. Also announced was the advancement of **Eugene R. Birchler** from vice-president to Mr. **Slater's** old post as executive vice-president.

Reliability And Maintainability

R. L. Harrington, J. W. Coats and F. E. Farley*

With the heavy emphasis traditionally placed on reliability and maintainability during the design of marine equipments, the recent trend towards more sophisticated formal reliability and maintainability analyses may appear to be unnecessary. Such would indeed be the case if the ship design philosophy had remained unchanged; however, over the years the basic philosophy utilized in the design of ships has shifted such that an even higher premium has been placed on the reliability and maintainability of shipboard equipments. One factor contributing to this shift is the continuous increase in complexity and sophistication of shipboard equipments.

The term "systems effectiveness," which has been introduced primarily in recent Defense Department specifications, is seemingly simple to comprehend in that it generally denotes efficient utilization of resources; however, upon closer examination, the concept of systems effectiveness is found to be most complex with a number of nebulous aspects. The basic principles involved in the concept of systems effectiveness, is illustrated by Figure 1. Reliability and maintainability are shown to constitute the availability element of systems effectiveness.

Although the demands for increased systems effectiveness from the merchant fleets have not been as formal as that from the naval arena, the urgent need similarly exists. For example, **William Elmer Jr.** and **E. R. Weber** told The Society of Naval Architects and Marine Engineers at the 1966 Spring Meeting that there are a variety of current situations which demand an increased emphasis on the reliability and maintainability of main propulsion machinery and projected that "reliability will be as critical a section of future specifications as fuel rate is today."

A review of the Navy's reliability and maintainability specification requirements currently imposed vary from those of a qualitative nature having little or no binding contractual obligations to quantitative requirements which could be troublesome to an unwary manufacturer. The reactions of the equipment manufacturers to such specification requirements have similarly covered a broad spectrum, varying from apathetic acknowledgment to mortal fear; however, the equipment manufacturers' reactions have not always been commensurate with the severity of the specification requirements.

While the primary objective of R&M analyses may be "to improve the systems effectiveness of the design under consideration," or "to ensure a proper balance between the reliability and maintainability designed into a system and the costs associated with maintenance during the system's service life thereby achieving minimum life-cycle costs," statements in such general terms are not informative. On the other hand, by investigating the secondary objectives (i.e., those which lead to the fulfillment of the primary objective) the essence of R&M analyses can be laid bare. Some of the many and varied secondary objectives of R&M analyses are as follows:

1. To ensure a specified level of operational reliability. Accomplishment of this objective can be an iterative process which entails assigning a level of reliability to the various system elements and then computing the overall system reliability to ensure the attainment of the specified level. As required, adjustments are then made to the level of reliability assigned to the system elements and finally the system elements are analyzed to ensure that they can provide the level of reliability assigned.

2. To consolidate the responsibility for R&M design characteristics. The interfaces between owners, design agents, and shipbuilders as well as the interfaces between specialists within these organizations provide opportunities for R&M design considerations in the areas of contiguous responsibility to escape attention as overall responsibility is seldom concentrated. R&M analyses tend to unite the design effort inasmuch as the analyses are properly conducted on a system basis thereby providing coverage for all areas of responsibility.

3. To provide an organized procedure for collecting and disseminating service experience data. The conventional philosophy of designers has been that "no news is good news"; that is, if no unsatisfactory reports were received from their designs, then the design was considered satisfactory.

With service experience playing a vital role in design innovations, it is paradoxical that no positive means of communication between the operators and designers has been provided.

The collection, study, and dissemination of service experience data is an integral aspect of R&M analyses.

4. To identify system failure modes which have a high probability of occurrence as well as unacceptably adverse effects.

5. To establish maintenance requirements. Assessment of maintenance requirements, in terms of manpower, manpower skill level, and special tools or facilities required, in advance of the realized need for such requirements is a design analysis capability that has not been fully exploited.

6. To ascertain logistic support requirements. Effective utilization of a shipboard system requires that the system be properly supported. The design stage is the appropriate point to analyze preventive and anticipated corrective maintenance logistic support requirements. Standardization in design, which may be feasible if pursued in the early design stages, is an example of measures which may be taken to alleviate the problem of logistic support.

7. To provide a scientific basis for the establishment of equipment inspection intervals. When marine equipments are opened and inspected in accordance with the customary practice and all is found to be in order, the usual reaction is to breathe a sign of relief. A more proper reaction would be to become enraged; because not only has money been wasted in conducting the inspection but, more importantly, experience indicates that there is a high probability of damage being done to the equipment during the inspection process. A thorough analysis of the reliability characteristics of marine equipment can provide a basis for establishing inspection intervals of optimum length thereby minimizing inspection costs and improving the reliability characteristics of the equipment.

8. To assemble R&M design criteria. In order to ensure a consistent level of R&M throughout the design of a system, system R&M design criteria are appropriately assembled and disseminated to all design personnel. Optimum systems effectiveness requires that regions of inconsistently high, as well as low, R&M be eliminated.

Conclusions

Due to economic considerations, there is an ever-mounting demand for increased cost effectiveness in shipboard systems. The disciplines of reliability and maintainability are major elements of cost effectiveness studies, and therefore, are receiving increased emphasis in the design of marine equipments. Analytical methodology has been developed within the reliability and maintainability disciplines which provide the capabilities required to ensure a proper balance between the first costs (inherent reliability) associated with a system design and the corresponding recurring maintenance costs.

The full potential of reliability and maintainability analyses presently cannot be fully realized due to the current lack of applicable reliability and maintainability data for marine equipments; however, meaningful and informative analyses can nevertheless be conducted. On the other hand, while many of the reliability and maintainability analyses do not require empirical data, sound engineering judgment with a constant view to that which is practical is a basic requirement in all instances.

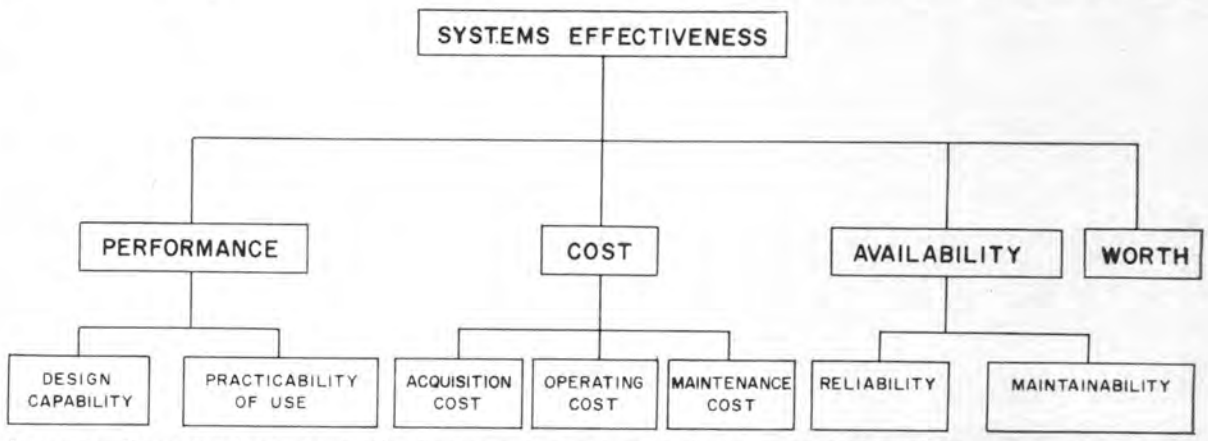
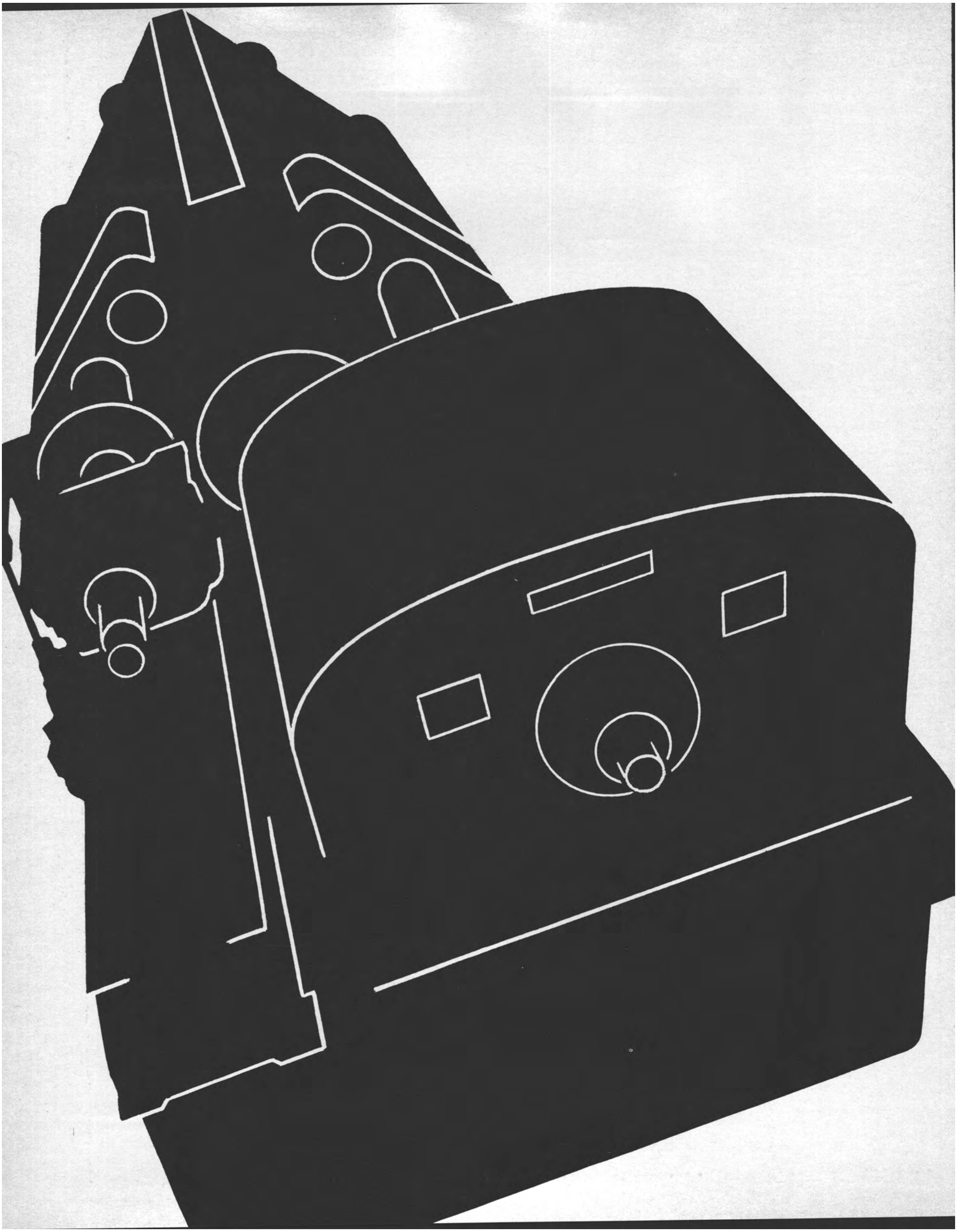


Figure 1—Elements of a systems effectiveness analysis, showing the importance of reliability and maintainability.

*Messrs. **Harrington, Coats** and **Farley,** Newport News Shipbuilding and Dry Dock Company, presented a detailed paper on this subject before a recent meeting of the Hampton Roads Section of The Society of Naval Architects and Marine Engineers. Reproduced here in condensed form is the introduction to the paper. The appendices to the paper covered R & M analyses, sources of information, etc.



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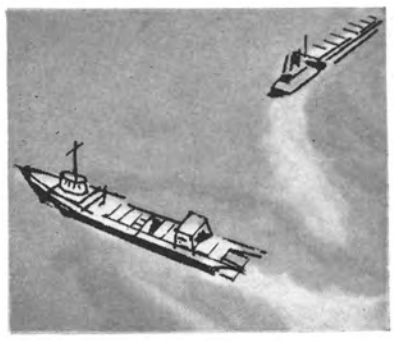

De Laval got the largest propulsion unit order placed by the merchant marine in recent years—11 sets of DLT-M main propulsion plants for new LASH vessels.

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

Submarines To Explore Under Arctic Ice For Oil

Marine Resource Consultants, Inc., Santa Monica, Calif., has announced the development of a unique submarine task force for offshore oil exploration in the Canadian Arctic. The firm has completed negotiations with the Swedish government for the purchase of three Neptune-class submarines. The 1,000-ton subs were released by the Royal Swedish Navy in May and will enter private service in July 1971.

"Submarines offer the only economical approach to unlocking the seismic secrets of the ice-covered Arctic," **John B. Gustavson,** MRC president stated. "Our subs will use satellite navigation, underwater television and modern geophysical equipment to survey the ocean bottom while running at a safe depth under the ice floes."

Conventional vessels cannot enter the vast continental shelf areas of the Canadian Arctic islands extending from the northwest passage to within 400 miles of the North Pole. The submarines will utilize patches of open water during the summer months for surfacing. During the winter, the subs will operate within a few miles of man-made, sonar-equipped surface openings. Hovercraft will be used to construct and maintain the surface openings and their electronic docking equipment to allow the oil exploration to continue through the Arctic winter.

"The magnitude and sophistication of this regional survey resembles a major space shoot," according to the ocean firm executive, who prior to founding Marine Resource Consultants in 1966 made his career in the aerospace industry. "Yet, our service is based entirely on fully developed techniques including polar passages of both German and American submarines at the end of World War II."

The U. S. Navy continued these operations with diesel-electric subs under tight security cover. The advent of the Nautilus nuclear submarine made the techniques obsolete for military purposes and caused a release of much of the data which now form the base for MRC's commercial submarine activity.

Marine Resource Consultants, Inc. has offered the submarine services on a turnkey basis to the major concession holders among the oil companies. The price per line of mile of seismic data starts at $3,000 for a 5,000-mile sweep and decreases to a $1,200 unit price for a 15,000-mile survey. Consequently, a number of the oil companies have suggested a group effort of regional character to reduce the unit cost and to acquire a broad geological base for the many scattered concession areas.

The 200-foot-long submarines will be drydocked in October in Sweden for general overhaul and modification. An overhead keel will be added based on a U. S. Navy recommendation. This will allow the subs to dock solidly against the ice during re-supply and battery recharging. Bow thrusters will be added to increase maneuverability. The snorkel system will be equipped with an ice drill for emergency use. The only other major modification will be the removal of the torpedo tubes and all other military equipment to allow additional scientific space.

Crew training will commence during the summer of 1970. Both the Royal Swedish Navy and the U. S. Navy have offered assistance in the form of retired personnel referrals. Mixed crews of Canadian, U. S. and Swedish nationality will fill the twenty-two positions in each sub at premium rates. During 1970, MRC will established the main base at the western shore of Ellef Ringness Island. The submarines will surface and dock in a controlled basin inside the main base structure.

Marine Resource Consultants, Inc. has performed other unusual tasks in the ocean environment. In 1967, the firm made headlines with its dramatic proposal for a tunnel under the Santa Barbara Channel which would remove all offshore oil production from the surface and pay its way through reduced maintenance requirements.

The firm has also pioneered offshore mineral exploration, having successfully completed geophysical and core sampling programs in the Philippines. An offshore iron deposit is now under development.

Worthington Corp. Assigns DesJardins And Samuelson To Machinery Systems Int.

Paul R. DesJardins has been appointed manager of operations and **A. J. Samuelson** was named manager-marketing in the newly-formed Worthington Machinery Systems International, Harrison, N.J., it was announced by Worthington Corporation.

Mr. **DesJardins** joined Worthington in 1938, and most recently was director of Worthington Corporation research and development planning.

Mr. **Samuelson** joined Worthington's International Sales Department in 1960 and has most recently been manager of contract engineering.

Worthington Machinery Systems International markets, coordinates, engineers and builds systems, subsystems and turnkey installations around the world, all based on Worthington components. These installations include air and gas compression, pumping, industrial and marine refrigeration and powerplants utilizing diesel engines, gas and steam turbines.

Erie Marine Officially Opened—Shows Construction Methods On Largest Lake Ore Ship

A new multi-million-dollar shipyard was officially dedicated the last weekend in June. At that time Erie Marine Inc., a division of Litton Industries, located just outside Erie, Pa., opened its doors so that maritime and governmental officials could see the progress being made in building a new automated shipyard.

Ellis B. Gardner, who heads Litton's shipbuilding operation and is also president of Ingalls Shipbuilding Corporation, another Litton division, officiated at the ceremony. He was assisted by **George K. Geiger,** president and general manager of Erie Marine.

Besides viewing the longest dry dock in the United States—1,250 feet—and the new fabrication building, the guests were shown the first hull sections of the 1,000-foot Lake ore carrier under construction. This new vessel, being built for Bethlehem Steel Company, will be the largest ship on the Great Lakes when completed in 1970.

In September 1967 Litton announced that it would build a shipyard in Erie, Pa. On March 12, 1968 ground was broken for the yard. From then on work progressed rapidly on the $2-million graving dock and the $3-million building to house the fabrication and assembly shops. In April 1968 Bethlehem Steel awarded the firm a contract to build the 53,000-dwt ore carrier.

This automated shipyard is building the cargo section of the vessel. In the assembly building at the end of the graving dock, the ship's steel panels are welded together to form sub-assemblies. When completed, these sub-assemblies are placed on a hydraulic turning platform in the graving dock floor and welded together vertically to form modules 105 feet wide by 48 feet long. As each module is completed, it is moved forward and welded to the one proceeding it.

Ingalls Shipbuilding is building the bow and stern sections of the vessel. These will be joined together at Ingalls and will sail under its own power to Erie, Pa. There it will be cut apart and each end joined to the 818-foot cargo section.

The Bethlehem ship will be a self-unloader capable of discharging its 51,500-tons of iron-ore pellets in approximately three hours. The unloading equipment was designed and built by Hewitt Robins, another division of Litton.

Mr. **Gardner,** in his talk at the ceremonies, stated that the ship was not an experimental vessel but that it was only unique in the method of construction. He further stated that future ships of this size and type would sell for approximately $22-million.

Erie Marine currently employs about 200 workers but estimates that between 400 and 500 people will be employed when the new yard is in full production.

Robert E. Berry Joins Navsat Systems Inc.

Navsat Systems Inc., Newport Beach, Calif., developers of a system to aid navigation and operations of commercial ships, has announced that **Robert E. Berry** has joined the company as vice-president-operations.

Mr. **Berry** announced simultaneously that **Robert A. Thompson** has been named director of engineering; Dr. **John B. Opfell,** assistant to the director of engineering, and Capt. **James D. Luse,** manager, systems development.

All four men were with Philco-Ford's space and re-entry systems division in Newport Beach, Calif., where they worked on the original research and development of the Navsat System.

Standard Dredging Elects Gahagan, Barnett Directors

William G. Gahagan

Bernard H. Barnett

The election of two new directors to the board of Standard Dredging Corporation, New York City, was announced last month by **Lawrence Schact,** chairman. They are **William G. Gahagan,** president of the firm, and **Bernard H. Barnett,** a Louisville, Ky. attorney and board chairman of National Industries, Inc.

New Vac-U-Vator Discharges 46,500-Ton Bulk Rice Cargo With Minimum Breakage

A 46,500-ton cargo of rice was recently unloaded in Korea and showed only an 0.8 percent kernel breakage for the unloading operation. This exceptionally low kernel damage was attributed to a new Vac-U-Vator, developed specially for rice.

The successful results of this first discharge, and those to follow, should encourage the exportation of rice in bulk to emerging countries throughout the world.

This large shipment was made on the Korea Rainbow, a seven-hold bulk carrier. Loading in Sacramento and San Francisco, four holds were filled with California Cal-rose rice and three holds held pearl rice. It was the maiden voyage for the ship. The vessel does not have any cargo handling gear other than the special Vac-U-Vator pneumatic rice unloaders.

In Inchon, Korea, the entire cargo was discharged in slightly under 14 days, It was discharged completely into lightering vessels while at anchor. The free-digging rate of discharge was 50 tons per hour per Vac-U-Vator. The ship is equipped with six of the special machines, yielding a total discharge rate of 300 tons per hour. Including necessary time to clean up hatches, shift barges, and other delays, the entire vessel was discharged at an overall average rate of 3,321 tons per day.

This was the second bulk cargo of rice to be discharged by pneumatic equipment at Inchon. The first vessel, which discharged about two years ago, had to discontinue unloading because the cargo surveyor noted excessive grain breakage. The same surveyor inspected the discharge from the Rainbow.

With the success shown on this voyage, the Korea Rainbow's next voyage will be a load of rice from the Gulf Coast to Korea. Dunbar Kapple Inc. feel that after years of discharging pneumatically other grains, they have now developed a Vac-U-Vator which will prove as successful with rice.

A. E. Gilman Joins Mitsui Osk Lines

Arthur E. Gilman has been named assistant general manager of Mitsui Osk Lines, Ltd., New York branch office, it was announced by **Y. Nakamura,** general manager in the United States for the Japanese steamship company. Mr. **Gilman** was previously traffic manager of the Orient service of Lykes Steamship Co. office in New Orleans.

LNG Ships For Alaskan Service Christened At Kockums Yard

The sponsoring couples, left to right: **Mrs. William W. Keeler,** Mr. **Keeler, Mrs. J. C. Donnell** and Mr. **Donnell.**

Two 450,000-barrel LNG carriers, which during the next 15 years will operate between Cook Inlet on the southwest coast of Alaska and Negishi on the Bay of Tokyo, are nearing completion at Kockums Shipyard in Malmo, Sweden. They will form the vital marine transportation link of the Phillips Petroleum Company's and Marathon Oil Company's joint venture in supplying the equivalent of 50-billion-cubic-feet of methane gas a year to Tokyo Electric Power Co. and Tokyo Gas Co. Two separate companies — Polar LNG Shipping Corporation and Arctic LNG Transportation Company, Liberia—will each own one ship, but both will be operated by Marathon Oil Co.

The recent christening ceremonies took place at Kockums, attended by leading representatives of both parent companies. Moored stem to stern at the yard's fitting out quay, the ships were christened one after the other from platforms decorated with American, Liberian, Japanese and Swedish flags. Serving as sponsors were **Mrs. J. C. Donnell II,** wife of the president of Marathon Oil Company, Findlay, Ohio, and **Mrs. W. W. Keeler,** wife of the chairman and chief executive officer of Phillips Petroleum Company, Bartlesville, Okla. With a bottle of champagne broken over the bow, the ships were named Polar Alaska and Arctic Tokyo, respectively.

The ships are unique, designed as they are for arctic outside and cryogenic inside conditions. The cargo is carried at atmospheric pressure and boiling temperature (−260°F.). This very low temperature is maintained by moderate evaporation in the six heavily insulated cargo tanks. The boil-off equalling about 0.3 percent of a full cargo a day is used as fuel in the two dual-fired boilers supplying steam to the ship's propulsion turbines.

Each ship has a length of 799 feet, 111½-foot breadth, 69½-foot depth and 33-foot maximum draft which is equivalent in size to a 70,000-dwt oil tanker. The double-reduction geared steam-turbine machinery develops 20,284 shp at 106 rpm. Contract and service speed is 18.25 knots at 31-foot draft, 18,250 shp and 103 rpm. Classification is by American Bureau of Shipping and U.S. Coast Guard.

The hull is double-skinned and provided with Class C ice strengthening and a 1,000-hp bow thruster. Ballast capacity is sufficient to maintain the same draft on the empty leg of a trip on the loaded leg.

The six cargo tanks are integral with the hull and of a so-called membrane type developed by Gaz Transport Co. of Paris, France. Containment of cargo is by two barriers each consisting of a gas-tight welded layer of 0.019-inch steel sheets of Invar (36 percent nickel steel) and a thermal insulation layer of plywood boxes filled with expanded perlite. The forces of the cargo are transmitted through the barriers to the inner hull.

Each cargo tank has two main pumps. Six pumps can unload a full cargo in about 15 hours at a rate of 30,000 bbl/hr. The pumps are fitted on welded columns of stainless steel. All cargo piping on deck is also of this material.

The extensive ancillary equipment includes an inert-gas generator producing the inert gas required for the preventing of fire and explosion risks in the cargo system. This is controlled and checked by means of a highly developed remote control system.

T. Smith & Son's Mickey Easily Handles Containers And Heavy-Lift Assignments

High-gantry 60-ton capacity Mickey transferring containers from a ship to a barge and loading some on its own deck.

T. Smith & Son, Inc., New Orleans, stevedore contractors, recently completed the second phase of a major derrick fleet modernization program when the company placed in service its all-new derrick barge Mickey.

The high-gantry, 60-ton capacity Mickey follows by less than a year T. Smith's construction of the 200-ton-capacity derrick Terence that last year inaugurated the company's multi-million-dollar three-phase fleet-improvement program.

The third and final phase, with a target completion of late 1969, will be construction of yet another new derrick barge of 90 tons capacity, according to **James E. Smith,** president of the local stevedoring firm.

"Our new Mickey was designed especially to meet the growing need for container-handling capability as well as general cargo heavy lift, and the new derrick already shows signs of becoming one of the most versatile pieces of cargo-handling equipment in the New Orleans port area," Mr. **Smith** said.

The Mickey's diesel-electric crane, a Clyde Model 20, is rail-mounted on a barge 200 feet by 50 feet by 10 feet. The crane revolves on a 26-foot-high gantry with 20 feet of clearance over the deck of the barge—high enough to pass over two levels of containers below.

"On a gantry this high, the crane is above most ships' decks and can boom completely across the great majority of cargo vessels afloat today," Mr. **Smith** explained.

The Mickey boasts a 120-foot boom with a 14-foot jib to accommodate a variety of special lifting gear, including a 15-ton clamshell bucket and an 8-ton electro magnet.

Main hoist power is provided by a 450-hp turbocharged Caterpillar diesel with three-stage torque converter. A variable voltage 50-hp electric motor rotates the crane at 2½ rpm. A set of four synchronized 5-hp electric motors powers the gantry's four two-wheel trucks that move the crane on single tracks over 180 feet of the barge length in under two minutes.

Electric generators are driven by a 175-hp turbocharged Caterpillar diesel. Compressed air from an Ingersoll-Rand compressor operates hoist clutches and brakes.

The new derrick can revolve a 60-ton lift in a 30-foot radius; 30 tons in a 60-foot radius; 16 tons in a 90-foot radius, and 10 tons in a 120-foot radius. With its crane in a fixed position, the Mickey can lift 72 tons.

Oberlin Named Administrator Of St. Lawrence Seaway Corp.

Secretary of Transportation **John A. Volpe** has announced the presidential nomination of **David W. Oberlin** as administrator of the St. Lawrence Seaway Corporation.

Mr. **Oberlin** is chairman of the American Section of the International Association of Port Authorities and director of both the Seaway Port Authority of Duluth and the American Association of Port Authorities.

He is a member of the National Defense Executive Reserve and the Upper Midwest Regional Export Expansion Council.

Since joining the Duluth Port Authority as its chief administrative officer in 1967, Mr. **Oberlin** has compiled a record of substantially increased revenue and attraction of new industry to port property.

Mr. **Oberlin** was a staff member of the Toledo-Lucas County Port Authority for 11 years prior to joining the Duluth Seaway Port Authority.

As assistant secretary and fiscal officer for the Toledo, Ohio, Port, he supervised construction and land development valued at nearly $10-million.

Mr. **Oberlin** in 1963, played a major role in staff operations leading to a purchase lease-back revenue bond issue of $65-million which brought the assets of the Toledo Port agency to nearly $80-million.

He was named manager of Trade Development for the Toledo Port in 1964, a position in which he worked closely with federal matters affecting the Great Lakes maritime industry. His duties included trade development planning, overseas trade promotion and industrial development.

A graduate of the University of Michigan, Mr. **Oberlin** is a former member of the U.S. submarine service and in World War II was awarded the Silver Star Medal and the Personal Commendation Ribbon. A former commander in the Naval Reserve, he was called to active duty during the Korean Conflict.

Jersey City May Obtain Caven Point From Army

One of the most valuable waterfront pieces of land in the northeast, Caven Point, may be made available to Jersey City, N.J. The 365-acre tract is in the process of being released by the U.S. Army. The land already has been offered to federal agencies as a prerequisite to its release. If not taken by such an agency, Congress can authorize its disposal by sale.

Jersey City has been in contact with the Army about obtaining the land for use as an industrial and shipping site and possibly a containerport. If purchased by Jersey City, the land either would be leased to industrial tenants or sold to them with stipulations as to its use.

A 75-acre plot on the southern side of Caven Point will be retained by the U.S. Army Corps of Engineers. Part of the 365 acres to be released is under water.

Barge Construction

Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., is to build two 900-dwt deck barges for its own use. Designated Hull Nos. 690 and 691, each barge will have the following dimensions: 135 feet by 40 feet by 8 feet 6 inches.

American Bridge Division (U.S. Steel Corp.), Ambridge, Pa., was awarded a contract by Ohio Barge Line, Inc., Dravosburg, Pa., for the construction of thirty-six 1,500-dwt covered hopper barges. Designated Hull Nos. 3610 through 3645, each barge will have dimensions of 195 feet by 35 feet by 12 feet.

American Marine Corp., New Orleans, La., will build a double-skin tank barge for undisclosed interests. Designated Hull No. 1040, the barge will have the following dimensions: 260 feet by 50 feet by 15 feet and will be of 2,400 dwt.

Avondale Shipyards, Inc., New Orleans, La., is to build a 15,000-dwt oil barge for undisclosed interests. Designated Hull No. 1197, it will measure 400 feet by 66 feet by 27 feet.

Diamond Manufacturing Co., Savannah, Ga., will build three deck barges for B. F. Diamond Construction Co., also in Savannah. Two of the barges, designated Hull Nos. 314 and 318, will have measurements of 100 feet by 54 feet by 8 feet, and the third barge, Hull No. 319 will measure 120 feet by 34 feet by 8 feet.

Jansen Marine Corp., Troutdale, Ore., was contracted by Schnitzer Leasing, Inc., Portland, Ore., for the construction of a 1,000-dwt crane barge. Designated Hull No. 2026, it will have the following dimensions: 180 feet by 45 feet by 12 feet.

Jeffboat, Inc., Jeffersonville, Ind., was awarded a contract by American Commercial Lines, Inc., Jeffersonville, for the construction of twelve 1,500-dwt hopper barges. Each barge will have the following measurements: 195 feet by 35 feet by 12 feet.

Levingston Shipbuilding Co., Orange, Texas will build an offshore, oil-well drilling barge for F. Orex of Paris, France. To be equipped with 3,000-bhp diesel-electric power units, the barge will measure 200 feet by 70 feet by 14 feet.

Circoolmatic Extends Stern Tube Seal Life

A major marine problem has been the frictional heat developed in the forward stern-tube seal, which causes the forward rubber seal rings to become brittle and subject to cracking. Waukesha Bearings states that they have introduced a totaly new seal oil-lube cooling system that substantially reduces this problem to increase seal life.

By means of this cooling system, descriptively named Circoolmatic, hot oil is pumped from the forward seal into an oil reservoir fitted with a seawater cooling coil. Constant circulation of the oil through the cooling system assures maximum lubrication, dissipating the frictional heat and reducing forward-seal deterioration. A panel with pilot lights, audible alarm, and low-level switch is provided for controls and monitoring.

The entire system, weighing less than 140 pounds, is packaged into a compact unit for easy installation by ship or shipyard technicians, on new or retrofitted ships. It is recommended that the system be employed on all seals measuring 710 mm or larger and/or on ships carrying hot cargo in the aft tanks, inducing heat into the shafting and seal.

Circoolmatic is available for prompt delivery, completely assembled and ready for installation. Complete price per unit is $750, from Waukesha Bearings Corporation, P.O. Box 798, Waukesha, Wis. 53186.

Ocean Science Appointed West Coast Representative For Oceans International

David D. Caulfield, president Oceans International, Inc., Mystic, Conn., has announced the appointment of Ocean Science Services, Inc. as West Coast marketing representative, headquartered in Palo Alto, Calif. Ocean Science Services will market the firm's contract surveying services, as well as its SUB-SCOPE ultra-high resolution sub-bottom profiling system.

MA Study Of Inland Waterways Made To Assist In Planning Full Use Of Containerization

A compilation has been made of facilities and commerce on navigable United States inland waterways, under a Maritime Administration contract with the Transportation Institute of Southern Illinois University, Carbondale, Ill. The study was made to assist in planning the full use of modern shipping technology, specifically unitization in the form of containerization and barge-carrying vessels.

Adoption of these concepts would permit international shipments to be sent from an inland consignor to a foreign inland consignee over an all-water route, utilizing navigable inland waterways, with a minimum of cargo handling, the report pointed out.

The report was developed in two sections. Section I contains a general view of inland waterway transportation with reference to prospective extension of marine commerce. The report notes that a resurgence in waterborne traffic has doubled the waterborne share of domestic freight traffic over the last 20 years and commercial capacity on inland waterways is expanding rapidly in response to domestic opportunity.

The report includes reviews of technological developments in inland commerce, social and economic changes affecting inland waterway commerce, development of river ports, types of river ports, types of carrier operations on the waterways, and rates for carriage of cargoes and rate factor advantages by different modes of transport.

Section II presents more detailed, quantitative information, with tables and maps on facilities and commerce by individual ports.

The report, "A Study of River Ports and Terminals," is available as PB No. 183-322, from the Federal Clearinghouse for Scientific and Technical Information, Springfield, Va. 22151, at a cost of $3.00 per copy.

Borg-Warner Division Promotes Three Men

Promotions of **Herbert E. Tracy, John T. Dunne** and **Albert J. Cella** to new positions of responsibility have been announced by Borg-Warner Mechanical Seals, Division of Borg-Warner Corporation, Los Angeles, Calif.

Mr. **Tracy,** general manager of the Division since its formation in 1958, moves to the company's central group to serve in a staff advisory capacity for both domestic and international operations.

Mr. **Dunne** has been named to succeed Mr. **Tracy** as general manager with full responsibility for the Division's operation. Mr. **Dunne** first joined the Borg-Warner group in 1953 and moved to mechanical seals as sales maneger in 1965.

Mr. **Cella** joined the Seal Division as its first field salesman. He served most recently as northeast district manager and now moves to Los Angeles to become sales manager for the entire Division.

Since its inception, less than 11 years ago, Borg-Warner mechanical seals have enjoyed a remarkable growth. Today as a major designer and manufacturer of precision mechanical shaft seals, the company also produces welded metal bellows, high-pressure heat exchangers and magnetic separators for use with seals.

Current operations include manufacturing in Los Angeles, Tulsa, Houston and New Jersey as well as overseas in Holland, Canada, Mexico, Argentina, South Africa, Australia and Italy.

Sales offices and warehouses are located throughout the free world.

De Launay And Berkich Join Ocean Design Engineering

Rene M. De Launay

Joseph A. Berkich

Rene M. De Launay has joined Ocean Design Engineering Corporation, 600 East Ocean Boulevard, Long Beach, Calif. 90802, as principal naval architect, it was announced by **Donald Hall,** president of ODEC. The firm also announced that **Joseph A. Berkich** has joined ODEC as marketing manager.

In his present capacity Mr. **De Launay** will be responsible for all marine design and naval architecture, reporting directly to **R. E. Hunter,** ODEC's vice-president of engineering.

Mr. **De Launay** was formerly senior naval architect with Global Marine, Inc., Los Angeles, where among other duties he was responsible for the design of the hulls for the drilling ships Glomar Grand Isle, Glomar Conception, and Glomar Challenger.

He is a member of The Society of Naval Architects and Marine Engineers, the International Oceanographic Foundation, and the American Arbitration Association.

Mr. **Berkich** assumes responsibility for marketing the company's diversified ocean engineering services, as well as ODEC's new marine products sales division.

Mr. **Berkich** was formerly head of Ocean Range Operations Section at Naval Undersea Warfare Center in Pasadena, Calif. He brings to ODEC a broad background in oceanographic projects involving submersible operations, saturated diving experiments, weapons recovery, and test and developmental support activities.

Tanker Facility To Be Built By Esso In Montego Bay

An option to purchase a six-acre site in the Montego, Jamaica $100-million harbor complex has been signed by Esso Standard Oil, S.A. Ltd. If the option is exercised the company plans to construct a petroleum products receiving and storage facility on the location in the near future.

Signing the option were **N. R. Gregston** for Esso and **Tony Hart,** chairman of Montego Freeport Ltd., developer of the port-resort city of Montego at Montego Bay.

According to its provisions, Montego Freeport Ltd. will provide Esso with a minimum 600-foot pier to accommodate vessels up to 32 feet in draft. Esso, for its part, stipulates it will not conduct any bunkering operations at the port or import or export black oils or other products likely to cause contamination of the harbor or adjacent land and beaches.

Terms permit Esso to construct 44-foot high storage tanks as part of the receiving and storage operation.

Exercise of the option is subject to Esso obtaining the necessary approvals required for erection of the storage tanks as well as the running of pipelines from the island to the pier.

Montego, which put its first dock in operation a year ago, currently is constructing two additional berthing facilities—each 600 feet in length—to handle incoming cruise and cargo ships. These are scheduled to be completed and ready for use by September.

The harbor eventually will have five general cargo and cruise ship berths, plus additional warehouse facilities to complement an initial warehouse which already has been completed.

Over-all, Montego will be a 500-acre city complete with resort and recreational facilities, residences, condominiums, commercial center and industrial area—each screened from the other for harmonious development.

Four 96,000-DWT OBO Ships Ordered From Gotaverken With Option For Four More

An international consortium has placed an order with Gotaverken for four 96,000-dwt OBO ships at a total price of about $44.5-million. Agreement also has been reached concerning the later ordering of another four ships. Negotiations lasting for more than a year have thus resulted in a deal of greater scope than any hitherto closed by a Scandinavian shipyard.

The first two ships will be delivered in 1972 and the remaining six during the years immediately following.

The four ships now ordered represent a continuation of the series of seven OBO vessels of the same size already on order at Gotaverken's Arendal shipyard and the subsidiary Oresundsvarvet at Landskrona for Swedish and Norwegian shipowners. All 11 vessels in the series are to be fitted with Gotaverken diesel engines of large-bore type rated at 19,800 bhp.

PFEL Contract With Avondale For LASH Lighters Approved

The Maritime Subsidy Board has given Pacific Far East Lines permission to enter into a contract with Avondale Shipyards Inc., New Orleans, La., for construction of 350 lighters—with an option for up to 150 more—for the lines' new lighter-aboard-ship (LASH) type ships.

The Maritime Subsidy Board had earlier approved in principle the eventual grantings of government mortgage insurance on up to 500 of the lighters.

Competitive bidding was waived on the projected construction, but MSB stressed that its agreement to allow PFEL to enter into the construction contract did not extend to any leasing arangements PFEL may later consider rather than outright purchase.

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Worthington	150 KW
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Westinghouse CA 20	50 HP
Westinghouse HP & LP Turbine	4400 HP
Allis Chalmers HP & LP Turbine	4400 HP
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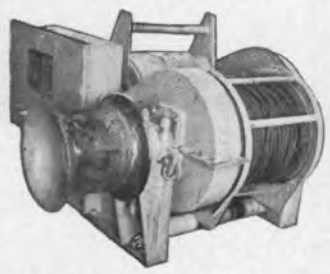

24-American Hoist & Derrick Company Cargo Winches, 12-R.H., 12-L.H., single drum, single gypsy, Mfgs. No. 67696, rated 7400 lb. line pull at 220 FPM, total stowage capacity 709′ of ⅞" wire rope, powered with Westinghouse Motors, 50 HP, 230 volts DC, 600 RPM, compound wound, Type CK, Frame 9, complete with Control Panel, Resistors and Master Switch. All units are of Recent Manufacture.

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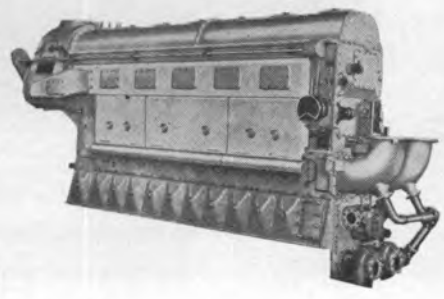

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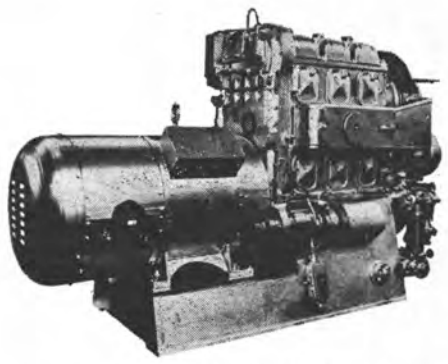
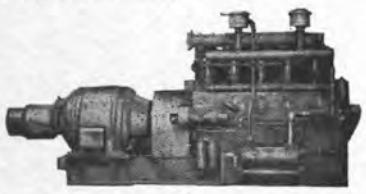
SUPERIOR, 10 KW, 120 Volts DC.
HERCULES, D0OC, 10 KW, 120 DC, Radiator cooled.
CATERPILLAR, radiator cooled, 15 KW, 120/240 Volts DC.
FAIRBANKS-MORSE, radiator cooled, 25 KW Continental Generator, 120/208/3/60.
Hercules DJXC, 25 KW, 120 DC.
GM 3-71, 30 KW, 120 DC.
Cummins A1, 30 KW, 120 DC.
MURPHY, Model ME 66, radiator cooled, 75 KW, 120/240 Volts DC.
CATERPILLAR DIESEL ENGINE, Model D17000, 167 HP, 900 RPM, 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.

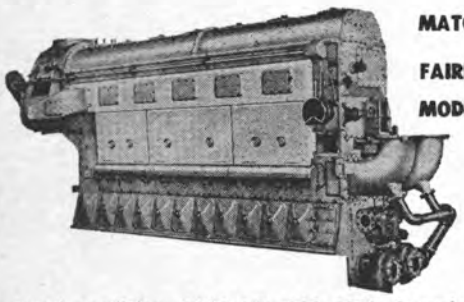
SUPERIOR, Model IDB-8, 100 KW, 450/3/60.

GENERAL MOTORS Model 3-268A, 152 BHP, 1200 RPM, 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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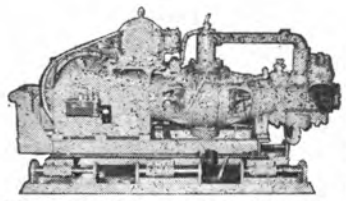
1 Port;
1 Starboard

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.

WORTHINGTON, 60 CFM, 110 PSI, with 15 HP Motor, 440/3/60.
WORTHINGTON, 60 CFM, 15 HP, 230 DC.
INGERSOLL-RAND, 150 CFM, 600 PSI, Model 75, with Westinghouse Motors, 75 HP, 230 DC.
INGERSOLL-RAND, 194 CFM, 110 PSI, 40 HP, 230 DC.
INGERSOLL-RAND, 50 CFM, 600 PSI, Model 30, with Westinghouse Motors, 15 HP, 230 DC.
CHICAGO-PNEUMATIC, 161 CFM, 100 PSI, 40 HP, 230 DC.
WESTINGHOUSE Air Brake, 246 CFM, 140 PSI, with 50 HP Motors, 440/3/60.
WORTHINGTON, 175 CFM, 125 PSI, with 50 HP Motors, 440/3/60.

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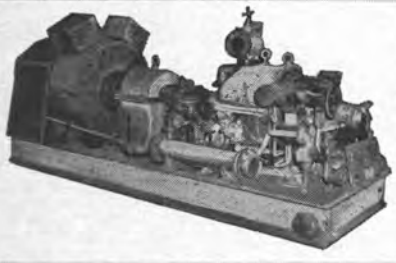
REDUCTION GEARS . . .



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.

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

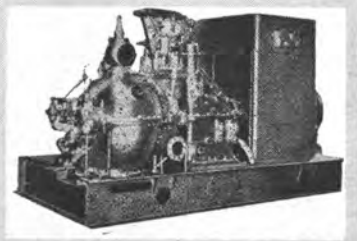
WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, driving on same comman shaft a 250 KW Generator, 440/3/60, and a 90 KW Generator, 125 Volts DC.

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

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

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

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



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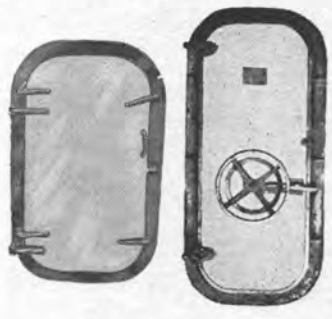

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2—Goulds, 2000 GPM, 470' head, Size 8x10, with Westinghouse Motors, 350 HP, 2300/3/60.

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, 25 H.P.

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.

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

STOCKLESS ANCHORS

USED, GOOD QUALITY . . . SAVE!

ANCHORS... Unused, surplus 3000 # size Danforth

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

ANCHOR WINDLASS

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

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

American Engineering, horizontal, double 2⅛" Chain, 65 HP, 230 DC, complete.

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

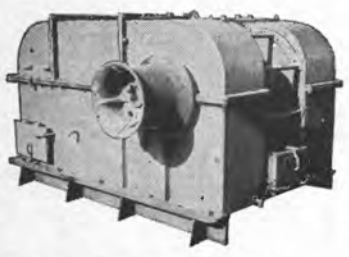
3—Hesse-Ersted, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

1—Hyde Horizontal Anchor Windlass double wildcat—for use with 2⅛" Anchor Chain, and with General Motors Electric Motor, 60 HP, 230 volts DC, 560/1700 RPM, Type CDM 18831 AE. Complete with Contractor Panel, Resistors, and Master Switch.

ANCHOR WINCHES

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

UNIWINCHES



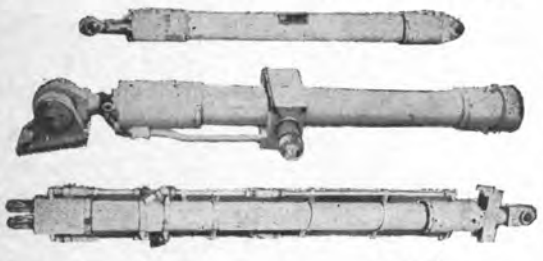
LAKESHORE UNWINCHES, with Allis-Chalmers Motors, 50 HP, 230 Volts DC, complete with Control Equipment.

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

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

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

HYDRAULIC CYLINDERS



3000 PSI

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

STEERING STANDS

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

$195.00 each

CAPSTAN WINDLASSES

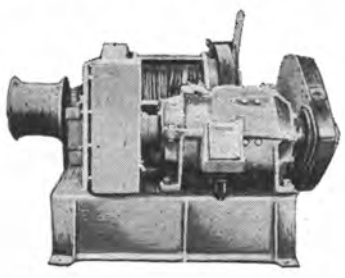
Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1¼" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

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

FAIRLEADS

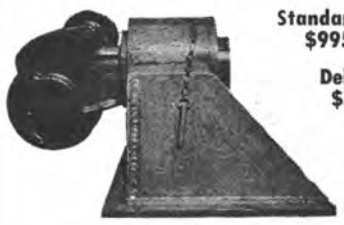
Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

To Give You These Features:

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

Self Aligning, Swivel Type Head.

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



Standard Design $995 each

Deluxe Design $1250 each

Model Design $1350 each

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

SPECIAL ITEMS

COUPLINGS

(Flexible Couplings between Turbines and Reducing Gear)

1—Set from C3-S1-A3 Vessel

1—Set from C2-S-B1 (Moore built)

1—Set from AP2 Victory Ship

PROPELLERS

From C3-S1-A3 Vessel

From C2-S1-B1 Vessel

From AP2 Victory Ship

From Liberty Ships and LST Vessels

PROPELLER SHAFTS

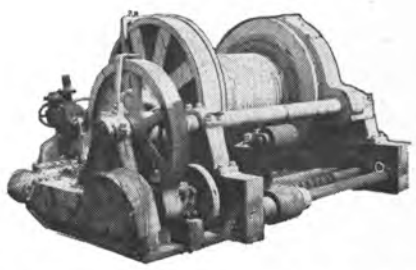
From C3-S1-A3 Vessel

From C2-S-B1 Vessel (Moore built)

From C2-SU Vessel

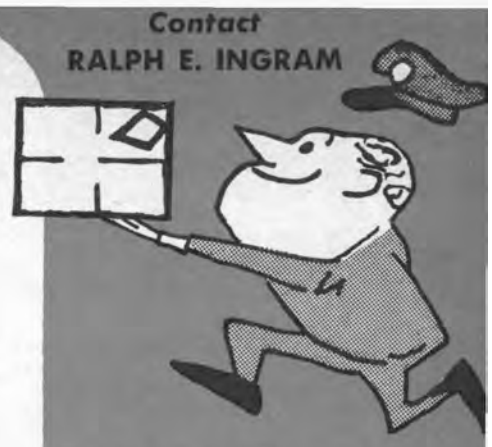
From Liberty Ships and LST Vessels

STEAM TOWING WINCH



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

Contact
RALPH E. INGRAM



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Rebuilt—Guaranteed

LaDel, STURTEVANT etc.

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

EXAMPLE LISTING:

Size A¼	**@ $160 each**
Size A½	**@ $185 each**
Size A1	**@ $215 each**
Size A2	**@ $290 each**
Size A3	**@ $350 each**
Size A4	**@ $410 each**
Size A5	**@ $500 each**
Size A6	**@ $550 each**
Size A8	**@ $630 each**
Size A10	**@ $695 each**
Size A12	**@ $750 each**
Size A16	**@ $900 each**

PRICES ARE F.O.B. PORTLAND, OREGON

SPERRY GYRO COMPASSES

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

Machinery and EQUIPMENT

as removed from

S.S. "JAMES O'HARA"

(AP-179) C3-S1-A3

NOW . . . Also dismantling identical companion ship . . .

The S.S. "FREDERICK FUNSTON"

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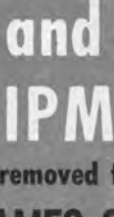

CARGO HOISTER BLOCKS

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

$34.50 each

$39.50 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.

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.

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

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

FORGED STEEL LINE SHAFTING

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

All items flanged

6—Sections 19" diameter, 23'—11" long,
1—Section 19" diameter, 23'—8" long,
3—Sections 19" diameter, 22'—10" long,
12—Sections 19" diameter, 22'—6" long,
6—Sections 14⅛" diameter, 26'—6" long,
2—Sections 14⅛" diameter, 18'—6" long,
2—Sections 14⅛" diameter, 13'—9" long,
39—Sections 13½" diameter, 22'—0" long,
15—Sections 13½" diameter, 14'—0" long,

OVERHAULED—TESTED

SALT WATER EVAPORATORS

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

SIZE 48-23 **SIZE 26-8**
SIZE 36-17 **SIZE 20-5**
SIZE 36-14

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MACHINERY AND EQUIPMENT FROM C2-S-B1 SHIPS

TURBINES, High Pressure and Low Pressure, manufactured by G.E., develop 6,000 HP (2 sets Available)

REDUCTION GEARS, G.E., 6,000 HP, RPM 6072-4048-882-92 (2 available)

MAIN CONDENSERS, Worthington, 5500 sq. ft. (2)

LUBE OIL PURIFIERS, De Laval, Model 55-13, 2 HP, 230 DC.

MAIN FEED PUMP, Worthington, Size 4 x 6, 35/50 HP, 230 DC (2)

AUXILIARY FEED PUMP, Worthington, steam, Size 11 x 7 x 24 (2)

PORT FEED PUMP, Worthington, steam, Size 9½ x 6 x 24 (2)

MAIN CIRCULATING PUMP, Allis-Chalmers, Size 18 x 18, Type SEV, 8500 GPM, 20.2' head, with 60 HP motor, 230 DC (1)

AUXILIARY CIRCULATING PUMP, Worthington, Size 8LS-1, 1240 GPM, 24.6' head, 10 HP, 230 DC (6)

MAIN CONDENSATE PUMP, Worthington, Size 2½-UZ-1, 120 GPM, 208 TDH, 15 HP, 230 DC (6)

AUXILIARY CIRCULATING PUMP, Worthington, Size 1½-UZS-3, 20 GPM, 208 TDH, 5 HP, 230 DC (6)

LUBE OIL SERVICE PUMP, De Laval-Imo, 250 GPM, 40 PSI, 15 HP, 230 DC (2)

LUBE OIL SERVICE STANDBY PUMP, Worthington, steam, Size 5½ x 2¾ x 6 (2)

FUEL OIL TRANSFER PUMP, De Laval, 225 GPM, 50 PSI, 15 HP, 230 DC (2)

FIRE PUMP, Worthington, Size 3-UBS-1, 400 GPM, 280' head, 50 HP, 230 DC (2)

STANDBY FIRE PUMP, Worthington, Steam, Size 12 x 11 x 18 (2)

BILGE PUMP, Worthington, Size 5LS-1, 415 GPM, 78.5 TDM, 20 HP, 230 DC (2)

BALLAST PUMP, Worthington, Size 5LS-1, 415 GPM, 78.5 TDM, 20 HP, 230 DC (2)

GENERAL SERVICE PUMP, Worthington, Steam, Size 10 x 11 x 18 (2)

SANITARY PUMP, Worthington, Size 2½ x 2, 2HP, 230 DC (4)

DRINKING WATER PUMPS, Size 2⅛ x 2, ¾ HP, 230 DC (4)

VACUUM PRIMING PUMPS, size MD537, 1½HP, 230 DC (4)

FORCED DRAFT FAN, Size 3½ AHS, 7880/5970 CFM, S.P.—6.2/14 with G.E. motors 5/25 HP, 230 DC, 1910/3120 RPM (7)

STEERING GEAR WATERBURY PUMP, Type A, Size 5, with 20 HP G.E. motor, 230 DC (4)

1 Only

ORTON WHIRLEY CRANE

Lifting Rate: 25 tons @ 50 Ft. Radius @ 50 to 60 FPM.—

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

Whip: 10 tons @ 125 FPM—2 part line

Track Centers: 20'—Engine: Cummins HBIS 601, 180 HP supercharged, elec. start—

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

Power: Diesel electric (DC)

ELECTRIC MOTORS

230 VOLT D.C. MOTORS

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

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

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

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

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

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

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

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

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

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

4—9.3 HP, Westinghouse, 640/852 RPM, Type SK, FR. 93.

120 VOLT D.C. MOTORS

1—304 HP, Westinghouse, 900 R.P.M., Shunt Wound, Horizontal, Pedestal Bearing.

3—25 HP, G.E., Type CDM, 1200 R.P.M., Horizontal, 2 B.B., unused. Removed from M.G. Sets.

20—7½ HP, Westinghouse Type SR, FR 43, Stab. Sh. Wd., 1750 RPM,.

STEERING GEAR MOTORS

2—General Electric, 30 HP, 230 V, DC, 600 RPM, Stab. Sh. Wd., Type CDM, Fields Continuous Duty, Armature 1 Hr.

1—Westinghouse, 35 HP, 230 V, DC, 850 RPM, Stab. Sh. Wd., Type SK, Fr. 123, Fields Continuous Duty, Armature 1 Hr.

SHIP'S LIGHTING M-G SETS

230 V, DC/115 V, DC. Ship's Lighting M.G. Sets for C3-S1-A-3 150 K.W. and Moore built C2 100 K.W.

SPECIAL D.C. GENERATORS

3—Unused, G.E., 15 KW, 100 A, 15 V, Type CDM, 1200 RPM, 2 B.B., D.P. Generators.

MOTOR-GENERATOR SETS

Unused Surplus in Original Boxes

Janette M-G Sets. Input: 1.75 HP, 230 V, DC, 7.2 Amperes, 1800 RPM. Output: 1-KVA (.85 KW), 115/1/60, 4 ball bearing, with speed regulator, and with noise filters. Navy Type CJM-21151, continuous duty. Net weight 435 #, Dimensions 44" L, 19½ W, 18⅝" H. Instruction book and parts list included.

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

D.C. MARINE CONTROLLERS

1—Cutler-Hammer, 250 HP, 230 V, DC, No. 232 793A14.
2—General Electric, 225 HP, 230 V, DC, CR 5430-B32D.
6—Westinghouse, 100 HP, 230 V, DC, Type 8585A SO-1B4636.
1—Cutler-Hammer, Unused, 50 HP, 230 V, DC, No. C280981A290, Contactor Panel for Stern Anchor Haulage Winch. Many others from ¼ HP & up—115 and 230 V.

ROTOTROLS

15—Westinghouse Rotorols, driven by 5 HP, 440 V, 3 phase, 60 cycle, 1700 RPM, AC Motors.

D.C. TRANSFER PANEL

Cutler-Hammer, 3-pole, 300 A, 120/240 V, DC, Bul. 6007, No. B870102A2.

SPARE ARMATURES

For C-3-S1-A3 Auxiliaries . . . Send for List A-1. Many others — Let us have your inquiries.

SWITCHBOARDS

Westinghouse Propulsion Control Switchboards as used on S-4 Vessels. AC and DC Switchboards. Let us know of your requirements.

CIRCUIT BREAKERS

2 and 3 Pole Air Breakers, 2 and 3 Pole Molded Case Navy Type Breakers. 2 and 3 Pole Trip Elements for Molded Case Breakers.

Need 3 Wire 120/240 Volts DC for Shore Power? Motor-Generator Sets and Engine Driven Units from 15 KW to 500 KW . . . Let us quote.

D.C. GENERATORS

2—500 KW, 120/240 V, Westinghouse FR. CB813.7, 750 RPM, 2 Pedestal Bearing, with Balance Coils. Removed from GM 8-278 Engines.

2—250 KW, 120/240 V, Westinghouse, 1200 RPM, Single Pedestal Bearings. Balance Coils not available, Type 12S18P107PH, removed from Turbines.

2—150 KW, 120 V, G.E., Type CDM-1348-S, Form HA, Model 25G 340, 1800 RPM, Compound Wound, Horizontal 2 B.B.

1—150, 120 V, GE, Type CDM, Form AA, Model 24G, 1200 RPM, Compound Wound, Horizontal, 2 B.B.

6—100 KW, 120/240 V, Westinghouse, Type SK, FR. 143.8, 1800 RPM, Single Ball Bearings. Balance Coils available.

3—100 KW, 120/240 V, Delco, 1200 RPM, Single Bushed Bearings, with Balance Coils. Removed from Superior GDB-8 Engines.

1—100 KW, 120/240 V, Allis-Chalmers, 1200 RPM, Single Sleeve Bearing, Shunt Wound, Type 4-14-45-13, removed from GM 3-268A Engine.

10—90/165 KW, Westinghouse, 125/400 Volt, Type SK, FR. 185, Shunt Wound, separately excited (120 V), 1200 RPM, Horizontal, 2 B.B.

4—75 KW, 120 V, G.E., Type CDM-1234, Mod. 24GA71, 1200 RPM, 2 Ball Bearing, Tapered Shaft. Removed from Motor-Generator Sets.

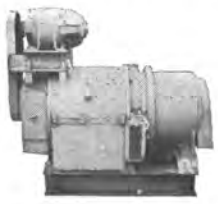
6—60 KW, 120 V, Westinghouse, Type SK, FR 143, Style 3B2855-PH, 1800 RPM, 1 B.B. Removed from Turbines.

6—60 KW, 120 V, Westinghouse, Type SK, FR. 153-L, Style 1B4632, 1200 RPM, Compound Wound, Horizontal, 2 B.B.

A.C. TO D.C. M.G. SETS

From 250 Watts to 500 KW in 115 Volt, 230 Volt and 120/240 Volt, 3 Wire DC. Any drive including Synchronous Motor. Let us have your inquiries.

Reconditioned
MOTOR GENERATOR SETS



MANY SMALLER UNITS IN STOCK

230 VOLTS D.C. TO A.C.

Hertner. Input: 230 V, DC, 24A. Output: 3.5 KVA, 440 V, 60 cy., 3Ø.
Hertner. Input: 230 V, DC, 28A. Output: 5 KVA, PF .85, 115 V, 60 cy., Ø1.
Continental. Input: 230 V, DC, 28A. Output: 7.5 KVA, 3.5 KW, 120 V, 1Ø, 60 cy., 62.5A.
Century. Input: 10 HP, 230 V, DC. Output: 7.5 KVA, 3.75 KW, 120/1/60.
Bogue. Input: 230 V, DC, 57A, 15 HP. Output: 10 KVA, PF .8, 120 V, 60 cy., 1Ø.
Fidelity. Input: 15 HP, 230 V, DC. Output: 12.5 KVA, 10 KW, 120/1/60.
Bogue Electric. Input: 15 HP, 230 V, DC. Output: 12.5 KVA, 10 KW, 120/1/60.
Burke Electric. Input: 20 HP, 230 V, DC. Output: 25 KVA, 12.5 KW, 120/1/60.
General Elec. Input: 25 HP, 230 V, DC. Output: 18.75 KVA, 15 KW, 120/1/60.
Star Kimble. Input: 30 HP, 230 V, DC. Output: 25 KVA, 20 KW, 120/1/60.
Ideal. Input: 40 HP, 230 V, DC. Output: 31.3 KVA, 25 KW, 450/3/60.
Star Elec. Input: 40 HP, 230 V, DC. Output: 33.4 KVA, 25 KW, 450/3/60.
General Elec. Input: 230 V, DC, 40 HP. Output: 25 KW, 480 V, 60 cy, 3Ø, 24A, 1800 RPM.
Star Elec. Input: 125 HP, 240 V, DC. Output: 93.75 KVA, 75 KW, 450/3/60.

115 VOLTS D.C. TO A.C.

Marathon. Input: 1 HP, 115 V, DC. Output: .500 KVA, .425 KW, 115/1/60.
Bludworth. Input: .75 HP, 115 V, DC. Output: .500 KVA, .450 KW, 115/1/60.
Elec. Spec. Input: 1 HP, 90/130 V, DC. Output: .500 KVA, .500 KW, 115/1/60.
Century. Input: 1.5 HP, 115 V, DC. Output: .750 KVA, .600 KW, 102/1/60.
Janette. Input: 13 Amp, 115 V, DC. Output: 1 KVA, 110/1/60.
Elect. Prod. Input: 1.5 HP, 115 V, DC. Output: 1 KVA, 115/1/60.
Allis-Chalmers. Input: 14 Amp, 115 V, DC. Output: 1.250 KVA, 1 KW, 115/1/60.
Cont. Elect. Input: 6 HP, 115 V, DC. Output: 2.9 KW, 440/3/60.
Louis Allis. Input: 10 HP, 105/130 V, DC. Output: 7.5 KVA, 440/3/60.
Cont. Elect. Input: 12 HP, 120 V, DC. Output: 7.5 KVA, 440/3/60.
Star Elect. Input: 12½ HP, 115 V, DC, 1800 RPM. Output: 7½ KW, 120 V, 60 Cy.
Ideal. Input: 40 HP, 115 V, DC. Output: 31.3 KVA, 25 KW, 450/3/60.
Continental. Input: 50 HP, 115 V, DC. Output: 50 KVA, 25 KW, 120/3/60.
Burke. Input: 20 HP, 115 V, DC. Output: 25 KVA, 12½ KW, 120/1/60.
RCA. Input: 4 HP, 105/130 V, DC. Output: 2.22 KVA, 2 KW, 120/1/60.

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Tremendous stock of electrical equipment at the "right" prices . . . for prompt service or further details phone or write Ralph E. Ingram at 503/228-8691 . . . you'll be glad you did!

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Dry Transformers • AC & DC Gear Motors • Centrifugal Fans • Propeller Fans • Port Hole Fans • Bracket Fans • Salinity Panels • Salinity Indicator Cells • Electric Telegraphs • Rudder Angle Indicators • Diesel Engine Starting Contactors • AC & DC Switchboards

SPECIAL 12" SIGNALING SEARCHLIGHTS

New—Unused, General Electric, or Westinghouse, 1000 watt, 115 volts, signaling shutter.

AL EPSTEIN, INC.

Most anything in Marine Supplies

(504) 525-5526 P.O. Box 51569
1226 St. Thomas St. New Orleans, La. 70150
Telex: 5-8293

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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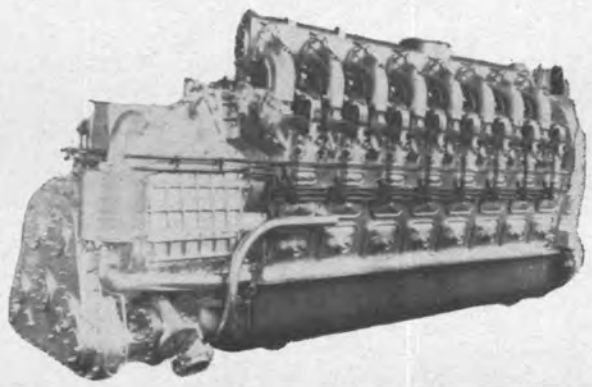
DIESEL WAREHOUSE CLEARANCE

GENERAL MOTORS



16-278A DIESELS

1700 HP @ 750 RPM

Large Quantity to Move

COMPLETE INSPECTION INVITED

PRICE ~~$9750~~ ?

ALSO AVAILABLE

8-268A 240 KW Diesel Generator Sets
500 HP @ 1200 RPM—3/60/440—with all accessories

3-268A 100 KW Diesel Generator Sets
150 HP @ 1200 RPM—3/60/440—complete. DC units also available

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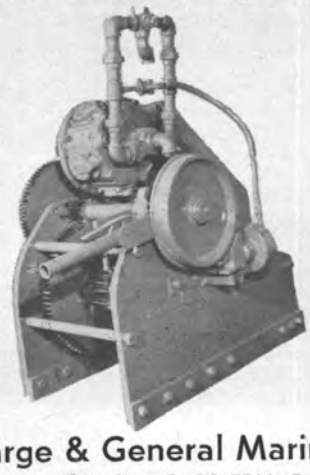
NEW YORK OFFICE: 11 Broadway — New York, N. Y. 10004 PHONE: 943-2640

NABRICO AIR-MOTOR DRIVEN WINCHES



For Barge & General Marine Use

Winch duty 11,000 lbs. @ 39 FPM. Drum capacity 115 ft. of 1" wire. Drum size—11". Air motor mfg by Gardner-Denver—type MKB-A—reversible —11.5 HP @ 100 lbs. pressure. 1" Pipe connections for air. Typical serial No. 458307. Just removed from unmanned barge. Good operating condition. 7 Units, with motors, available.

$695.00 Each

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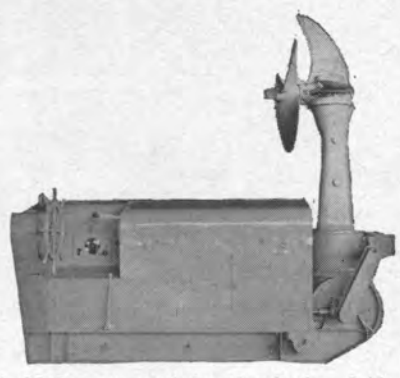
MURRAY & TREGURTHA

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!

ALSO AVAILABLE

1 Model 0-7 unit in stock. Powered by twin GM 6-71 diesels with hydraulic clutch & electric steering. Propeller diam. 64" pitch 48".

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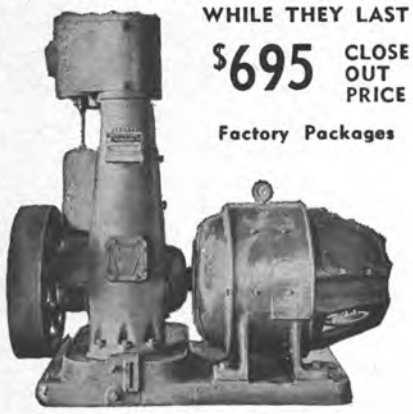
NEW-UNUSED LIBERTY SHIP
Troy-Enberg 20 KW Generators

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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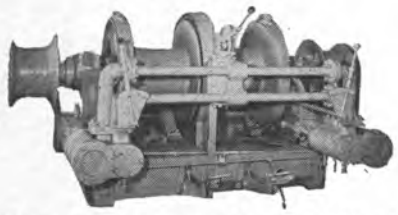
7 x 10 CLYDE DOUBLE DRUM
WINCHES



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 - 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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NOW DISMANTLING
AIRCRAFT CARRIER "TARAWA"

CV-40—Essex Class—Built Norfolk

CALL FOR ANY ITEMS

Axial Flow Fans, Pumps, Navy, Auxiliary Condensers, Boiler Parts, Catapult Hydraulic Equipment, Armored Door Hatches, Winches, MG Sets, Motors, Etc.

NAVY YARDS PLEASE NOTE!

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LESLIE PUMP GOVERNOR VALVE

New—in original crates. For U.S. Naval Vessels—type CT-HNS-3. For merchant vessels—type CTHS. Size 2". Typical serial 241-423. For immediate delivery.

$495

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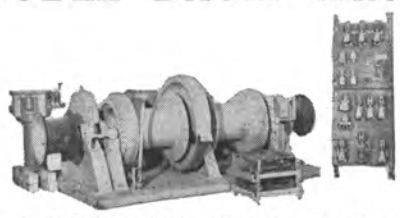
3 TON CLYDE
DOUBLE DRUM WINCH



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

$1500.00

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14" & 16"
ALL-BRONZE PORTLIGHTS with deadlights

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M.G. SETS

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

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.

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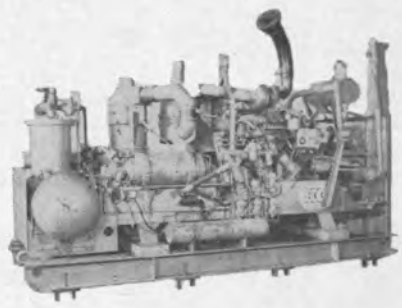
Practically New 600 CFM

GARDNER-DENVER ROTA-SCREW ROTARY AIR COMPRESSOR



FOR AUTOMATIC REMOTE OPERATION OF UNMANNED BARGE, SHORE LOCATIONS etc.

Model SP-600-DB—mfg by Gardner-Denver—600 CFM @ 100 lbs. Full load 1800 RPM—no load 1100 RPM. Water cooled. Engine is Caterpiller D-333—4½ x 5½—with electric starting. 6-Cyl.—turbo-charged. NOTE: This unit was used to remotely operate an anchor windlass on an unmanned barge. It has all automatic 24 volt electrically controlled air valves for low oil alarm, water temperature, shut down and starting service, and can be left for long periods of time unmanned. Complete with large air receiver, it was made by Elliott-Brandt—W.P. is 150 lbs.—test 500 lbs.—shell ¼"—heads ⅜"—radius of head 36". Dimensions: approx. 14'6" long—by 42".

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NEW – UNUSED 10 H. P. REVERSING CAPSTANS

Shipboard Use
Duty 10,000 lbs @ 60 FPM

MOTOR: 10 HP—totally enclosed—fan cooled—continuous duty — horizontal flange mounted — special shaft & oil seal fitted—440/3/60—1760 RPM. CONTROL: Marine type water-tight push-button—forward/reverse/stop—watertight starter box—rated for 40 starts per hour—triple pole contactor with silver contacts, thermal overload relay and trip adjustment. DIMENSIONS: Barrel 10" diameter — Flange 10" diameter — approx. 26" wide and 36" long.

6 IN STOCK FOR IMMEDIATE DELIVERY

$1675

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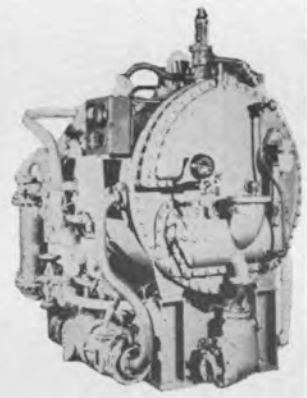
EVAPORATORS

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. — can furnish with 440 AC motor and controls.

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Please Note!
Shipyards, Work Vessels, Etc.

DIESEL DRIVEN
INGERSOLL-RAND AIR COMPRESSOR

Tank mounted. Ingersoll-Rand compressor—315 cu. ft. @ 125 lbs—driven by International Harvester UD-18 diesel. Radiator cooled and skid-mounted, Reconditioned and ready to go. Formerly aboard Corps of Engineers vessel "Griswold". Has had very little use.

$2950.00

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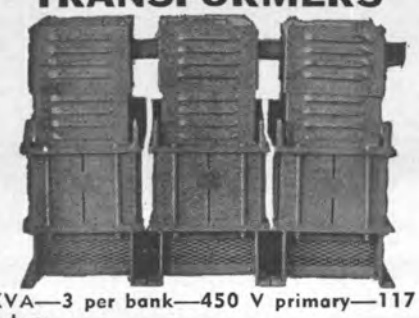
TRANSFORMERS



15 KVA—3 per bank—450 V primary—117 volt secondary.

$190.00 PER BANK

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

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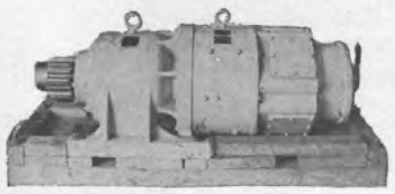
NOTICE!

DREDGES — CONTRACTORS
OLD FAITHFUL IS BACK!!!
NEW 20 HP 230 VOLT D.C.

GEARHEAD MOTORS

30 R.P.M. OUTPUT



Star Electric Co.—20 HP—230 VDC—73 amps—1200 R.P.M.—compound wound—1 hr. duty—55° rise—with reduction gear 41.2:1—type 5R3165.

$1450.00 EACH

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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"
26" x 60"
26" x 66"
30" x 60"

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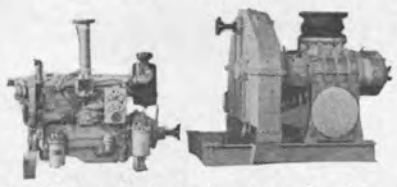
LExington 9-1900 ELgin 5-5050

14" R-2418 WATEROUS CARGO PUMP

With Reduction Gear & Diesel Drive



PUMP: All bronze body & rotors. Shaft and gears of Hi Tensile steel. Suction and discharge 14". Top discharge—side suction. CAPACITY: Bilge service 2500 GPM @ 20 PSI @ 71 HP. Oil service 2400 GPM @ 75 PSI @ 130 HP. Gear input at top (12 o'clock). Length of pump and gear: 75⅜" long by 51" wide. ENGINE: Cummins diesel model JN-130-M—6 cyl.—4⅛ x 5—130 HP @ 2500 RPM with power takeoff. Weight 2080 lbs.—reduction gear ratio 10.059:1—air starting but can be converted to electric starting. Typical serial No. 5289.

THE BOSTON METALS COMPANY

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

BUYERS DIRECTORY *for* ADVERTISERS

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

ANCHORS AND ANCHOR CHAINS
Baldt Anchor, Chain & Forge, P.O. Box 350, Chester, Pa. 19016
Blue Water Marine Supply, Inc., 2102 69 St., P.O. Box 9156, Houston, Texas 77006
DiMattina Supply Co., 59-61 Seabring St., Brooklyn, N.Y. 11231

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

BOILERS
Combustion Engineering, Inc., Windsor, Connecticut 06095
Foster Wheeler Corp., 666 Fifth Ave., New York, N.Y. 10019

BOW THRUSTERS
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171

BULKHEAD PANELLING
Johns-Manville, Box 290-T, New York, N.Y. 10016

BUNKERING SERVICE
Fuel Service Inc., P.O. Box 712, Pascagoula, Miss. 39567
Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y. 10019
Independent Petroluem Supply Co., 277 Park Ave., N.Y. 10017
Refineria Panama, S. A. 277 Park Ave., New York, N.Y. 10017
The West Indies Oil Co., Ltd., St. John's Antigua, W. I.

BURNERS—Oil
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y.

CABLE - ELECTRIC MARINE
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150

CARGO CONTAINERS—Components
Fruehauf TrailerDiv.,Fruehauf Corp., 10940 HarperAv.,Detroit 32,Mich.

CATHODIC PROTECTION
Engelhard Industries, Inc., 850 Passaic Ave., E. Newark, N.J. 02029

CLUTCHES, GEARS & BRAKES
Koppers Company, Inc., Power Transmission Dept., 3602 Scott St., Baltimore, Md. 21203
Wichita Clutch Co., Inc., Wichita Falls, Texas 76307

COATINGS—Protective
Amercoat Corp., 201 N. Berry St., Brea, Calif. 92621
Calfonex, Inc., 166 Coolidge Ave., Englewood, N.J. 07631
E. I. Dupont De Nemours & Co., Inc., Wilmington, Delaware 19898
Enjay Chemical Company, 60 West 49th St., New York, N.Y. 10020
Eureka Chemcial Co., 234 Lawrence Ave., South San Francisco, Calif. 94080
Farboil Company, 90 West St., N.Y., N.Y. 10006
Plasma Chemical Systems, Inc., 13909 Lee Jackson Hway, Chantilly, Virginia 22021
USS Chemicals (Div. of U. S. Steel), P. O. Box 86, Pittsburgh, Pa.

CONTAINER HANDLING SYSTEM
A.A.I. Corp., Cockeysville, Maryland 21030
Clyde Iron Works, Inc., P.O. Box 370, Duluth, Minn. 55801
Lighter Aboard Ship, Inc., 225 Baronne St., New Orleans, La. 70112
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
RPC Corp., Marine Sales, 200 Park Ave., New York, N.Y. 10017
Star Iron & Steel Co., 336 Alexander Ave., Tacoma, Wash. 98421
York Trailer Ltd., Corby, Northants, England

CONTAINER LASHINGS
American Forge & Mfg. Co., Box 74, McKees Rocks, Pa. 15136

CONTROL SYSTEMS
Barber-Colman Co., Marine Prod. Div., Rockford, Ill.
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Lake Shore Electric Corp., 205 Willis St., Bedford, Ohio 44014
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231

CORROSION CONTROL
Eureka Chemcial Co., 234 Lawrence Ave., South San Francisco, Calif. 94080
Radiator Specialty Co., 1400 Independence Blvd., Charlotte, N.C 28205

CRANES—HOISTS—DERRICKS—WHIRLEYS
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 147 E. 50th St., N.Y. 10022
Clyde Iron Works, Inc., P.O. Box 370, Duluth, Minnesota 55801
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 7 Dey Street, N.Y., N.Y. 10007
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
Hensen-Rotterdam, P.O. Box 5040, Rotterdam, Holland
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98401
Wiley Mfg. Co., Box 97, Port Deposit, Md. 21904

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Lockstad Co., Inc., 179 W. 5th Street, Bayonne, New Jersey 07002
Marine Moisture Control Co., 39 Redfern Ave., Inwood, L.I., N.Y.

DECK MACHINERY—Cargo Handling Equipment
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 147 E. 50th St., N.Y. 10022
Blackburn Marine Equipment, 6105 England St., Houston, Tex. 77021
Beebe Bros., Inc., 2724 - 6th Avenue So., Seattle, Wash. 98134
Clyde Iron Works, Inc, P.O. Box 370, Duluth, Minn. 55801
Garrett Marine Div. of the Garrett Corp., 255 Attwell Dr., Rexdale, Ontario, Canada
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 7 Dey Street, N.Y., N.Y. 10007
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
A. S. Pusnes, MeK. Verksted, Arendal, Norway
Smith-Berger Mfg. Corp., 3236 16th Ave.S.W., Seattle, Wash. 98134
Western Gear Corp., Heavy Machinery Div., Everett, Wash. 98201

DECKING
Asbestolith Mfg. Corp., 257 Kent St., Brooklyn, N.Y. 11222
Metropolitan Floor Covering, Inc., Div. of Drehmann Paving & Flooring Co. 2101 Byberry Rd., Philadelphia, Pa. 19116

DIESEL ACCESSORIES
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
Kiene Diesel Accessories, Inc., P.O. Box 216, Franklin Park, Ill. 60131

DIESEL ENGINES
Alco-Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029
Bruce GM Diesel, Inc., U.S. Route 46 at Savoy St., Lodi, N.J. 07644
Burmeister & Wain, 2 Torvegade, Copenhagen K, Denmark
Colt Industries Inc., Fairbanks Morse Power Systems Div., Beloit, Wisc. 53511
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
Peck Iron & Metal Co., 3500 Elm Avenue, Portsmouth, Va. 23704
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
Valad Elec. Heating Co., 71 Cortlandt St., Tarrytown, New York

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 NAVIGATION EQUIPMENT & AIDS
American Hydromath Co., 2020 Jericho Tpke, New Hyde Park, N.Y. 11040
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
Safety Guide Prod. Div. Borg Warner, P.O. Box 248, Scottsburg, Indiana 47170
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
Gadelius, K. K., P.O. Box 802, Kobe Port, 651-01 Japan
Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
H & H Engineering Co., 430 So. Navajo, Denver, Colo. 80223
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Kearfott Marine (Div. of The Singer Co.) 21 West St., New York, N.Y. 10006
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
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
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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
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Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Motorola Communications & Electronics, Inc., 4935 W. LeMoyne Ave., Chicago, Ill. 60651
RF Communications, Inc., 1680 University Ave., Rochester, N.Y. 14610
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Marine Products Operation, 213 East Grand Avenue, South San Francisco, California 94080
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101

NAVAL ARCHITECTS AND MARINE ENGINEERS
BG Marine Services, Div. of Genge Industries, Inc., 4419 Van Nuys Blvd., Sherman Oaks, Calif. 91403
Coast Engineering Co., 711 West 21 St., Norfolk, Va. 23517
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
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Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
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J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
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James S. Krogen, 1460 Brickell Ave., Miami, Fla. 33131
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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.
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Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
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Pearlson Engineering Co., Inc., 2825 Oak Ave., Miami, Florida 33133
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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
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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
Peck Equipment Co., 3500 Elm Avenue, Portsmouth, Virginia 23704

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

POLLUTION CONTROL
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PROPELLERS—New and Reconditioned
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
Goulds Pumps, Seneca Falls, N.Y. 13148

RATCHETS
American Forge & Mfg. Co., McKees Rocks, Pa. 15136
W. W. Patterson Co., 830 Broket St., Pittsburgh, Pa. 15233

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Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
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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, P.O. Box #709, Orange, Calif. 92669
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
Electric Tachometer Corp., 68th & Upland Street, Phila., Pa. 19142
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.
Gotaverken American Corp., 39 Broadway, New York 6, N.Y.
Groignard Shipyards, P.O. Box 829 Colbert, Marseilles, France.
Holifax 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
John J. McMullen Associates, Inc., 17 Battery Pl., N.Y., N.Y. 10004
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

STEAM GENERATING EQUIPMENT
Combustion Engineering, Inc., Windsor, Connecticut 06095

STEVEDORING
M. P. Howlett, Inc., 415 32nd St., Union City, N.J.
Luckenbach Steamship Co., 120 Wall St., New York 5, N.Y.

SWITCHBOARDS
Hose McCann Telephone Co., Inc., 524 23rd St., N.Y. 10011

SYNTHETICS
E. I. Dupont De Nemours & Co., Inc., Textile Fibers Dept., Wilmington, Delaware

TANK CONTAINERS
Fruehauf Trailer Div., Fruehauf Corp., 10940 Harper Ave., Detroit, Mich. 48232

TOWING—Lighterage, Transportations, Barge Chartering
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Curtis Bay Towing Co., Mercantile Bldg., Baltimore 2, Md.
G & H Towing Company, 509 Texas Building, Galveston, Texas 77550
Henry Gillen's Sons Lighterage, 140 Cedar St., New York, N.Y. 10006
James Hughes, Inc., 17 Battery Pl., New York, N.Y.
Jackson Marine Corp., P.O. Box 1087, Aransas Pass, Texas 78336
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y.
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
P. F. Martin, Inc., 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.
Hydrosearch Co., Inc., Riva Rd., Annapolis, Md. 21401
Marine Moisture Control Co., 39 Redfern Ave., Inwood 96, L.I., N.Y.
Mechanical Marine Company, 45-15 37th St., Long Island City, N.Y.
Todd Products, Div. of Todd Shipyards Corp., Halleck St., Brooklyn, N.Y. 11231

VAN CONTAINERS—Insulated, Refrigerated, General Commodity
Fruehauf Trailer Div., Fruehauf Corp., 10940 Harper Ave., Detroit 32, Mich.

WEATHER ROUTING
Weather Routing, Inc., 90 Broad St., New York 4, N.Y.

WIRE ROPE
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., Bethlehem, Pa. 18018
DiMattina Supply Co., 59-61 Seabring St., Brooklyn, N.Y. 11231
United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230

ZINC
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CONDENSERS, AUX.—Turl and Struthers Wells, two pass surface type, 484 Sq. Ft., 3630 lbs./hr., 1125 G.P.M.

TURBO-GENERATORS, SHIP'S SERVICE—Worthington turbine, 240 K.W., 5 stage, 6097 R.P.M., 440 P.S.I., 740 Deg. F., with reduction gear, Westinghouse D.C. Generator, 90 K.W., 125 volt, 1200 R.P.M., and Westinghouse A.C. Generator, 3/60/450, 400 Amps, 312 K.V.A., 250 K.W., Reduction gear ratio— 5:081.

TURBO-GENERATORS, AUXILIARY— Westinghouse Turbine, 440 P.S.I., 740 Deg. F., 7288 R.P.M., Westinghouse 100 K.W., D.C. Generator, 240/120 Volts, 416 Amps, 1800 R.P.M.

WINCHES, CARGO—Lake Shore Engineering Co. UNIWINCH, Type VB, Model 21, single speed double drum, line pull-7450 lbs. at 220 Ft. per min., Allis-Chalmers D.C. motor, 50½ H.P., 230 Volts, 180 Amps, Cutler Hammer marine brake.

WINCHES, CARGO—Lake Shore Engineering Co. UNIWINCH, Type 4-B, model 12, two speed, single drum, single line pull—7450 lb. at 220 Ft. per min. and 14,440 lbs. Allis Chalmers D.C. motors, 50½ H.P., 230 Volts, 180 Amps.

PURIFIER, LUBE OIL—Sharples Corp. **Type:** M-67-28, 8N39, Speed, 15,000 R.P.M. Wagner Elect. Corp. A.C. Motor, 1 H.P., 3/60/440, 3500 R.P.M.

DIESEL ENGINE—Buda, Mod. No. 6LD468, 6 cylinder, 4½ x 5½ 1850 RPM, 100 BHP.

AIR COMPRESSORS—Sullivan Machinery, Type EA, V Belt Driven, 60 C.F.M., free air, 880 R.P.M., 110 lb. disch., Press, Wagner Motor, 15 H.P., 1750 R.P.M., size: 4½" x 4½".

MAIN CONDENSATE PUMPS—Vertical Centrifugal Motor Driven, Allis Chalmers, Type SSC-V, 3" x 1½", 68 G.P.M. Wagner A.C. Motor, 7.5 H.P., 1750 R.P.M., 114 Ft. total Hd.

AUX. CIRCULATING PUMPS—Vertical Centrifugal Motor Driven, Dayton-Dowd Pump, 8"x10", 1150 RPM, type CSLHV, 5 P.S.I. suction, 15 P.S.I., disch., 22.4 Ft. head. Wagner Motor, 10 H.P., 3/60/440, 1600 R.P.M.

FUEL OIL SERVICE PUMP—Quimby Vertical Rotary, Motor Driven Screw Pump, Size 2½" x 1½", Capacity 10/6 GPM, Disch. Press 350 PSI, 1150 RPM. Wagner Motor; 6/3 H.P., 3/60/440, 1160/575 RPM.

BOILER FEED PUMP—Wilson Snyder, Vert, Simp., 95 GPM, 10"x7"x24", 4" Suction, 3" Discharge, 440 lbs. steam press @ 500°F.

FIRE & SANITARY PUMP—Wilson Snyder, Vert. Simp. 400 GPM, 14" x 12" x 12", 5 lbs. suction press, 100 lbs. disch. press., 150 PSIG @ 435°F.

BILGE PUMPS—Wilson Snyder, Vert, Simp., 410 GPM, 10" x 12" x 12", 6 lbs. Suction Press., 30 lbs. discharge.

GENERAL SERVICE—Wilson Snyder, Vert. Simp., 330 GPM, 10" x 12" x 12", 5 lbs. Suction Press, 35 lbs. discharge.

FRESH WATER PUMP—Wilson Snyder, Vert, Simp., 100 GPM, 10" x 7" x 12", 4 lbs. suction press., 80 lbs. discharge pressure.

FUEL OIL TRANSFER—Wilson Snyder, Vert. Simplex, 150 GPM, 14" x 10" x 12", 5 lb. suction, 150 lbs. discharge.

FIRE PUMP—(Handy-Billy), Johnson Motor Co., Model P-500E, 500 G.P.M., 4500-5000 R.P.M., 100 P.S.I.

FORCED DRAFT FANS—Buffalo Forge Co., 5000 CFM, 6000 CFM, 8000 CFM, 12,000 CFM, Wagner Motor, 3/60/440.

LIBERTY SHIPS

REFRIGERATION UNITS—Compressor York Corp. Vertical 2 cylinder 4¼" x 3", 600 RPM Motor-Westinghouse Mod. 4B3608, 7.5 HP. Stab Shunt 1750 RPM, 57 amps, 120 Volts D.C.

FUEL OIL HEATERS—Coastal Eng. Co. Capacity 17,500 Lbs. per hour Bunkers "C" oil 100° to 230° F.

FEED WATER HEATERS—Davis Eng. Co. Size 11-13 E. Capacity 48,000 Lbs. per hour 125° to 230° F.
Multi-Pass closed type. Shell 150 PSI. Tubes 600 PSI.

GYROS—Sperry Mk. XIV, Motor Generator, Control Panel, Carbon Pile, Steering and Bearing Repeaters, with stands.

DISTILLERS—Davis Paracoil: Type Vert. Marine. Capacity 6000 GPD. Shell Test 50 PSI. Tube Test 100 PSI. ¾" OD. Aluminum Brass Tubes. Muntz Metal Tube Sheets.

LIFEBOATS—EC2 (Liberty) Motor & Oar Propelled, Wood & Steel Hulls 22' and 24' 4 Cyl. Eng. Palmer, Gray & Universal.

EVAPORATORS—Vertical Type: Single Effect. Size 36 x 14. Capacity 24 Tons per day. Max Shell Press. 30 PSI. Max Tube Press 150 PSI.

GENERATORS, D.C.—EC2 (Liberty) Manufacturer: Generator, G.E. 20 K.W. 120 Volts D.C. 167 Amps. Mod. 256333. Within, Recip. Steam Engine, 6 x 7 Single Cyl. Model C, 400 RPM, 220 PSI.

WINCHES, CARGO—Steam-EC2 (Liberty) 2 Cyl. Double Geared Horizontal 5/15 Tons. 7" x 12", Working Pressure 125 PSI. Also 9" x 12". Heavy Duty.

WINDLASS, ANCHOR—Steam-EC2 (Liberty) Manufacturer: Summer Iron Works—Size 10" x 12", Working Pressure 125 PSI. Chain Size 2-1/16".

CARGO BOOMS—EC 2 (Liberty) 5 Ton 47' & 55', 15 Ton 51', 30 Ton 51', 50 Ton 51'.

PUMPS, BOILER FEED—Worthington: Vertical Simplex. 12 x 8 x 24 Head 300 PSI. Capacity 200 GPM. Steam 220 PSI.

PUMPS, VERT. DUPLEX—Fuel Oil, Transfer-EC2 (Liberty) Manufacturer: Worthington—10" x 11" x 12"—320 GPM Working Pressure, 220 PSI.

PUMPS, VERT. DUPLEX—Ballast, Fire, Bilge and General Service—EC2 (Liberty) Manufacturer: Worthington—10" x 11" x 12"—560 GPM, 125' Head.

PUMPS, VERT. SIMPLEX—S. W. Service—EC2 (Liberty) Manufacturer: Worthington—6" x 8" x 8". With Air Chamber.

PUMPS, HOR. DUPLEX—F.W.—EC2 (Liberty) Manufacturer: Various—5" x 7" x 10". 220 PSI.

PUMPS, AUX. COND.—Circ. And Condensate, Under Condenser—EC2 (Liberty) Manufacturer: Worthington—Typ. Ser. 1075376—10" x 12" x 12" x 12"—220 PSI.

PUMPS, MAIN COND.—Circ. Centrifugal Pump—EC2 (Liberty) Manufacturer: Sturtevant—30 HP. Engine 5" x 6"—400 RPM, 220 PSI, 14" Pump. 3650 GPM, 25' Head.

PUMPS, VERT. SIMPLE—Fuel Oil Service—EC2 (Liberty) Manufacturer: Worthington—7½" x 4" x 10" 8 GPM.

MANY OTHER ITEMS NOT LISTED ARE AVAILABLE. CONTACT US FOR COMPLETE INFORMATION.

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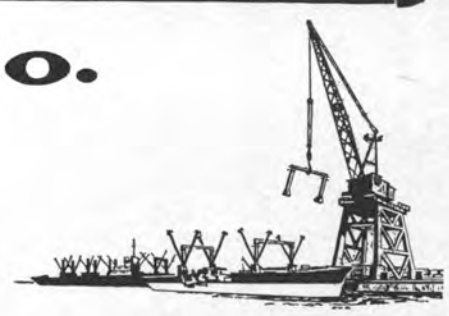

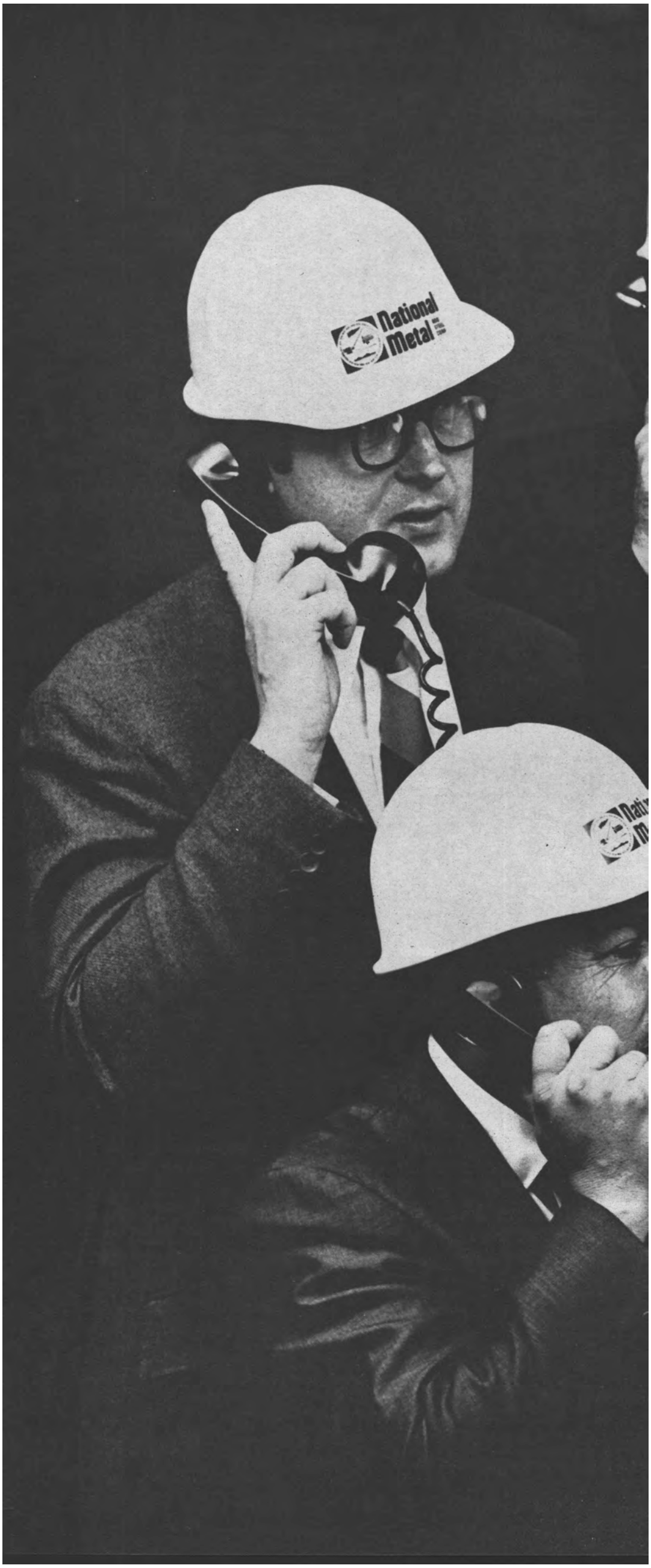
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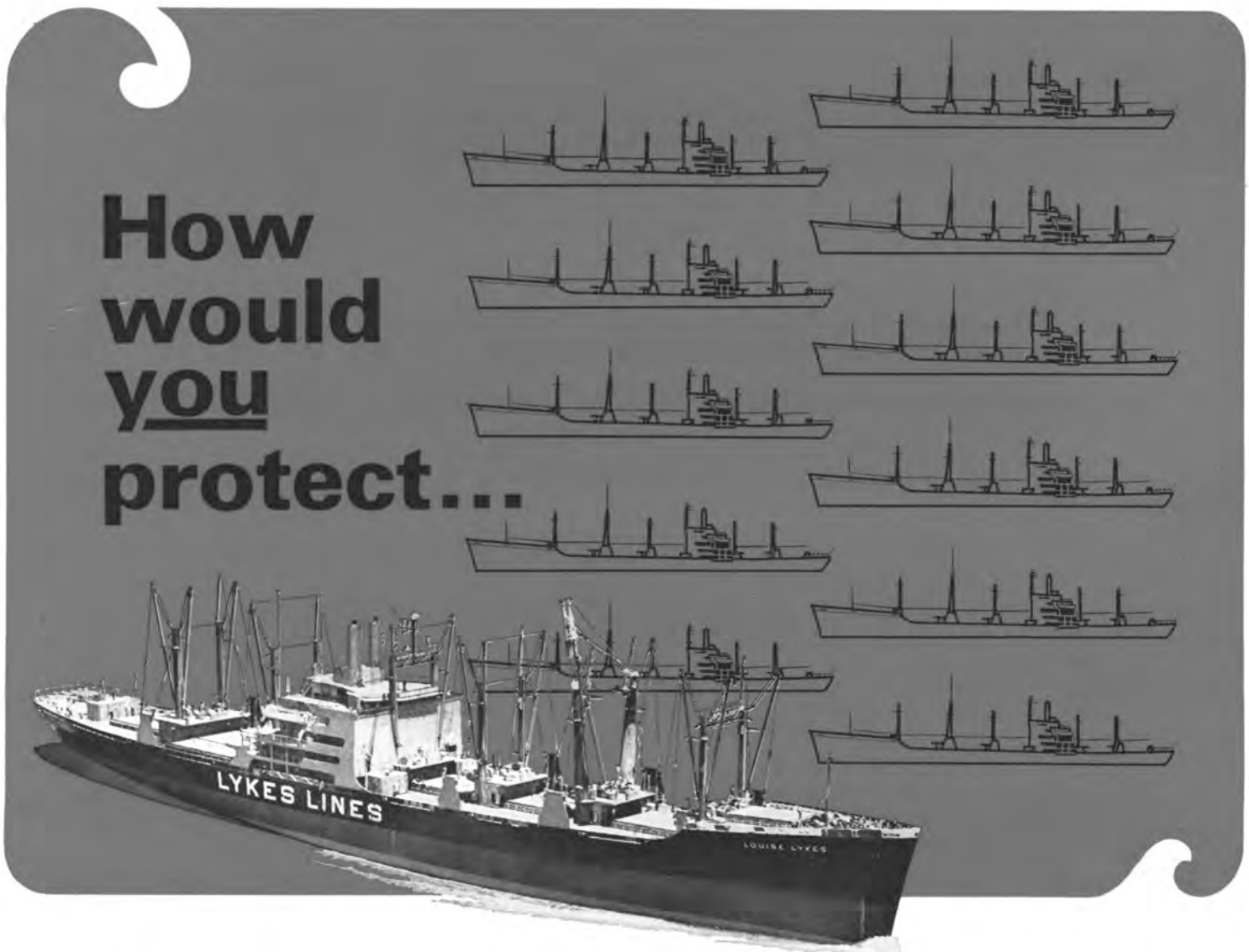

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