

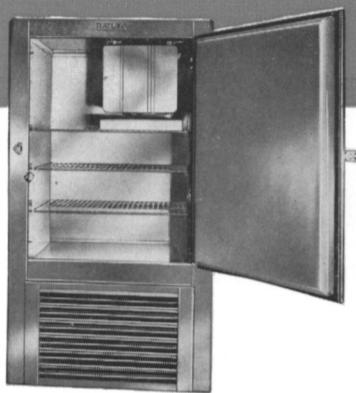
# MARITIME REPORTER AND ENGINEERING NEWS



**First Lykes SEABEE "Doctor Lykes"  
Largest American Built Breakbulk Ship  
Christened At General Dynamics Quincy**  
(SEE PAGE 7)

**AUGUST 15, 1971**

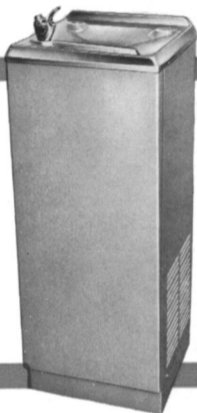
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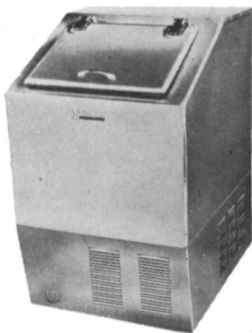
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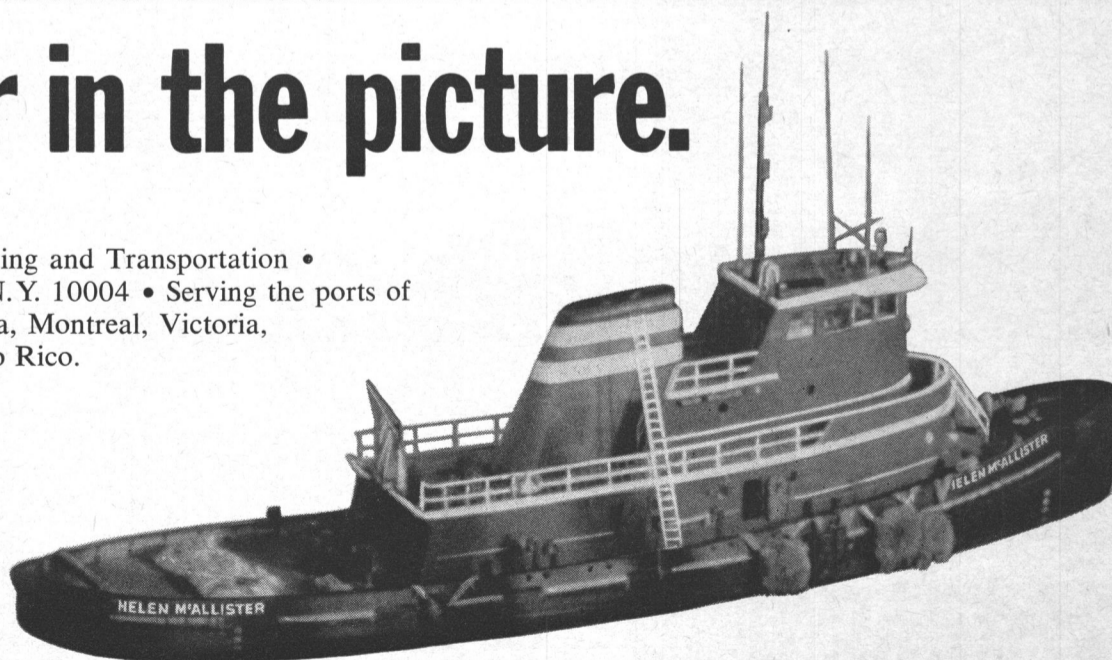
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## Maritime Group Forms Panel On Shipbuilding Research/Development

The National Research Council's Maritime Transportation Research Board, under the chairmanship of Edgar F. Luckenbach Jr., recently established a Panel on Shipbuilding Research and Development. The panel's assignment, under the sponsorship of the Maritime Administration of the U.S. Department of Commerce is to determine what Government and industry research will enable the industry to achieve the goals of the President's Shipbuilding Program. One key question concerns the types of incentives required for the industry to expand its own research and development efforts.

In recent weeks the panel has visited several shipyards, including Litton's new yard at Pascagoula, Miss., the Naval Shipyard at Portsmouth, Va., and the Newport News Shipbuilding and Dry Dock Company in Newport News, Va.

The chairman of the Shipbuilding Research and Development Panel is Dr. John C. Warner, president emeritus, Carnegie Institute of Technology. The members are: Capt. Edward S. Arentzen, USN (ret.); Joseph D. Deal Jr., director of market development, Newport News Shipbuilding and Dry Dock Company; Prof. Heinz Eulau, chairman, department of political science, Stanford University; Gerald Kraft, president, Charles River Associates, Inc.; Dr. Samuel A. Lawrence, vice president for administration, Cornell University; Richard F. Pollard, vice president, Chase Manhattan Bank; Dr. Robert S. Schairer, corporate director of development planning, Lockheed Aircraft Corporation, and Dr. Milton C. Shaw, head, department of mechanical engineering, Carnegie-Mellon University. The project manager is John Leeper, staff, Maritime Transportation Research Board. Rear Adm. John B. Oren, USCG (ret.), is Executive Director of the Maritime Transportation Research Board.

## Keels For Two Barges Laid At Todd-Houston

The keels have recently been laid at Todd Shipyards Corporation (Houston Division) for two 140-foot by 40-foot by 8-foot 9-inch deck cargo barges for Pipeline Contractors, Inc. of Tulsa, Okla. Each barge will have two 40-foot spuds. The barges will be towed to Nigeria shortly after completion, which is scheduled for mid-September 1971.



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No. 16

Volume 33

107 EAST 31st STREET  
NEW YORK, N. Y. 10016

MURRAY HILL 9-3266, 3267,  
3268, 3269

ESTABLISHED 1939

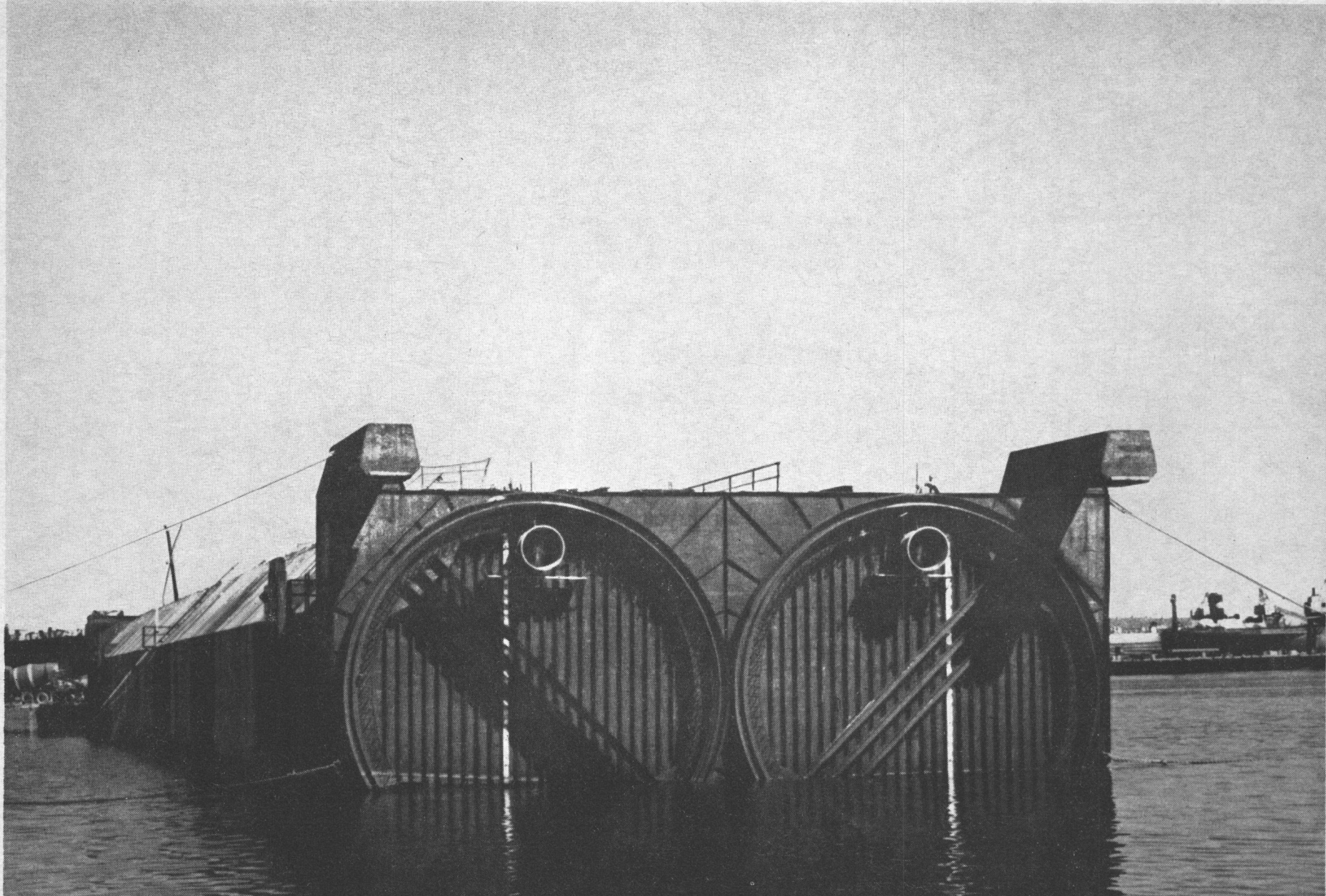
Maritime Reporter/Engineering News is published the 1st and 15th of each month by Maritime Activity Reports, Inc., with executive, advertising and editorial offices at 107 East 31st Street, New York, N. Y. 10016; publishing office at 41 First Street, Hoboken, New Jersey 07030

Controlled Circulation postage paid  
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## **Alabama Dry-Dock and Shipbuilding Company also builds tunnels.**

The 3000-foot Mobile River Tunnel for Interstate 10 will be open early in 1972.

This tunnel was made in sections approximately 339 feet long, 40 feet high, 84 feet wide...floated to the site and sunk.

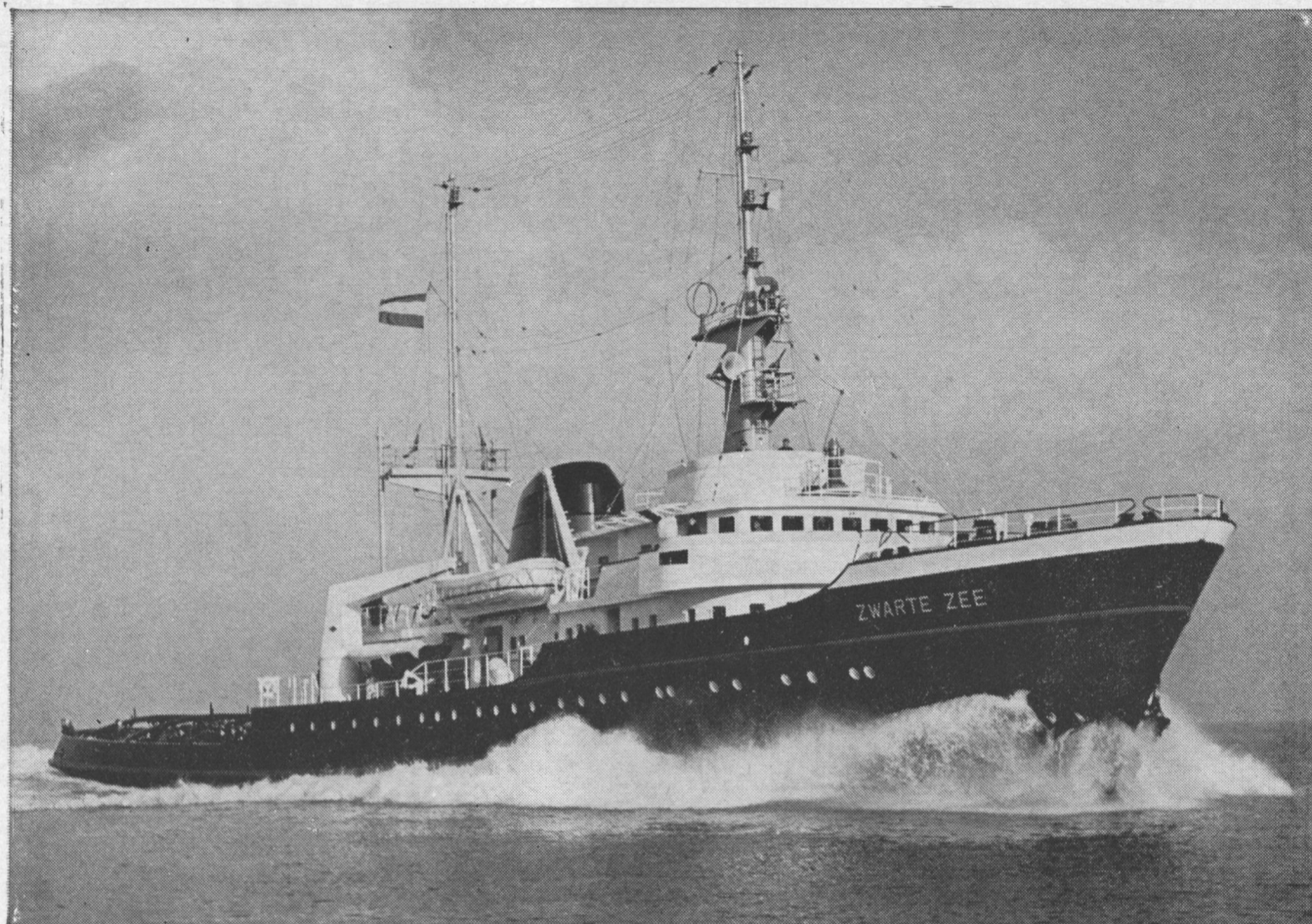
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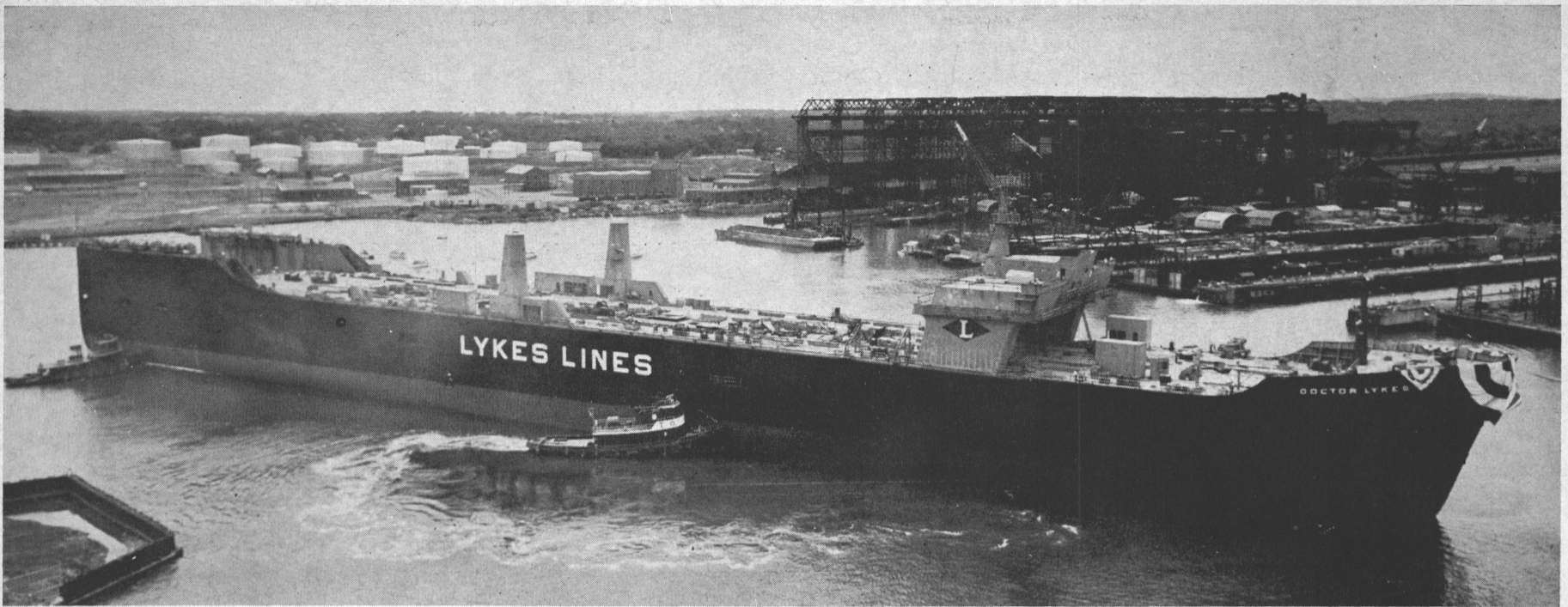
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The Doctor Lykes occupies the entire river as it moves from the building basin to the outfitting pier at General Dynamics Quincy shipyard.

## Lykes Christens The First SEABEE

# The DOCTOR LYKES

One of the most unique and outstanding cargo ships ever constructed anywhere in the world and the largest break-bulk ship ever built by an American shipyard was christened in mid-July at the Quincy Shipbuilding Division of General Dynamics. The 875-foot ship, the Doctor Lykes, first of a new merchant-ship class known as SEABEES, is one of three identical craft being built by General Dynamics for Lykes Bros. Steamship Company, Inc., of New Orleans.

Miss Ashley Lykes, 17-year-old daughter of Joseph T. Lykes Jr., Lykes Bros. chairman, sponsored the Doctor Lykes by breaking the traditional bottle of champagne across the bow of the 51,000-ton displacement ship just before the vessel was floated out of the building dock.

Andrew E. Gibson, Assistant Secretary of Commerce for Maritime Affairs and principal speaker at the ceremonies, said that the Doctor Lykes "in every way symbolizes our resurging merchant marine. It will make its full contribution to the seapower so vital to our nation's welfare."

"The flexibility of the SEABEE design is such," Mr. Gibson noted, "that with no structural modifications the ships can be quickly adapted into full or partial container ships or roll-on/roll-off vehicle carriers. This vessel, along with her sisterships, will provide this nation with a military sealift capability in time of emergency that is unmatched by any other class of commercial cargo ships or comparable military vessel yet designed."

Mr. Gibson paid tribute in his address to the team involved in the SEABEE program. He singled out Frank A. Nemec, president of both Lykes Bros. Steamship Company and its corporate parent Lykes-Youngstown Corporation, for his development of the SEABEE concept. He said, "Frank Nemec and his management deserve full credit for conceiving an innovative transportation system."

He also complimented the design agent, J.J. Henry Co., Inc. of New York, whose staff translated the SEABEE concept into the working plans and specifications for constructing the sophisticated vessels.

"General Dynamics is to be commended," Mr. Gibson added, for its role in building one of the largest and most advanced cargo ships ever to come off the drawing board. Special credit goes to Quincy Shipbuilding Division's general manager, Lloyd Bergeson, and the tremendous contribution he has made in providing the leadership to successfully produce this ship. He is truly the manager of what I predict will be a pennant-winning team."

In his introductory remarks, Mr. Bergeson said, "There were many doubts that we could launch this ship on time, that we could successfully operate the transporter/elevator system, or that we could deliver the Doctor Lykes on time. We are launching on time. We have operated the elevator with her own power. And we shall deliver this ship ahead of her contract date."

Additional remarks were given by David S. Lewis, chairman and chief executive officer of General Dynamics, and Hilliard W. Paige,

recently elected president of the company.

The ship will enter service early next year, plying routes between ports on the Gulf of Mexico, England and continental Europe. Since the elevator permits fast loading and unloading away from congested terminals, turn-around time on round trips is expected to be cut by at least eight days.

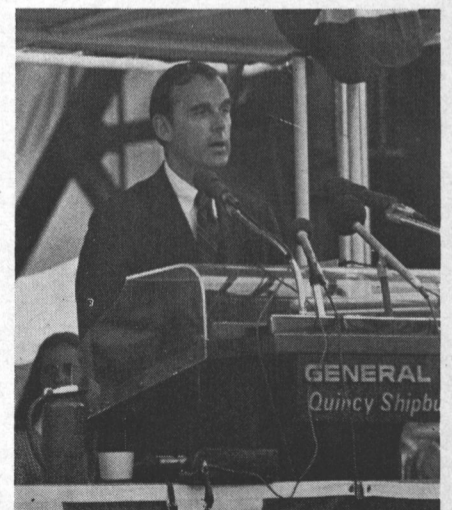
The SEABEE's barges are specially designed for use on rivers such as the Mississippi and the Rhine and canals in the United States, Europe and Great Britain.

The Doctor Lykes is named after Doctor H.T. Lykes, father of the seven Lykes brothers who founded the steamship company in 1900.

(Continued on page 8)



"I christen thee Doctor Lykes," said Miss Ashley Lykes as she broke the traditional champagne bottle on the ship's bow. The sponsor's sister, Miss Sheldon Lykes, and father, Joseph T. Lykes Jr., indicate their approval of her positive action.



Andrew E. Gibson, Assistant Secretary of Commerce for Maritime Affairs, delivering the principal address at the christening ceremonies, praised Lykes Lines, the design agent and the shipyard for taking a major step forward in ocean transportation.

## The Doctor Lykes—

(Continued from page 7)

The two other SEABEEs under construction at Quincy, Almeria Lykes and Tillie Lykes, will be delivered and will enter service later in 1972.

### The SEABEE

The SEABEEs are the largest break-bulk ships ever built in American shipyards. Each ship will carry up to 24,500 long tons of cargo. Each SEABEE can transport 38 fully loaded barges or 1,800 containers or vehicles, or any combination of these cargoes, including liquids in tanks, unitized cargoes, or break-bulk cargoes. The cargo is stored on the equivalent of 3½ miles of single-laned highway on three decks that run unobstructed for the length of each ship.

The unique feature of the SEABEEs is the self-contained, hydraulic elevator in the stern of the ship. This permits fast loading and unloading away from congested terminals. Barges are floated into the stern well and then lifted by the 2,000-ton capacity elevator to one of the three decks. Here the shipping units are moved into stowage by means of self-propelled transporters.

In both commercial and possible

#### SEABEE Characteristics

Length overall	875 ft. 0 in.
Breadth	106 ft. 0 in.
Draft, maximum	36 ft. 0 in.
Full-load displacement	51,000 tons
Shaft horsepower	36,000
Propeller weight	45 tons
Propeller diameter	23 ft. 0 in.
Speed @ 28-ft. draft	20+ knots
Number of boilers	two
Shaft weight	53+ tons
Turbo-generators	two—2,000-kw
Cargo capacity in 38 barges or 1,800 containers	24,500 tons

#### Barge Characteristics

Length	97 ft. 6 in.
Width	35 ft. 0 in.
Depth	17 ft. 1 in.

military use, a SEABEE can load or off-load, without shoreside support, in 13 hours or less.

Each SEABEE can carry 12 barges on each of the two lower decks and 14 on the top deck. The highly sophisticated, specially designed steel barges are 97 feet 6 inches long, 35 feet wide and 17 feet 1 inch deep, and each can load 850 long tons of cargo. The barges were designed for easy integration with regular tows on inland waterways in the United States and abroad, and are large enough to permit short coastwise voyages.

The barges, which can be easily converted to special use, also carry either ten 30-foot or twenty-four 20-foot containers plus additional cargo. On top of the hatch covers, the barges can handle up to sixteen 40-foot containers.

Below the lower barge deck, the SEABEE is essentially a tanker with a capacity of about 1,270,000 cubic feet, or 30,100 tons of water plus 5,780 tons of fuel oil. The tanks are fitted to carry ballast, fuel oil or other liquid cargoes. This tank capacity may be particularly useful in military service as each ship could carry troops, vehicles, supplies and fuel and assure immediate operational capability as the units are rolled off to shore.

In the tower-supported deck-house over the top deck are navigation and ship-control communication equipment, and an automated propulsion-plant control console.

The General Electric geared steam turbine powerplant of 36,000-shp makes the ship one of the most powerful single-screw merchant vessels and will enable the Doctor Lykes to cruise at over 20 knots. The main machinery cycle consists of two stages of regenerative feed heating and one stage of combustion air heating with steam at 850 psig and 950°F. developing the shaft power through a compound-geared steam turbine.

To obtain maximum sea speed



J.F. Dallinger, Quincy Shipbuilding Division's director of engineering, explains the operation of the elevator to an interested group of visitors. Shown, left to right, are: Hilliard W. Paige, General Dynamics' president; Mr. Dallinger; David S. Lewis, chairman of General Dynamics' Board; Frank A. Nemec, president of Lykes-Youngstown; Mrs. Joseph T. Lykes Jr., and Joseph T. Lykes Jr., chairman of Lykes Bros.

and to minimize vibration, even in heavy weather, the ship's lines are very fine. Anti-roll tanks reduce ship motions.

### 2,000-Ton Lift

The SEABEE design is flexible, primarily because of her elevator and transporter system. This is a self-contained unit so the ship does not have the cargo limitations of traditional crane lifts.

The elevator system can lift or lower two barges simultaneously up to 2,000 tons—four times more than any other ship in design, under contract or in service. With the platform submerged, the barges will be nudged by a tug over the elevator, then positioned and secured by a constant-tension winch system on the ship. Loading and unloading of barges is facilitated and protected by use of a Johnson Rubber Company fendering system consisting of fairing blocks, bumpers and pads for positioning the barges on the stern elevator.

The elevator is operated by an electro-hydraulic system which includes three double-drum winches on each side of the ship lifting at six points on each side of the elevator. Traveling at four feet per minute, the elevator raises the barges to one of three decks and locks into position.

Self-powered transporters, which consist of a series of motorized wheeled dollies with self-contained jacks, then move on to the elevator under the barges. The jacks lift the barges three inches and move them onto the cargo deck at 30 feet per minute. In stowage position, the jacks lower the barges onto support blocks, and the transporters withdraw to receive the next load.

This unique system is the product of a meticulous engineering effort participated in by Lykes, J.J. Henry Co., Inc., General Dynamics, the Rucker Company, Western

Gear Corporation, General Electric Company and others. The original engineering was started nearly three years prior to the award of the ship-construction contract.

Since the elevator-transporter system is the key to the ship's operation, great care had to be taken to properly sequence its installation. Working back from the ship's delivery date, all phases of engineering, development, design, fabrication, installation and testing of the total barge-handling system were carefully scheduled through a detailed planning network.

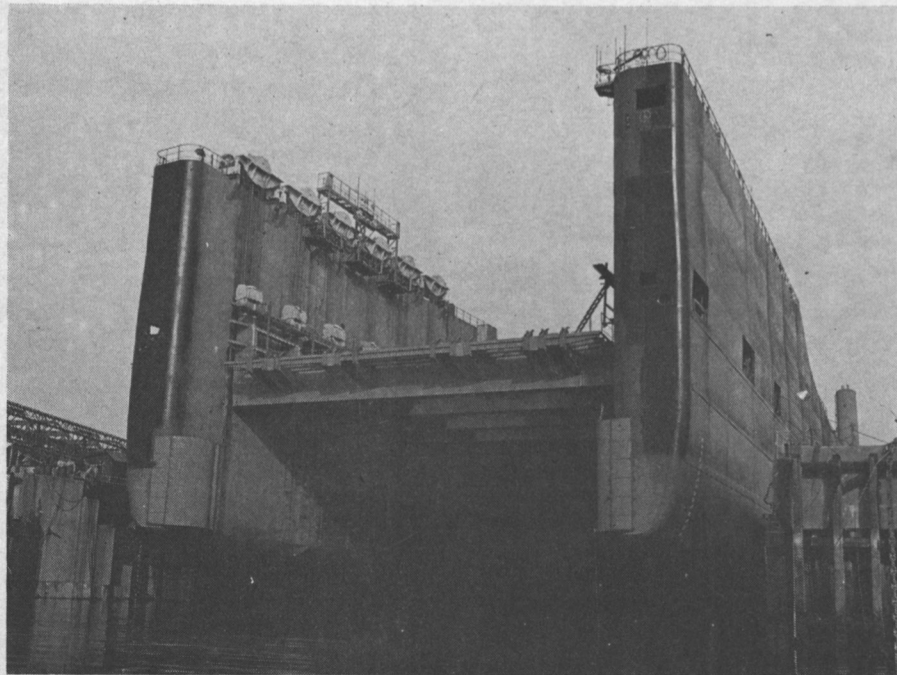
According to Mr. Henry, president of the J.J. Henry Co., "the SEABEE is the most flexible cargo carrier the world has ever seen. It can operate as a roll-on/roll-off ship entirely apart from its barge-carrying capabilities. The SEABEE can carry tugboats with the barges and, for the Department of Defense, a complete moon rocket or a 2,000-ton machine on the upper deck."

### Construction

The keel for the Doctor Lykes was laid on July 15, 1970. It is the first commercial ship built at the Quincy Shipbuilding Division since the yard was acquired by General Dynamics in 1964.

The Doctor Lykes is also the first American-built ship to be fully designed with the aid of the Autokon system. Developed in Norway, this is a computer-based operation that consists of three major programs: 1. use of a computer to develop the faired lines of the ship and to define the contour of the hull at any point. A numerical description of the ship's form is fed into a special drafting machine which provides a drawing of the ship's body plan; 2. taped instructions for the layout and automatic

(Continued next page)



The stern elevator, with 2,000-ton capacity, is shown at the main deck position prior to christening. The elevator was operated with ship's power early in July.

cutting of steel plate, and 3. development of the best layout for cutting the maximum number of small pieces from each steel plate.

According to General Dynamics staffer **Lennart Thorell**, Lykes program manager at the Quincy shipyard, the Autokon system has been "a real time saver" and has improved the fit of the hull plates.

"When a ship is built in pieces, off location," he explained, "you have to be very careful with respect to dimensional control and how you put them together. With Autokon you get very accurate cuts and this minimizes recutting and patching."

Other modern manufacturing processes at the Quincy yard used in constructing the SEABEEs include an automatic sand-blasting unit to clean the steel modules, an all-weather priming-painting unit, and automated vertical welding that seals steel plates extending from the keel to the top deck.

Another example of innovative methods used in construction was the erection of the elevator platform. This weighed 540 tons, almost twice the capacity of the shipyard cranes. To raise the elevator in its installed position, the Quincy shipbuilders devised a scheme to use the ship's own power. This required that major machinery be aboard the ship far earlier in the erection cycle than normal and so placed unusual demands on planning and production.

Mr. **Bergeson**, general manager of the shipyard, said: "These extraordinary ships posed unique design, construction and quality control challenges. The Doctor Lykes is the first ship General Dynamics has

built modularly from the ground up. To meet the tight time and cost schedule, 177 steel sections, some weighing over 100 tons each, were prefabricated offsite and moved by cranes to the ship's framework. This technique compressed the time the ship had to remain in its building position and was a major factor in our ability to meet the delivery schedule."

#### The SEABEE Story

Mr. **Nemec** began developing the SEABEE concept in 1964 following a trip to Russia where he observed Soviet maritime progress. He was dismayed, he said, by the advances he saw, and annoyed by the lack of such progressive thinking in the United States.

His company, considered one of the world's most advanced ship operators, had just contracted for some of the first advanced automated ships to be built in an American yard. Motivated by his Russian trip, Mr. **Nemec** then determined to force a major breakthrough in the state of the maritime art.

"We wanted a ship that would do what no other merchant ship had done before," he said. "We wanted a ship so flexible she could serve undeveloped coastlines and waterways as well as established ports, so economical she could outperform other ships, so versatile she could carry all manner of cargoes in all transport modes singularly or in combinations."

Lykes considered many alternatives in seeking to find the kind of ship best suited to its needs.

(Continued on page 10)



Part of the program for invited guests was a presentation of photography depicting the construction of the Doctor Lykes from keel laying to christening ceremonies.

#### MAJOR VENDORS

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| Gears   |  |



The 45-ton Ferguson propeller being lowered sideways between the building-basin wall and the ship's cantilever stern, since normal access was obstructed by work on the 2,000-ton capacity elevator platform. The propeller has a diameter of 23 feet.

## The Doctor Lykes—

(Continued from page 9)

At the outset Lykes considered building an updated version of a conventional break-bulk ship. One of the immediate drawbacks to this approach is a limitation in cargo-carrying capacity. While technology can achieve greater speed, advanced cargo-handling gear and other improvements, this type of ship is limited in its loading and discharge operations to small tonnage lifts.

Another consideration was the cellular full containership. This type of vessel is a specialized ship designed to achieve major economies within a particular application. The containership generally handles only those cargoes which can be containerized; and in most of its most recent forms, these vessels have even eliminated shipboard cranes in favor of shoreside loading equipment. However, it is clearly understood that Lykes is very definitely increasing its involvement in the field of containerized cargo with a rapidly growing container capability.

A number of other new ship types were considered. But a realistic appraisal of each of them individually indicated limitations which appeared to Lykes to be significant when related to the export and import cargoes of the U.S. Gulf.

From within the Lykes organization came the SEABEE solution. It is the creation of a system rather than a specialized new ship. This system allows within itself specialized concepts to be performed in any proportion that the traffic demands. The Lykes design of its SEABEE Class barge carrier encompasses the advantages of the barge-carrying ship, the containership, the roll-on/roll-off ship, the break-bulk ship, and to some degree the small tanker. And these features are immediately available on any given voyage, all at one time without any major physical change in the SEABEE ship itself.

When considering SEABEE, it is essential to use the system approach. The two essential elements are the ships themselves and the individual barge units. The ships act solely as deep-sea transporters of pre-loaded barges and are eliminated from the everyday cargo-handling activities at individual ports. The direct cargo carriage is performed by the barge units which also perform the individual port calls. The flexibility of this system requires more than ever before that all interested parties be familiar with the equipment characteristics and the overall capabilities of these two basic components.

The SEABEEs will not only provide faster, more economical and more versatile service on established routes but will also provide a means for the U.S.A. to develop business with countries which have rich natural resources but limited port facilities.

## British Shipyard Awards \$5.6-Million Contract To EDO Corporation

EDO Corporation, College Point, N.Y., announced that it has received a \$5.6-million contract from Vosper Thornycroft, Ltd. of Southampton, England, for new model sonar equipment to be installed on the Mark-10 frigates which Thornycroft is constructing for the Federative Republic of Brazil. The contract includes an option for additional equipment which, when exercised early next year, will bring the total EDO contract to approximately \$7.5 million.

William R. Ryan, president of EDO, said that this order is for ASW sonar systems designed and built to meet requirements of the Brazilian frigate fleet. He added that work will get under way immediately on the contract at EDO's College Point plant and that first deliveries will be made early in 1974. "It is anticipated that this equipment will be built with existing personnel in our Government Products Division here," Mr. Ryan said.

According to Mr. Ryan, the new contract brings EDO's current backlog of work to approximately \$33 million, which represents an increase over the company's backlog of \$29 million reported at the end of the first quarter.

EDO Corporation is one of the pioneer builders of sonar and other oceanographic equipment and has been a major supplier of this type of equipment to the U.S. Navy, the Canadian Navy and many foreign fleets for many years. The company also produces avionic equipment such as loran for commercial aircraft, navigation and communication aids for private aircraft, and is the world's leading producer of seaplane floats.

## Mueller Appointed To TMT Managerial Post

The commercial marine and chartering firm of Thompson-Mowbray-Templett (TMT), Houston, Texas, has appointed Horst Mueller to the post of manager of dry cargo chartering according to an announcement by TMT president, Fred Thompson.

Mr. Mueller, who was born in Hamburg, Germany, has been active in the freight and chartering field in Hamburg, Montreal, New York and London for the past 12 years.

In the chartering field, Mr. Mueller worked for shipowners, agents and brokers. Upon coming to the United States 11 years ago he was employed in freight department operations and chartering with various shipowners and brokers.

Mr. Mueller served his apprenticeship in Hamburg, one of the world's leading shipping centers, in association with the Hamburg-South American Steamship Company. He attended the School of Commerce in Hamburg and thereafter continued his career in the shipping field.

TMT conducts a three-fold op-

eration as a worldwide chartering firm, ship agents, and in the purchase, sale and leasing of commercial marine equipment. Its headquarters are in Houston's Petroleum Building. The firm also has an active New York partner, Mowbray Marine Enterprises, who specialize in the sale and purchase of dry cargo vessels, tankers, barges and tugs, and are active as chartering brokers.

## PACECO Licensed By Kaiser To Produce Speed-Tainer System

An exclusive license for the Kaiser Speed-Tainer® System has been granted by Kaiser Engineers Division of Kaiser Industries Corporation to Paceco, a Division of Fruehauf Corporation. The agreement covers the manufacture and sale of the Speed-Tainer System for use in all areas of the world except Japan and certain other Asian countries. The system is presently under active consideration in a number of locations throughout the world, including ports in San Francisco Bay and Japan.

Covered by patents in the United States and abroad, the Speed-Tainer System is a highly-automated system for receiving, storing, retrieving, and transferring shipping containers between ship, rail, truck and air. Key elements of the system include a vertical storage structure served by one or more high-speed, automated stacker cranes.

Paceco, with headquarters and main plant in Alameda, Calif., and a new production facility in Gulfport, Miss., is one of the world's leading designers and fabricators of container handling systems and equipment.

## Liberian Operator Installs Syncrolift To Service Fleet

The outstanding growth of the fishing industry in Liberia during recent years is illustrated by their export of 370,000 pounds of shrimp to the United States in 1970. One of the leading developers of the fishing industry in all of the West African states has been the Mesurado Fishing Company, Ltd.

Mesurado's expansion program in the area of fishing vessels included ordering shrimp boats from Belgium, and six American-built trawlers. To accommodate their increased fleet and to satisfy the drydocking needs of tugboats in Monrovia, a Syncrolift was put into operation.

The Syncrolift drydock has a platform 100 feet long and 32 feet wide. It can be raised and lowered at the rate of one foot per minute, allowing a 230-ton tugboat to be drydocked in less than 30 minutes. During the first three weeks of operation, 10 vessels were serviced on the Syncrolift.

Pearlson Engineering Company of Miami, Fla., supplied all the drydocking equipment, along with design plans of the Syncrolift system. The installation was carried out by Raymond International, Inc.

## Marine Boilers Outlive Carrier

Babcock & Wilcox marine boilers, like old soldiers never die, it seems. Nor do they fade away.

Two of the B&W marine boilers installed on the ex-USS Leyte more than 25 years ago have outlived the proud aircraft carrier in useful service. The Leyte was sold for scrap last summer and recently returned to the shipyard of Newport News Shipbuilding and Dry Dock Co., Newport News, Va., where she was launched in August 1945.

The shipyard plans to put to use as steam auxiliaries two of the Leyte's eight B&W boilers. One will supplement an existing shore test boiler in evaluating systems aboard ships, while the other will furnish additional steam for heating in the yard. The boilers were taken out by way of a hole cut through the carrier's flight deck and into the fire room. Due to the height involved, the shipyard's 19-story gantry crane was utilized for the lift.

The Leyte was launched in 1945 and commissioned in April 1946. The ship was named for the historic World War II naval battle which precipitated the liberation of the Philippines and the fall of Japan. The Leyte saw service in Korea and appeared around the world in "show the flag" cold war operations.

Reclassified in 1953 as an anti-submarine carrier, the Leyte was converted to handle specialized aircraft for such service. Her last active years were spent in antisubmarine warfare activities along the Eastern Seaboard of the United States, and the Caribbean. She was decommissioned in 1959 and, in an economy move, sold for scrap by the Navy last year.

According to shipyard inspectors, the boilers were overhauled to like-new condition several years ago before the carrier was retired to the Atlantic Reserve Fleet.

## RF Communications Names Taylor To Head New St. Louis Office

RF Communications, Inc., a subsidiary of Harris-Intertype, has established a Midwest regional office in St. Louis, Mo., according to an announcement by M.B. (Bill) Long, manager, national marketing.

Michael R. Taylor, Midwest regional manager, has moved from RF's home office in Rochester, N.Y., and opened the new office at the following address: RF Communications, Inc., 127 Carmel Woods Drive, Ellisville, Mo. 62011, Telephone (314) 391-0650. Ellisville is a suburb of St. Louis.

Mr. Long said this move was in conjunction with RF's continuing policy to provide their dealers and customers better service and support. Mr. Taylor will be responsible for developing a marketing organization for the distribution of RF's line of marine and land mobile products in the Midwest region.

## Graham offers you marine vacuum and condensing equipment in integrated systems— unconditionally guaranteed to perform to your specifications

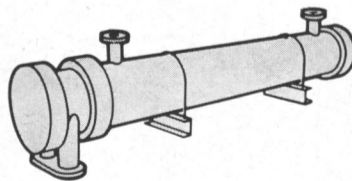
More and more Graham marine vacuum and condensing systems are specified for installations throughout the world. One reason could be we're the only company that goes all the way—that does the whole job of design, manufacture and custom assembly—just as we have been doing for over thirty-five years.

Try it the Graham way—one package, one manufacturer—undivided responsibility.

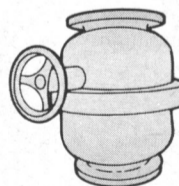
For details call the Graham sales engineer representative in your area telephone directory. Or contact one of our international headquarters shown below. In the U.S.A. call (516) 482-5200, Telex 12-5070, TWX 510-223-0808.

### **GRAHAM**

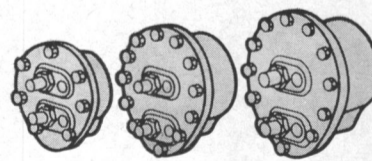
*Vacuum and heat transfer equipment  
for the process industries*



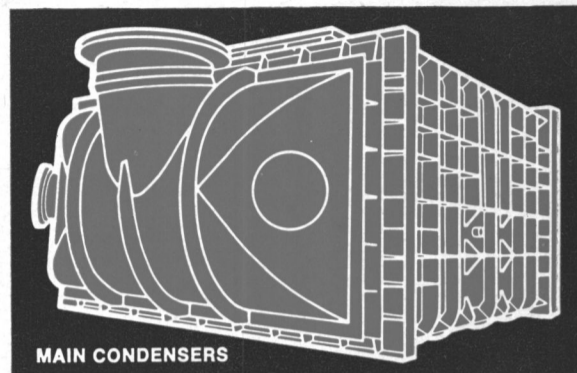
LUBE OIL COOLERS



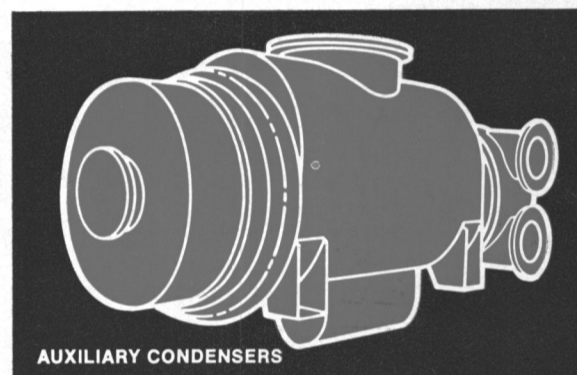
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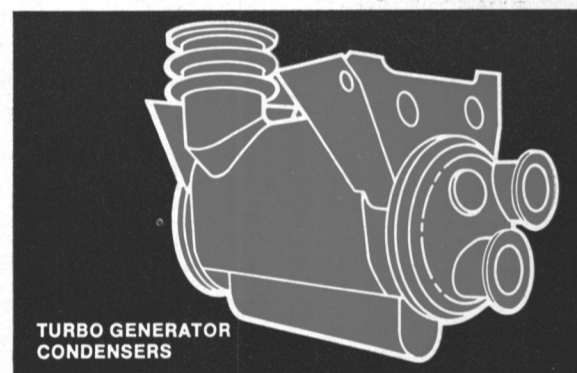
HELIFLOW COOLERS/HEATERS



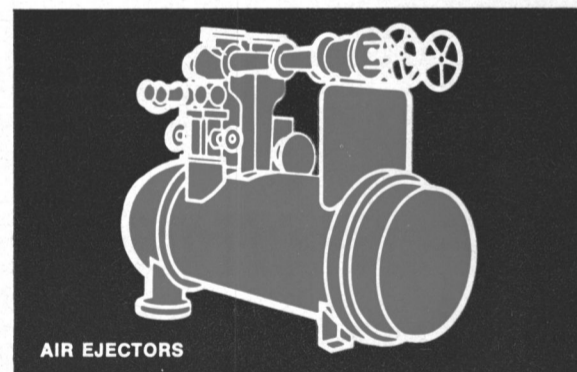
MAIN CONDENSERS



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## Watson To Direct New Department At United States Lines

The appointment of **Jack E. Watson** of Oradell, N.J., as director of the newly-established department of industrial relations at United States Lines, was announced by **E.J. Heine Jr.**, president of the company. Mr. **Watson** has been with the company since 1946, for the past five years as director of

standards and controls in corporate planning.

Mr. **Heine** said the new department will formulate and implement labor agreements with unions, establish comprehensive programs to evaluate employee performance and disseminate information of interest to employees, and generally administer the full-range of industrial and labor relations. The existing personnel department will be merged into this new department.

Mr. **Watson** joined United States Lines the year he was graduated from the United States Merchant Marine Academy. After nearly 17 years at sea as an officer and captain of United States Lines' vessels, he was appointed assistant pier superintendent. In that post, Mr. **Watson** served at the Brooklyn Army Terminal and at other United States Lines' terminals until May 1964, at which time he became assistant to the company's

general operating manager. As director of standards and controls, his duties included the planning of the company's container service to Europe and the Far East. His responsibilities also included making recommendations as to locations and design of container terminals. Mr. **Watson** has been involved in evaluating stevedoring contracts and proposals, particularly in terms of their economic effect on the company.

A native of Clinton County, Mo., Mr. **Watson** attended the University of Missouri for one year before enrolling in the U.S. Merchant Marine Academy. He is a member of the Northern New Jersey Chapter of the Academy's Alumni Association. A holder of a master's certificate and a lieutenant in the U.S. Naval Reserve, Mr. **Watson** is a member of the National Defense Executive Reserve Unit of the United States Maritime Administration.

## Dravo Corporation Names Gary Long To Engineering Works Div.



Gary Long

**Gary Long** has been appointed Eastern sales manager, marine sales department, for the Engineering Works Division of Dravo Corporation, Pittsburgh, Pa.

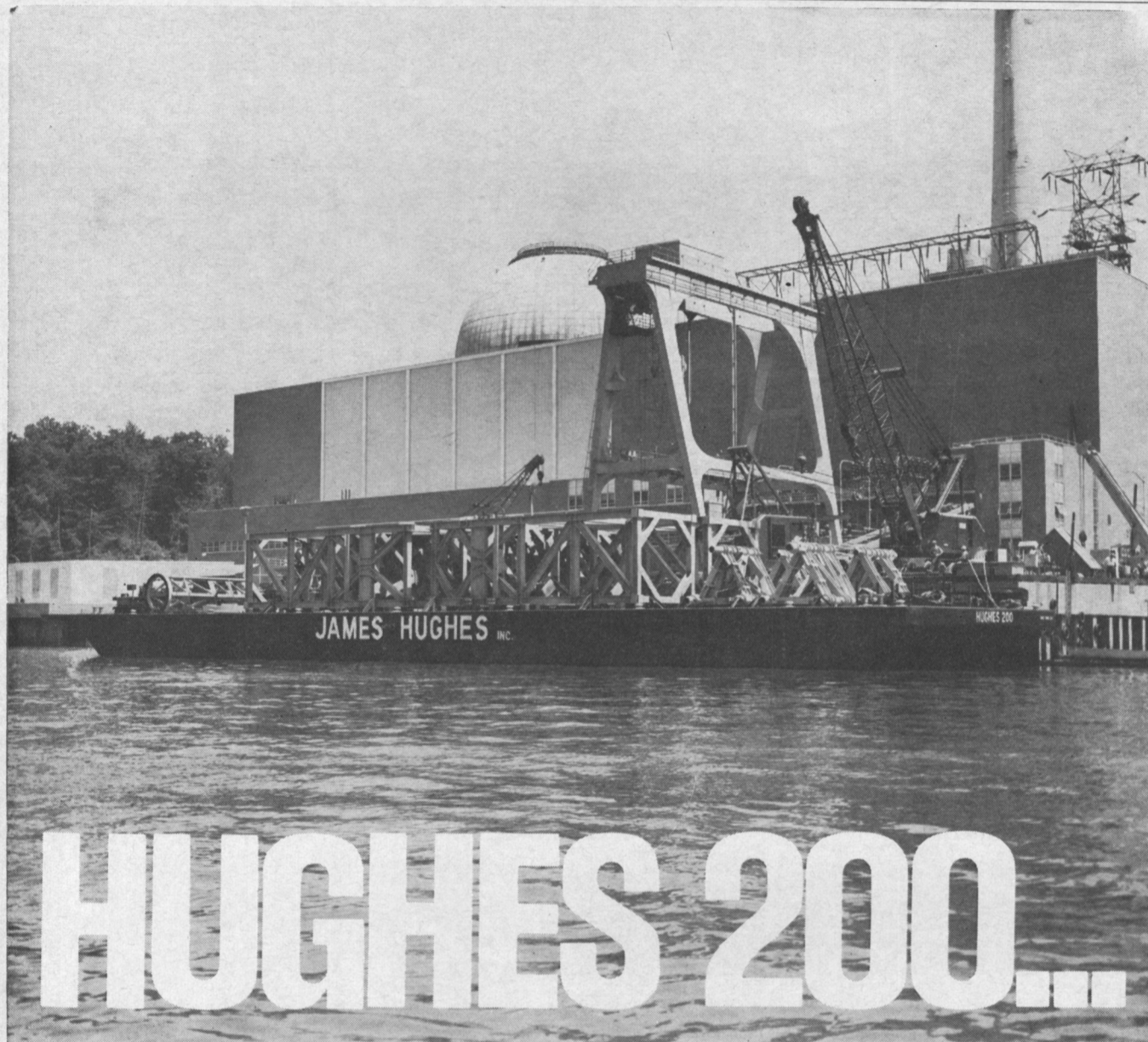
Mr. **Long** has served as sales engineer since joining the company in 1969. He is a graduate of Southern Illinois University, holds an M.B.A. degree from Northwestern University, and is a member of the Association of Iron and Steel Engineers and the National Management Association.

Dravo's Engineering Works Division is engaged in the design and fabrication of a complete range of marine and bulk materials handling equipment and specialized heavy machinery.

## Spanish Yards Name Pancontinental In U.S.

Pancontinental Overseas Company, 50 Broadway, New York, N.Y. 10004, has been appointed exclusive U.S. agents for drydocking, repairs and conversion work of Empresa Nacional "Bazan", a major Spanish shipyard combine according to **J.R. Kirsten**, president of the New York company.

Bazan has repair and drydocking facilities at El Ferrol, Cartagena, San Fernando and Las Palmas. A drydock capable of accommodating vessels of 220,000 deadweight tons is presently under construction at El Ferrol and is scheduled for completion in the spring of 1973.



# HUGHES 200...

## BUILT FOR THE ATOMIC AGE

Water transportation — the *only* feasible way to move units too heavy or massive for road or rail — acquires a new dimension with the HUGHES 200. This rugged sea scow was designed specifically for cargoes of unusually concentrated weight, including nuclear reactors and other ultra-heavy equipment used by the power industry today.

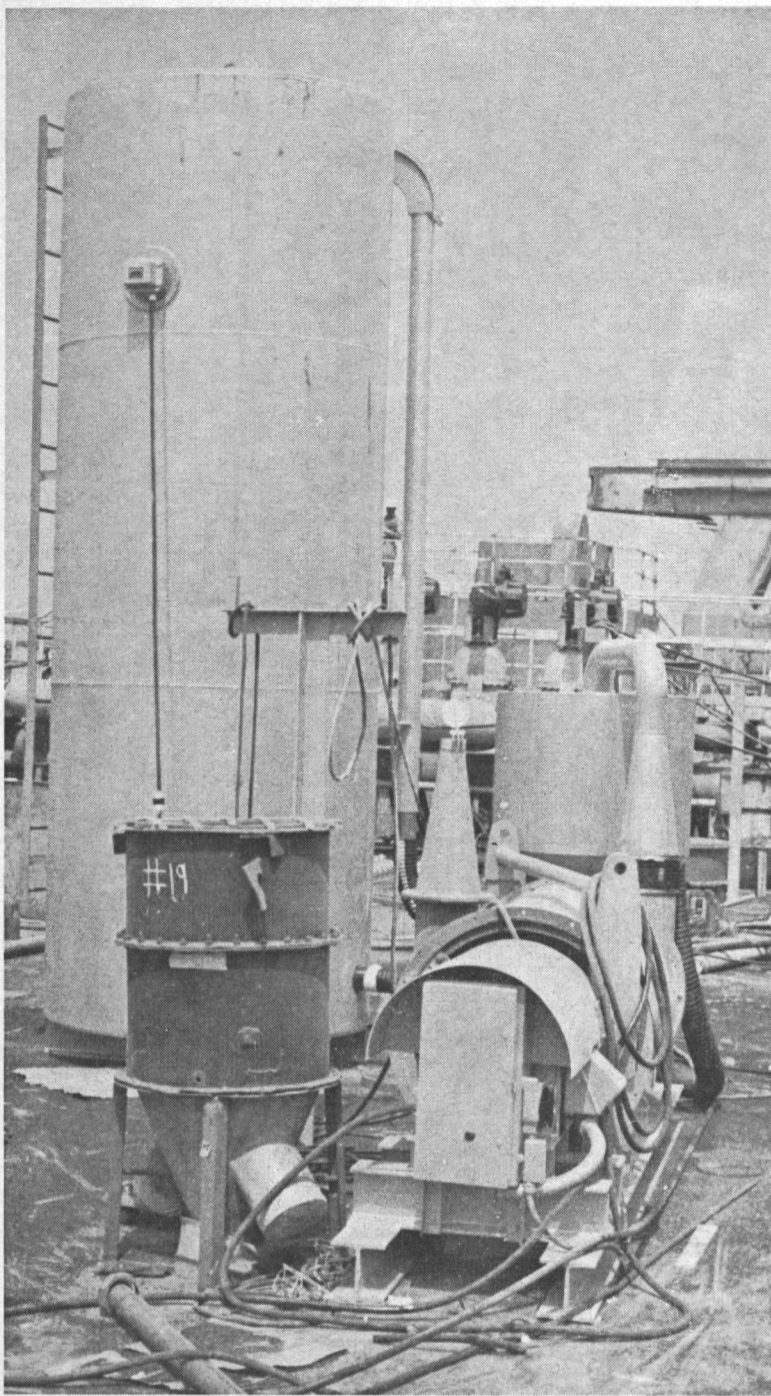
The HUGHES 200, with dimensions of 196' x 48' x 12' has an all-clear steel deck capable of loading 2,000 lbs. per sq. ft. Capacity: 2,200 tons. Approved for full ocean service. Other Hughes barges and scows to meet your needs. Prompt attention to your inquiries.



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Vacuum Unit Model VR-5600 for removing spent abrasives from tanks.  
AVONDALE SHIPYARD

# Where have all the workers gone?

We build equipment that will make your sandblaster the loneliest man in your plant.

And maybe the most productive.

By providing him with the abrasive capacity and a key "dead-man" remote control.

All he needs to do is press a switch to become a profit producer.

Key Engineering builds blasting units which range from one to one hundred ton capacity — and operate as many as twelve individual blasters.

Each blasting hose is completely independent and equipped with a Key "dead-man" remote control.

The fastest acting, most positive and dependable "dead-man" control available. No more waiting for the rigger and crane operator to bring him abrasives midway through the morning, or for a pot tender to start or stop him, or for the maintenance crew to repair his equipment.

Key provides engineered production and dependability along with the facilities and experience to custom build equipment for your particular requirements.

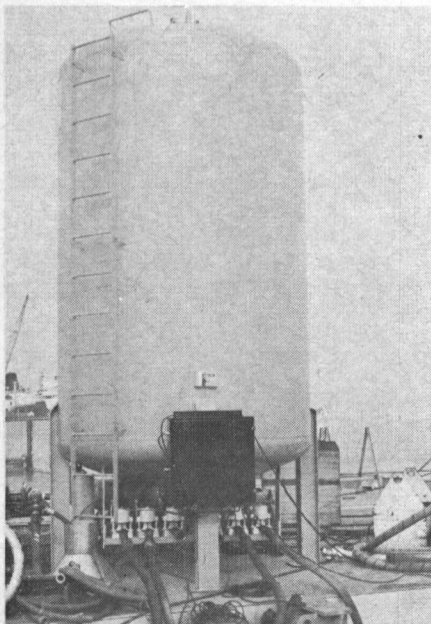
Our vacuum recovery systems are designed to remove spent abrasives and debris from the compartments and tanks of the largest tankers — efficiently and economically.

With a minimum of labor, maintenance and set up time.

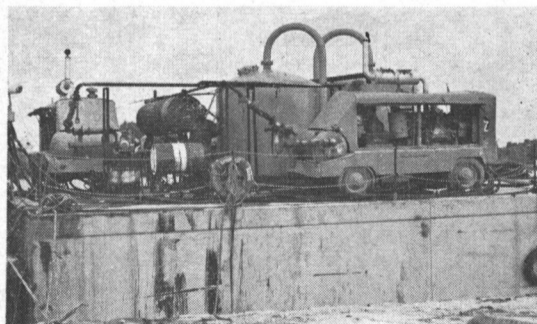
If you don't mind your sandblasters being a little lonely, write or call our Houston, Texas office for additional information.

Or for a demonstration.

Incidentally, we have also engineered an entirely different concept in shot blasting facilities for manually blasting large sections of pre-assembled vessels in shipyards.



22-ton capacity Key Blaster operates 6 blasters. Designed to sit on the deck of a ship for interior or blasting. SUN SHIPBUILDING



Two 40-ton capacity KEY Blast Units modified for barge mounting. Capacity to operate 12 individual blasters for harbor or offshore work.  
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7-ton capacity Blaster operates two blasters. Unit is with optional pneumatic loading connection.



The completely integrated tug-barge unit, with a length of 620 feet 6 inches and a deadweight of 36,530 tons, resembles a self-propelled tanker.

## A New Concept In Transportation—

# Largest And Most Powerful Integrated Tug-Barge Unit Placed In Deepsea Service By Ingram Ocean Systems

A new and economic transportation system was recently christened in New Orleans. The new system "holds the promise of developing into a major element of our coastal shipping and hopefully can be the means of recapturing much of the cargo that has been lost to railroads and pipelines," according to **Andrew E. Gibson**, Assistant Secretary of Commerce for Maritime Affairs.

Mr. **Gibson** was speaking at the christening of the tug MV Martha R. Ingram which forms part of the most powerful tug-barge combination in the United States. The tug, built by Southern Shipbuilding Corporation, Slidell, La., and the barge I.O.S. 3301, built by Alabama Dry Dock and Shipbuilding

Company, Mobile, Ala., form a unit 620 feet 6 inches long and having a deadweight of 36,530 tons.

The tug was christened by **Mrs. E. Bronson Ingram**, wife of the president of Ingram Corporation. Immediately following the christening the tug-barge combination entered service in the coastwise trade for a major oil company.

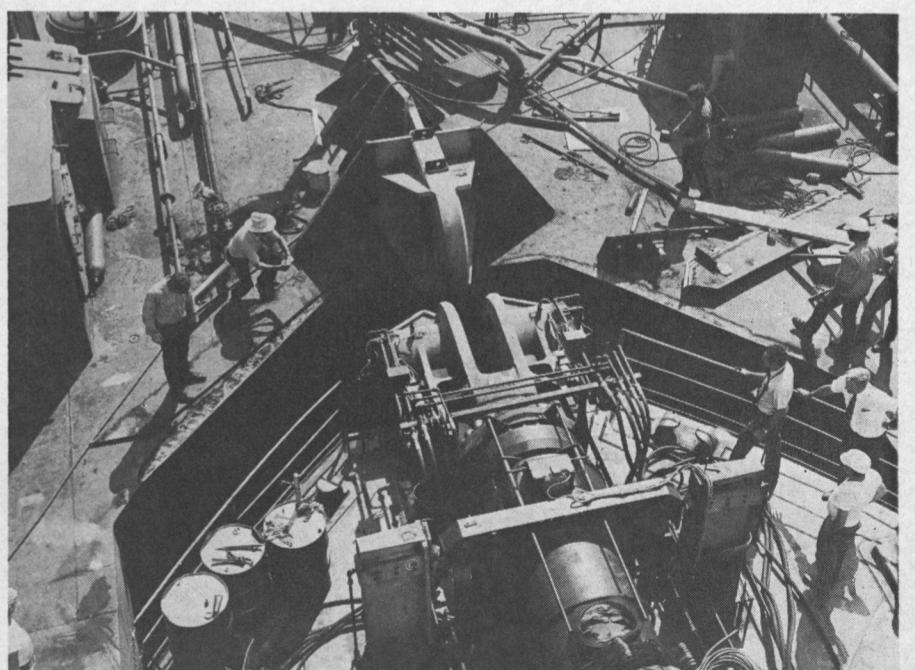
The Ingram Ocean Systems, Inc., the ocean transportation subsidiary of the Ingram Corporation, has thus motivated a new concept of deep-sea carriage of bulk commodities by the use of a completely integrated, fast-locking type tug-barge unit. The locking arrangement was developed and patented by the Ingram Corporation (Continued next page)



The 11,250-hp Martha R. Ingram, built by Southern Shipbuilding, Slidell, La., is capable of pushing the 285,500-barrel barge at a speed of 14 knots at full load draft.



The I.O.S. 3301, built by Alabama Dry Dock and Shipbuilding, measures 532 feet in length, has a beam of 87 feet, and an unusually deep stern slot for the powerful tug.



In this view the tug is ready to make the hookup connection with the barge. The combined unit will transport petroleum products from the Gulf to the East Coast.

## Tug-Barge Unit—

(Continued from page 14)

and Breit Engineering, Inc., of New Orleans.

F.B. Ingram, chairman of the board of Ingram Corporation, said that it is cheaper to build two units like this than one equivalent-sized tanker. The total investment of the combination is \$10 million, compared to an estimated cost of \$16-18 million to build a tanker of the same capacity.

The Martha R. Ingram has an overall length of 156 feet 6 inches, a beam of 46 feet and a depth of 33 feet 4 inches. It is powered by two 12-cylinder, four-stroke, turbocharged, intercooled Mirrlees diesel engines supplied by Hawker Siddeley. The two engines, driving twin-propellers, develop a total of 11,250 bhp at 625 rpm. This power provides the unit with a speed of 14 knots at the full-load draft of 37 feet 5 inches. The engines drive KaMeWa, variable pitch, 14 feet 6 inch diameter propellers through single-reduction gears.

Navigating and communicating equipment on the tug includes one Decca anti-collision radar and one standby radar; RF Communications radiotelephone and transceiver; Tracor Omega navigator; Raytheon digital indicator and echo depth sounder.

Accommodations are provided on the tug for 14 officers and men in air-conditioned quarters.

Both the tug and barge are approved by the Coast Guard and classed by the American Bureau of Shipping.

The tug and barge are secured by hydraulic rams situated at the bow of the tug and on the port and starboard sides of the bow. In addition, a series of laminated steel and rubber wedges are used be-

tween the two slightly abaft of the tug's beam.

Ingram Ocean Systems expects to put its next combination unit to sea in 1972. The firm also is working with the Maritime Administration in a research and development project to measure the stresses of the new linkage system.

## Electric Boat Division Names Poul Sterregaard Machine Shop Supt.

Poul Sterregaard of Norwich, Conn., has been appointed machine shop superintendent at the Electric Boat Division of General Dynamics, Groton, Conn.

In announcing the appointment, Owen O'Neill, works manager, said Mr. Sterregaard would have general supervision of all machine shop operations. Mr. O'Neill also named Elliot E. Sheagren of Groton, a veteran of 39 years' service with the company, as superintendent of machining and assembly, reporting to Mr. Sterregaard.

Mr. Sterregaard joined Electric Boat Division in 1963 as an engineer, advancing to nuclear construction supervisor in 1966. In 1969, he became assistant to the machine shop general superintendent.

Born in Dalum, Denmark, Mr. Sterregaard holds a bachelor's degree in marine engineering from the Odense Maskinteknikum and served as an engineer officer aboard submarines of the Royal Danish Navy, later joining the Danish shipbuilding firm of Burmeister & Wain. He came to the United States in 1946, after serving throughout World War II aboard commercial tankers. Before coming to Electric Boat, Mr. Sterregaard was plant engineer at S.L. Allen & Co. Inc., Philadelphia, Pa.

## New Booklet Describes Marine Engineering Developments In Japan

The latest edition of an annual review of marine engineering developments in Japan is now available free of charge from the Ship Machinery Division of the Japan Trade Center in New York.

Called "Progress in Marine Engineering in Japan 1970," the 39-page booklet describes eight specific projects carried out by individual Japanese manufacturers, often in cooperation with the Japan Ship Machinery Development Association. The Association was established in 1966 under Government sponsorship to stimulate research and development in the ship machinery field.

Achievements depicted in the new edition include: a water-cooled four-cycle diesel engine with a unique two-step fuel injection system; an underwater parachute system for emergency braking of mammoth vessels; a receiver/display unit for use with the worldwide Omega navigation sys-

tem, due to become operational in 1972; a twin-deck crane apparatus with a common slewing base, in which the cranes can be operated together for heavy loads or individually for lighter hoisting; an electromagnetic coupling system for multiple-power propulsion plants; die-forging of a large solid crankshaft with continuous grain flow; a dual fuel apparatus for diesel propulsion engines aboard liquefied natural gas tankers, which makes economical use of that portion of the gas cargo which would otherwise be lost to evaporation; and a telescoping undersea observation vessel—essentially a "floating elevator shaft" that takes a three-man chamber down as far as approximately 164 feet for all types of surveys. Each report is illustrated with photos, charts and diagrams.

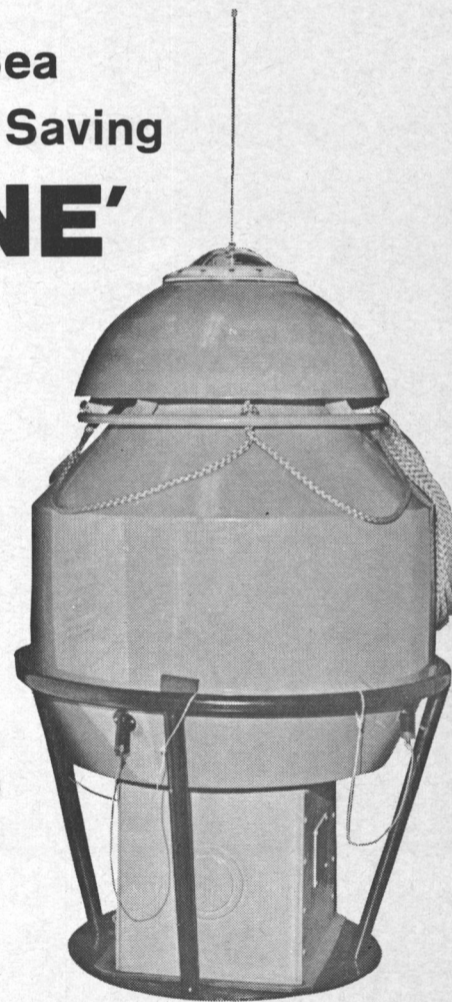
Requests for copies of the new publication, and other inquiries concerning Japan's ship machinery industry, should be directed to: Ship Machinery Division, Japan Trade Center, 437 Fifth Avenue, New York, N.Y. 10016.

## For Safety at Sea Install the Life Saving

# 'LIFELINE' SEARCH INITIATOR BUOY

- Self-Anchoring
- Mooring for Survivors
- Radio & Light Beacon
- Wreck Locator

The multi-purpose "Lifeline" uses the sunken vessel as its anchor, reels out 3,000 feet of tension-controlled steel cable from a built-in drum and becomes a stationary rallying point for survivors. It is also an efficient 2-frequency radio and light homing beacon complete with radar reflector. Manually or automatically released, it emits calming oil, marker dye and shark repellent and is equipped with a mooring rail for buoyant life-saving equipment. Invented by Capt. W. Y. Higgs, and manufactured from moulded fiberglass, polyurethane foam filled to withstand puncture damage, it also serves as a wreck marker for future salvage operations. "Lifeline" models are available for all classes and sizes of coastwise vessels. Contact Star Lifeline Limited today for full details.



"Lifeline" Model 2, Automatic Anchoring Device for Buoyant Life-saving Equipment. For vessels of 75 feet and over.

Canadian Patent 849286. U.S. and other patents pending.

## Star Lifeline Limited

1148 West 15th Street, North Vancouver, B.C.

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"WITH ALL THIS FOG, HARRY, - HOW CAN YOU BE SURE WE'RE ON THE FERRY?"



**You can specify main system oil, auxiliary diesel oil, air compressor oil, turbocharger oil, steering gear oil, gear oil, stern tube bearing oil, and variable-pitch propeller oil.**

You may be using one oil for motorship main system lubrication, another oil for auxiliaries.

Shell MELINA Oil could take care of both.

You may be using an assortment of oils for other shipboard machinery.

Shell MELINA Oil can take care of most other shipboard machinery.

Result: MELINA Oil may help you save a considerable amount of money.

Consider the potential savings from bulk handling. The more applications you find, the greater your opportunities for buying in bulk.

Consider the problems you have with drums. When you lift MELINA in bulk, you get fast, safe de-

livery and clean, secure storage in your own tanks.

Consider that MELINA Oil is available in bulk at 13 major U. S. ports—pumped directly into your tanks from waterside or pierside—whichever works best for you. (Standard Boat Co., Shell's distributor in N.Y. Harbor, pumps MELINA Oil aboard motorships from 450-gallon "jumbo drums"—see photo above—carried on a lighter or truck.)

Consider your motorships of the future. MELINA makes it possible to greatly simplify shipboard lube oil storage and distribution systems. Result: important cost savings in ship design, equipment and maintenance.

You get these benefits because MELINA Oil



## Or in most instances you can specify Shell Melina® Oil.

offers performance like this:

Gives excellent protection to most marine diesels for main and auxiliary power—whether high, medium or slow-speed.

Exceeds Supplement 1 performance level to meet requirements of gasoline and diesel auxiliary units designed for this quality level oil.

Possesses gear anti-wear characteristics superior to those of most gear oils used aboard ship.

Satisfies most shipboard applications—available in SAE 20, 30 and 40 grades.

Is fully compatible with the Shell lube oils you are presently using. No purging of systems necessary when changing over.

Is widely approved by leading manufacturers of marine engines. Available worldwide, including major U.S. ports.

You can get all the facts on this remarkable oil for motorships by calling the Shell Representative at the nearest Shell Transportation Sales office.

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Shell Commercial Marketing,

One Shell Plaza,

Houston, Texas 77002



## Second Quarter Of '71 Shipbuilding Returns Reported By Lloyd's

In its quarterly report ending June 30, 1971, Lloyd's Register of Shipping states that world shipbuilding continues at a record level. Excluding Communist China and Russia, for whom figures are not available, there are 1,950 ships totaling 22,196,123 gross tons, under construction in the world.

The total order book which, apart from the ships now building, also includes those on order but have not been commenced, now stands at 83,686,675 tons. This is an increase of 1,287,836 tons over the previous quarter, and the sequence of record figures continues unbroken since December 1966.

Japan's total order book stands at the mammoth figure of 37,705,045 gross tons, followed by Sweden with 6,385,072 tons and France with

5,575,083 tons. The United States retains 12th place with 1,910,266 gross tons, 309,579 tons more than at the end of March.

Bulk carrier tonnage completed is the highest since December 1967, while tanker tonnage launched is the second highest figure recorded. Output figures for general cargo tonnage remain high, and the prospect of the addition of a further 6.5 million tons gross of conventional tonnage to the world fleet during the next

two or three years cannot be encouraging news to companies severely affected by the currently depressed freight market.

6,792,967 gross tons of the ships actually under construction are now being built under the supervision of Lloyd's Register.

## Atlantic Richfield Co. Orders First Japan-Built 'Oil Storage Barge'

Mitsubishi Heavy Industries, Ltd. recently received an order for an oil storage barge from Atlantic Richfield Co., U.S.A. This is the first oil storage barge built in Japan, and it will be the second one in the world.

This one-million-barrel oil storage barge, measuring approximately 468 feet in length, 158 feet in breadth, and 87 feet in depth, will be used to store oil for offshore oil fields owned by the Atlantic Richfield Co., off the shore of Java in Indonesia.

After a comprehensive study of various aspects, such as the quantity of oil to be produced, oil structures and deposits and the location of oil fields, an oil storage barge of this kind is regarded as the most economical for Indonesian waters.

The barge will have living quarters for 50 persons, a heliport, generators, and measuring equipment. The vessel is designed to be self-contained, will have its own supply of electricity, etc., making it possible to function without aid from land.

Nagasaki Shipyard & Engine Works is building the barge, which is scheduled to be delivered in June 1972. The main features are: an installed oil heating system; living quarters and a relaxation area for workers; a heliport, making it possible to keep in close contact with the home base and other installations, and one fixed mooring buoy.

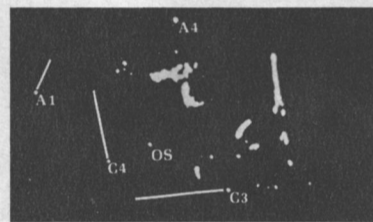
## When two's a crowd

**How COMAN, a new automatic computer/radar system is being used on giant tankers and container ships for safer passage through crowded waters.**

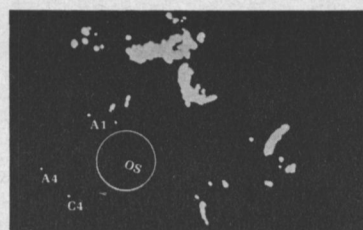
COMAN can show Captain and pilot where other ships are going as well as where they are. It's the on-board plotting system that has passed its sea trials. The only system that gives you visual tracking on one display and a live listing showing range, bearing, course, speed and CPA of each target on a second display.



Working with your on-board radar, COMAN tracks for the watch all ships and land masses within 24 miles. As each target is entered, a vector shows where that target will be at a selected time.



The watch officer can employ a variable radius guard ring around his own ship (OS). Any target crossing ring will automatically sound an alarm.

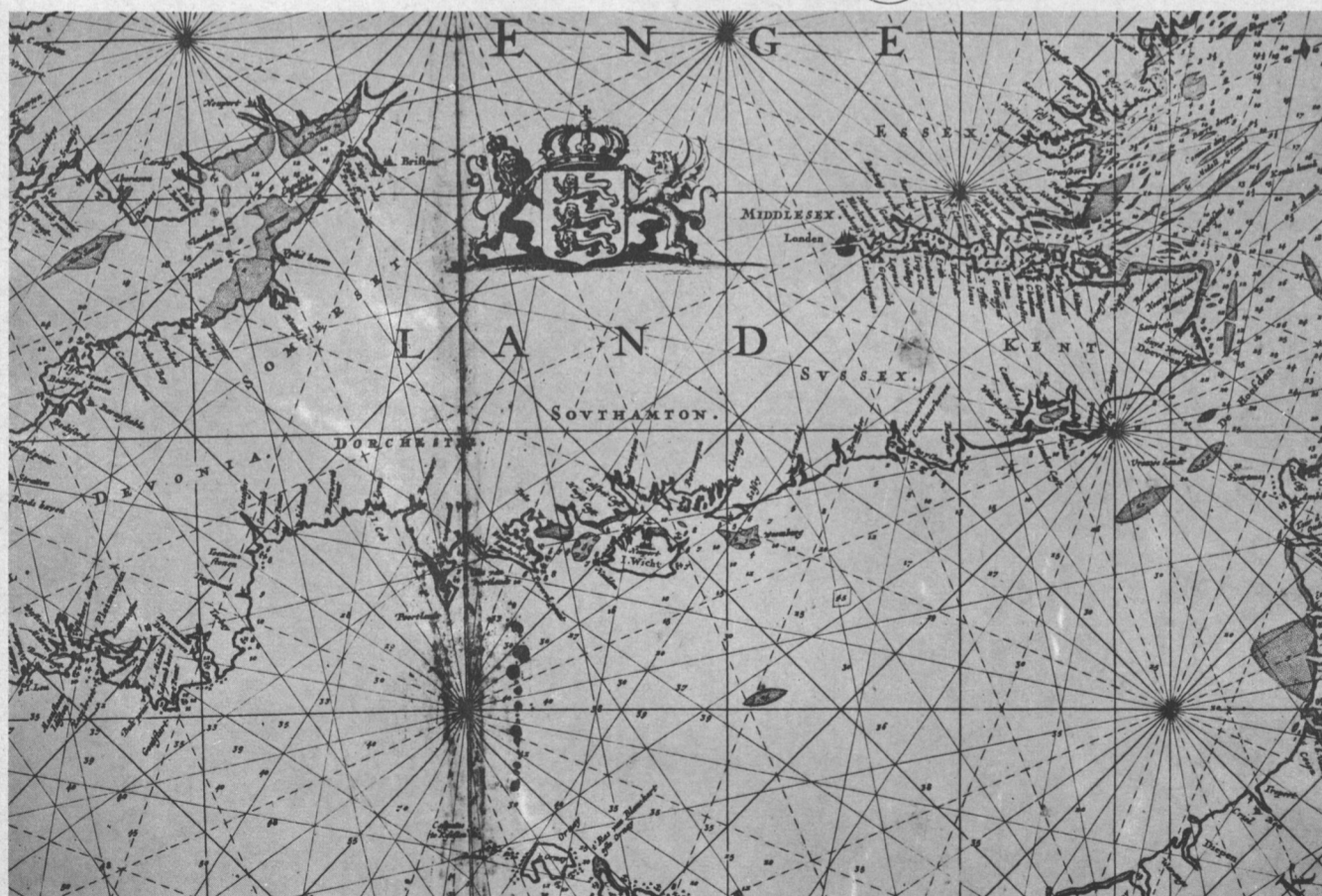


At the same time the second display gives a written plot for each target similar to the typical listing shown below.

TC	CPA	TCPA	BCPA	VEL	CRS	RNGE	BRNG
A1	0.2	79.4	093	02.2	183	01.2	025

Altogether COMAN will track up to 25 ships simultaneously and will allow you to evaluate trial maneuvers. If you'd like to learn more about this unique new on-board computer system — or if you'd like a reproduction of this antique map of the Channel to remind you what crowded waters were like — write Box 68, Marine Digital Systems, Inc. at the Plymouth Rope Walk, North Plymouth, Massachusetts 02360. Or telephone (617) 746-7000.

**MDS Marine Digital Systems, Inc.**  
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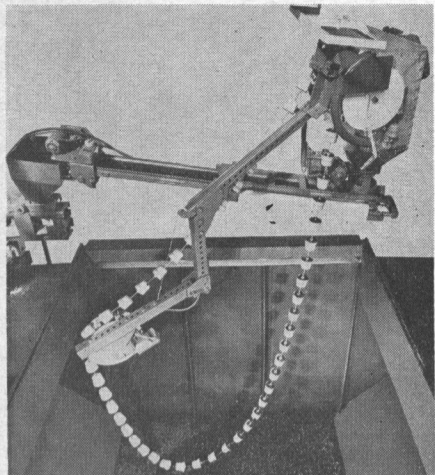
## Hyde Announces New Shipboard Sewage Treatment System

Hyde Products Inc., a subsidiary of W.E. Zimmie, Inc., Cleveland, Ohio, has introduced a new sewage treatment system which will allow fleets operating on the Great Lakes and other inland waters to comply with existing antipollution regulations, including the new Michigan law specifying total containment of shipboard wastes.

The new Hyde Sewage Treatment System, according to the announcement, eliminates all pollutants normally pumped overboard from bilge, galley sinks (garbage), laundry, showers, wash basins, drains and toilets. Comprised of a fore and aft section, the completely automatic system is modular and compact and can be installed easily on new or existing vessels.

The company said the system can be sized to suit requirements, but normally operates at an approximate rate of 3,500 gallons per day. Effluent produced by the system is well below existing or proposed standards for overboard discharge and has virtually no coliform content.

## PACECO Introduces 'Buckets On Rope' For Bulk Unloading



The Catenary Bulk Unloader can be directed into corners of the hold to perform the final cleanup without mechanical assistance.

A giant step forward has been taken in the design of equipment for unloading bulk materials from the hold of a ship. The Catenary Bulk Unloader being introduced by PACECO, a division of Fruehauf Corporation, employs a continuous train of buckets which can unload dry bulk materials at a constant rate of production, regardless of the depth at which it works.

The principle of this new design concept is a catenary loop of steel buckets, connected by wire rope that is driven at high speed over special sprockets. Each bucket in the moving train digs and fills completely with material, then lifts and dumps the material onto a conveyor in an endless cycle. Thus the rate of production never varies, no matter how deep in the hold the Catenary Bulk Unloader must operate.

Unloading efficiency of this new equipment is further increased by a special hinged boom which guides the bucket train into wing areas of the ship inaccessible with conventional bucket unloaders. PACECO's Catenary Bulk Unloader is able to perform the final cleanup job without other mechanical assistance, because the buckets can be directed into corners of the hold.

"This is an entirely new concept in bulk unloading," said J.P. Tepley, general manager of PACECO's Bulk Systems Division. "Not only will the new Unloader provide faster, more efficient production, but it is completely portable. Because of its design simplicity and lightweight construction," he explained, "the Catenary Bulk Unloader can be moved easily to any dock location where it is needed." It operates from a PACECO Portainer, or any mobile crane, Mr. Tepley explained.

The new PACECO equipment is versatile too. A variety of dry, bulk materials can be unloaded with the Catenary Bulk Unloader, among them being grains, sand, ammonium sulphate, rock phosphate, and cement. The tons per hour which can be unloaded by the bucket

train are determined by the bucket size which a customer orders. To meet the differing needs, PACECO is building six bucket sizes ranging from 10 inches in diameter, with a rated capacity of 171 tons per hour, up to 36-inch diameter buckets which give the Unloader a rated capacity of 1,500 tons per hour.

The operating principle of the Catenary Bulk Unloader is unique. Special patented sprockets have

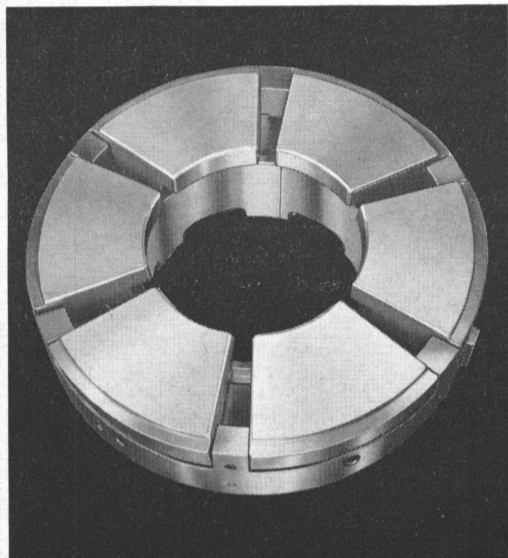
been designed to provide smooth movement of the catenary loop of buckets, whether the buckets are full or empty. The drive sprocket, which is in the form of a large wheel, has alternate sets of drive-and-guide rollers and support rollers. Similar support rollers for the buckets are found on the Idler sprockets, and there are special four-roller guides between the buckets.

The design simplicity of the

bucket and rope sections is another feature of the Catenary Bulk Unloader. Each section is quick-coupled making the bucket train easy to lengthen or shorten. This quick-coupling feature also minimizes operating procedure and aids in maintenance of the equipment.

PACECO will manufacture and sell the new equipment through its headquarters office in Alameda, Calif., as well as through PACECO licensees on five continents.

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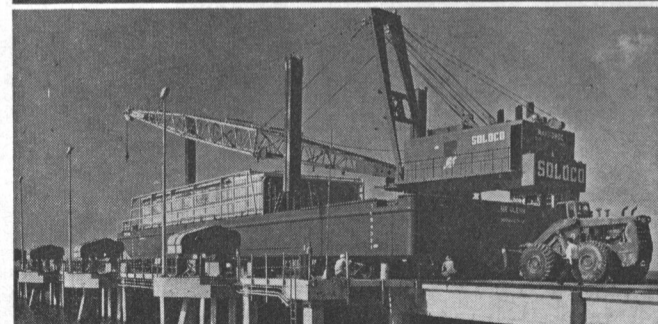
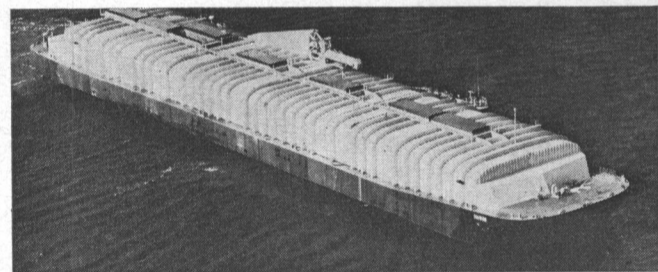
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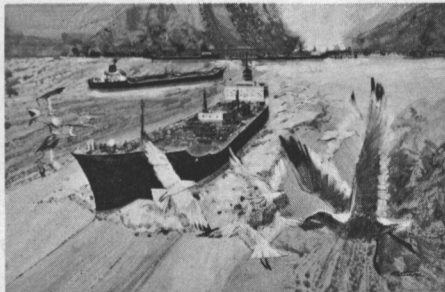
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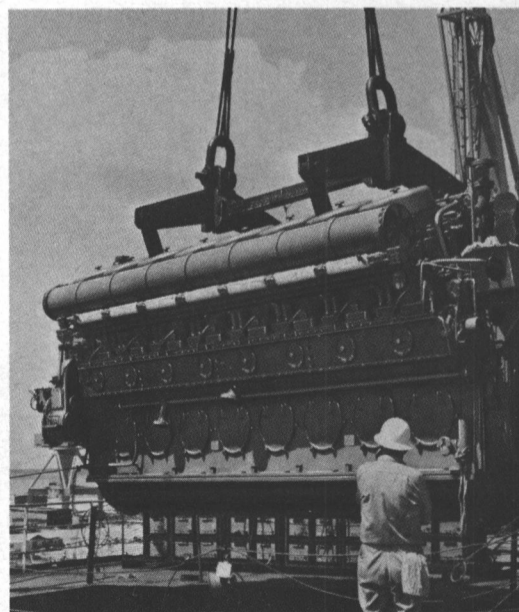
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\*S.E.M.T.-Pielstick is a registered trademark of Societe d'Etudes de Machines Thermiques, Paris, France.



**Colt Industries**

## Officers Reelected At Virginia Port Authority

The Board of Commissioners of the Virginia Port Authority, in action taken at their recent annual meeting July 21, have reelected their entire slate of officers to a second term.

Edward R. English, Altavista building contractor who was elected the VPA's first chairman in July 1970, will again lead the 11-

member board during the 1971-72 fiscal year.

Other officers chosen to serve second terms were: vice chairman, C.L. Jones Jr., plant manager of the Allied Chemical Corp. at Hopewell; secretary, L.C. Ackerman, president of the Newport News Shipbuilding and Dry Dock Co.; treasurer, Paul V. Fitchett Jr., VPA director of administration and personnel, and assistant secretary, J. Robert Bray, VPA counsel.

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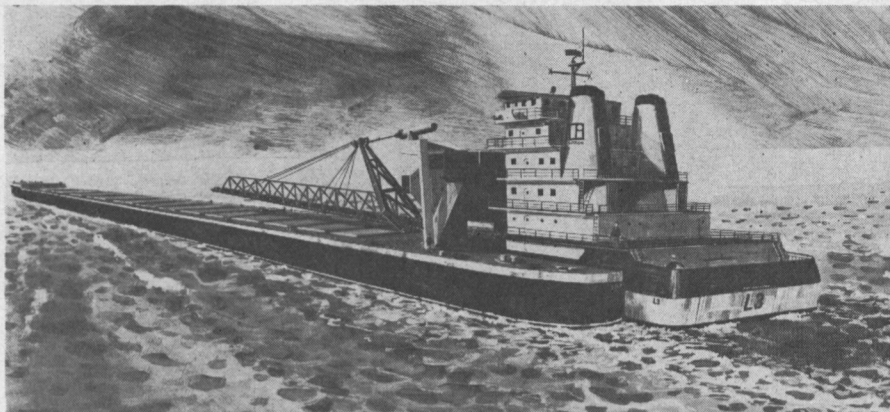
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## Litton Industries Plans To Build And Operate New Tug-Barge System On Great Lakes—Awards \$3.5 Million Tug Contract To Halter



Artist's concept of Litton Industries' newly-designed tug-barge system which will transport bulk materials on the Great Lakes. Combined with the tug, the complete system will be 1,000 feet long—the biggest size permitted by the Poe Lock passage at Sault Ste. Marie and the largest pusher-type tug-barge system in the world.

Litton Industries has announced plans to produce and operate the first of a new-type tug-barge system designed for transporting bulk materials on the Great Lakes.

The unique, self-unloading, 15,000 horsepower tug-barge system, with a deadweight cargo capacity of approximately 52,000 long tons, will be the largest pusher-type tug-barge system operating in the world. It will carry iron ore and pellets, coal, limestone and grain between Great Lakes ports in the United States and Canada.

The huge barge is being produced at Litton's Erie Marine division in Erie, Pa. Litton recently awarded a contract for approximately \$3.5 million to Halter Marine Services, Inc. of New Orleans, La., for construction of the world's largest pusher-type tug boat. The contract with Halter includes installation by Halter Marine of the main engines, propellers and other equipment furnished by Litton.

The powerful tug will be 152 feet long and 54 feet wide, with twin 7,500 horsepower engines driving separate controllable-pitch propellers. Litton and Breit Engineering Inc., also of New Orleans, are co-designers of the tug.

The Litton barge, 975 feet long, 105 feet wide, and 28½ feet maximum draft, will be 1,000 feet long when attached to the tug—the maximum length permitted by the new Poe Lock passage at Sault Ste. Marie.

A large notch in the barge stern will accommodate the bow of the pushing tug. The newly-designed rigid connecting system, invented by Breit Engineering, will permit the tug and barge to function as an integral unit in all kinds of weather, including high seas. The connecting system will also permit quick and easy separation for added operational flexibility and maintenance.

The self-unloading system uses a boom that reaches 200 feet over either side of the barge to discharge materials at rates up to 10,000 tons per hour into storage piles or shore side hoppers. The barge can be loaded at pocket docks as well as sites using conveyor systems.

Litton's new tug-barge system is expected to provide significant economies over conventional tug-barge units. It also offers several major advantages over self-propelled cargo ships, including: lower operating costs, lower construction costs, and greater operational flexibility. The new tug-barge system is designed to perform with the same speed and turnaround time as conventional bulk cargo ships.

Litton Industries, headquartered in Beverly Hills, Calif., is a major multinational corporation specializing in products, systems and services for business, defense, marine, industrial and professional markets.

## Panel Evaluates Container Systems For Use By Navy

A panel of the Maritime Transportation Research Board of the National Academy of Sciences recently completed a report recommending the testing of several container systems for use in naval under way replenishment. The panel, chaired by Rear Adm. John W. Ailes III, USN (ret.), was formed by the Maritime Transportation Research Board at the request of the Chief of Naval Research to evaluate the capability of the merchant containership fleet to perform replenishment-at-sea operations.

In addition to Rear Admiral Ailes, the panel members participating were: John W. Boylston III, Sea-Land Service, Inc.; Capt. Robert L. Evans, USN (ret.); Dr. Peter Van Dyke, Hydronautics, Inc., and Charles M. Wax, The Boeing Company. John Leeper of the Maritime Transportation Research Board staff was Project Manager.

The Maritime Transportation Research Board is chaired by Edgar F. Luckenbach Jr., president and chairman of the board of Luckenbach Steamship Company, Inc. The board's executive director is Rear Adm. John B. Oren, USCG (ret.).

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## Westinghouse Electric Awarded \$44.9-Million Subcontract By Litton

Litton Industries has awarded Westinghouse Electric Corporation a multi-year subcontract with a potential value of \$44.9 million to produce the main reduction gears for 30 U.S. Navy Spruance class destroyers, according to an announcement by Dr. R.L. Roderick, Litton Ship Systems presi-

dent. The initial award covers the main propulsion reduction gear assemblies on the first nine ships and totals \$15.4 million.

Dr. Roderick stated: "This is one in a continuing series of significant major subcontracts that will be awarded on this important national defense effort to produce these advanced multi-mission U.S. Navy destroyers. Within the next few months, subcontracts worth nearly 56 percent of the dollar value of

each ship will have been awarded to hundreds of companies throughout the United States."

Previous awards on this program include a multi-year subcontract to General Electric of Cincinnati with a potential of \$130 million for marine gas turbine engines and a potential \$101-million subcontract to General Electric of Syracuse for sonar systems.

Litton received the prime multi-year contract from the U.S. Navy

with a potential total ceiling price of \$2.14 billion for the production of 30 Spruance class (DD-963) destroyers in June 1970. Three ships were initially funded by 1970 appropriations providing for a ceiling price of \$214 million. In January 1971, Litton received an additional authorization of \$357.8 million for the second fiscal increment which provided for the production of six additional ships. This increment was the second in a planned five consecutive fiscal year procurement program.

The subcontract to Westinghouse calls for the design and production of 60 main reduction gear assemblies—two for each of the 30 Navy multi-mission destroyers. These gears will reduce the speed of the marine gas turbine engine shafts—rotating at over 3,000 revolutions per minute—to the rotational speed required to drive the destroyer's controllable pitch propellers.

Each gear assembly will weigh nearly 100 tons and are machined to within the close tolerances of a fine watch and must operate virtually vibration free to assure a quiet ship for antisubmarine warfare missions. The gear assemblies will be built by Westinghouse Marine Division at their plant in Sunnyvale, Calif.

These Spruance class ships, the first general purpose destroyer production program since the late 1950s, will be the backbone of the U.S. Navy's destroyer forces in the 1970s and beyond. The destroyers were designed by Litton Ship Systems Division's marine technology center at Culver City, Calif. They will be series-produced at Litton Ship Systems' new ship manufacturing facility at Pascagoula, Miss. The new ship production plant, the most advanced in the world, will manufacture the destroyers using modular techniques.

Litton Industries, headquartered in Beverly Hills, Calif., is a major multinational corporation specializing in products, systems and services for business, defense, marine, industrial and professional markets.

## Santa Fe Drilling Names L.M. Jones

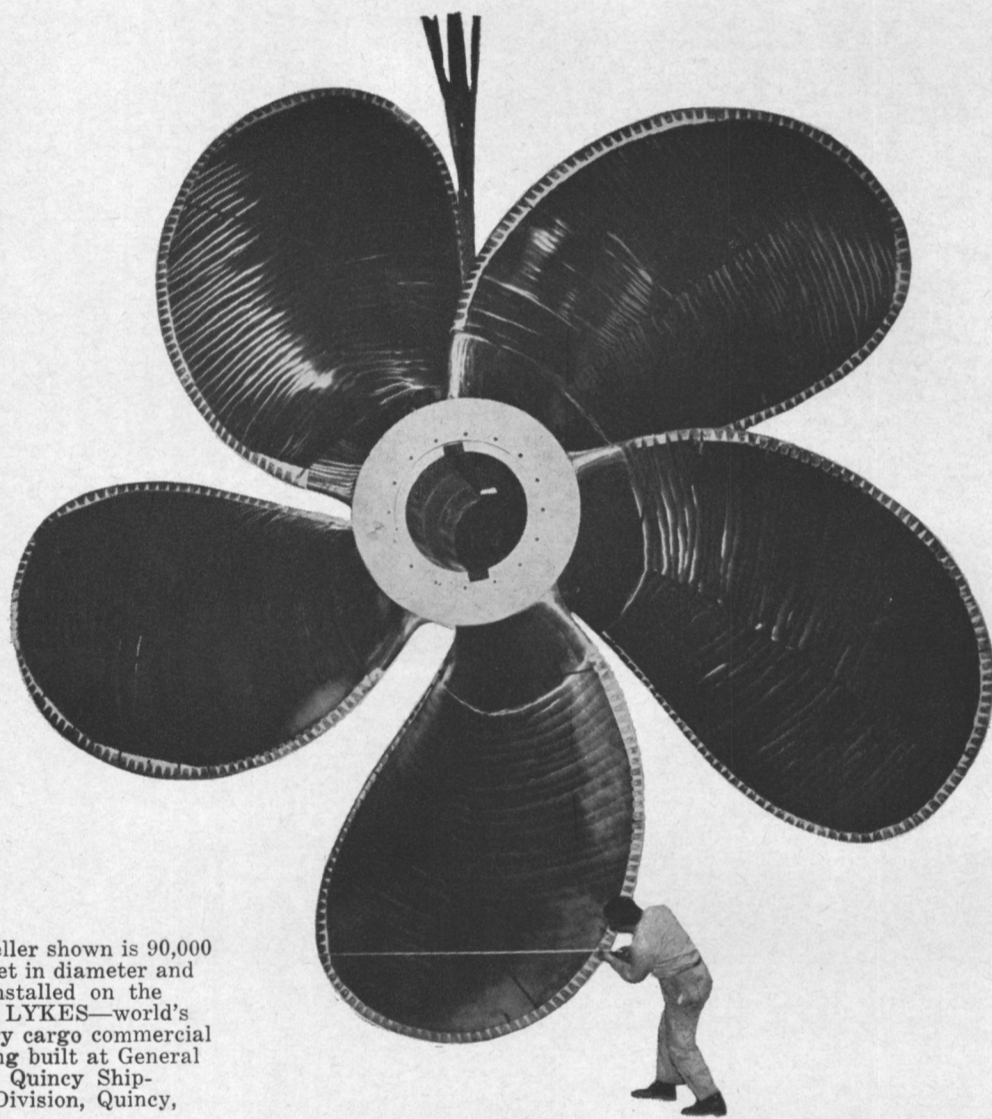
Lawrence M. Jones has been named vice president and regional manager, Western Hemisphere, for Santa Fe Drilling Co.

Before moving to the company's new headquarters in Orange, Calif., Mr. Jones had been stationed in London since 1968 as assistant manager, Eastern Hemisphere. In his new assignment, he is responsible for all Santa Fe drilling operations in North and South America.

A 1956 petroleum engineering graduate of Colorado School of Mines, Mr. Jones worked for Mobil Oil Co. five years before joining Santa Fe in 1961.

During his 10 years with Santa Fe, Mr. Jones has been assigned to Peru, Chile, Venezuela, Iran, Libya, Abu Dhabi, Lebanon, England, and California.

## all bronze...and 10 yards wide



The propeller shown is 90,000 lbs., 28 feet in diameter and will be installed on the DOCTOR LYKES—world's largest dry cargo commercial ship—being built at General Dynamics Quincy Shipbuilding Division, Quincy, Mass.

## new Ferguson Propellers finished to 140,000 lbs 30 foot diameter - in all bronze alloys

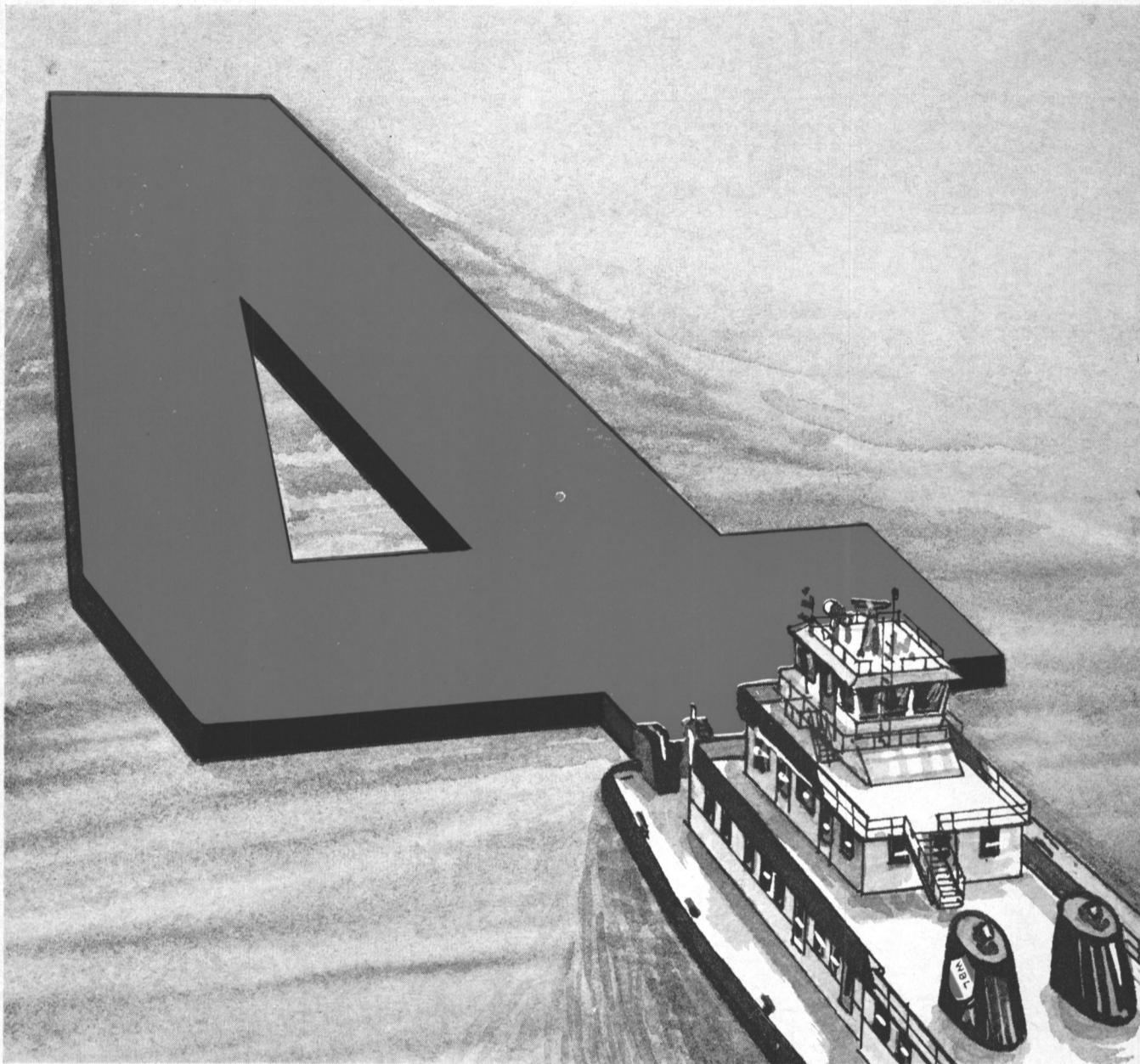
We put the best into a new wheel . . . get the most out of a reconditioned one . . . and the best includes not only materials but a superior "know-how" gained from producing propellers for most of

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## 4TH ← HYDRODYNE IN 4 YEARS FOR WISCONSIN BARGE LINE, INC.

Wisconsin Barge Line recently added its 4th Hydrodyne towboat to its ever growing fleet. Twin screw engines, generating 7000 hp, make the new M/V Myra Eckstein the most powerful towboat in the Wisconsin fleet. The M/V Kathryn Eckstein and the M/V Penny of Cassville, delivered in 1968; and the M/V Rose Tranchita, delivered in 1970, have proved their maneuverability, speed and thrust to the experienced crews

that man them. The efficiency and economy of Hydrodyne engineering, have proved themselves to Wisconsin Barge Line management.

Next time you need a towboat, think Hydrodyne. ←HYDRODYNE towboats are built exclusively by St. Louis Ship . . . America's Largest Inland Shipbuilding and Repair Firm. Call us at (314) 638-4000, if we can help you.



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## Nippon Kokan Receives Rights To Manufacture LNG Cargo Tanks

Rights to manufacture and market an improved cargo tank for use in ocean transport of liquefied natural gas (LNG) have been granted by Gaz-Transport S.A.R.L. of France to Nippon Kokan (NKK), Japan's leading shipbuilder-steelmaker-fabricator.

Hiroo Ikematsu, NKK New York shipbuilding department manager, said Gaz-Transport will provide technical assistance and data under terms of the agreement.

Known as membrane tanks, the improved units feature double layers of insulation box barriers and use of thin 36 percent nickel steel which has a very low thermal expansion coefficient. These permit elimination of the complicated

construction required in conventional LNG tanks due to contraction and expansion of tanks during loading and unloading.

Steel materials used in the membrane tanks include corrosion-resistant aluminum alloy, 18-10 stainless, 9 percent and 36 percent nickel alloy.

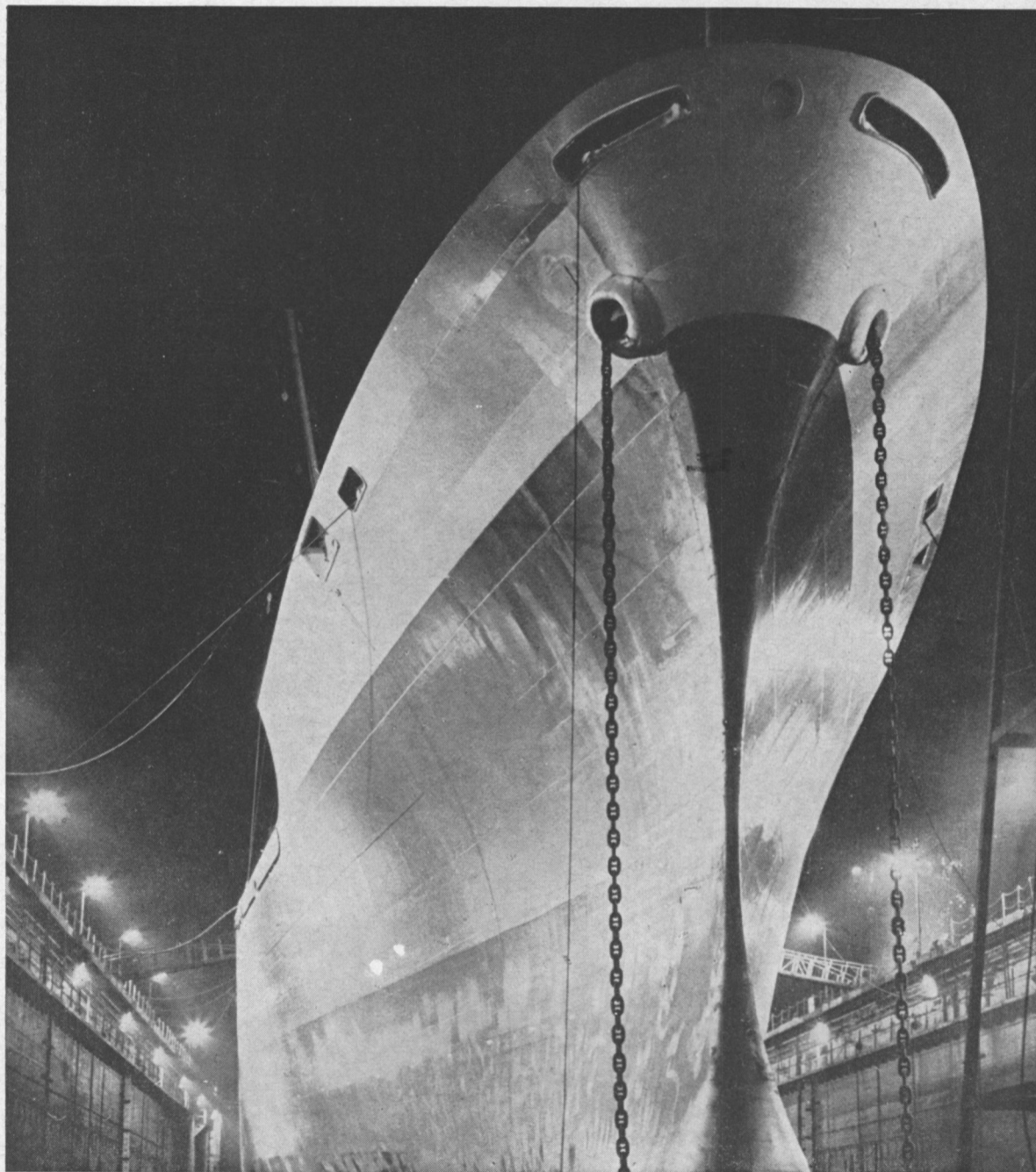
LNG must be maintained during transport at a temperature of minus 162 degrees centigrade, under

normal pressure. Ships assigned to this service must therefore be fitted with special cargo tanks and cargo loading and discharging equipment.

Currently, there are three types of LNG carrier cargo tanks: the independent type in which separate tanks are fitted onboard; semi-independent or semi-membrane type tanks, and membrane tanks which are reported to be especially advantageous for large capacity LNG carriers.

Of the nine LNG carriers presently in service worldwide, two are equipped with Gaz-Transport membrane tanks. Eight of the 25 LNG carriers now under construction or on order will also be equipped with the Gaz-Transport units.

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The longer your ship is in drydock, the longer it is before you start making money again. You know it and we know it.

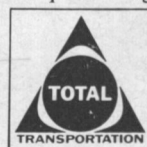
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right. We've got 2300 men, every one of them a professional.

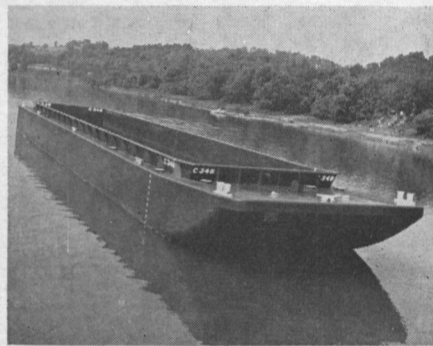
When your ship needs service, you can't afford to wait around. We don't make you. Maryland Shipbuilding & Drydock Co., a subsidiary of Fruehauf Corporation. P.O. Box 537, Baltimore, Maryland 21203. New York Sales Office: 1 Battery Park Plaza, New York, N. Y. 10004 (212) 943-2397.



## Maryland Shipbuilding & Drydock Co.

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## Hillman Delivers 35th Of 52-Barge Order

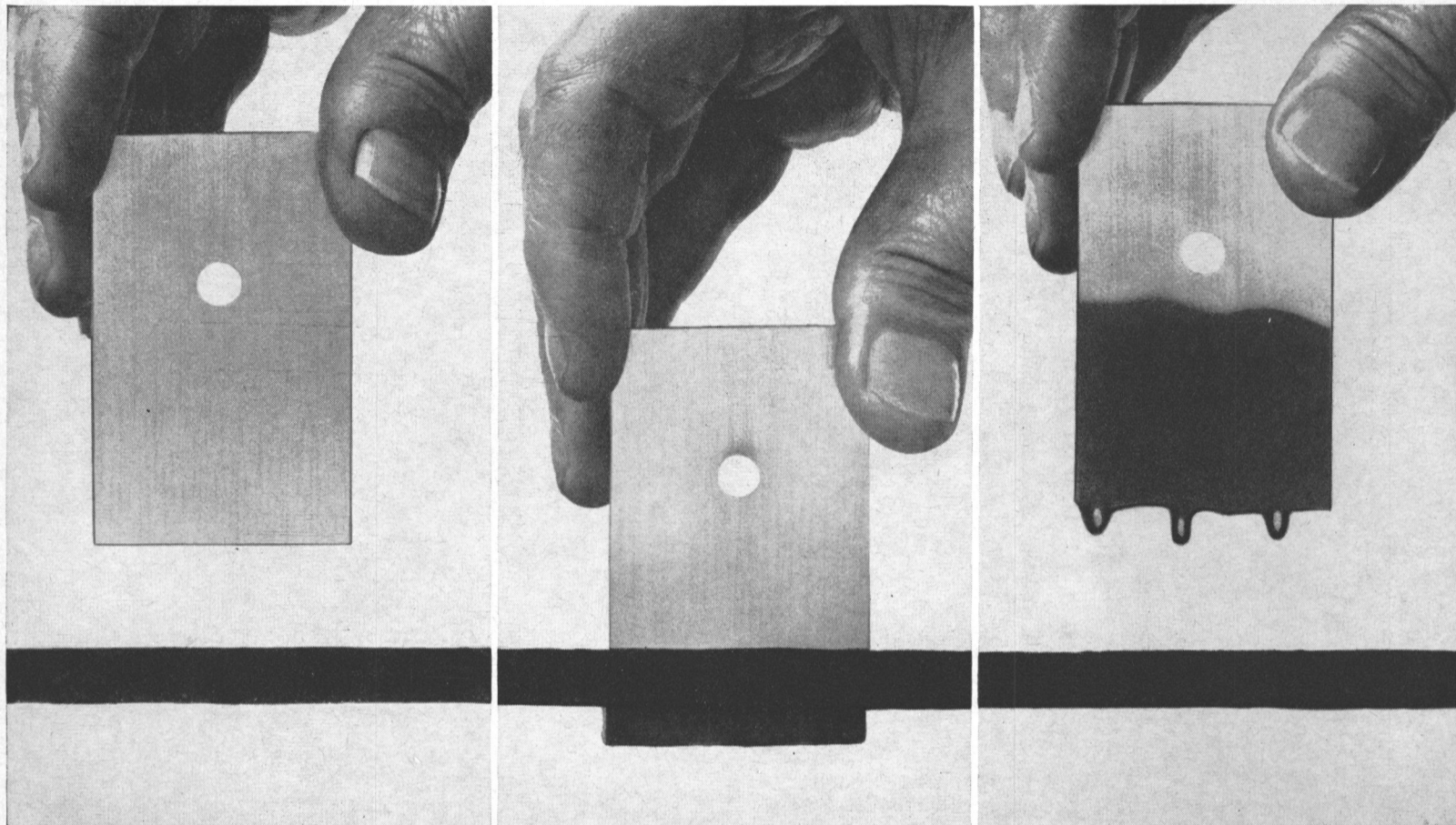


Each of these heavy duty barges has a cargo capacity of over 1,500 tons at normal operating draft.

Hillman Barge & Construction Company, Pittsburgh, Pa., recently launched and delivered the 35th of an order of 52 open hopper barges to the Crouse Corporation of Paducah, Ky. These heavy duty barges are 195 feet long, 35 feet wide; and 11 feet deep. Each has a cargo capacity of over 1,500 tons at normal operating draft. These semi-integrated barges are designed for the severe operating conditions in the particular segment of the coal transportation trade in which Crouse Corporation engages; they feature rake sections especially designed to alleviate flooding problems in the event they become damaged, and other special innovations to help protect the coaming and inner hoppers from bucket damage during unloading. A feature of the barges in the current order is a steep slope sheet extending from the top of the bow coaming to the inner bottom. This slope sheet is designed to minimize bucket damage and is also ideal for use with continuous ladder unloaders now coming into widespread use. The barges have hand winches on both bow and stern to facilitate making up tows.

Crouse Corporation is currently moving more than 14,000,000 tons of coal annually, primarily servicing electric power generating stations along the Ohio, Mississippi, Green and Tennessee rivers. With the addition of this Hillman order, the company will have 300 coal barges of this size in service.

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FLOATCOAT	300,000	\$7,654	\$.026

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Floatcoat floats on the surface of the ballast water.

Each time you raise or lower the ballast water level, you automatically apply a new coat of rust-proofing.

No surface escapes Floatcoat.

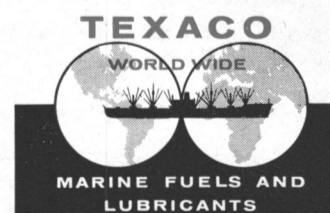
Not even hidden corners or pockets.

To keep ballast tanks, cofferdams, and rudder interiors really rust-free, remember this: you float, we coat.

Ask your local Texaco Marine Engineer about it.

Or send for the free booklet: "Texaco Floatcoat."

Write: Texaco, Inc., International Marine Sales Dept., 135 East 42nd Street, New York, New York 10017.





# National Marine Service and Goulds Pumps

**join to bring you the best in service and pumps.**

National Marine Service, Inc. of St. Louis now stocks the complete line of Goulds Autoprime® pump parts and components, including bowl assemblies that can be fitted to any deep well barge pump.

Marine Service now becomes the most complete marine pump service organization anywhere on the Mississippi Inland Waterways, offering:

- Round-the-clock service, seven days a week.
- Central location with excellent air, rail, truck and water transportation for fast service.
- Experienced technical advice.
- Skilled, experienced pump mechanics and machinists to service Autoprimes and deep well barge pumps.
- Complete machine shop and tooling facilities for pump repairs, including metalizing shafts.
- Complete facilities to gas free barges for pump removal or repair.
- Crane barges and tug service to remove or replace pumps.

The Goulds Autoprime pumps

unload and strip product tankers and tank barges faster than any pumps developed. When operating through a suction manifold system, they discharge air or vapors quickly and automatically, and prime without auxiliary equipment. Stripping is complete to the last small amount, with no back flooding or special attention required.

The Autoprime has a fabricated steel discharge head, heavy-duty flanged discharge column, over-sized 416 stainless steel lineshaft, balanced impellers, and a maximum 5-foot bearing span for vibration-free operation.

National Marine Service capabilities complements Goulds Pumps products and service for the marine industry. Goulds' network of sales offices include:

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1760 Tully Circle, N.E., Atlanta, Georgia	30329 404-636-0388
P.O. Box 15673, Baton Rouge, Louisiana	70815 504-927-3870
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P. O. Box 25146, Houston, Texas	77005 713-782-7530
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354 Lancaster Ave., Haverford, Pennsylvania	19041 215-TR8-0921 215-MI9-3600
710 Benedum Trees Blvd., 223 Fourth Ave., Pittsburgh, Pa.	15222 412-281-4522
5928 Nine Mile Rd., Richmond, Virginia	23223 703-737-2868
1401 S. Brentwood Blvd., St. Louis, Missouri	63144 314-961-1900 314-961-2226
1034 Stuart St., Lafayette, California	94549 415-283-6144

Call or write for Goulds Autoprime Pump Bulletin 3A.6.

Goulds Pumps, Seneca Falls, New York 13148

 **GOULDS PUMPS, INC.**  
Vertical Pump Division



# THE BOSTON METALS CO.

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

Main Office: LExington 9-1900 • Marine Dept.: ELgin 5-5050

## TURBO GENERATOR SETS

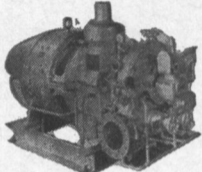
1



WESTINGHOUSE  
440/3/60  
200 KW UNIT

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

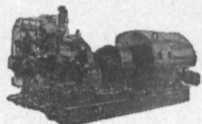
2



WESTINGHOUSE  
60 KW 120 VDC  
M-20-EH

120 VDC—1800 RPM TURBINE: M-20-EH—20 lbs—dry & saturated—25" vacuum. 7283 RPM. GEAR: 7283/1800. GENERATOR: 60 KW—120 VDC—500 amps—SK—stab. shunt wound.

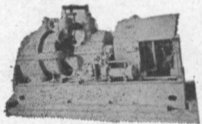
3



300 KW  
WORTHINGTON-MOORE  
CROCKER-WHEELER  
UNITS

AP2 ExMedina Victory units. Worthington-Moore turbine—440 lbs—740°TT—28 1/2" vac.—type S4—5-stage—6097 RPM—serial 7547 & 7548. GEAR: 14x7—6097/1200. GENERATOR: Crocker-Wheeler 300 KW 120/240 DC—1250 amps—type 102-H—compound—973643—999759—armature flange 8 1/4" bolt circle 7"—12 holes. Also new armature in stock (weighs 1840 lbs). Also have 2 units—generator 102 HP—300—KW120/240—stab. shunt—1200 RPM.

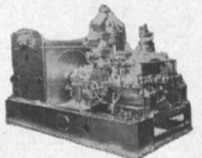
4



VICTORY 300 KW  
WESTINGHOUSE TURBO  
GENERATOR SET

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

5

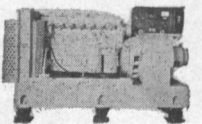


1000 KW G.E. TURBO  
GENERATOR—READY  
TO GO—WITH A.B.S.

TURBINE: Type FSN—eight stage—9268 RPM—525 lbs—825°TT or 590 PSI & 0° superheat. Turbine serial No. 53729. GEAR: Serial 54804—9268/3600. GENERATOR: Serial 5596572—1000 KW—450 volt 3-phase 60 cycle—3600 RPM—0.8 PF—type ATB—2-pole—complete with air cooler. EXCITER: EDF—10.2 KW—120 volts—4-pole—3600 RPM—direct connected. UNIT JUST COMPLETELY OVERHAULED & IN EXCELLENT CONDITION—READY TO INSTALL.

## DIESEL GENERATOR SETS

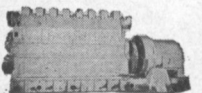
6



G.M. 6-71 DIESEL  
GENERATOR SET

60 KW—440/3/60—1200 RPM—with switchgear.

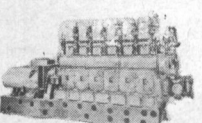
7



350 KW 120/240 VDC  
DIESEL GENERATOR SET

Ingersoll-Rand heavy duty type S engine—8 cyl.—505 HP—10 1/2" x 12. GENERATOR: G.E. 350 K.W. 120/240—600 RPM—switchgear. Good condition—as removed from Grace Line ships.

8

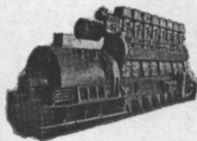


250 KW DIESEL  
GENERATOR SET

ENGINE: Enterprise 12 x 15 DSG-6—6 cyl.—450 RPM crank No. 501. GENERATOR: Westinghouse 250 KW—120/240 DC—1040 amps—450 RPM. Typical serial No. 3S-10P-913. Complete with switch gear.

\$12,500.

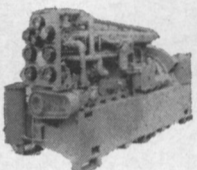
9



UNUSED 500  
KW 120/240 VDC  
BALDWIN/ALLIS  
CHALMERS DIESEL  
GENERATOR SET

ENGINE: Baldwin-DeLaverne 725 HP—12 1/2" x 15 1/2"—8 cyl.—500 RPM—air starting. Dry weight 54050 lbs. GENERATOR: Allis-Chalmers 500 KW—120/240 VDC—500 RPM—550 RPM overspeed. 60°C rise—class B insulation—3-wire—25% unbalance—2083 amps—stab. shunt—open—drip-proof—self-ventilated—8-poles.

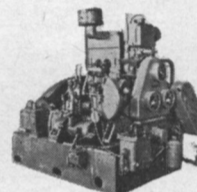
10



UNUSED 100KW  
SUPERIOR DIESEL  
GENERATOR SET

GENERATOR: 120/240 VDC—417 amps—stab. shunt—1200 RPM. DIESEL: Superior GBD-8—8 cyl.—5 1/2" x 7.

11



UNUSED  
10 KW SUPERIOR  
DIESEL GENERATOR SET

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

## TURBINE ROTORS

### MAIN PROPULSION

12



19 STAGE  
WESTINGHOUSE  
H.P. ROTOR FOR  
AP2 VICTORY

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

13

## SPECIAL! COMPLETE TURBINE OR ROTORS

8500 HP G.E. C-3 Victory—Sun C-4's

L.P.—Serial 77943 H.P. Serial 77942  
G.E.I. 16263

14

### NEW L.P. BLADE RINGS

for large 8500 H.P. Victory  
Joshua Hendy Westinghouse

15

### NEW 8500 H.P. G.E. TURBINES

Large Victory or C-3

H.P. #72271 L.P. 72272

10 BOXES SPARE PARTS, TOOLS & FITTINGS. WITH MANEUVERING VALVES.

ALSO AVAILABLE

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

With 13 boxes spare parts. H.P. 77994—L.P. 77987—with maneuvering valves.

16

17

9500 H.P. G.E. — C-3 OR VICTORY  
H.P.—8-stage—6159 RPM—serial 62043  
L.P.—8-stage—3509 RPM—serial 62042  
G.E.I. 16263

18

6000 H.P. G.E. — NORTH CAROLINA C-2  
H.P.—8-stage—serial 78040  
L.P.—7-stage—serial 78043  
G.E.I. 16262

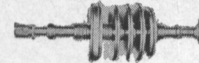
19

VICTORY SHIP AP2 H.P. & L.P. TURBINES  
NEW — UNUSED — 6000 HP SETS  
G.E.—H.P. & L.P.—with throttle valve  
Westinghouse—L.P.—with throttle valve  
Allis-Chalmers—H.P. & L.P.—with throttle valve

## AUX. GEN. ROTORS

20

250 KW & 300 KW  
ALLIS-CHALMERS ROTORS



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

21

300 KW 5965 RPM JOSHUA HENDY  
Turbine—3H-69 Gear—52269  
Turbine—3H-52 Gear—52252  
Turbine—3H-62 Gear—52262

## T-2 ROTORS, STATORS COOLERS, ETC.

22

ELLIOTT 10-STAGE MAIN PROPULSION  
TURBINE ROTOR

#28702—Ex-Texas Trader—will interchange with large G.E. 1st Row—1 1/8" to shroud—1 3/16" O.A.H. 2nd Row—1 7/16" to shroud—1 9/16" O.A.H.

23



LARGE G.E.  
MAIN PROPULSION  
SCHENECTADY  
TURBINE ROTOR

Turbine serial 77418—reconditioned with certificate. Just out of Beth shop 1970.

24

AUXILIARY GENERATOR ROTORS



DORV—325M—T-2 Tanker Aux. Generator.

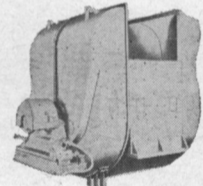
25



WESTINGHOUSE  
MAIN PROPULSION  
REVOLVING FIELD

Ex-Ohio Sun—A.B.S.—ready to go. Serial 25R10

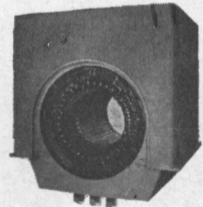
26



WESTINGHOUSE  
MAIN GENERATOR  
STATOR

A.B.S.—ready to go—certificate 70BA5297—May 19, 1970—Rewound.

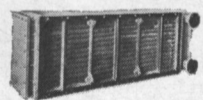
27



G.E.  
MAIN GENERATOR  
STATOR

A.B.S.—ready to go—mfg. by Elliott for G.E.—over G.E. design.

28



WESTINGHOUSE  
MAIN GENERATOR  
AIR COOLER

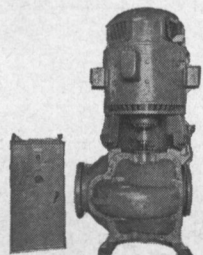
Reconditioned with A.B.S.

29

UNUSED G.E. MAIN GENERATOR  
AIR COOLER

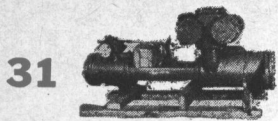
## PUMPS

30

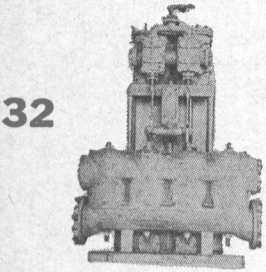


VICTORY AP2 MAIN  
CIRCULATOR

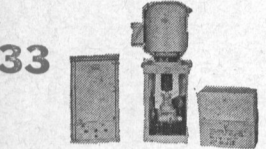
Ingersoll-Rand — 18 VCM—20" x 18"—10,500—10 lbs. MOTOR: 75 HP—Allis Chalmers—230 VDC—670 RPM. Spare unused armature. Motor frame F.B.V.—162.



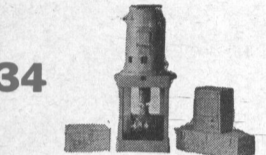
**31** **UNUSED 10x9x12 VERTICAL SIMPLEX FUEL OIL TRANSFER PUMPS**  
Furnished on some T-2 Tankers. 160 GPM Bunker C—viscosity 70 to 700 SSF 122°F @ 100 lbs. discharge pressure. WP steam 150 lbs.—exhaust 10 lbs. 1 1/4" steam inlet—1 1/2" exhaust. 4" Pump suction—3 1/2" discharge.



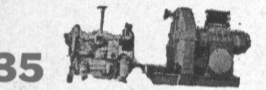
**32** **WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP**  
1400 GPM @ 110 PSI—suction lift 11.5 ft.—steam back pressure 15 lbs. 14" Suction—10" Discharge—2 1/2" Steam—4" Exhaust. Overall width 6'8"—Overall height 9'1 1/2"—depth 3'9 1/2"—wt. approx. 10,000 lbs.



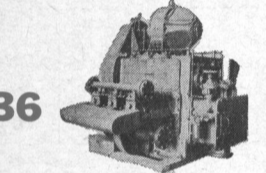
**33** **NEW BLACKMER FUEL OIL TRANSFER PUMP**  
Rotary—50 GPM—50 lbs.—2"—5 HP—440/3/60—with starter & spares.



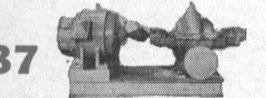
**34** **UNUSED BLACKMER VERTICAL ROTARY PUMP**  
4"—100 GPM—100 PSI—15 HP—440/3/60—gear head.



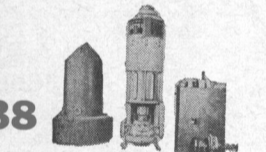
**35** **R-2418 WATEROUS CARGO PUMP**  
Bronze—14"—top discharge—capacity 2500 GPM—20 PSI. Bilge service—oil service—2400 GPM—75 PSI. Reduction gear. ENGINE: Cummins JN-130M—6 cylinder—4 1/8 x 5—130 HP—air starting.



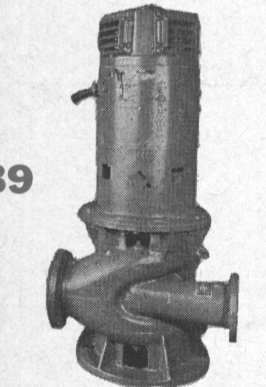
**36** **UNUSED BOILER FEED PUMP**  
Worthington Triplex—36.5 GPM—590 PSI—variable stroke—2 3/4 x 5—P<sub>2</sub>—S<sub>2</sub>—R<sub>2</sub> vessels. 40 HP—230 VDC—1800/2400 RPM.



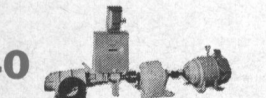
**37** **UNUSED WARREN BRONZE PUMP**  
1175 GPM—11.1 lbs.—8" x 8". MOTOR: Reliance 10 HP—115 VDC—850—RPM—76 amps.



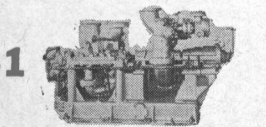
**38** **NEW WORTHINGTON VERTICAL SUBMERSIBLE BILGE PUMP**  
For emergency use on passenger ships, etc. PUMP: JAS—264 GPM—171' head—two 6" inlets—one 5" outlet. Motor: 40 HP—230 VDC—149 amps.



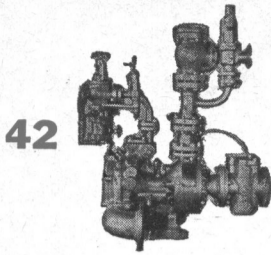
**39** **NEW—UNUSED BRONZE VERTICAL LST BALLAST PUMP**  
1500 GPM—56' head or 25 lbs.—8" suction—6" discharge. MOTOR: Century 30 HP—230 VDC—110 amps—1750 RPM—40° rise—stab. shunt—BB drip proof—controls available.



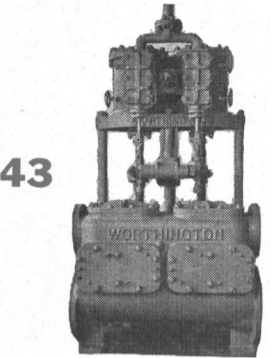
**40** **EXCELSIOR MOLASSES PUMP—SIZE 5 1/2"**  
6" Suction and discharge—210 GPM—45 PSI—125 RPM. MOTOR: 10 HP—230 VDC—Frame 67—with gear.



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

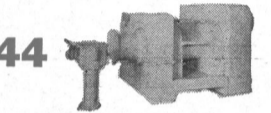


**42** **COFFIN MODEL F BOILER FEED PUMP—VICTORY OR T2**  
Control valve 1 1/4"—Form V1—constant pressure regulator—type C—150 HP—200 GPM at 575 lbs discharge pressure. 7200 RPM—440 PSI—500° TT.

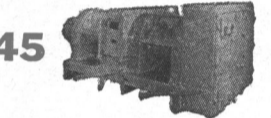


**43** **BRONZE 14x14x12 CARGO STRIPPING PUMPS**  
700 GPM @ 100 lbs. Ex-T2 Tanker pump. Also available in steel.

## WINCHES AND WINDLASSES



**44** **VICTORY UNIT WINCHES**  
50 HP—230 VDC—U-1, U-2, U-4, U-5—reconditioned.



**45** **MODEL U-6 DOUBLE DRUM WINCHES WITH GYPSIES**  
50 HP—230 VDC—reconditioned.



**46** **HYDE NO. 7 WINDLASS**  
1 3/4" Chain—Wildcat centers 3'3"—Handles 3000 lb anchors. MOTOR: 8.7/35 HP—440/3/60—1800/450 RPM.



**47** **NEW—UNUSED LINK BELT WINDLASS**  
1 1/2" and 7000 lb. anchors. 56" Centers—50 HP—230 VDC—spares.



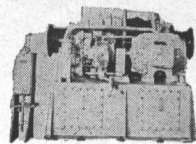
**48** **IDEAL WINDLASS—UNUSED**  
1-5/16" Chain—36" Centers—15 HP—115 VDC—1750 RPM—6000 lb. line pull.



**49** **UNUSED 70 HP MCKIERNAN-TERRY WINDLASSES**  
2 3/4" Chain and two 10640 lb anchor & 30 fathoms chain @ 30 FPM. 70 HP—230 volts—shunt DC motors—233 amps—550 RPM—55°C rise. Wildcat centers 47 1/2". Base 9'5" wide x 11' long. Weight 36,000 lbs.

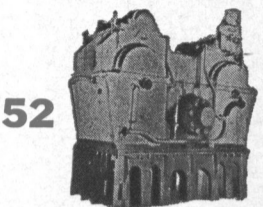


**50** **LCT-6 JAEGER GASOLINE DRIVEN WINCH**  
With torque converter & free declutchable drum, 31,000 lbs @ 6 FPM or 3000 lbs & 350 FPM. DRUM: 20"x23 3/4"x37 1/2". GYPSY: 15"x13". Twin Disc torque converter—6 cyl. Hercules gas engine model WXL-3. Total weight approx. 4500 lbs—serial 81843.

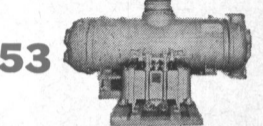


**51** **4 SINGLE DRUM ELECTRIC HYDRAULIC WINCHES**  
From Navy Research Ship Liberty AGTR-5. Like new. Mfg. by Lakeshore Engineering Co. Gypsy heads can be operated separately from drum. 7400 lbs @ 220 FPM; 624 ft. of 3/4" rope in 5 layers. Total weight of winch, motor & pump 7221 lbs. OAW 84 1/4"; OAL 88"; OAH 58". With remote control stands.

## MISCELLANEOUS



**52** **VICTORY AP2—WESTINGHOUSE MAIN PROPULSION GEAR**  
6000 SHP—Serial 4A—1620—Medina Victory.



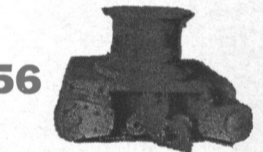
**53** **UNUSED 1135 SQ. FT. C.H. WHEELER CONDENSER**  
20" Ex. inlet—5/8" Cu-Ni tubes—with or without air ejector.



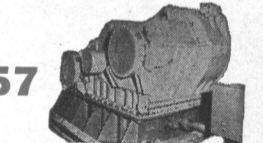
**54** **1 PAIR OF 300 HP UNION DIESEL ENGINES**  
Port and starboard—model 06—1300 HP at 350 RPM—4 cycle—direct reversible—11 x 15—overhauled 1966—in good condition. Just in from Navy.



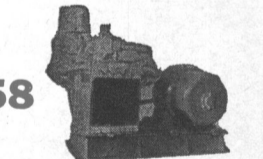
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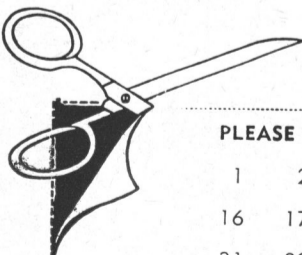
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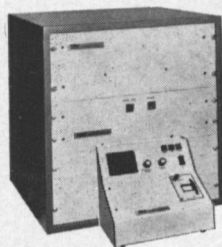
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## Colt Industries Desalting Unit To Be Installed On Huge New Jack-Up Type Drilling Rig

A sea water desalting unit designed and built by Colt Industries' Power Systems Division, Beloit, Wis., is being installed on a new offshore drilling rig. The announcement was made by F.J. Eubank, vice president and general manager of the Water and Waste Management Operation.

The huge jack-up type drilling rig is now under construction and is designed for operations in the North Sea. The unit is being built for Zapata North Sea, Inc., which is a subsidiary of Zapata Norness Incorporated of Houston, Texas. This company operates many drilling units in various world locations.

In making the announcement, Mr. Eubank stated: "The Colt Industries desalting unit features simplicity of design and automatic operation resulting in minimum operating labor. These features make the 15,000 gallon per day unit uniquely applicable for offshore equipment."

Designated as the Model 15VC1, the machine is an ambient temperature vapor-compression distillation desalter. It is completely packaged with only electric power needed to start operation. Because of low operating temperatures, corrosion and scaling are virtually eliminated. The compact unit is skid mounted, factory assembled and weighs less than 15 tons.

Aboard the new Zapata drill rig, the equipment will produce potable water for the crew of about 70 and will also supply enough fresh water, when required, for actual drilling operations. The product water is of high quality, with dissolved solids concentration in a range suitable for nearly all industrial and commercial uses as well as for human consumption.

"We at Colt Industries are heavily engaged

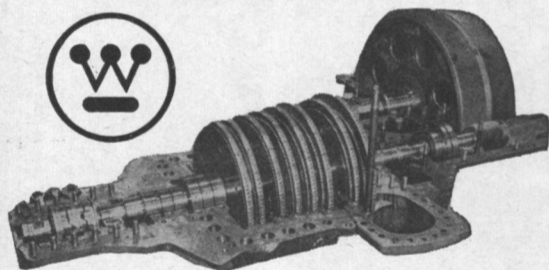
in research and manufacturing of marine water processing and pollution control equipment," Mr. Eubank commented. "Our sewage treatment plants are designed for military and commercial vessels and our desalting plants are producing fresh water in dry areas of the world."

Colt Industries also produces the world-famous Fairbanks Morse, opposed piston diesel engine, which has powered submarine and surface vessels for many years on the world's seaways.



**TAUBLER-DESIGNED:** Delivered recently to the Monrovia Port Management Company, Ltd., Monrovia, Liberia, was the new pilot boat Maryland, which was built by James & Stone (Brightlingsea) Ltd., Colchester, Essex, England. The new vessel has a length overall of 40 feet 6 inches, a beam of 12 feet 3 inches, and a loaded draft of about 4 feet. The boat is powered by two Caterpillar model D333 diesel engines developing 190 bhp each. The hull and superstructure is of welded steel construction. A heavy duty rubber guard is fitted around the entire periphery of the main deck. Equipment includes a recording echo sounder, Marconi SSB radio, Johnson Messenger radio set, a V.H.F. radio set and lifesaving outfit. The vessel was designed by Richard R. Taubler, Inc., Brooklyn, N.Y., firm of naval architects.

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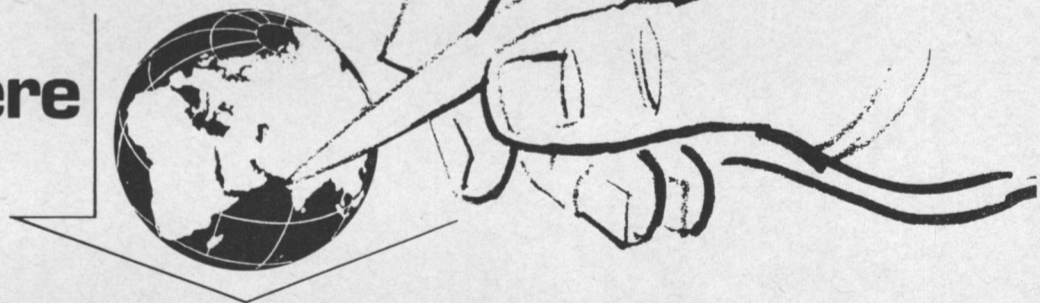
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**GROIGNARD CONVERSIONS:** Groignard Shipyards of Marseilles, France, recently completed the conversion of two Danish car-ferries into cruise ships. The vessels, Dana Corona and Dana Sirena, each 408-feet 6-inches long, were delivered to their owners, Det Forende Company of Copenhagen, Denmark, on schedule. Shown above are both vessels being completed simultaneously by the Groignard Shipyards in Drydock No. 9 of Marseilles, with the bow of one vessel in the raised position to permit the operation.

### John J. McMullen Buys Norton, Lilly & Company, Inc.

S.S. Norton and Joseph Lilly have announced the sale of Norton, Lilly & Company, Inc. and its subsidiary companies to Dr. John J. McMullen. In making the announcement, Mr. Norton and Mr. Lilly emphasized their pleasure and that of the existing management of Norton, Lilly, at the prospects of continued growth and development of the Norton, Lilly steamship agency business, which has been in their respective families since 1841. They also point out that Dr. McMullen has indirectly been associated with Norton, Lilly and its clients through his father before him since the time of World War I, and that such a continuity of tradition and spirit would continue to be the keynote of Norton, Lilly.

In joining with Mr. Norton and Mr. Lilly in the announcement, Dr. McMullen also emphasized his pleasure at the prospect of being associated with a name he has been familiar with since boyhood, and announced his determination that Norton, Lilly would continue to maintain the same type of prestige and performance that they have over the past 130 years.

The present management of the company will continue, and H.E. Bilkey, president for the last three years, will continue in that capacity, as will all of the other officers of the company. Skeffington Norton and Joseph Lilly will continue as directors of the firm and, in this capacity, lend their long experience to the future growth of the company.

At the same time, Dr. McMullen announced that John H. Griffith, presently vice president-Far East, U.S. Lines, Inc., will join Norton, Lilly (effective August 1, 1971) as chairman, and bring with him his acknowledged expertise and performance in the area of ocean transportation marketing and operations. Most recently, while at U.S. Lines, Mr. Griffith had full responsibility for the changeover from a traditional Trade Route 12 breakbulk service of USL in the Far East to one of the world's most modern containership operations, as typified by the U.S. Lines' Tri-Continental Service.

Dr. McMullen will not engage himself in the day-to-day activities of the company, but will leave these responsibilities to Mr. Griffith and Mr. Bilkey and will serve as a member of the board of directors, and will continue to devote himself to the activities of John J. McMullen

Associates, Inc., a firm of naval architects, marine engineers and transportation consultants.

Norton, Lilly was founded in 1841 as John Norton & Company, engaged specifically as merchants and charterers of sailing packets. Over the years, the firm has been involved in all aspects of international ocean transportation.

The advent of steam brought a rapid expansion in company activities, and in 1893, together with three British concerns, Norton & Sons established the first direct steamship services from New York to India, to South Africa and to Australia and New Zealand. Later, services were started to China, Japan and South America.

Their participation during World War I and World War II in managing ships for the War Shipping Administration and United States Agents for the British Ministry of War Trans-

port, as well as for "Notraship" Norwegian Government Shipping Agency, gained recognition as an outstanding management task. Over the years, many persons in the steamship business gained their experience at Norton, Lilly, and the name has been recognized as one of the outstanding agents in the United States.

Mr. Griffith, in accepting his position as chairman, and Mr. Bilkey, in continuing as president of the firm, both expressed their confidence and enthusiasm that the expertise as typified by the new ownership and management of the company would permit Norton, Lilly and its subsidiaries to broaden their participation as agents in the overall field of transportation. They believe that the time-honored reputation and performance of Norton, Lilly, coupled with vigorous and expert management, will result in Norton, Lilly making available to its clients an ever-improving capability.

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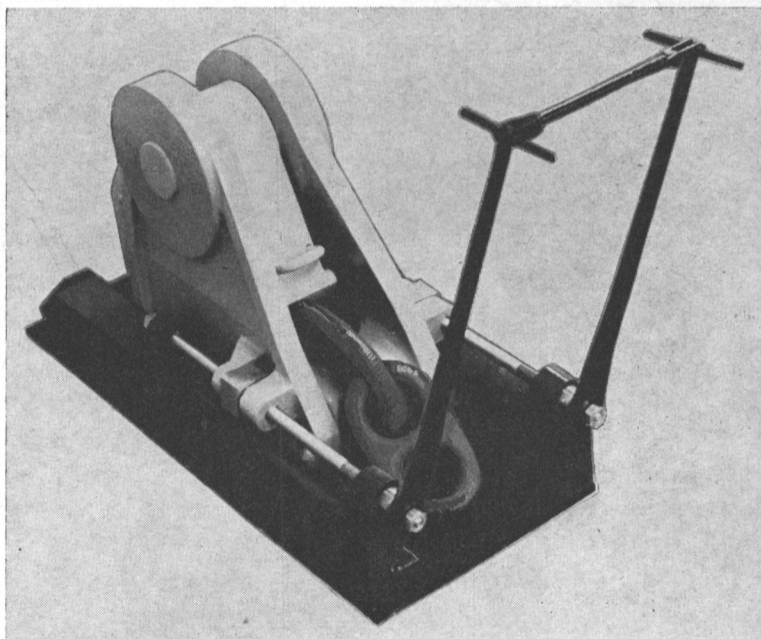
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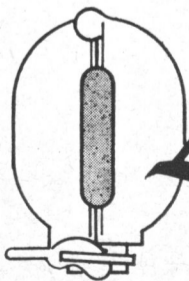
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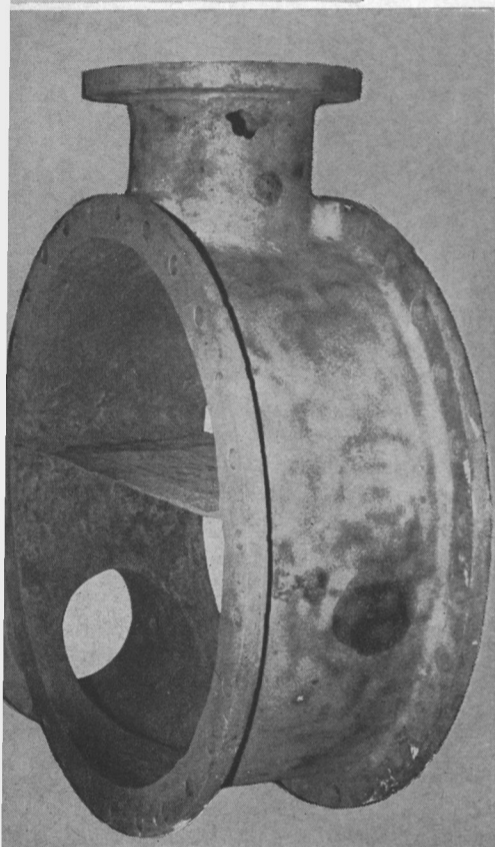
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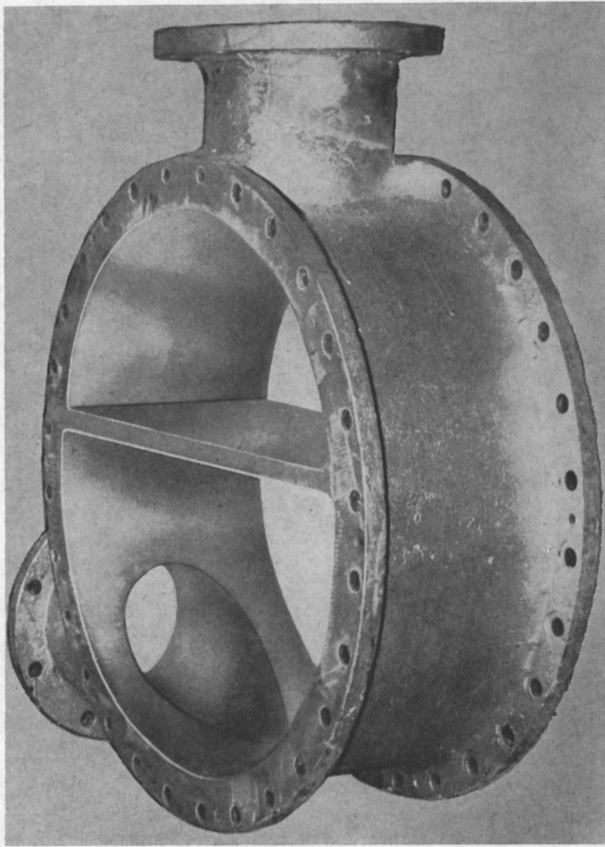
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## New Methods Are Proposed For

# Tank Washing Very Large Tankers

Richard G. Wooler, C.E.\*

Present systems used for tank washing on very large crude-oil carriers are basically enlarged versions of those that fulfilled the safety standards of the relatively trouble-free tankers of the early 1950s. However, recent tanker casualties, with resultant operational apprehensions, dictate a pressing urgency for long awaited improvements in systems design and revised operational techniques.

Most operators are well aware that tank washing cannot be safely fulfilled unless at least one of the following variables can be conditioned or eliminated:

1. Hydrocarbon gases,
2. Oxygen, or
3. Generation and charge accumulation of electric fields.

Very little can be done to change the natural phenomenon of static electricity, however, we can condition its charge accumulation by reducing unnecessary tank-washing turbulence.

Electric charging is very much dependent upon the velocity, splashing and spraying of the wash water. Since the operation of the rotating washing machine subscribes to these turbulent factors, it is well to review its operational cycle. The portable washing machine (the same principle applies to fixed-position machines as well) is lowered about 20 feet into the tank and secured. The primary purpose of this position is to wash the upper reaches of the tank. Since the cycle of the machine is geared for 360 degree sweeps, intermittent velocity jets are freely directed at the tank bottom. The violence of such repeated impinging prematurely releases gases from the bottom sludge and rapidly promotes a heterogeneous mixture of hydrocarbon gases, oxygen and charged mists throughout the tank.

During the operations of first, second and third drop positions, the tank is syphoning oxygen and being conditioned towards the upper explosion level. Further, the high velocity jets, freely directed at the tank bottom from closer proximity, increases the turbulence and gas generation from the piles of sludge lodged in inaccessible corners.

It would be a much safer operation if the washing machines, particularly when used in the upper and

intermediate wash positions, were designed for a limited degree of downward arc. This would eliminate direct bottom impingement. Consideration also should be given to reducing the degree of upward washing arc in the intermediate and bottom washing positions. There can be no benefit in uselessly directing intermittent high-pressure, high-velocity jets into an upper or lower void from great distances. Further, copious amounts of tank bottom sludge that continuously generate gas during conventional washing procedures should be removed first.

The industry may wish to evaluate submerged washing for tank bottoms. This method would be less hazardous and more practical for removing sludge.

It is proposed that tank bottom washing manifolds be fitted. These manifolds would be fitted with fixed fantail nozzles or oscillating nozzles and sectionally controlled, if desired. The jets should be angled downward to prevent any direct penetration of the ballast surface. The trim of the tanker by the stern should be regulated to prevent excessive sectional submergence of the nozzles. The nozzles should be submerged about two feet prior to starting the washing operation.

The close proximity of the bottom nozzles to the structure will allow effective use of solvents and warmer wash water. If solvents are used for bottom washing, the deck wash line should be thoroughly flushed prior to being used for upper area washing.

The maximum allowable pressure should be applied for submerged bottom washing. High turbulence is required to hold dispelled sludge and solid particles in liquid suspension. The solids in liquid suspension must be continuously discharged to the decanting tank or heavy slop tank. The initial rate of discharge should not displace the original two feet of submergence of the bottom nozzles. Also, holding the accumulating solids in suspension too long will increase the gravity of the ballast water and, thus, will require extreme turbulence to prevent precipitation. Such violent turbulence will unnecessarily accelerate unwanted ionization and the rise of charged mists.

Knowledge of the bottom sludge accumulations will decide the time element for washing. Operational experience will dictate the point of ballast saturation and the required pumping rate for continuous dilution and ultimate removal of all gas-generating sludge.

### Electrical Charge Potential

Electrically charged mists disperse slowly. The charge is normally grounded to the sea via the tank bulkheads and other structure. Charged mists also are liable to produce a spark by discharging through air to closer conductors. These conductors may be isolated structural points and, particularly, suspended conductors such as the nozzles on washing machines. The grounding of a suspended conductor is no guarantee of safety.

Since the amount of the electrical charge is greatest on protruding points on conducting bodies—and washing-machine nozzles meet these requirements—it would seem logical and prudent to equalize the potential on all parts by increasing the metal surface of nozzle tips. This can be accomplished by brazing to each nozzle end a hermetically sealed metal ball (an aspect of the "Van de Graaf" principle). The tapered nozzle would pass through the center of the ball and the end would be flush and contoured to the ball. Both ends of the nozzle penetration of the ball would be brazed to the ball. The diameter of the conducting ball is optional; however, the larger the better. The metal composition of the ball should be as identical as possible to the member to which it is fitted.

The use of conducting balls on suspended washing machines would require a minimum increase of 200 percent conducting capacity over the existing conductors imbedded in rubber suspension hoses. There also must be fail-safe grounding of the hose attachments to the washing machine and a connection to the deck wash line. It is felt that the principle would be ideal for permanently installed, fixed-position washing machines that directly ground to the ship structure.

### Operational Aspects

Prior to the start of tank washing, and subsequent stopping and starting, the full length of the fire line should be purged at its extremity for several minutes. The advantage of clearing the total system of hazardous start-up bursts of velocity air pockets and entrained solids will assist the cause of safety.

It is the opinion of the author that the most hazardous periods of tank washing are:

1. Two to five minutes after the initial start of tank washing because:
  - (a) Failure to purge the deck fire line of initial bursts of velocity air pockets and entrained particles, and
  - (b) light ballast and excessive speeds, combined with pitching and rolling,

encourage air intake at the wash-water pump suction.

2. Immediately after completing the washing of a particular tank or tanks. The diffuse pockets of like charged vapor mists that had been subjected to violent turbulence, spiralling and charge accumulation are abruptly tranquilized. Consequently, the mists give up their charges to conductors, such as cargo-tank bulkheads, and are safely grounded to the sea, or the charged mists discharge through the air to any neighboring and pointed conductor, such as a protruding and inactive washing-machine nozzle, thus producing a spark. Grounding of a suspended washing machine is no guarantee of safety.

## G.W. Gladders Towing Names Capt. Simpson Operations Manager

G.W. Gladders Towing Company, Inc., St. Louis, Mo., has announced the appointment of Capt. Bill S. Simpson as operations manager. Captain Simpson has been associated with Gladders for seven years as a master and for the past three years has served on the M/V Thomas W. Martin, owned and operated by the firm. In his new capacity, Captain Simpson will have responsibility for personnel, purchasing, repairs and maintenance, safety, and other operational areas.

Thomas L. Gladders, vice president of the concern, is relinquishing his responsibilities in the operations area and will devote full time to sales and administration from now on.

## Santa Fe Moving To New Quarters

Santa Fe International Corp. and its drilling and construction subsidiaries, Santa Fe Drilling Co. and Santa Fe-Pomeroy, Inc., are moving to new headquarters in Orange, Calif.

Edfred L. Shannon Jr., Santa Fe International president, said the company has leased more than half of the 12-story South Tower in Union Bank Square in Orange and plans to consolidate the principal operating divisions with the corporate staff.

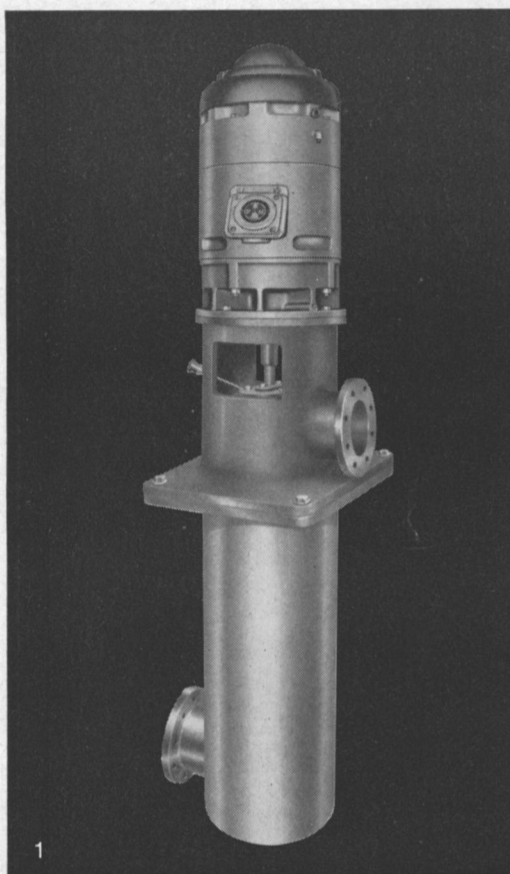
Santa Fe Drilling Co. and Santa Fe International have already moved into the new facilities, and Santa Fe-Pomeroy will move from San Francisco the end of this month.

The consolidation, Mr. Shannon said, is expected to improve communications and to make the company more efficient in conducting its worldwide operations. The new address of the companies is: Union Bank Square, South Tower, P.O. Box 1401, Orange, Calif. 92668.

Curran & Co., Santa Fe International's domestic pipeline construction subsidiary, will continue to headquarter in Aurora, Colo., and the pre-stressed-concrete and domestic construction divisions of Santa Fe-Pomeroy, Inc., will remain in the San Francisco Bay area, Mr. Shannon said.

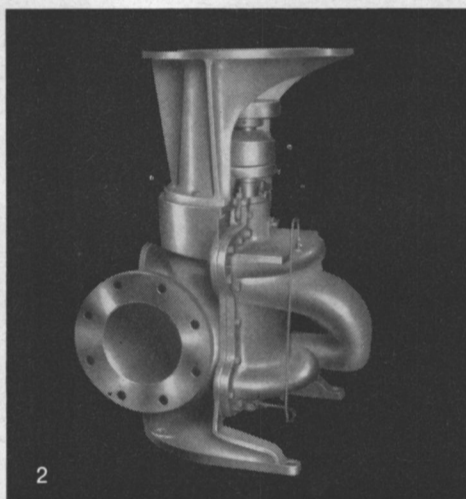
\* Mr. Wooler, an international marine surveyor and consultant located in Tenafly, N.J., recently retired from Mobil Oil Corporation where he was a superintendent engineer. His last two years of service were spent on Mobil's "Explosion Committee."

# Fairbanks Morse marine pumps

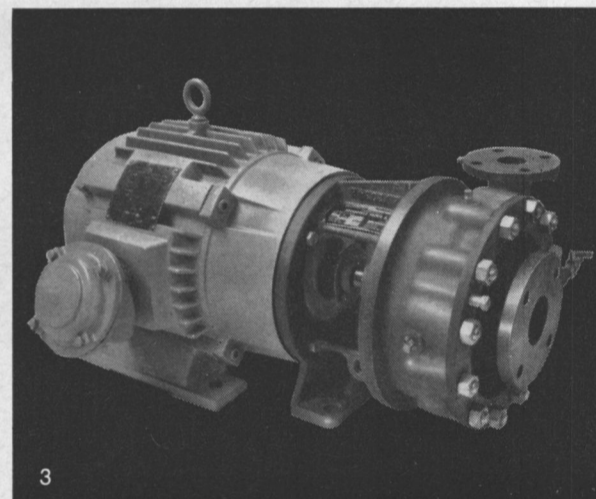


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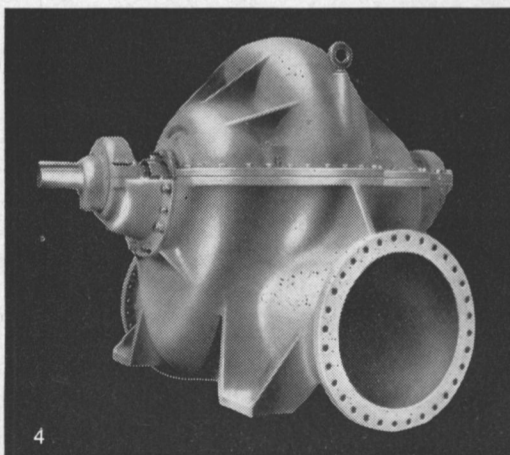
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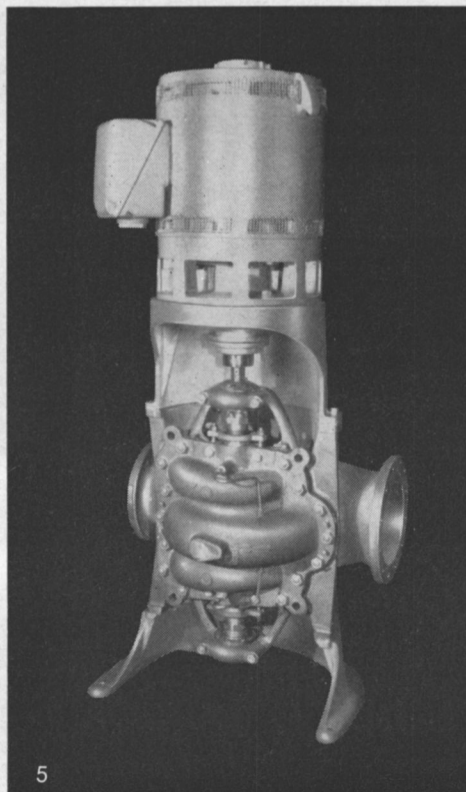
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**Colt Industries**

## Carboline Subsidiary Publishes New Guide On Protective Coatings

Admiral Paint Company, subsidiary of Carboline Company, St. Louis, Mo., has released a new 45-page illustrated Protective Coating Guide specifically devoted to coating recommendations for barges, work boats and motor vessels on coastal and inland waterways.

Coating recommendations are given for hulls, decks, interior spaces and rudders on tugs and work boats. Barge recommendations include systems for barge bottoms, sides and rakes, deck piping and equipment, voids and tank linings.

Technical Data Sheets on 18 separate products are included along with a partial list of Admiral users and a color chart.

This comprehensive Protective Coating Guide for barges, work boats and motor vessels is available to engineering design companies, naval architects, shipyards, owners and all personnel concerned with marine corrosion control. Copies may be obtained by writing Admiral Paint Company, subsidiary of Carboline Company, 328 Hanley Industrial Court, St. Louis, Mo. 63144.

## Nippon Kokan Plans Computer Controls For New Supertanker

An advanced computer-aided control system will be featured in a 259,000-dwt supertanker whose keel has just been laid at Tsu Shipyard of Nippon Kokan (NKK), Japan's only integrated shipbuilder-steelmaker-fabricator.

Hiroo Ikematsu, NKK's New York shipbuilding department manager, said computer control will be applied in the mammoth ship's anti-collision radar, speed measurement equipment, automatic chart position plotter, and boiler monitoring. Application of the monitoring system to a turbine ship will be the first ever attempted in Japan.

Scheduled for delivery in March 1972, the vessel will be equipped with OKITAC 4300 central computer unit with 16 kilo-word capacity of fixed memories and required accessories for data processing and calculation.

The system was developed jointly by Showa Shipping Co., Ltd., owner of the vessel; NKK, and Oki Electric Industry Co. Its primary purpose is to assess efficiency during normal vessel operations.

The radar installation will include an anti-collision indicator/digital display, 3 cm/5 cm microwave transmitting-receiving unit, and antenna. The anti-collision indicator will be provided with an automatic alarm which rings when other vessels come into the pre-set "warning ring."

Other vessels will be manually tracked on the radar unit. If desired, collision danger assessment can be easily and rapidly enacted with computer-assistance and necessary target indicated on the display panels.

Ship's speed will be measured by a Doppler sonar system which calculates speed relative to sea bottom. Especially designed to measure very low speeds, the unit is particularly effective as a navigation aid in ports or narrow waters.

Automatic chart plotter will continuously provide accurate calculations of estimated position on an optically projected chart by integrating ship's speed signals from the Doppler sonar equipment. This

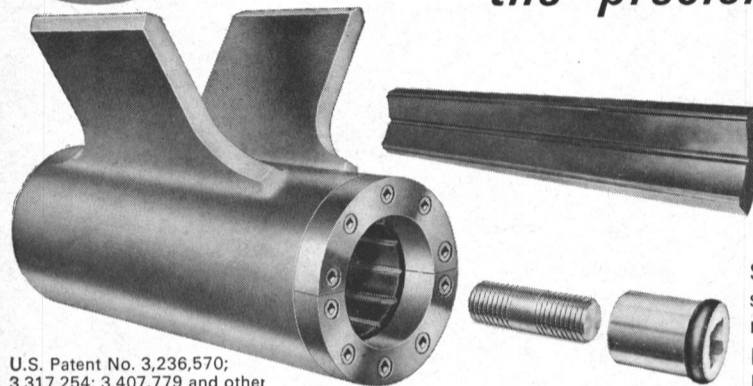
will enable operating personnel to immediately see the geographical position of the ship.

The boiler monitoring system is concentrated on this most important equipment in the engine room turbine plant. Scanning watch of primary measuring points will signal any abnormal condition in boiler operations. Location and cause of any trouble will be indicated by the computer system. Another computer function is to monitor

turbine plant operating conditions and efficiency levels in order to develop more effective operations.

Main particulars of the vessel are: length overall, 1,087.60 feet; length between perpendiculars, 1,030.18 feet; breadth molded, 179.79 feet; depth molded, 86.61 feet; draft, 67.26 feet, and gross tonnage, 133,000. Her main engine is a turbine with an output of 36,000 shp x 85 rpm developing a service speed of 15.8 knots.

## Johnson® DURAMAX® MARINE PRODUCTS the "precision engineered" group

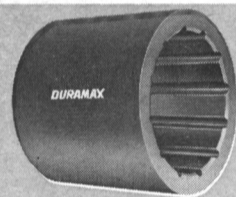


U.S. Patent No. 3,236,570;  
3,317,254; 3,407,779 and other  
U.S. and Foreign Patents Pending

### FAMOUS "PRECISION FITTED" DEMOUNTABLE SELF-LOCKING

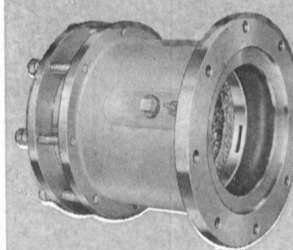
#### RUBBER STAVE BEARINGS

Special formulated hard rubber replaces bronze shell or metal backing on staves, thereby eliminating special machined or dovetailed housings. For V-Strut, Stern Tube, Rudders and Cutter Head Shafts in sizes from 4 inches to 48 inches.



### DURAMAX RUDDER BEARINGS

This completely machinable non-metallic bearing is molded from a nitrile composition specially formulated with enough resiliency to withstand and dampen high shock and impact loads. Features internal lubricant (grease and/or water) grooves the full length of the bearing. It resists swelling and environmental contamination.



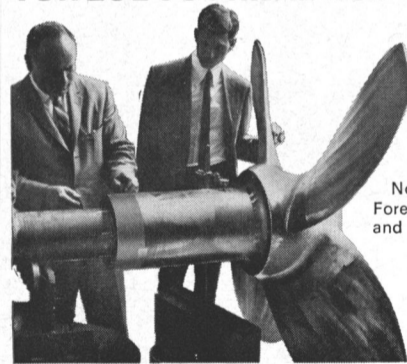
### "AIR SEAL" STUFFING BOXES for HEAVY COMMERCIAL MARINE SERVICE FOR ALL SHAFT SIZES

"Air Seal" design permits complete change of packing without dry docking.

STYLES AVAILABLE: Fig. 1786 I.R. (most popular)  
Air-Water-Grease Service  
Fig. 1787 I.R.  
Air-Grease Service

Fig. 1788 I.R.  
Air-Water Service  
Fig. 1789 (conventional design)  
Water Service Only

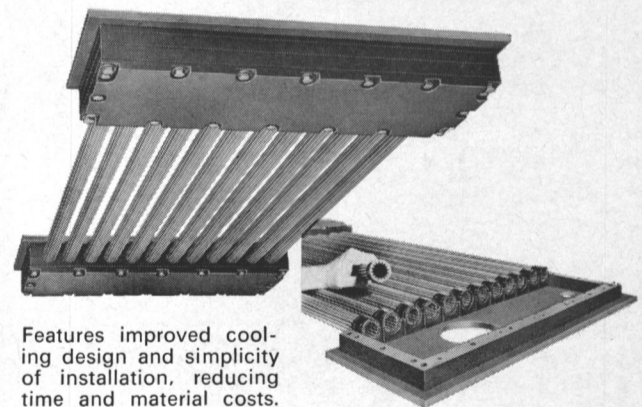
## TORQUE JOURNAL HUB PROPELLER



U.S. Patent  
No. 3,470,843.  
Foreign Patents granted  
and pending.

Features greatly improved shaft stability and water lubrication at increased unit loads. The Torque Journal Hub Propeller eliminates the serious problem of bent tailshafts prevalent in work boat class vessels; and in vessels with 20 foot diameter propellers or larger, shaft deflection problems are eliminated. Propeller hub (conventional tailshaft located in propeller hub is not required) "journals" the propeller within the aft strut on Johnson Demountable water lubricated bearings. The "Torque Journal Hub" design can accommodate 30 foot diameter propellers and larger without losing its performance advantages.

## KOOL-FLO DEMOUNTABLE COOLER for OUTBOARD MARINE SERVICE



Features improved cooling design and simplicity of installation, reducing time and material costs. Available in a variety of assemblies ranging from 4 tubes to 32 tubes in a single unit.

U.S. and Foreign Patents Pending

Completely Detailed Folders Are Available for the Products Described—Write for your copies. Also write for information on Dock and Ship Rubber Bumpers.



## JOHNSON RUBBER COMPANY MARINE DIVISION

MIDDLEFIELD, OHIO 44062 U.S.A. • Area Code 216-632-2111

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©JOHNSON—Reg. Tradename, Trademark Applied For. SALES ENGINEERS LOCATED IN ALL MAJOR SHIPBUILDING PORTS THROUGHOUT THE WORLD

## Astilleros Espanoles Plans New Facility To Build Supertankers

Plans to erect supertanker construction facilities in the Bay of Cadiz have been disclosed by Astilleros Espanoles S.A. (AESAs), Spain's leading shipbuilder.

According to a report of stockholders, the new Cadiz Yard will have capacity to build 1.5 million deadweight tons of shipping annually,

meaning vessels between 20,000 and a million deadweight tons in size.

Additionally, work is to begin late this year or early next year on a repair dock for ships of up to 400,000 dwt, making the Cadiz Bay facility "one of the most important in Europe."

Observers noted that Lisbon already possesses tanker repair yards capable of handling ships of up to a million tons dwt and similar centers are under way elsewhere in Europe.

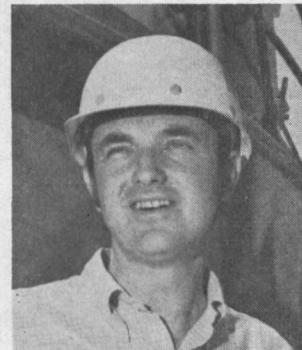
The AESA group, result of a merger among leading Spanish shipbuilders about two years ago, reported that it was one of two Europeans to launch more than a score of big ships last year (the other being Swan Hunter).

The AESA firm delivered two dozen vessels of 441,000 gross tons and launched 25 of 550,000 grt, which represented three-fifths of all Spanish launchings. The company began the current year with order books tally-

ing 79 ships of 2.2 million grt, thus insuring full work for the next two years and also part of 1974-75.

Last year's income totaled \$228.3 million, of which more than half corresponded to export orders.

## Grafton Boat Names Preston Chief Engineer



William G. Preston

William G. Preston has assumed the duties of chief engineer at Grafton Boat Co., Inc., Grafton, Ill., it was announced by Edward D. Fry, president. In his new position, Mr. Preston will be responsible for the engineering and design development of all projects contracted by Grafton Boat. He will be working closely with Grafton's naval architect Timothy Graul, who will direct all engineering work, concentrating on proposals and securing new business.

Mr. Preston comes to Grafton from New Orleans, La., where he was a designer for Halter Marine Services, Inc. Prior to that, he was employed by Grafton Boat as a design engineer subsequent to his discharge from the United States Navy. He is a graduate of Oregon State University and the Westlawn School of Yacht Design. In addition to his four years in the Navy, Mr. Preston has spent considerable time at sea in yachts and has a schooner in Nova Scotia. He is active in the design of sailing yachts, having turned out several designs for construction in ferroceement, two of which are under construction at the present time.

At present, Grafton is in the final construction and outfitting stages of two 6,000-gpm fireboats which will be delivered to the City of Boston this fall. The firm is a subsidiary of Continental Boiler & Sheet Iron Works of St. Louis, Mo., and is located at Grafton, Ill., at the mouth of the Illinois River.

## Dovar Shipping Names Pendleton And Zelins

The appointment of Jon C. Pendleton to the newly-created post of director of sales and development for Dovar Shipping Agency, Inc., has been announced by Douglas Barnard, president of the firm. Mr. Pendleton previously served as outward freight manager for Gdynia America Line.

The appointment of Peter R. Zelins to the post of sales manager for Dovar was also announced. Mr. Zelins served with U.S. Navigation, Inc., and prior to that with Stockard Steamship Co., Inc., for a period of 26 years.

# On October 21, 1970 the U.S. Merchant Marine was given a stay of execution.

That's the day President Nixon signed the Merchant Marine Act of 1970.

The Act doesn't guarantee the resurgence of American Flag shipping. But it does provide the basic plan. And the incentive.

So now it's up to us.

All of us. Commercial shipowners and operators. Labor. And shipbuilders.

As America's largest private shipyard, we feel we have a particularly heavy responsibility. And a challenging opportunity. That's why we're so deeply com-

mitted to a vigorous, new Merchant Marine shipbuilding program.

Our commitment began in 1969, with our successful bid on a MarAd CMX study contract to develop foreign trade forecasts and standard ship designs for the next decade.

It has continued with the establishment of a Market Development Division geared to capture a major share of the commercial shipbuilding market.

And it will continue with active and competitive bidding on merchant ship

construction.

That's why we can say Newport News Shipbuilding is ready when you are. Ready with the talent, experience and facilities it takes to help revitalize and keep the U.S. Merchant Marine alive.

If you'd like to see how we can put this commitment to work, please write to Mr. Joseph D. Deal, Jr., Director of Market Development.

Or call collect. (703) 247-1211.

**NEWPORT NEWS SHIPBUILDING**  
NEWPORT NEWS, VIRGINIA 23607

## Roll Stabilizer Widely Accepted By Fishing Industry

Flume Stabilization Systems, Inc. has recently completed sea trials of its stabilizer aboard the A.K. Strom, a 225-foot tuna seiner owned by Delta Fishing Company of Terminal Island, Calif. The ship, under the command of Capt. David Rico, is the second largest tuna seiner in the world. From her home base of San Juan, Puerto Rico, the ship will range from the Pacific to waters off Africa.

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## Two Foreign Operators Order LNG Carriers Totaling \$60 Million

Two leading foreign shipping enterprises have placed orders with the French shipyard Chantiers de l'Atlantique, St. Nazaire, for the construction of large liquid natural gas carriers of approximately 4,237,872 cubic feet capacity. Initial value of the order will be about \$60 million, according to an announcement made

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**Choose from the most comprehensive line of solid state 3cm and 10cm high power marine radars available anywhere today.**

Raytheon marine radars are versatile. Ten different models cover 10cm all-weather, as well as 3cm high-definition, shipping requirements, and both relative motion and computerized true motion displays are available. With Raytheon's interswitch unit, any two radars can be interconnected for the greater reliability of redundant operation, the significant advantages of having both 3 and 10cm radars aboard, plus general navigational versatility.

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Raytheon is the first choice in marine radar. We have installed more than 15,000 radars on merchant ships of all nations. Each new radar is fabricated from military-type solid state components, then tested. Every Raytheon marine radar meets environmental standards exceeding those required for B.O.T., F.C.C., D.H.I., and F.T.Z. approval, with accelerated life tests based upon A.G.R. E.E. requirements (Advisory Group on Reliability of Electronic Equipment).

To maintain this unrivalled performance, marine electronics specialists are available at Raytheon Service Centers and authorized dealers in all principal ports on every continent around the world.

For complete information on Raytheon marine radars, and other fine shipboard electronics, write or call Raytheon Company, Marine Products Operation, Manchester, N.H. 03103. Tel. (603) 668-1600.

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The other  
marine  
insurance.



## Star Shipyards Launches Tug For RivTow Straits Limited



which is unmanned, complies with requirements for automation of marine engines.

Auxiliary power is provided by two General Motors, Series 3-71, diesel engines driving two 50-kw Delco generators.

**Norman Cosulich**, RivTow Straits' vice president of operations, states that "The original concept in the design of the vessel was to get a fast boat, and the new tug is expected to be faster than average, and because of the low silhouette, to show good sea-keeping qualities. We feel that the vessel will be extremely safe as it has two completely identical propulsion systems—with two of everything."

The highly efficient tug is built for service under two classifications, either Home Trade 11 with a seven-man crew, or Home Trade 111 with a six-man crew.

ject and was then assigned to Electrical Design B, where he has been in charge of developing departmental management systems and procedures.

## The State Of Alaska Requests Bids From West Coast Yards To Upgrade 352-Ft. Ferries

An announcement has been made by the State of Alaska, Department of Public Works, Division of Marine Transportation requesting bids from West Coast shipyards for the lengthening and upgrading of two 352-foot Malaspina Class Southeastern Alaska ferry vessels. The third vessel of this class will be modified at a later date under a separate contract.

Essentially, the work will consist of lengthening of the ferries by adding a new 56-foot midbody

## Session Chairmen Named For Third Int'l LNG Conference

Technical session chairmen have been named for the Third International Conference and Exhibition on Liquefied Natural Gas (LNG-3), which will be held in Washington, D.C. from September 24 through September 28, 1972. The seven technical sessions and their co-chairmen are:

- The Impact of LNG on Gas Supply—**D.E. Rooke**, member for production and supply, The Gas Council, London, England; **T.J. Joyce**, Chief, Bureau of Natural Gas, Federal Power Commission, Washington, D.C.

- LNG Technology: Research and Development—**Prof. G.G. Haselden**, department of chemical engineering, University of Leeds, England; **Pierre Verret**, directeur, Direction des Etudes et Tech-

niques Nouvelles, Gaz de France, Paris, France.

- International Trade in LNG—**C.P. Coppack**, managing director, Shell International Gas Limited, London, England; **George D. Carameros Jr.**, vice president, El Paso Natural Gas Company, Houston, Texas.

- New Developments in LNG Transportation—**Rene Boudet**, president directeur general, Gaz-ocean, Paris, France; Ing. **G. Sac-**

**chi**, l'amministratore delegato, SNAM, Milan, Italy.

- Liquefaction Plant Experience: Baseload, Peakshaving and Satellite—**A. Chanderli**, president directeur general, CAMEL, Algiers, Algeria; **Leslie J. Clark**, chairman, Northern Gas Board, Newcastle-Upon-Tyne, England.

- LNG Technology: Safety, Codes and Other Aspects—**Dipl. Ing. Christoph Brecht**, member of executive board, Ruhrgas Aktiengesellschaft, West Germany; **Yves Delavesne**, directeur du gaz naturel, Entreprise de Recherches et d'Activites Petrolieres, Paris, France.

- LNG Projects: Financial and Economic Aspects—**Dr. Benito Luongo**, director, Technical Office of Hydrocarbons, Ministerio De Minas E Hidrocarburos, Caracas, Venezuela; **Pedro Grau Hoyos**, director general, Gas Natural, S.A., Barcelona, Spain.

Persons interested in presenting papers at any of the sessions should submit abstracts, not to exceed 200 words in English and/or French, no later than October 15, 1971, to Program Committee Secretary, **A. G. Higgins**, International Gas Union, 17, Grosvenor Crescent, London, S.W. 1, England.

The sponsors of LNG-3 are the International Gas Union (IGU) headquartered in London, England, the International Institute of Refrigeration (IIR) located in Paris, France, and the Institute of Gas Technology (IGT), based in Chicago, Ill.

## Gilger Promoted At Matson Terminals

Matson Terminals, Inc. has named **William F. Gilger** regional terminals manager for northern California, it was announced by **James P. Gray**, president. Mr. Gilger succeeds **Stanley M. Kowleski** who has taken the post of ferry transit manager for the Golden Gate Bridge Highway and Transportation District.

Mr. Gilger started with Matson in the Port of Los Angeles in 1949. He became assistant regional terminals manager for northern California in 1967 and was named regional operating manager in August 1970.

**I.S. Kotelnikoff** has been named regional operating manager, the post formerly held by Mr. Gilger. Mr. Kotelnikoff, who started with

## H.O.PENN MARINE POWER

# SERVICE ON THE DOCKS



## KEEPS YOUR VESSEL ON THE GO

**PROXIMITY** - H. O. Penn Marine Power Service speeds help to you when and where you need it, along 1,000 miles of coastline. And for deep water dock-side repair service, our New York City East River dock chart location is 40° 48' 50" N, 73° 54' 20" W, west of North Brothers Island.

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**POWER** - H.O. Penn custom designs marine power in the shipyard of your choice from a complete in-stock line of diesel marine engines and power units from 60 Hp. to 1200

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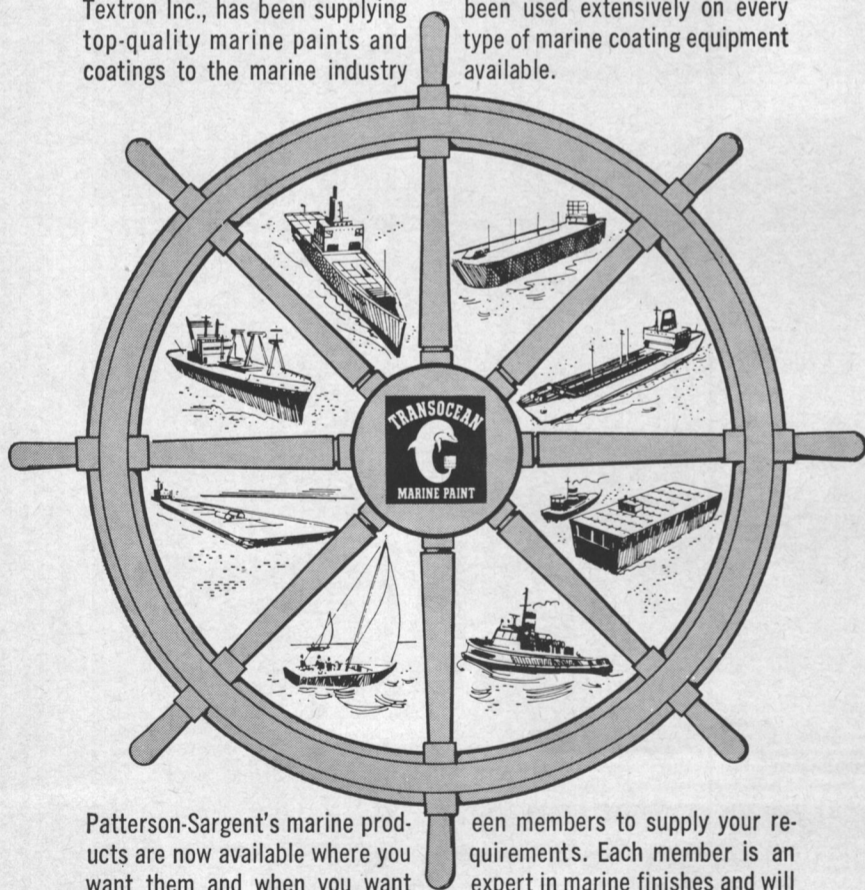


**BULK CARRIER FROM ASTILLEROS:** The 80,000-dwt bulk carrier Soledad Maria, built for Naviera Letasa, S.A., is shown above shortly after launching at the Sestao shipyard of Astilleros Espanoles, S.A. Sponsoring the vessel was **Mrs. Maria Soledad Guzman de Lopez Tapia**, who was accompanied on the launching dais by military and naval authorities as well as representatives of the shipping company and members of the governing board of Astilleros Espanoles, S.A. The vessel's approximate measurements are length 797 feet, breadth 106 feet, and depth 65 feet. Propulsion equipment consists of a main AESA-Burmeister & Wain 7K84EF engine with a potential of 17,500 bhp at 114 rpm producing a speed of 16.6 knots. The main engine, auxiliary units, boilers, shafting and large forged and cast pieces were manufactured in the different shipyards making up the Astilleros Espanoles, S.A. group.

## High quality Marine Paint from Patterson-Sargent

Patterson-Sargent, A Division of Textron Inc., has been supplying top-quality marine paints and coatings to the marine industry

for 100 years. Our products have been used extensively on every type of marine coating equipment available.



Patterson-Sargent's marine products are now available where you want them and when you want them. As a member of the Transocean Marine Paint Association, we can call on any of the eight-

teen members to supply your requirements. Each member is an expert in marine finishes and will provide complete dry-docking inspection when your ship enters the yard.

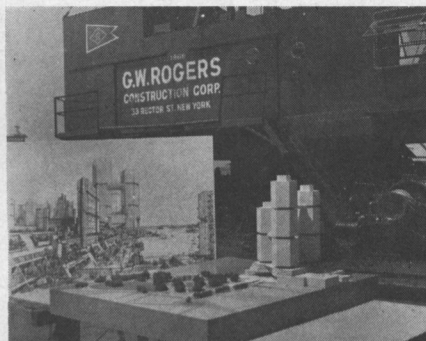


Should you require additional information or would like a copy of our "Sophisticated Coatings" brochure, please write to us at

P.O. Box 494  
New Brunswick, N.J. 08903



## George W. Rogers Construction Corporation Starts Work On New York's Battery Park City



A sketch and a model of the broad plazas and terraces and the complex of buildings for Battery Park City were shown to guests on the deck of one of the large George W. Rogers Construction Corporation floating construction units. In the right hand photo, **George W. Rogers** is shown in the hard hat in a jovial mood with New York Governor **Nelson A. Rockefeller** at the inauguration ceremony.

New York's Battery Park City Authority held a water breaking ceremony on July 15, 1971 at Pier 2, North River, launching the first phase of construction for its eventual development of Battery Park City. The entire project will eventually consist of 91 acres of housing, offices and stores. It is hailed as the largest real estate development ever undertaken in the nation.

Battery Park City will be a billion dollar investment and the most important thing is that it will not require the investment of a penny of capital funds by the City of New York. This will be possible because Battery Park City has been designed to create its own schools, fire stations, police stations, recreation and other facilities.

The George W. Rogers Construction Corporation, 33 Rector Street, New York, N.Y., with a bid of \$8,536,888, received a contract on this first phase of construction.

The phase will provide the base upon which 10-million-square-feet of office, commercial, recreational and service space and a community for 45,000 people of all income ranges will rise. The bulkheading, piling and filling will give the Authority, and the people of the City of New York, a new location upon which to add to the facilities of Manhattan without requiring the relocation of one single family or individual. This development will permit lower Manhattan to maintain its ascendancy as the investment, banking, trading and insurance capital of the world, and will permit a reawakening of interest in full utilization of urban centers for work, pleasure and residence.

The George W. Rogers Construction Corp. will erect an underwater stone embankment backed with close to one-million-cubic-yards of sand fill. The contract also calls for the firm to sink reinforced 20-inch-square concrete piles, many as deep as 60 feet, to bedrock below the 16-acre area involved in the first phase of the filling operation. The piles will be topped with a concrete relieving platform which in turn will be topped with five feet of earth fill.

The first phase fill area will extend from north of Pier A at Battery Park to just south of Rector

Street, at which point it will tie in with the 24-acre area already filled with excavation from the adjacent World Trade Center. Ten of the south 16 acres will serve as the site of three office buildings of 40, 50 and 60 stories, which together will comprise a total of five million square feet of office space. The remaining six acres, along with the already filled 24-acre portion, will serve as the location of two of the four residential neighborhoods which will comprise Battery Park City and will contain approximately half of the 14,100 housing units in the completed project.

The bulkheading and filling of the south 16 acres is expected to take 15 months and will be financed by the Battery Park City Authority through a first-instance loan from the State.

The bulkhead and fill operation which the Authority has authorized was designed by Mueser, Rutledge, Wentworth and Johnston. While work goes forward on this phase of development, design of the other items in the infrastructure to be supplied by the Authority is proceeding under the project's architectural and engineering firm, a joint venture composed of Tippetts-Abbett-McCarthy-Stratton and Gibbs & Hill, Inc.

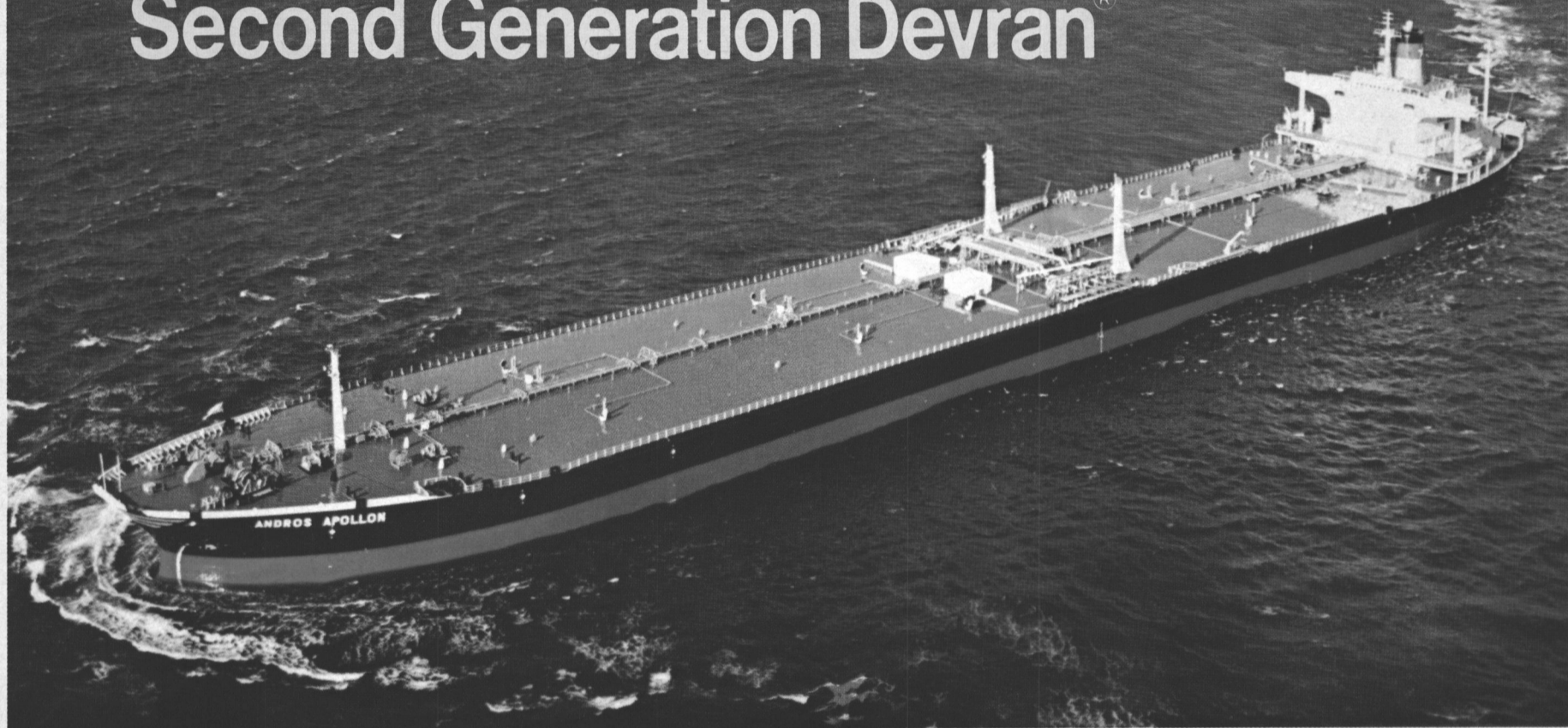
The Rogers organization has been servicing New York Harbor for 102 years and is considered one of the foremost specialists in this type of marine construction.

## Baldt Corporation Announces Sale Of Palmer Electric

Baldt Corporation (OTC), New York, N.Y., has announced the sale of its Palmer Electric & Manufacturing Co. division in Saugus, Mass., to Tabet Manufacturing Co., Norfolk, Va., for an undisclosed amount. Tabet will add Palmer's line of shipboard electrical equipment to its existing lines of shipboard electronics products and electrical systems.

Baldt Corporation is a diversified manufacturer whose operations include a Marine and Oceanographic Group and an Industrial Products and Equipment Group. Baldt reported sales of \$3,280,000 and earnings of \$91,000, or \$.07 per share, for the first quarter of 1971.

# DEVOE announces Second Generation Devran®



The Global Chartering and Brokerage vessel *ANDROS APOLLON* built by Ishikawajima Heavy Industries, delivered December 1969: fully coated with Devoe high-performance coatings.

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## Star Shipyards Launches Tug For RivTow Straits Limited



The Mercer Straits will be used basically for the towing of equipment barges and gravel barges on the British Columbia coast and can also be used for log barge towing.

The recent launching of the modern twin-screw towboat Mercer Straits at Star Shipyards, Limited, New Westminster, British Columbia, Canada, and the naming ceremony by the sponsor, **Mrs. T.G. Aitchison** (nee Gladys Mercer), bring into focus a number of related history-making events.

In addition to being the first vessel to be completed for RivTow Straits Limited since the formation of the company last year by the merging of Straits Towing Limited and Riv Tow Marine Ltd., the tug is also a tribute to the pioneer shipbuilding Mercer family for whom it was named and at whose yard, Star Shipyard (Mercer's) Ltd., the keel was laid. It was the last contract to be negotiated by **Gordon and Arthur Mercer**, and an important chapter of British Columbia marine history was closed when they decided to sell out their interests in the 62-year-old shipyard in October 1970 to **A.G. Asplin**, retired president of Horton Steel Works Ltd., of Fort Erie, Ontario.

Under **Grant Asplin's** leadership, ably assisted by the same shipyard personnel, a new page has now been written, and Star Hull No. 401 has become a vessel that was almost ready for sea at the time of launching, itself an unusual event, and was in fact complete except for the lining up of shafts and engines.

Built to a design by naval architects Jackson, Talbot, Walkinshaw & Associates Ltd., of North Vancouver, the tug is 92 feet 6 inches long, with 24 feet 6 inches molded breadth, and has a steel hull of round-bilge form with decks and shell longitudinally framed. The superstructure is all-aluminum, transversely framed, and she has an aluminum mast.

The main propulsion plant consists of twin General Motors, Series 149, diesel engines developing a combined output of 1,800 bhp at 1,800 rpm. Each 900-hp engine turns a Seffle design controllable-pitch three-blade propeller, 84 inches in diameter in a fixed nozzle, driving through a 5:1 Twin Disc reduction gear box. The controllable pitch factor of the propellers can be used to good advantage to prevent overloading of the engines when engaged in log towing, and the tug is quite suitable for bundle boom towing duties. The engine room,

which is unmanned, complies with requirements for automation of marine engines.

Auxiliary power is provided by two General Motors, Series 3-71, diesel engines driving two 50-kw Delco generators.

**Norman Cosulich**, RivTow Straits' vice president of operations, states that "The original concept in the design of the vessel was to get a fast boat, and the new tug is expected to be faster than average, and because of the low silhouette, to show good sea-keeping qualities. We feel that the vessel will be extremely safe as it has two completely identical propulsion systems—with two of everything."

The highly efficient tug is built for service under two classifications, either Home Trade 11 with a seven-man crew, or Home Trade 111 with a six-man crew.

## Wiley Manufacturing Building Ocean Service Deck Barge For S.C. Loveland, Inc.

Wiley Manufacturing Co., Port Deposit, Md., has received an order from S.C. Loveland Co., Inc., Philadelphia, Pa., for a steel deck barge.

The vessel is specially constructed to handle heavy deck loads and large concentrated weights.

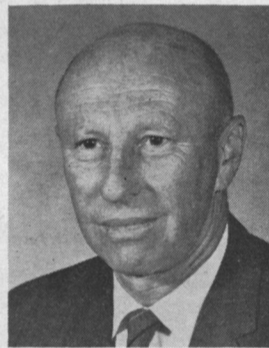
Principal dimensions of this new barge are 180 feet, by 43 feet 6 inches, by 12 feet 9 inches. To be built under special survey of the American Bureau of Shipping, the barge will be classed with an unrestricted load line assignment for worldwide ocean service.

The barge was designed by J.J. Henry Co., Inc., naval architects.

## Newport News Ship Appoints Two To Engineering Posts



**B.L. Skeens**



**J.H. Giedemann**

**J.R. Kane**, director of engineering of Newport News Shipbuilding, Newport News, Va., has announced the appointment of **B.L. Skeens** as assistant chief engineer, machinery design division, of the Tenneco subsidiary. The post was formerly held by **George B. Johnson**, who has retired.

**J.H. Giedemann**, as an associate engineer, will assume Mr. Skeens's former position as head of the machinery design division staff office.

Mr. Skeens, a native of Grundy, Va., entered the shipyard's apprentice school in 1953 and subsequently won a Homer L. Ferguson scholarship to Virginia Polytechnic Institute. He graduated in 1963 with a B.S. degree in mechanical engineering, ranking third in a class of 140. He returned to work in the machinery design division of the shipyard and in 1965 was assigned to the division staff office. He was promoted to senior designer and junior design supervisor before his appointment to associate engineer in 1968. He was named an assistant engineer in October 1970.

Mr. Giedemann is a native of Little Falls, Minn., and a graduate of the University of Wisconsin, with a degree in chemistry. He joined the production department at Newport News Shipbuilding in 1951 and became a senior design supervisor in 1965. From 1966 to 1968, he worked on the shipyard's LHA pro-

ject and was then assigned to Electrical Design B, where he has been in charge of developing departmental management systems and procedures.

## The State Of Alaska Requests Bids From West Coast Yards To Upgrade 352-Ft. Ferries

An announcement has been made by the State of Alaska, Department of Public Works, Division of Marine Transportation requesting bids from West Coast shipyards for the lengthening and upgrading of two 352-foot Malaspina Class Southeastern Alaska ferry vessels. The third vessel of this class will be modified at a later date under a separate contract.

Essentially, the work will consist of lengthening of the ferries by adding a new 56-foot midbody section. Additional crew's quarters for 20 will be added in the new section. Existing passenger staterooms will be removed and a total of 90 new modular staterooms will be installed, sleeping 280 passengers. A new cafeteria, together with a new cocktail lounge and bar, will be provided, and existing public rooms will be modified and redecorated. A solarium will be installed on the sundeck to provide a sheltered, panoramic view area for passengers. The solarium will be lighted and provided with infra-red radiant heat units for passenger comfort.

### Principal Characteristics

Length overall	408' - 0"
Length design load waterline	382' - 0"
Length between perpendiculars	380' - 0"
Breadth, extreme overguards	73' - 7 1/2"
Breadth, molded at DLWL	55' - 10 1/2"
Depth, molded at maindeck amidships	23' - 6"
Draft, design load waterline	15' - 4"
Subdivision draft	16' - 0"
Service speed	18 knots
Deadweight and Capacities	
Certified passenger capacity	750
Crew accommodation capacity	62
Vehicles: automobiles	134
Tankage:	
Fuel oil	131,625 gal.
Lube oil	5,248 gal.
Potable water	105,248 gal.
Displacement at design load draft	4,774 L.T.

**Philip F. Spaulding and Associates**, Division of Nickum and Spaulding Associates, 71 Columbia Street, Seattle, Wash. 98104, are the designer of the vessels.

Shipyards interested in bidding on this project are requested to communicate with the naval architect. One complete set of bidding documents, including plans and specifications, will be furnished upon the receipt of \$100 deposit, which will be returned after the bid award and the return of all plans and specifications.



**TWO MORE FOR SINGAPORE:** Equitable Equipment Co., Inc., New Orleans, La., recently delivered two Equity Standard water taxis which are shown in the Mississippi River just prior to being loaded aboard a freighter for shipment to Singapore. In the background is shown the 65-foot Locolina V, while in the foreground is the 59-foot Locolina VI. The two vessels are the fifth and sixth of a nine-boat fleet of Equity water taxis to be operated in the Strait of Malacca and the South China Sea by Robin Shipyard (Pte.) Ltd. of Singapore.

## Dixie Dredge Corporation Announces Four Promotions



Charles W. Blaney



Al Meizius

Dixie Dredge Corporation, a subsidiary of Pott Industries Inc., St. Louis Ship Division, has announced the promotion of **Charles W. Blaney** to the position of general manager of its Miami, Fla., facility. **Don R. King**, president of the company, also announced the promotions of **Al Meizius** to production control manager, Miami, **Dave Hewett** to production superintendent, Miami, and the appointment of **Mel Goldstroph** as special sales representative for the Southeast territory.

The company maintains its general offices and main plant in St. Louis, Mo., and a complete branch, including production, sales, parts and service facilities, in Miami.



Dave Hewett



Mel Goldstroph

Mr. **Blaney** has been with Dixie for the past 3½ years and has been in the dredge manufacturing industry for over 20 years. His experience includes several years in each of the major functions of dredge manufacturing, production, engineering, parts, service, sales and administration.

Mr. **Meizius** has been with the company for three years, serving as chief design engineer. Prior to that, he served for 10 years as design engineer for Alliance Machine Company. His new position includes primary responsibility for production engineering and control at the Miami plant.

Mr. **Hewett** has been with Dixie for over 15 years and is regarded as one of the most capable field engineers in the industry. Most of his years of service have been in the area of field erection, and he has been responsible for erection and launching machines in virtually every corner of the world. More recently, he has been primarily concerned with production and as a design consultant. His field experience has made significant contributions to the practical design of the modern Dixie dredge.

Mr. **Goldstroph** is a graduate engineer who has spent his entire adult life in the dredging industry. After earning his engineering degree at the University of Pittsburgh, he immediately began a career in dredging, working for the Panama Canal Commission in the Panama Canal Zone. He has since worked in dredge construction in many areas of the world and, for the past five years, has been in sales engineering for a leading dredge manufacturer. He will travel the Southwest states while maintaining his office in Miami.

August 15, 1971

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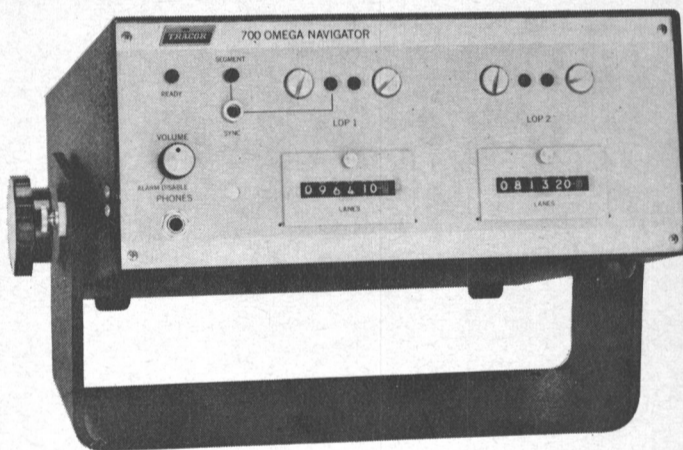
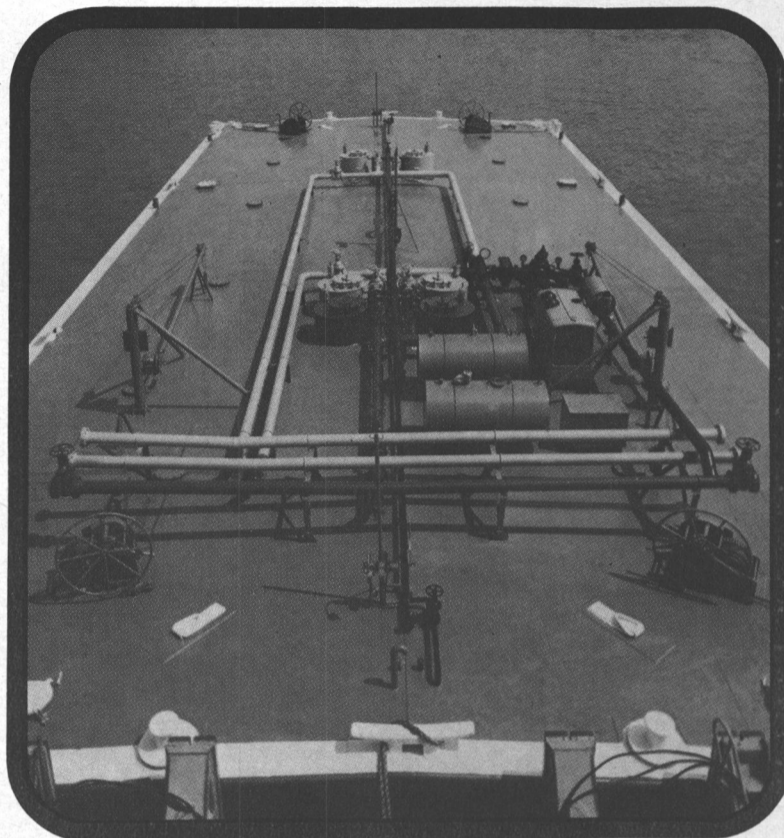
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## Session Chairmen Named For Third Int'l LNG Conference

Technical session chairmen have been named for the Third International Conference and Exhibition on Liquefied Natural Gas (LNG-3), which will be held in Washington, D.C. from September 24 through September 28, 1972. The seven technical sessions and their co-chairmen are:

- The Impact of LNG on Gas Supply—**D.E. Rooke**, member for production and supply, The Gas Council, London, England; **T.J. Joyce**, Chief, Bureau of Natural Gas, Federal Power Commission, Washington, D.C.

- LNG Technology: Research and Development—Prof. **G.G. Haselden**, department of chemical engineering, University of Leeds, England; **Pierre Verret**, directeur, Direction des Etudes et Tech-

niques Nouvelles, Gaz de France, Paris, France.

- International Trade in LNG—**C.P. Coppack**, managing director, Shell International Gas Limited, London, England; **George D. Cameros Jr.**, vice president, El Paso Natural Gas Company, Houston, Texas.

- New Developments in LNG Transportation—**Rene Boudet**, president directeur general, Gaz-ocean, Paris, France; Ing. **G. Sac-**

**chi**, l'amministratore delegato, SNAM, Milan, Italy.

- Liquefaction Plant Experience: Baseload, Peakshaving and Satellite—**A. Chanderli**, president directeur general, CAMEL, Algiers, Algeria; **Leslie J. Clark**, chairman, Northern Gas Board, Newcastle-Upon-Tyne, England.

- LNG Technology: Safety, Codes and Other Aspects—Dipl. Ing. **Christoph Brecht**, member of executive board, Ruhrgas Aktiengesellschaft, West Germany; **Yves Delavesne**, directeur du gaz naturel, Entreprise de Recherches et d'Activites Petrolieres, Paris, France.

- LNG Projects: Financial and Economic Aspects—Dr. **Benito Luongo**, director, Technical Office of Hydrocarbons, Ministerio De Minas E Hidrocarburos, Caracas, Venezuela; **Pedro Grau Hoyos**, director general, Gas Natural, S.A., Barcelona, Spain.

Persons interested in presenting papers at any of the sessions should submit abstracts, not to exceed 200 words in English and/or French, no later than October 15, 1971, to Program Committee Secretary, **A. G. Higgins**, International Gas Union, 17, Grosvenor Crescent, London, S.W. 1, England.

The sponsors of LNG-3 are the International Gas Union (IGU) headquartered in London, England, the International Institute of Refrigeration (IIR) located in Paris, France, and the Institute of Gas Technology (IGT), based in Chicago, Ill.

## Gilger Promoted At Matson Terminals

Matson Terminals, Inc. has named **William F. Gilger** regional terminals manager for northern California, it was announced by **James P. Gray**, president. Mr. Gilger succeeds **Stanley M. Kowleski** who has taken the post of ferry transit manager for the Golden Gate Bridge Highway and Transportation District.

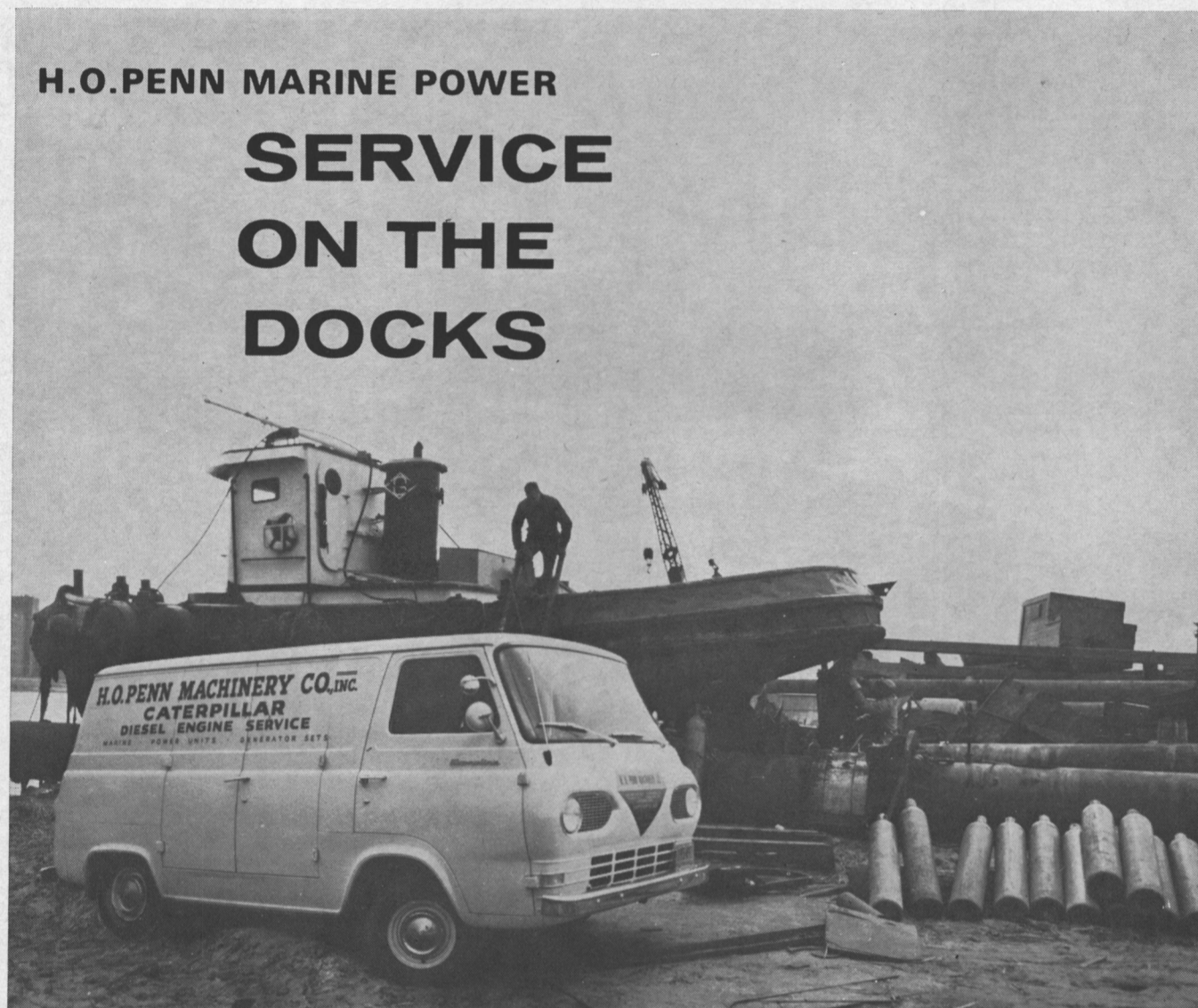
Mr. Gilger started with Matson in the Port of Los Angeles in 1949. He became assistant regional terminals manager for northern California in 1967 and was named regional operating manager in August 1970.

**I.S. Kotelnikoff** has been named regional operating manager, the post formerly held by Mr. Gilger. Mr. Kotelnikoff, who started with Matson Terminals in 1961, has served as general superintendent of container operations at the Oakland container yard for the past two and one-half years.

## Mitsubishi Delivers 229,500-Dwt Tanker

Mitsubishi Heavy Industries Ltd. announced that it has delivered the F.A. Davies, a 229,516-dwt tanker to its owners, the Seaspray Oil Transport Corp.

The vessel, built at Mitsubishi's Nagasaki Shipyard & Engine Works, is scheduled for service between the Persian Gulf and Europe, under charter to the Arabian American Oil Co. (Aramco).



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
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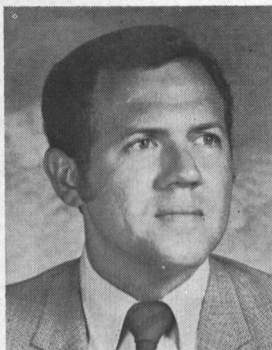
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## Port Of Galveston Promotes Shideler



John V. Shideler

John V. Shideler, Midwestern sales manager for the Port of Galveston since 1967, has been promoted to the new position of general sales coordinator for the port with offices in Houston, Texas, according to an announcement by C.S. Devoy, port director.

M.L. Haworth, assistant Midwestern sales manager in Dallas, Texas, for the Port of Galveston since July 1968, will succeed Mr. Shideler in the Dallas position of Midwestern sales manager.

The new position that Mr. Shideler now fills was created to commence specific efforts toward backing up Galveston's new container and barge terminals now being built, Mr. Devoy stated, and these facilities will be ready by the end of the year.

Galveston recently opened a sales office in San Francisco and now has sales offices in San Francisco, Dallas, Houston and New York City. As sales coordinator, Mr. Shideler will be working out of Houston and sharing the sales office there with William L. Brewster, Galveston's Western sales manager and manager of the Pier Point Packers Division, export packers for the port.

## Diamond M Drilling Names Chief Engineer

Glenn F. Miller has been named chief engineer for Diamond M Drilling Company (OTC), according to Don E. McMahon, president and chief executive officer for the publicly held drilling firm. The company, with executive offices in the First City National Bank Building, Houston, Texas 77002, currently operates 17 offshore and inland barge rigs.

Mr. Miller served as vice president of operations for High Seas, Inc. from 1969 until joining Diamond on July 1, 1971.

A native of Arkadelphia, Ark., Mr. Miller graduated from the University of Texas in 1952. He immediately began his career in the oil business with Phillips Petroleum Company. In 1959, he resigned as division engineer for that firm to become assistant superintendent, Gulf of Mexico, of Loffland Bros. He later became superintendent, West Texas; division manager, Argentina, Bolivia, Chile and Columbia, and was chief engineer of all Loffland Bros. operations when he joined High Seas, Inc.

## Electric Boat Awarded Contract To Design Waste Treatment Plant

A \$588,600 contract to develop and design a compact waste treatment plant for installation on Navy ships has been awarded the Electric Boat Division of General Dynamics, Groton, Conn., by the Naval Ship Engineering Center.

The system will combine two existing methods of sewage treat-

ment—bacterial absorption and microscopic filtration.

Harold Wallman of New London, director of the program and chief of chemical and environmental engineering at Electric Boat Division, said that the effluent to be discharged by the unit should be cleaner than that from most municipal secondary treatment plants. He said the effluent should be pure enough to be reused in the ship's sanitary facilities.

Navy plans call for the unit to be fully developed and tested before being installed on ships having crews of 40 or more. It will be designed into new ships and ships already in the fleet will be refitted.

As prime contractor, General Dynamics has overall design responsibility, with filtration units and other process technology subcontracted to Dorr-Oliver, Inc., Stamford, Conn.

**CARBO ZINC 11, CARBOLINE 190 HBW**

**CARBO ZINC 11, CARBOLINE 3630**

**CARBO ZINC 11, CARBOLINE 190 HBW, CARBOLINE 1294**

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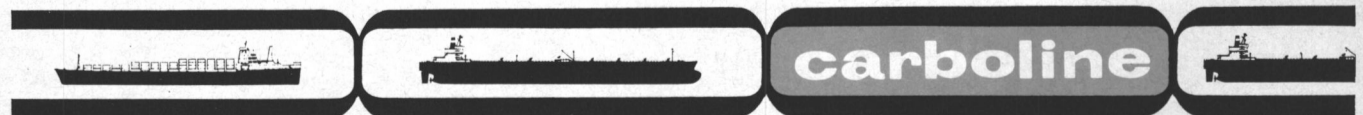
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\*U.S. Patent No. 3,056,684



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## Ore-Oil Carrier And Cargoliner Delivered By Mitsubishi Yards

Mitsubishi Heavy Industries Ltd. announced that it has recently delivered two new ships to their owners. The Cabo Pilar, a 68,932-dwt ore-oil carrier built for Sociedad Anonima de Navegacion Petrolera, Compania sud Americana de Vapores, and Compania Chilena de Navegacion, was constructed at the firm's Hiroshima

shipyard. Said to be the largest vessel in Chile's merchant fleet, the new ship is scheduled to carry iron ore from Chile to North America, and Venezuelan oil to Chile.

Also announced was the delivery at its Shimonoseki Shipyard & Engine Works of the 12,400-dwt cargo-liner Bunga Orkid to the Government of Malaysia. The new vessel is scheduled to be placed in service between Southeast Asia and Europe for the Malaysia International Shipping Corp.

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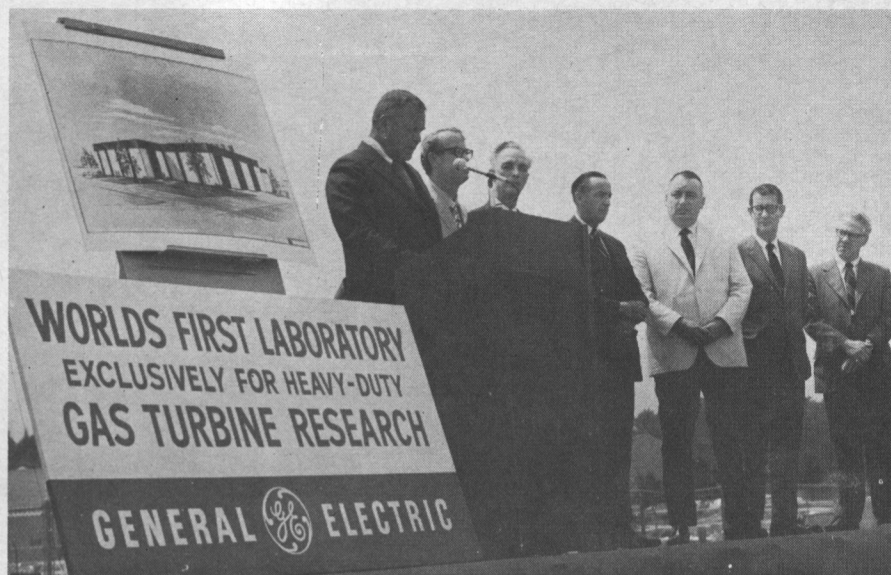


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## General Electric Building Heavy Duty Gas Turbine Development Laboratory



Whitman Ridgway (at podium), deputy division general manager of General Electric's Turbine Operations, with Schenectady government officials at the groundbreaking ceremony in Schenectady, N.Y., for GE's \$6.7 million Gas Turbine Laboratory.

The General Electric Company recently broke ground in Schenectady, N.Y., for construction of the first laboratory devoted exclusively to heavy-duty gas turbine research and development.

The company, which pioneered the now rapidly growing gas turbine business, will build a \$6.7 million Gas Turbine Development Laboratory here. The two-story building will contain 35,000 square feet of laboratory space, and is scheduled to open in mid-1972.

Whitman Ridgway, deputy division general manager of GE's Gas Turbine Operations, said at the groundbreaking ceremonies that "the size and variety of the gas turbine business has grown very rapidly in the past few years. To maintain present market posi-

tion in a business the company pioneered, and to continue to be in the forefront of the development of this business, expansion of 'high technology' activities must be made."

Mr. Ridgway said the laboratory will be used to develop new products, enhance GE's current world leadership position in the heavy-duty gas turbine business, and improve products to meet the ecological needs of the future.

The facility will be divided into six components: a combustion laboratory, rotor dynamics laboratory, hot gas facility, fuels and corrosion laboratory, mechanical components laboratory and advanced control development laboratory.

Among the major areas of research and development at the new GE facility, Mr. Ridgway said, will be work on increased abatement of air and noise pollution and more efficient uses of fuels.

GE is the world's leading producer of gas turbines, which are used worldwide by electric utilities, gas transmission companies, process industries such as petroleum and refining companies, and the maritime industry. The market more than quadrupled from 1965 to 1970, with electric utilities providing the most growth as they turned to gas turbines for use as peaking stations to provide extra system capacity. In addition to Schenectady, GE also has gas turbine manufacturing facilities in Greenville, S.C.

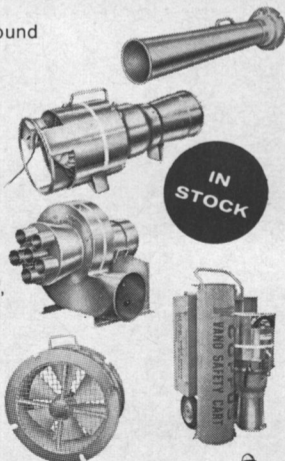
## French Yard To Build 250,000-Ton Tankers For Esso And Shell

The French shipbuilding firm of Chantiers de l'Atlantique has received an order for a 270,000-dwt tanker from Shell and an order for a 250,000-ton tanker from Esso Standard S.A.F., according to reports from France.

This increases the tankers on order at the St. Nazaire yard to 16 vessels over 1,050 feet in length, ranging from 220,000 deadweight tons each to 270,000 tons.

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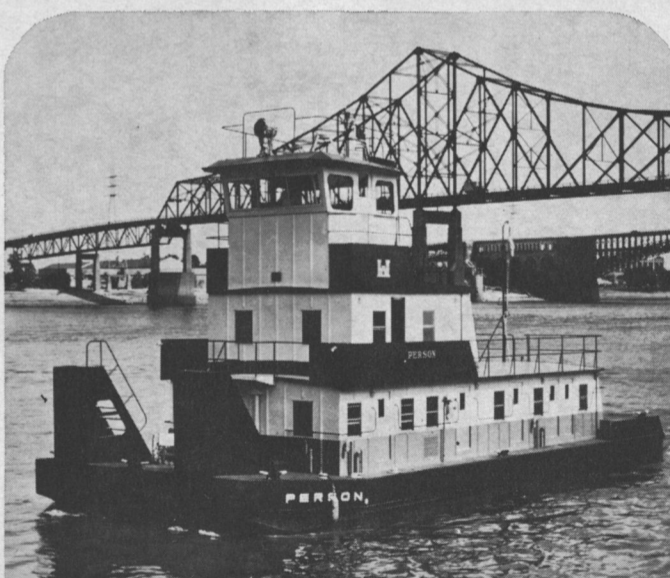
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## MarAd Awards Research Contract To Wartsila Shipyard

The Maritime Administration, U.S. Department of Commerce, has awarded a \$250,000 research contract to the Wartsila Helsinki Shipyard in Finland. The purpose of the contract is the determination of ship hull forms and features best suited to prolong the navigational season on the U.S. Great Lakes.

**Andrew E. Gibson**, Assistant Secretary of Commerce for Maritime Affairs, who announced the contract, stated that Wartsila is to investigate the relative efficiency of various ore-carrier hull forms and bow shapes when navigating in ice.

Attention will be focused on the relationship between hull characteristics, ice resistance and power requirements. Five different bow shapes will be tested on a model of a typical Great Lakes ore-carrier hull in one series of experiments. Another series will cover different sizes of vessels in order to obtain guiding principles for the design of various ship types. The results of the study will be made available to U.S. ship designers.

The unique Wartsila icebreaking model basin and research laboratory was built in 1969 in connection with the consulting agreement made between Wartsila and Esso International for the Manhattan project. Aside from the personnel at Wartsila, other Finnish ice-breaking experts will be involved in the project, including representatives of the Finnish Board of Navigation.

The West German yard A.G. Weser has also ordered model tests to be conducted at Wartsila under

various ice conditions. These will relate to the so-called EOS project which involves the development of icebreaking OBO vessels intended for navigation in Arctic waters. These tests will be made at Wartsila in September 1971.

## W.G. Baskerville Sr., Neville Stone Elected New UMTC Officers

Upper Mississippi Towing Corporation, Minneapolis, Minn., announced the recent election of **W. G. Baskerville Sr.** as board chairman and chief executive officer, and **Neville Stone** as president. Both will also serve in the same capacities for Hennepin Towing Company, a UMTC subsidiary.

**Mr. Baskerville** is a co-founder of Upper Mississippi Towing, which he helped establish in October 1937, along with his brother, **H.M. Baskerville Sr.**, former board chairman. These same two men founded Hennepin Towing Company in 1947. **Mr. Baskerville** was also instrumental in founding Western Oil and Fuel Company and International Refineries, Inc. He is a member of the traffic advisory committee of Water Resources Congress, and of the Upper Mississippi Waterway Association.

**Mr. Stone** joined Upper Mississippi Towing Corporation September 1, 1968, as executive vice president. He formerly held a similar position with Crounse Corporation, Paducah, Ky. He is a former board chairman of The American Waterways Operators, Inc., and a director of AWO. He is also a member of the Upper Mississippi Waterway Association. **Mr. Stone** attended the University of Kentucky.



**KEEL FOR THIRD SEABEE:** The keel for the Tillie Lykes, third in a series of the world's largest breakbulk commercial ships, was laid on July 15 at the Quincy Shipbuilding Division of General Dynamics. Representatives of General Dynamics, Lykes Bros. Steamship Co., Inc., and the Maritime Administration attended the ceremony at which the 120.5-ton keel unit was lowered into position. The Tillie Lykes construction began only five days after the July 10 christening of Doctor Lykes, first ship in the series of new craft, known as SEABEES. (See cover story this issue of Maritime Reporter/Engineering News.) A second vessel, Almeria Lykes, is already under construction. All three ships will be delivered by July 1972. **Tillie Lykes**, for whom the new SEABEE is named, was the only daughter of Dr. **H.T. Lykes**, father of the seven Lykes brothers who founded Lykes Bros. Steamship Co. in 1900. Pictured above at the ceremony were, from left: "**Bing**" **Neal**, superintendent of shipfitting at Quincy; **Tom McGeoghagen**, hull inspector for the Maritime Administration; **Joseph Manzo**, Maritime Administration representative; **L.M. Thorell**, Quincy Shipbuilding Division's Lykes Program Manager; **M.J. Laurier**, Quincy's assistant director for Lykes operations, and **R.S. Campbell**, representing Lykes Bros. Steamship Co., Inc.

## Two Appointments At Philadelphia Resins

Philadelphia Resins Corporation, Montgomeryville, Pa., has announced the appointments of **E.B. (Red) Marquez** and **John H. E. Martin** as sales representatives.

**Mr. Marquez** has been appointed to service marine customers in the Texas and Louisiana Gulf Coast areas. **Mr. Marquez** has long

been associated with marine operations and has an extensive background in shipbuilding over a period of 30 years. His background particularly fits him to service Philadelphia Resins customers in shipyards, oil and chemical refineries and associated plants, in addition to ship operators. Additional representation nationally by Philadelphia Resins Corporation is part of its extensive expansion program.

**Mr. Martin** was appointed sales representative covering general territory from New York through Baltimore, Md. As an exclusive representative on marine coatings, **Mr. Martin** will be responsible for refinery and other industrial plants and cover generally marine operations. He comes to Philadelphia Resins with a strong background in marine coatings and is completely familiar with the marine market. **Mr. Martin** received his M.B.A. degree in marketing from Temple University, Philadelphia, Pa., with additional credits in mechanical engineering.

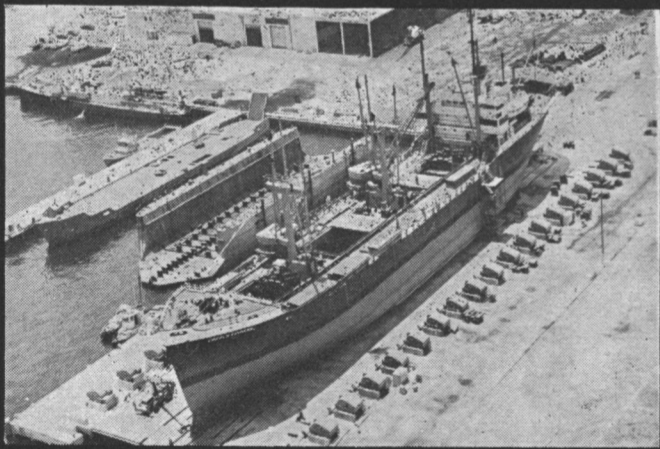
## Anco Tanker Service Appoints Mithassel Managing Director

**Andreas Mithassel** has been appointed managing director of Anco Tanker Service A.S., Oslo 1, Norway. **Mr. Mithassel** replaces **Capt. Aage M. Olsen**, who is retiring from this position later in the year.

**Mr. Mithassel** previously held the position of managing director of Stolt-Nielsen Shipping A.S., Oslo.

**Captain Olsen** will continue to assist Anco Tanker Service A.S. on a consultant basis.

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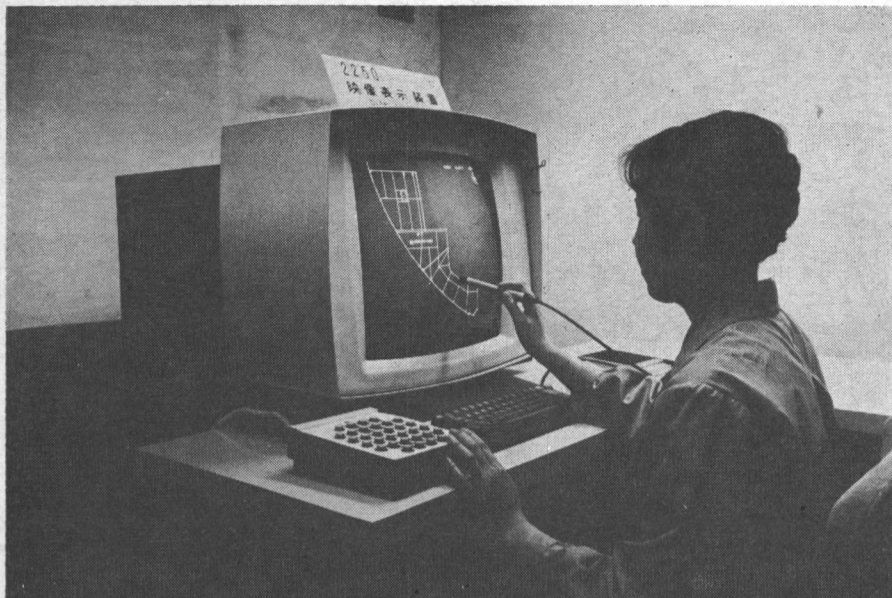
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## Nippon Kokan Computer System Introduces Man-Machine Dialogue To Shipbuilding Design



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Key feature is the man-machine dialogue in which the operator, manipulating a fiberoptic light pen and two types of keyboards, produces drawings on the cathode ray tube display screen which are filed in a secondary memory unit for immediate retrieval. Paper tape

prepared from stored data is fed into a numerical control drafting machine which automatically produces scale drawings. These are used in the company's electro print marking machinery for complete imprinting of drawings onto steel plates, prior to numerically controlled cutting. The system is now incorporated as an integral part of NKK shipbuilding division production flow.

Called the Graphic Lofting or G-Loft System, the new process is a considerable improvement over the computer-aided, automatic drawing technology developed by NKK in 1968. Unlike its predecessor, which required partial prior programming, G-Loft is based on software which needs no advance programming. Another major benefit

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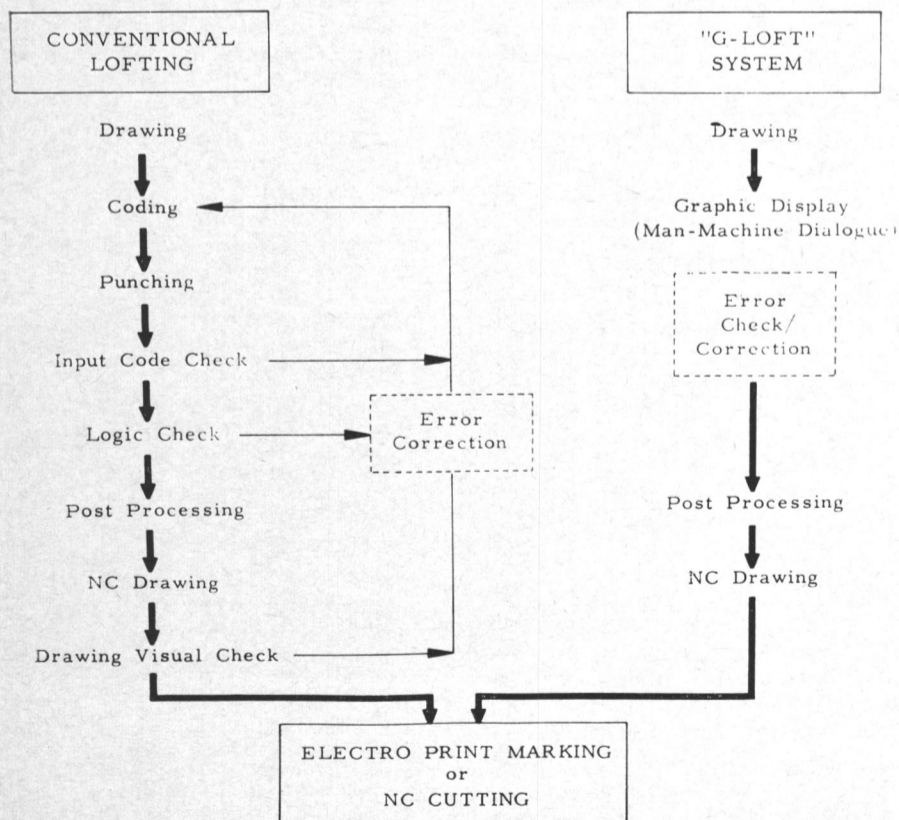
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for easy reading from any angle, its smart appearance is matched only by the convenience of its single-control utility. Also adaptable to pedestal mounting.

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Graphic Lofting—Diagram above compares conventional lofting with world's first computer-aided shipbuilding design system to incorporate man-machine dialogue through cathode ray tube graphic display.

## OSA Launches First Lloyd's Ice Class 1 Supply Vessel —Orders Nine New Vessels

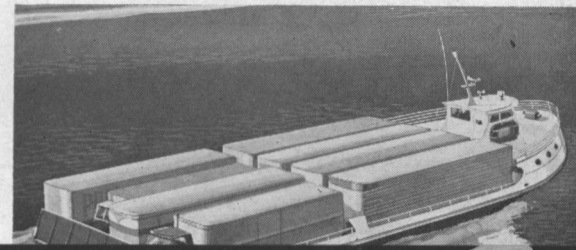
Nine new supply vessels costing a total of \$12 million will be built by Offshore Supply Association (OSA) in the next year, according to an announcement by the company.

This order is in addition to the 16-vessel, \$18-million shipbuilding program announced nine months ago. By March 1973, the London-based consortium will have a fleet of 56 specially-designed vessels, ranging in size from 1,500 hp to 7,000 hp. Included are icebreaker class ships

service vessels to the offshore oil and construction industries, has launched the first supply vessel to be built to Lloyd's Class 1 standards.

The 699-ton Polar Shore was built at Cochran's Yard, Selby, England. Intended for use in Arctic conditions, she is capable of generating 7,620-hp, ranking her as one of the most powerful tug supply boats now afloat. Her specifications include variable pitch propellers which can absorb maximum power throughout their full range of running speeds to facilitate easier towing operations. She is also equipped with a powerful bow thruster for maximum maneuverability when operating close to drilling rigs.

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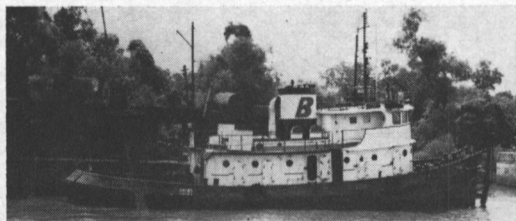
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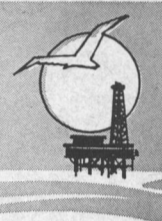
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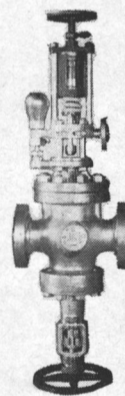
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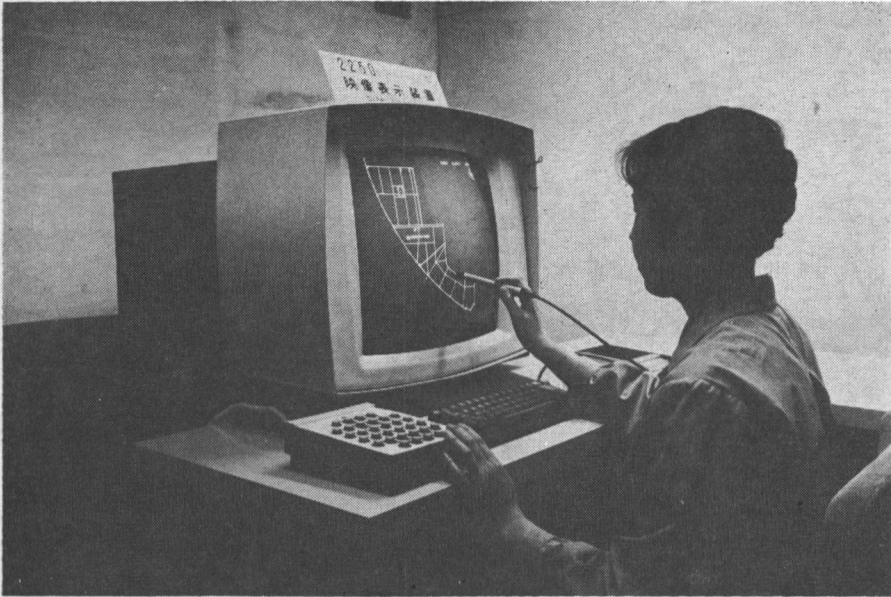
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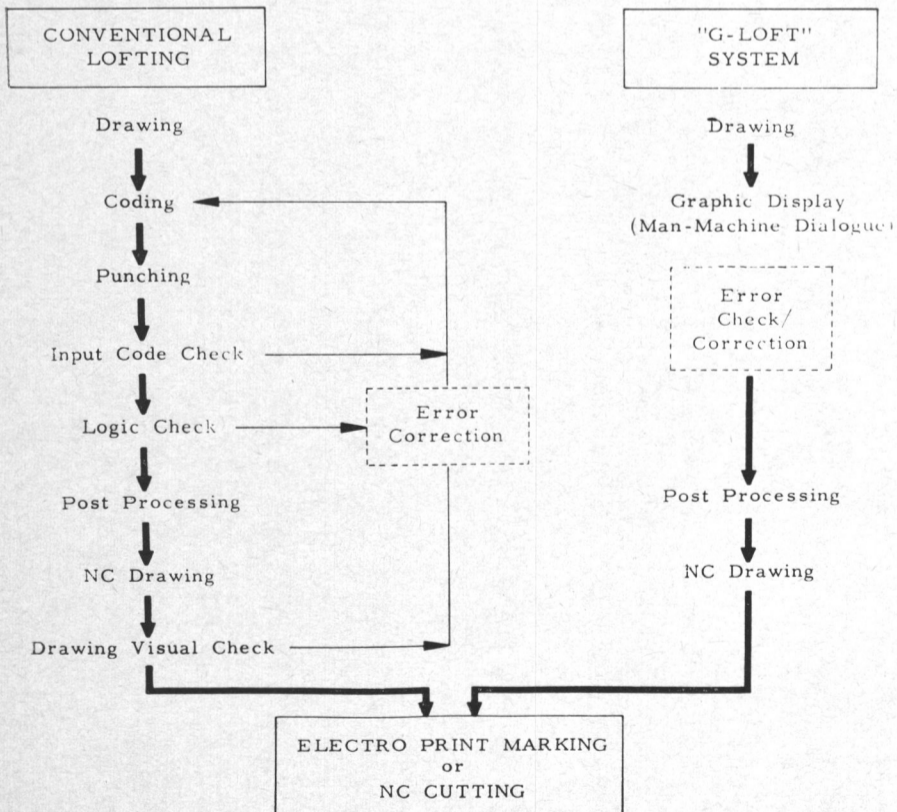
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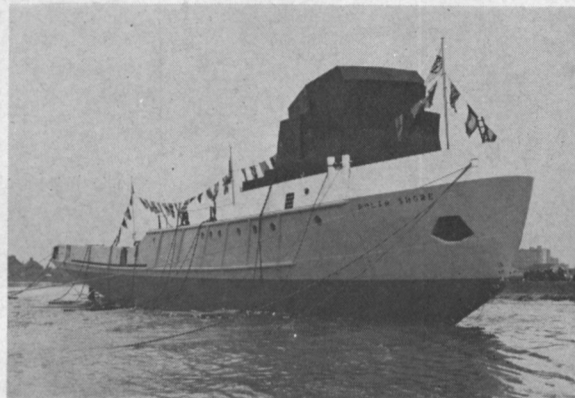
Nine new supply vessels costing a total of \$12 million will be built by Offshore Supply Association (OSA) in the next year, according to an announcement by the company.

This order is in addition to the 16-vessel, \$18-million shipbuilding program announced nine months ago. By March 1973, the London-based consortium will have a fleet of 56 specially-designed vessels, ranging in size from 1,500 hp to 7,000 hp. Included are icebreaker class ships capable of operating in severe Arctic conditions. The new tonnage, which will add another 36,400 hp to the OSA fleet, is being built in British, Dutch, German and Singapore shipyards.

OSA, Europe's largest operator of supply and

service vessels to the offshore oil and construction industries, has launched the first supply vessel to be built to Lloyd's Class 1 standards.

The 699-ton Polar Shore was built at Cochrane's Yard, Selby, England. Intended for use in Arctic conditions, she is capable of generating 7,620-hp, ranking her as one of the most powerful tug supply boats now afloat. Her specifications include variable pitch propellers which can absorb maximum power throughout their full range of running speeds to facilitate easier towing operations. She is also equipped with a powerful bow thruster for maximum maneuverability when operating close to drilling rigs.



The 7,620-hp Polar Shore, shown immediately following her launching at Cochrane's Yard, Selby, England.

"The search for oil is expanding daily into increasingly difficult areas, demanding more sophisticated service from supply ship operators," an OSA spokesman said. "With a modern offshore rig costing upwards of \$25,000 a day to operate, the oil companies demand the utmost reliability from us. Based on our worldwide experience and proven record, particularly in severe climatic conditions, we think we can meet all the demands likely to be made on us," he added.

OSA ships are being used for surveying, rig-towing, anchor-handling and stand-by work, as well as for such purpose as ferrying personnel, provisions and engineering equipment. Currently, the OSA fleet of 42 vessels is supporting drilling operations in Nova Scotia, South America, the North Sea, the Mediterranean, the Adriatic, Africa, Malaysia, Japan and the South Pacific.

OSA is a consortium of three companies: "Hansa" of Bremen, a major German shipping company; Offshore Marine Limited of Great Yarmouth, a subsidiary of the Cunard Steamship Co., Ltd.; and NVG of Hamburg, a subsidiary of Preussag, one of the largest German companies with interests in mining, oil transport and chemicals.

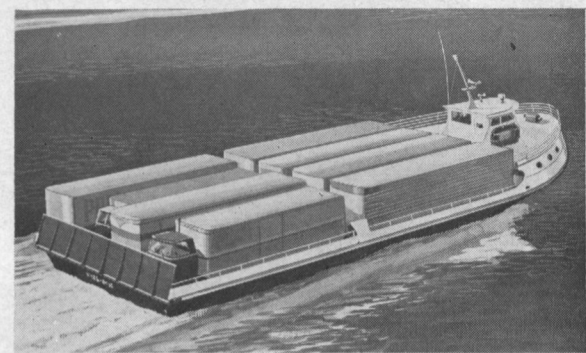
## M.A.N. Offers Studies On Flexible Seating; Noise Control In Marine Diesel Engines

Flexible seating of marine diesel engines and the control in the noise level of marine main and auxiliary engines are the subjects of two detailed studies by Dr.-Ing. Walter Biber, M.A.N.-Augsburg, and Dr.-Ing. Wolfgang Hempel, MTU Friedrichshafen, respectively.

For example, the flexible seating of marine diesel engines proved to be the best solution to a series of varying demands raised by shipping companies for ferries to ensure swift, quiet passages by day, and the greatest possible degree of peace in the passenger cabins by night and during slow crossings. Special considerations had to be borne in mind in the solving of these problems, as air noise and noise conducted through solids, vibrations and general noise development had to be reduced to a minimum by economically justifiable measures.

Both of these studies are available in English and can be obtained from the Central Information Department of M.A.N.-Augsburg.

## New England Firms To Operate Passenger And Freight Vessel In Caribbean Island Service



An artist's conception of the 122-foot inter-island freight and passenger vessel to be built by Blount Marine Corporation of Warren, R.I.

Three New England firms jointly announced they will construct, purchase, lease and operate a 122-foot passenger and freight vessel destined for scheduled operation in the Caribbean between Puerto Rico, St. Thomas and St. Croix later this year.

The joint announcement was made by principals of three firms: Clarence H. Gifford Jr., chairman of the board and president of R.I.H.T. Corporation, a one-bank holding company whose leasing subsidiary, Hospital Trust Leasing Corporation, is purchasing the ship; Luther H. Blount, president of Blount Marine Corporation of Warren, R.I., which has designed and will construct the ship; and Raymond A. Farland, treasurer of Caribbean Ferry Service, Inc., a Massachusetts-based firm to which the ship will be leased and which will be responsible for its operation.

Built for coastal and inter-island service, the new ship will have an assigned draft of only 6 feet and a beam of 38 feet. It will carry from 30 to as many as 350 passengers, depending on the number of vehicles aboard, the maximum of which will be 8 tractor-trailers or 16 automobiles. It will carry a crew of five, including the captain.


## B&W Corporate Brochure On Products And Sales Offices

A six-page corporate brochure on products and sales offices is available from Babcock & Wilcox. The B&W brochure lists all products and services coded numerically to divisions and subsidiaries, and the addresses and telephone numbers of all headquarters and sales offices. A brief history of the company and photos of its products are also included.

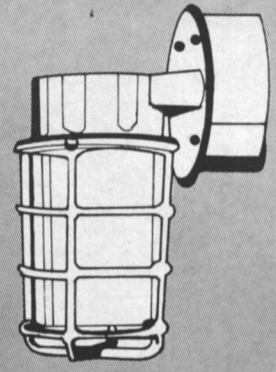
For a copy of the brochure write The Babcock & Wilcox Company, Advertising Department, 161 East 42nd Street, New York, N.Y. 10017.



**HITACHI TANKER DELIVERY:** The 232,079-dwt oil tanker Sanko Lake, constructed at Hitachi Zosen's Sakai Shipyard was recently delivered to Regent Shipping Inc., Liberia. Classed by Bureau Veritas, the approximate measurements of the tanker are: length, 1,000 feet; breadth, 167 feet, and depth, 85 feet. The vessel is powered by a Hitachi Zosen UA-360 type marine steam turbine with a maximum output of 36,000-horsepower providing a trial speed of 16.63 knots.



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# ZIDELL EXPLORATIONS, INC.

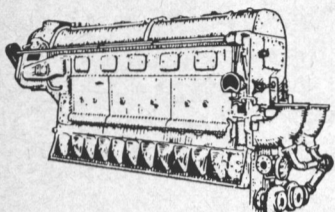


# Marine Equipment VALUES 3 BIG PAGES PACKED FULL!

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## MARINE DIESEL ENGINES



### FAIRBANKS-MORSE, Md. 38D8-1/8

Matched Pair, Port & Starboard  
Used condition, 1800 HP, 800 RPM, 2 cycle, 8-1/8" bore, 10" stroke, Air Start. Complete with Westinghouse Reduction Gears, 2.216:1 ratio—with hydraulic coupling.

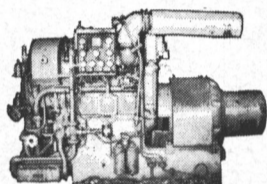
### 3—COOPER-BESSEMER, Model LS-8-DR

1300 HP, 277 RPM, direct reversing, turbo charged.

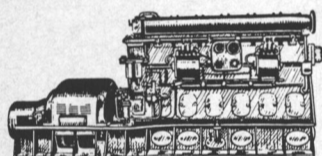
## MARINE DIESEL GENERATORS

Used, Good — Will Overhaul

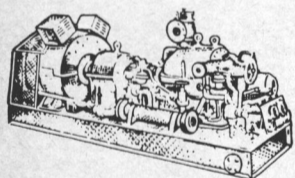
HILL, Type C, 10 KW, 120/240 DC.  
HILL, Type B, 12 KW, 120/240 DC.  
HILL, 4 Cylinder, 15 KW, 120/240 DC.  
SUPERIOR, GA2, 10 KW, 120 DC.  
HERCULES, DOOC, 10 KW, 120 DC.  
CATERPILLAR, D3400, 15 KW, 120/240 DC.  
BUDA, 4 cylinder, 15 KW, 120/240 DC.  
HERCULES, DJXC, 25 KW, 120 DC.  
CUMMINS, WA255, 30 KW, 120 DC.  
P & H, 387C-18, 45/56KVA, 120/208/3/60.  
BUDA, 6DH909, 40 KW, 115 volts DC.  
CUMMINS, HDG, 60 KW, 120 DC.  
BUDA, 6DHG691, 60 KW, 120 DC.  
CUMMINS, 6 cylinder, 60 KW, 120/240 DC.



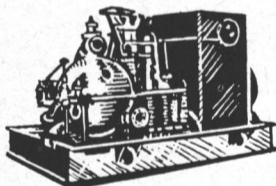
GM, 6067, 60 KW, 450/3/60.  
BUDA, 6DC844, 75 KW, 125/250 DC.  
CATERPILLAR, D17,000, 75 KW, 230 DC.  
MURPHY, ME66, 75 KW, 240 DC.  
LORIMER, F5SS, 75 KW, 240 DC.  
CATERPILLAR, D17000, 85 KW, 220/3/60.  
GM, 3-268A, 100 KW, 120/240 DC.  
SUPERIOR, GBD8, 100 KW, 120/240 DC.  
GM, 3-268A, 100 KW, 440/3/60.  
SUPERIOR, 100 KW, 440/3/60.  
LORIMER, F5SS, 100 KW, 440/3/60.  
LORIMER, 100 KW, 450/3/60 Volts AC.  
GM, 8-268, 300 KW, 345/260 DC.  
GM, 6-278A, 300 KW, 120/240 DC.  
FAIRBANKS-MORSE  
38E5-1/4, 300 KW, 345/260 DC.



COOPER-BESSEMER, FS6, 250 KW, 440/3/60.



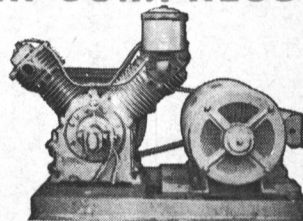
## TURBINE GENERATORS



ALLIS-CHALMERS, 440 PSI, 740°F, with Allis-Chalmers Generators, 300 KW, 120/240 DC.  
ALLIS-CHALMERS, 440 PSI, 740°F, with Allis-Chalmers Generators, 300 KW, 240/240 DC.  
TERRY, Type TM5, 440 PSI, 740°F, with Crocker-Wheeler Generators, 300 KW, 120/240 DC.  
DE LAVAL, 450 PSI, 750°F, with Crocker-Wheeler Generators, 300 KW, 120/240 DC.  
WORTHINGTON, Form S4, 440 PSI, 740°F, with Crocker-Wheeler Gen., 300 KW, 120/240 DC.  
JOSHUA HENDY, 300 PSI, 550°F, with Westinghouse Generator, 300 KW, 120/240 DC.  
WORTHINGTON, Form S4, 440 PSI, 740°F, coupled to two Westinghouse Gen., 250 KW, 440/3/60 and a 90 KW, 120 DC.  
GENERAL ELECTRIC, Type FN3-FN24, Steam 265#G, with G.E. Generator, 750 KW, 440/3/60.

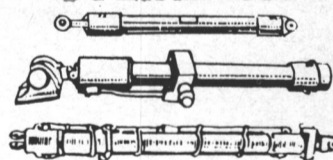
WORTHINGTON, 225 PSI, 397°F, with Westinghouse Generator, 300 KW, 120/240 DC.  
WESTINGHOUSE, 410 PSI, with Westinghouse Generators 200 KW, 450/3/60.  
WESTINGHOUSE, 440 PSI, 740°F, with Westinghouse Generators, 300 KW, 240 DC.  
GENERAL ELECTRIC, 525/618 PSI, with G.E. Generators, 200 KW, 450/3/60.  
WESTINGHOUSE, 590 PSI, 487°F, with Westinghouse Generator, 540 KW, 120/240 DC.  
GENERAL ELECTRIC, 410 PSI, with G.E. Generator, 200 KW, 450/3/60.  
GENERAL ELECTRIC, 525 PSI, with G.E. Generator, 250 KW, 450/3/60.  
GENERAL ELECTRIC, 525/618 PSI, with G.E. Generators, 438 KVA, 450/3/60.  
WORTHINGTON, 225 PSI, 397°F, with Westinghouse Generator, 150 KW, 120 DC.  
WESTINGHOUSE, 200 PSI, with Westinghouse Generators, 60 KW, 120 DC.

## AIR COMPRESSORS



INGERSOLL-RAND, 50 CFM, 150 PSI, 20 HP, 440/3/60.  
SULLIVAN, 60 CFM, 110 PSI, 15 HP, 440/3/60.  
WORTHINGTON, 60 CFM, 110 PSI, 15 HP, 230 DC.  
INGERSOLL-RAND, 50 CFM, 600 PSI, 15 HP, 230 DC.  
CHICAGO-PNEUMATIC, 161 CFM, 100 PSI, 40 HP, 230 DC.  
WORTHINGTON, 175 CFM, 125 PSI, 50 HP, 440/3/60.  
JOY, 100 CFM, 300 PSI, 30 HP, 220/440/3/60.  
INGERSOLL-RAND, 150 CFM, 600 PSI, 75 HP, 230 DC.  
INGERSOLL-RAND, 60 CFM, 125 PSI, 15 HP, 230 DC.  
WORTHINGTON, 142 CFM, 100 PSI, 20 HP, 230 DC.  
HARDIE-TYNES, 30 CFH, 3000 PSI, 75 HP, 230 DC.  
HARDIE-TYNES, 30 CFH, 3000 PSI, Steam Turbine Drive.  
INGERSOLL-RAND, 30 CFH, 3000 PSI, Steam Turbine Drive.  
WORTHINGTON, 30 CFH, 3000 PSI, Steam Turbine Drive.  
WESTINGHOUSE AIR BRAKE, 246 CFM, 140 PSI, 50 HP, 440/3/60.

## HYDRAULIC CYLINDERS



Bore	Overall Stroke	Rod Diameter	retracted length	Action
10"	12"	3.75"	45 1/2"	double
10"	26"	3.75"	58 1/2"	single
2"	8"	1 1/2"	20"	double
2.5"	15"	1.12"	25 1/2"	double
3"	8"	1.37"	15 1/2"	double
6"	8"	4"	144"	double
13"	9'7"	5 1/2"	14'	double

## SPERRY GYRO COMPASSES



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

## AXIAL FLOW FANS



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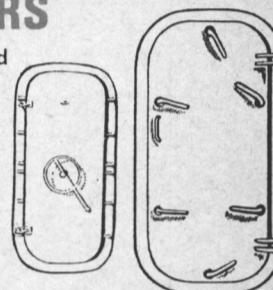
In 440 AC, in 115 DC, and in 230 DC, and in sizes 1 HP through 20 HP. Completely reconditioned.

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Size A 1/2	Size A4	Size A10
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Size A2	Size A6	Size A16

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

## REDUCTION GEARS

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

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

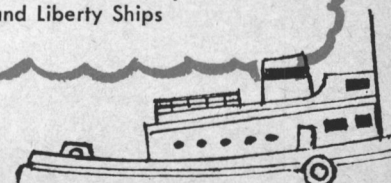
FARREL-BIRMINGHAM, as orig. used on two 1375 HP electric motors in submarine, 2 pinions, single output gear, pinion RPM 1302, Gear RPM 280; ratio 4.65:1.

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

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

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



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## CAPSTAN WINDLASSES



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

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

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

## ANCHOR WINDLASSES

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

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

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

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

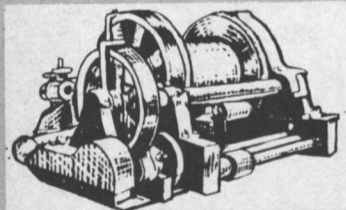
3—HESSE-ERSTED, horizontal, double wildcat, 2 1/8" chain, 60 HP, 230 DC.

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

## ANCHOR WINCHES

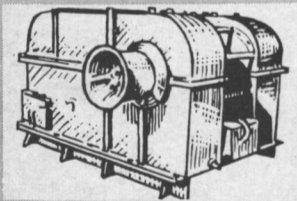
2—JAEGER, single drum capacity approximately 900' of 1 1/2" wire rope, double gypsy, with 35 HP Motors, 230 Volts DC, complete with electricals.

## STEAM TOWING WINCH



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

## UNIWINCHES



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

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

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

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

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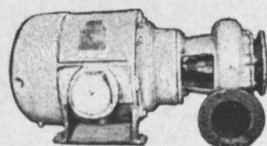


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## AC PUMPS

### Horizontal Centrifugal



1—GOULDS, 2000 GPM, 470' head, size 8 x 10, Westinghouse Motor, 350 HP, 2300/3/60.

1—WORTHINGTON, 400 GPM, 150 PSI, 5-1/2" suction, 3-1/2" discharge, G.E. Motor, 75 HP, 440/3/60.

1—GOULDS, 300 GPM, 336' head, 3" suction, 2" discharge, G.E. Motor, 50 HP, 440/3/60.

5—J. C. CARTER, 365 GPM, 250' head, Aluminum Alloy, 3" suction, 3" discharge, with 25 HP motors, 220/440/3/60.

5—BUFFALO, Class CCS, 250 GPM, 100 PSI, 4" suction, 3-1/2" discharge, Westinghouse motor, 25 HP, 440/3/60.

6—WORTHINGTON, 200 GPM, 100 PSI, 3-1/2" suction, 3" discharge, Wagner motor, 25 HP, 440/3/60.

2—WORTHINGTON, 80 GPM, 60 PSI, 2-1/2" suction, 2" discharge, G.E. motor, 8 HP, 440/3/60.

6—BUFFALO, 875 GPM, 7-1/2" suction, 6-1/2" discharge, motor, 7.7/4.3 HP, 440/3/60.

7—WORTHINGTON, 650 GPM, 9 PSI, 6" suction, 6" discharge, with Star motor, 6 HP, 440/3/60.

1—WORTHINGTON, 175 GPM, 20 PSI, 3-1/2" suction, 3" discharge, with G.E. motor, 3.74 HP, 440/3/60.

4—WORTHINGTON, 60 GPM, 22 PSI, 3-1/2" suction, 2" discharge, with G.E. motor, 3 HP, 440/3/60.

3—ALLIS-CHALMERS, 35 GPM, 100' head, 2" suction, 1-1/2" discharge, with Allis-Chalmers motor, 3 HP, 440/3/60.

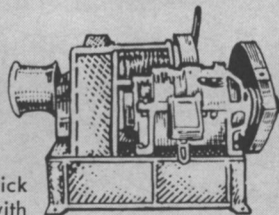
1—ALLIS-CHALMERS, 65 GPM, 80' head, 1-1/2" suction, 1-1/2" discharge, with Allis-Chalmers motor, 3 HP, 440/3/60.

2—WORTHINGTON, 13 GPM, 51 PSI, 1-1/2" suction, 1-1/2" discharge, with G.E. motor, 2.64 HP, 440/3/60.

4—WORTHINGTON, 30 GPM, 30 PSI, 1-1/2" suction, 1-1/2" discharge, with G.E. motor, 1.75 HP, 440/3/60.

11—WARREN, 6 GPM, 36 PSI, 1-1/4" suction, 1" discharge, with G.E. motors, 1.25 HP, 440/3/60.

## CARGO WINCHES

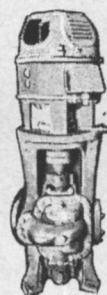


American Hoist and Derrick Company Winches with Westinghouse Motors, 50 HP, 230 Volts DC, complete with Contactor Panels, Master Switches, and Resistors.

Single Speed, Single Drum  
Two Speed, Single Drum

## AC PUMPS

### Vertical Centrifugal



6—WORTHINGTON, 275 GPM, 56.6 PSI, 8-1/2" suction, 3-1/2" discharge, with G.E. motor, 440/3/60.

4—WORTHINGTON, 490 GPM, 35 PSI, 7" suction, 4-1/2" discharge, with G.E. motor, 440/3/60.

6—CHICAGO PUMP CO., submersible, 400 GPM, 6# suction, 30# discharge pressure, with Wagner Motor, 15 HP, 440/3/60.

7—DAYTON-DOWD, 1160 RPM, 15 PSI, 10" suction, 8" discharge, with Wagner motor, 10 HP, 440/3/60.

6—ALLIS-CHALMERS, 68 GPM, 114' head, 3" suction, 1-1/2" discharge, with Wagner motor, 7-1/2 HP, 440/3/60.

3—WORTHINGTON, 100 GPM, 40 PSI, 5" suction, 3" discharge, with G.E. Motor, 7.37 HP, 440/3/60.

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

1—WORTHINGTON, 35 GPM, 62.4 PSI, 3" suction, 2" discharge, with G.E. motor, 5.83 HP, 440/3/60.

3—WORTHINGTON, 350 GPM, 11.1 PSI, 10" suction, 3-1/2" discharge, with G.E. motor, 5 HP, 440/3/60.

9—ALLIS-CHALMERS, 10 GPM, 2" suction, 2-1/2" discharge, with 3 HP motor, 440/3/60.

## AC PUMPS

### Horizontal Rotary

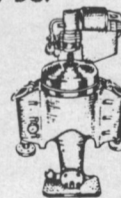
4—WARREN, 197 GPM, 175 PSI, with Electro-Dynamic motor, 30 HP, 440/3/60.

## CENTRIFUGES

### SHARPLES PURIFIERS

150 GPH—400 AC,—230 DC.  
350 GPH—230 DC.  
600 GPH—230 DC.

ALSO: De Laval, size 55-N13, 1-1/2 HP, 440 AC.



## AC PUMPS

### Vertical Rotary



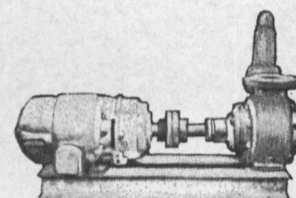
1—DE LAVAL, 550 GPM, 50 PSI, with G.E. motor, 27.4 HP, 440/3/60.

5—QUIMBY, size 2-1/2, 10/6 GPM, 350 PSI, 2-1/2" suction, 1-1/2" discharge, with Wagner Motor, 6/3 HP, 440/3/60.

4—BLACKMER, 50 GPM, 35 PSI, 420 RPM, with G.E. geared motor, 2 HP, 440/3/60.

## DC PUMPS

### Horizontal Centrifugal



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

6—WORTHINGTON, Size 12LA1, 4000 GPM, 67.3 TDM, with Westinghouse motor, 100 HP, 230 DC.

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

6—WORTHINGTON, Size 4L1, 400 GPM, 83' head, with Westinghouse motor, 15 HP, 230 DC.

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

3—WARREN, 1175 GPM, 11.2 PSI, with Reliance motor, 10 HP, 230 DC.

2—YEOMANS, 135 GPM, 115' head, 3" suction, 3" discharge, with Kimble motor, 10 HP, 230 DC.

2—WARREN, Size 5, 600 GPM, with Electro-Dynamics motor, 8/4.5 HP, 230 DC.

1—WARREN, 5" suction, 4" discharge, with Reliance motor, 7-1/2 HP, 115 DC.

1—DAYTON-DOWD, 3" suction, 2-1/2" discharge, with Crocker-Wheeler motor, 5 HP.

3—INGERSOLL-RAND, Size IMVR, 50 GPM, with Electro Dynamics motor, 3.9 HP, 230 DC.

## UNIT WINCHES

### American Hoist and Derrick Company

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

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

U5—SINGLE DRUM, Two speed (2)  
High Speed line Pull: 7450 # - 224 FPM, 6360 # - 238 FPM, 3720 # - 288 FPM,  
Low Speed Line Pull: 1100 # - 114 FPM, 19000 # - 96 FPM (third layer of rope).

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

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

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2—WESTCO, 20 GPM, 50 PSI, with Century motors, 1-1/2 HP, 115 DC.

2—WORTHINGTON, 60 GPM, 23.7 PSI, 2-1/2" suction, 2" discharge, with Diehl motors, 1.43 HP, 230 DC.

5—WARREN, 4 GPM, 38 PSI, 1-1/2" suction, 1" discharge, Century motors, 1.25 HP, (3) 230 DC, (2) 115 DC.

3—ALLIS-CHALMERS, 180 GPM, 81' head, 2-1/2" suction, 2" discharge, with Allis-Chalmers motor, 7-1/2 HP, 230 DC.

4—ALLIS-CHALMERS, 650 GPM, 29' head, 5" suction, 5" discharge, with Allis-Chalmers motor, 7-1/2 HP, 230 DC.

2—ALLIS-CHALMERS, 55 GPM, 51' head, 2-1/2" suction, 2" discharge, with Allis-Chalmers motor, 2 HP, 230 DC.

2—ALDRICH, brine overboard, 30 GPM, 34.5 PSI, 1-1/4x1, with 2 HP motor, 230 DC.

1—WORTHINGTON, 30 GPM, 22 PSI, 1-1/4x1, with 1 HP motor, 230 DC.

## DC PUMPS Vertical Centrifugal



1—GOULDS, Fig. 3090, 13000 GPM, 24.5' head, size 20, with Reliance motor, 100 HP, 230 DC.

1—WORTHINGTON, Type 20LAS-1, 13000 GPM, 11.5 PSI, size 20, with Westinghouse motor, 100 HP, 230 DC.

2—ALLIS-CHALMERS, Type LS-V, 12, 550 GPM, 20' head, 20" suction, 20" discharge, with Allis-Chalmers motor, 100 HP, 230 DC.

1—WORTHINGTON FIRE & BUTTERWORTH, size 3UBS, 400 GPM, 300 PSI, with Westinghouse motor, 75 HP, 230 DC.

2—ALLIS-CHALMERS, Type BU-V, 400 GPM, 280' head, 4x3, with Allis-Chalmers motor, 50 HP, 230 DC.

3—WORTHINGTON, size 3UBS, 400 GPM, 280' head, with Westinghouse Motor, 50 HP, 230 DC.

2—BUFFALO, size 3SAV, 400 GPM, 125 TDH, with Electro-Dynamics motor, 50 HP, 230 DC.

1—ALLIS-CHALMERS, Type SE-V, 2820 GPM, 29.2' head, 12" suction, 12" discharge, with Allis-Chalmers motor, 40 HP, 230 DC.

1—DE LAVAL, size 14", 5900 GPM, 25'8" head, with Electro-Dynamics motor, 25/50, 230 DC.

1—DE LAVAL, 400 GPM, 127 PSI, with Electro-Dynamics motor, 25/50 HP, 230 DC.

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

1—INGERSOLL-RAND, size 18VCM, 8500 GPM, with Electro-Dynamics motor, 20/40 HP, 230 DC.

2—WORTHINGTON, Type 16LAS-2, 5600 GPM, 10 PSI, with G.E. Motor, 20/40 HP, 230 DC.

1—WORTHINGTON, size 10SLHV, 1500 GPM, with Reliance motor, 25 HP, 230 DC.

1—WORTHINGTON, 8-LS-1, 1800 GPM, 13 PSI, with Westinghouse motor, 20 HP, 230 DC.

4—ALLIS-CHALMERS, Type SGV, 600 GPM, 30 PSI, 5" suction, 5" discharge, with Allis-Chalmers motors, 20 HP, 230 DC.

1—INGERSOLL-RAND, 1050/2000 GPM, 10" suction, 10" discharge, with G.E. motor, 20 HP, 230 DC.

2—WORTHINGTON, submersible, size 5", 600 GPM, 30 PSI, with 20 HP motor, 230 DC.

2—ALLIS-CHALMERS, Type CF-2V, size 6" x 3-1/2", 170 GPM, 208' head, with Allis-Chalmers motor, 20 HP, 230 DC.

4—WORTHINGTON, size 5LS-1, 415 GPM, 78.5' head, with 20 HP motor, 230 DC.

1—WORTHINGTON, Type 2-1/2 UZS-1, 170 GPM, 75 PSI, with Westinghouse motor, 16.8 HP, 230 DC.

2—WORTHINGTON, 340 GPM, 33.6' head, 6" suction, 3" discharge, with G.E. motor, 15 HP, 230 DC.

1—INGERSOLL-RAND, size 2VHM, 150 GPM, 85 PSI, with Reliance motor, 15 HP, 230 DC.

6—WORTHINGTON, size 2-1/2 UZ1, 120 GPM, 208 head, 15 HP, 230 DC.

1—WORTHINGTON, 5LS, 600 GPM, 18 PSI, with Westinghouse motor, 15 HP, 230 DC.

2—INGERSOLL-RAND, 450 GPM, 15' head, 4" suction, 3" discharge, with G.E. Motor, 10/15 HP, 230 D.C.

2—BUFFALO, size 3SLV, 425 GPM, 35' head, with Electro-Dynamic motor, 7-1/2/15 HP, 230 DC.

2—ALLIS-CHALMERS, Type CF-2V, 30 GPM, 208' head, with Allis-Chalmers motor, 7-1/2 HP, 230 DC.

1—DE LAVAL, 1600 GPM, 27' head, with Electro Dynamic motor, 7-1/2/15 HP, 230 DC.

2—DE LAVAL, 425 GPM, 28' head, with Electro Dynamic motor, 7-1/2/15 HP, 230 DC.

2—INGERSOLL-RAND, size 8VCM, 1400 GPM, with Electro-Dynamic motor, 5/10 HP, 230 DC.

2—WORTHINGTON, size 8LS-1, 1400 GPM, 10 PSI, with G.E. motor, 5/10 HP, 230 DC.

2—DE LAVAL, 80 GPM, 75 PSI, with Electro-Dynamics motors, 5/10 HP, 230 DC.

2—INGERSOLL-RAND, size 1-1/2 VBM, 70 GPM, with Electro-Dynamics motor, 5/10 HP, 230 DC.

1—DAYTON DOWD, 30 GPM, 85 PSI, Mod. VHM, with Continental motor, 5 HP, 230 D.C.

2—WORTHINGTON, Type 1-1/2 UZS-3, 20 GPM, 75 PSI, with G. E. Motor, 5 HP, 230 DC.

1—WARREN, size 1-1/2-2CV-6, 30 GPM, 196' head, with Continental motor, 5 HP, 230 DC.

2—WORTHINGTON, 400 GPM, 13.5' head, 5x4, with Westinghouse motor, 5 HP, 230 DC.

1—DE LAVAL, 25 GPM, 75 PSI, with Electro-Dynamics motor, 2.5/5 HP, 230 DC.

2—WEIL, 20 GPM, 40 PSI, 1-1/2x1-1/4, with G.E. motor, 3 HP, 230 DC.

2—INGERSOLL-RAND, size 1MVR, 20 GPM, with Electro-Dynamic motor, 3/1.5 HP, 230 DC.

## DC PUMPS Horizontal Rotary

2—WORTHINGTON, size 5GES, 400 GPM, 50 PSI, with Westinghouse Motor, 20 HP, 230 DC.

1—DE LAVAL, 15 GPM, 350 PSI, 2-1/2 x2-1/2, with Diehl motor, 10 HP, 230 DC.

2—VIKING, Type EKK, 60 GPM, 70 PSI, 2x2, with Diehl motor, 5 HP, 230 DC.

2—NATIONAL TRANSIT, 50 GPM, 50 PSI, 34 HP, 230 DC.

## DC PUMPS Vertical Rotary



4—QUIMBY, size 5, 400 GPM, 60 PSI, 6x5, with Westinghouse motor, 30 HP, 230 DC.

2—QUIMBY, size 5, 400 GPM, 48 PSI, 6x5, 25 HP, 230 DC.

3—WORTHINGTON, Mod. 4GRVS, 225 GPM, 35 PSI, with G.E. motors, 15/20 HP, 230 DC.

2—DE LAVAL-IMO, 250 GPM, 40 PSI, 15 HP, 230 DC.

2—QUIMBY, size 4D, 225 GPM, 50 PSI, 15 HP, 230 DC.

2—DE LAVAL, 325 GPM, 40 PSI, 15 HP, 230 D.C.

1—QUIMBY, size 2-1/2, 20 GPM, 400 PSI, 10 HP, 230 DC.

1—DE LAVAL, 175 GPM, 42 PSI, 10 HP, 230 DC.

1—DE LAVAL, 225 GPM, 35 PSI, 7.5/15 HP, 230 DC.

1—QUIMBY, size 4, 175 GPM, with Electro-Dynamics Motor, 7-1/2/10 HP, 230 DC.

1—DELAVAL, 13 GPM, 400 PSI, with Westinghouse motor, 7.5 HP, 230 DC.

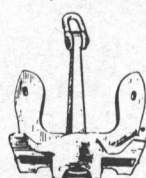
2—WORTHINGTON, Type 3GRVS, 90 GPM, 75 PSI, with Diehl motor, 7-1/2 HP, 230 DC.

1—DE LAVAL, 8 GPM, 400 PSI, with Electro-Dynamics motor, 5 HP, 230 DC.

1—WORTHINGTON, Type 2GRVS, 7 GPM, 400 PSI, with G.E. Motor, 2.5/5 HP, 230 DC.

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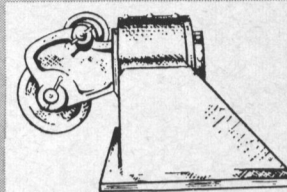
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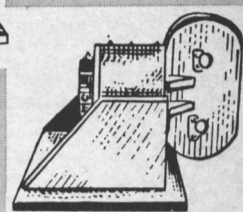
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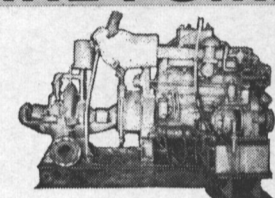
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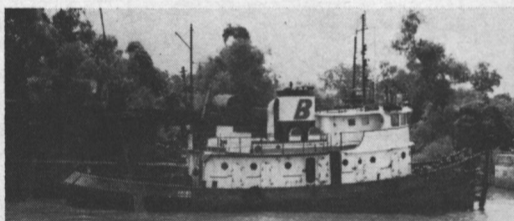
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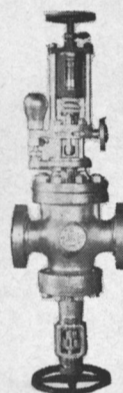
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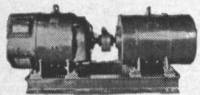


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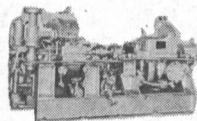
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Steam turbine 440—507—TT—  
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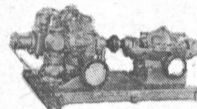
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SKH—1200 GPM—125 PSI—  
3500 RPM. Coppoos turbine type  
TF-22-2½—3500 RPM. 273#—  
50° superheat.

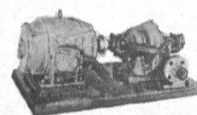
### FUEL OIL SERVICE PUMP



**\$1250.00**

Turbine driven rotary pump with  
reduction gear. Warren vertical  
rotary—size 3¼"—65 GPM @  
350 PSI discharge. Powered by  
Terry horizontal turbine type Y-  
w—20 HP—575# steam—5065  
RPM. Pump speed 1025. Suit-  
able for large tankers, ore car-  
riers. Originally for U.S.N. cruis-  
ers. Unused.

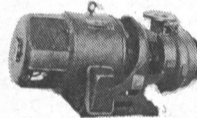
### FIRE & GENERAL SERVICE PUMP



**\$975.00**

Fairbanks-Morse centrifugal  
pump—300 GPM @ 275' dis-  
charge. 3460 RPM—3" suction—  
2½" discharge. MOTOR: 30 HP  
—220/440/3/60—3460 RPM.  
BASE: OAL 52"—OAW 24".  
UNIT: OAH 24½". Looks new.

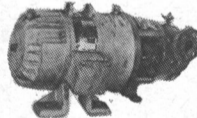
### UNUSED CIRCULATING PUMP



**\$877.77**

Allis-Chalmers—close-coupled—  
bronze—375 GPM—40' head—  
size 4x3—5 HP motor—115 VDC  
—40 amps—1750 RPM—com-  
pound wound—continuous.

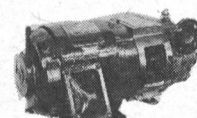
### UNUSED REFRIGERATION CONDENSER CIRCULATOR



**\$397.66**

Frederick Iron & Steel Co.—close  
coupled—bronze—high head—  
10 GPM—56' @ 3500 RPM—  
1"x1¼"—test pressure 75#—  
48" submergence horizontal  
MOTOR: Barble-Card Electric—  
1 HP—440/3/60—1.7 amps—  
3500 RPM. Spraytite enclosure—  
continuous duty 50-125 degrees  
F—with magnetic controller—  
some spares. Motor is high shock  
non-magnetic.

### HORIZONTAL DISTILLER



**\$397.66**

Bronze Davidson pump—20 GPM  
—51' head—submergence 4—  
3500 RPM. MOTOR: Reliance 1  
HP—220/440/3/60—3500 RPM  
—162 lbs total weight—1¼"  
suction—1" discharge. OAL  
22½"—OAW 9½"—OAH 12".  
Complete with Cutler-Hammer  
controller.

### FRESH WATER PUMP

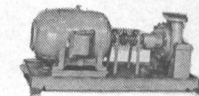
### NEW BRONZE FRESH WATER PUMP



**\$429.66**

Mfg by Allis-Chalmers. 35 GPM  
@ 43.3 lbs head. MOTOR: 3 HP  
—440/3/60—with spare parts  
and control.

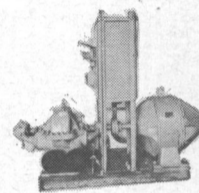
### UNUSED HIGH HEAD CENTRIFUGAL PUMP



**Priced Right**

For butane, fuel oil, hot solvents  
to 800° max. Ingersoll-Rand  
HFLA—serial 056-3136—600  
GPM—580' head—6" inlet—4"  
outlet. Flange connection—steel  
base mounted. Westinghouse  
motor CS—125 HP—440/3/60  
—3530 RPM—4200 lbs total  
weight.

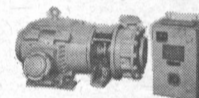
### FIRE PUMP



**\$1950.00**

Reconditioned Worthy fire pump  
—3" UBI—450 GPM—125 lbs  
—1750 RPM. MOTOR: 50 HP—  
230 VDC—178 amps—type SK  
—frame 133—compound—1310  
/1750—with magnetic starter.

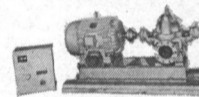
### HIGH HEAD DIESEL FRESH WATER SERVICE PUMP



**\$475.00**

Fairbanks-Morse pump—75 GPM  
—56.1 ft head—test 110 lbs.  
MOTOR: Reliance 3 HP—frame  
284 UCZ—440/3/60—1750  
RPM—with starter.

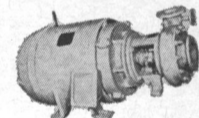
### UNUSED BUFFALO PUMPS



**\$1495.00**

All bronze—model S.L.—750  
GPM—50 PSI head—28 BHP.  
MOTOR: Continental—30 HP—  
440/3/60—37 amps—1760 RPM.  
5" Suction—4" discharge. OAL  
4' 8½"—OAW 22"—OAH 30"  
—weight 1200 lbs.

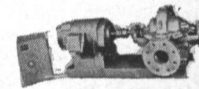
### A. C. FIRE PUMPS



**\$887.00**

250 GPM—160 PSI discharge.  
Suction 3½"—discharge 2½"—  
3500 RPM. MOTOR: Reliance—  
25 HP—440/3/60—35.6 amps.  
3 Weil pumps and 3 Aldrich  
pumps available. Reconditioned  
pumps and motors.

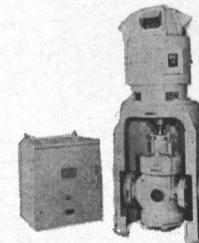
### UNUSED AURORA PUMP



**\$877.77**

300 GPM—37' head—5 HP—  
120 volts DC Centrifugal Pump.  
Bronze—size 5 x 4—flanged.  
MOTOR: Reliance—super T.D.C.  
Electric Motor—5HP—120 VDC  
—36.8 amps—1750 RPM—  
Frame L216A—with control by  
Cutler-Hammer. Excellent con-  
dition. Latest USN surplus.

### UNUSED DELAVAL IMO ROTARY PUMP



**\$1850.00**

175 GPM—35 PSIG—10 HP—  
120 volts DC—1750 RPM—serial  
E-8619—frame 324 VY—76  
amps—mfg by Electro Dynamics.  
With magnetic control. Excellent  
condition.

## THE BOSTON METALS COMPANY

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

# Guaranteed ready to use

The items advertised on this page are ready for your use. Most have been completely reconditioned, many are ABS certified, all have been carefully inspected to assure their serviceability. If it's listed here, you can depend on it . . . today . . . when you need it. Call Jeff Feder for fast answers on your replacement needs.

## C3 RUDDER

Reconditioned with A.B.S. Certificate  
Ingalls Hull #267

## STEERING UNIT PUMPS

Hele-Shaw Pump, Size 11P12, RPM 850  
Pressure 1000, Westinghouse Motor  
Type CS 440 Volt, 35 HP 880 RPM  
49 Amps, 3 Phase 60 Cyl.

## TOPPING WINCHES

Lakeshore Type T Model 5D  
Single Speed, General Electric 5 HP,  
Model 5AR254960, 440/3/60,  
1100 RPM

## CARGO WINCHES

Single Drum, Single Speed,  
General Electric, COM-1830-AEY,  
230 Volt DC Motor

## GENERATOR SETS

General Electric, 440 Volt AC/230 Volt  
DC, G.E. Model 6PC2096A1,  
Motor Type K, Frame 405S, 1770 RPM

## FUEL OIL PUMPS

Quimby Pump, Size 2½, RPM 1150,  
GPM 15, Press 325, General Electric,  
Model 5KF364PPI, 440 Volt 7½/3¾ HP,  
1160/580 RPM

## C-4 S1A TURBINE

Bethlehem 17,500 SHP  
Low Pressure, Complete  
Falk Reduction Gear, 17,500 Shaft HP,  
102 RPM Output, Complete with spares

## GENERAL ELECTRIC

Rebuilt Starter Boxes, 440 Volts,  
From 2 HP to 50 HP

## MAIN CONDENSATE PUMPS

Ingersoll Rand, Type 2 VHM, 180 GPM,  
Westinghouse Motor, 440 Volts 25 HP,  
1750 RPM 32-5 Amps

## T-2 NEW • UNUSED

General Electric, 6000 HP, AC Motor  
New-unused, Type TSM-HL-80,  
Synchronous Type, 2300 Volts, 60  
Cycles, 3 Phase, 1160 Amps 90 RPM

## MAIN PROPULSION TURBINE ROTORS

Reconditioned with A.B.S. Certificate

## C-2 SB1 BRONZE PROPELLER

## C-2 SB1 RUDDERS

## 5, 10 AND 30 TON BOOMS

## CARGO WINCHES

Nine pair, Single Drum, Single Speed,  
General Electric, COM-1830-AEY,  
230 Volt DC Motor

## GENERAL ELECTRIC 300 KW. DC

### TURBO GENERATOR

Generators: 300 KW DC, 120/240 Volts,  
1200 RPM, 1250 Amps, Type MPC,  
Model 24G869, 3 Wire,  
Compound Wound

Turbines: Type DS 60-25, 5636 RPM,  
440 PSI, 40 F.

Reduction Gears: Ratio: 5636/1200 RPM  
Completely rebuilt, A.B.S. Certificate

## GENERATOR SETS

General Electric, Seven Each,  
440 Volt AC/230 Volt DC,  
G.E. Model 6PC2096A1, Motor Type K,  
Frame 405S, 1770 RPM

## CIRCULATING PUMPS

Warren Main, Type 24 MFP,  
18,000 GPM, 690 RPM, 16 Foot TDH,  
Vertical with 150/38 HP  
440/3/60 Motor with Spare Parts

## CONDENSATE PUMP

Warren Main, Type 4-2CVP-10,  
325 GPM, 50 RPM, 180 Foot TDH,  
Vertical with 25 HP, 440/3/60 Motor

## SUPERHEATER HEADERS

For Port-Boiler, CE Type V2M (two each)  
For Starboard-Boiler,  
CE Type V2M (two each)

## BOILER HEADERS

For Port-Boiler, CE Type V2M  
(three each)  
For Starboard-Boiler (three each)

## TURBINES

Dorv 325/525 KW, G.E. 325/300 KW  
Worthington 300 KW  
Main Turbine Rotor for T-2 (6000 HP)

## ANCHOR WINDLASS

Manufactured by Webster Brinkley Co.  
Model WNE-5 Vertical Type 2¾/16" Die  
Lock Chain. Two Wildcats.  
Two Capstans

Electric Powered 75 HP 230 Volt DC  
Motor with controls and motor brakes

Capstans designed for 10"  
circumference rope 90 FPM  
under load of 20,000 lbs

Each wildcat and capstan can be  
operated simultaneously or  
separately

Electrical and Mechanical spares  
included

Fairbanks Morse Model 38D 1/8  
1600 HP diesel engines with common  
Farrell-Birmingham gear 2.677:(270  
RPM). Complete with all accessories,  
including heat exchangers, air  
compressors, air tanks, mufflers,  
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Few hours since engines fully rebuilt at  
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Engine logs available

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# BUYERS DIRECTORY

## AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231  
Carrier Air Conditioning Co., Carrier Parkway, Syracuse, N.Y. 13201  
Union Carbide Corp., Linde Div., 270 Park Ave., N.Y., N.Y. 10017

## ANCHORS AND ANCHOR CHAINS

Baldt Anchor, Chain & Forge, P.O. Box 350, Chester, Pa. 19016  
Lockstadt Co., Inc., 179 West 5th St., Bayonne, N.J. 07002

## BEARINGS

BJ Marine Bearings, a Borg-Warner Industry, P.O. Box 2709, Terminal Annex, Los Angeles, Calif. 90054  
Glacier Metal Co. Ltd., Alpertown, Wembley, Middlesex, England.  
Johnson Rubber Co., Marine Division, Middlefield, Ohio 44062  
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

## BOILERS

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

## BOW THRUSTERS

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

## BUNKERING SERVICE

Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y. 10019  
Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019  
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. 11231

## CABLE ELECTRIC MARINE

Anixter-Harbor, Inc., 1050 Aladdin, San Leandro, Calif. 94577  
Anixter-Netherlands, Utrecht Gebouw, Coolingsel 75, Rotterdam 3002, Netherlands  
Anixter-New York, 300 Executive Blvd., Elmsford, N.Y. 10523  
Anixter-New Orleans, 315 Notre Dame, New Orleans, La. 70130  
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150

## CLUTCHES, GEARS & BRAKES

Amarillo Gear Co., 517 No. Polk St., Amarillo, Texas 79105  
Eaton Corp., Industrial Drive Division, 9919 Clinton Rd., Cleveland, Ohio 44111  
Wichita Clutch Co., Inc., Wichita Falls, Texas 76307

## COATINGS—Protective

Ameron Corrosion Control Div., Brea, Calif. 92621  
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144  
Devoe & Reynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105  
Enjay Chemical Company, 60 West 49th St., New York, N.Y. 10020  
Farbair Company, 90 West St., N.Y., N.Y. 10006  
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.  
Spee-Flo Co., 4631 Winfield Rd., Houston, Texas 77039

## CONTAINERS—CONTAINER HANDLING SYSTEMS

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

## CONTAINER LASHINGS & COMPONENTS

American Engineered Products Co., Box 74, McKees Rocks, Pa. 15136  
W. W. Patterson Co., 830 Brockett St., Pittsburgh, Pa. 15233  
Pro Par Div. Fruehauf Corp., 10940 Harper Ave., Detroit, Mich. 48232

## CORROSION CONTROL

Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215  
General Electric Industry Control Dept., Salem, Virginia  
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913  
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.  
Ameron Corrosion Control Div., Brea, Calif. 92621  
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144  
Corrosion Dynamics, 1100 Walnut St., Roselle, N.J. 07203  
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., 400 Executive Blvd., Elmsford, N.Y. 10523  
Conrad-Stork, Div. Stork-Werkspoor, P.O. Box 134, Haarlem, Holland  
Hoffman Rigging & Crane Service, 560 Cortlandt St., Belleville, N.J. 07109  
Kocks Pittsburgh Corp., Four Gateway Center, Pittsburgh, Pa. 15222  
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 1010 Third Ave., New York, N.Y. 10021  
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany  
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501  
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98401

## DECK COVERS (METAL)

Lockstad Co., Inc., 179 W. 5th Street, Bayonne, New Jersey 07002  
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696

## DECK MACHINERY—Cargo Handling Equipment

ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523  
Garrett Corp., 9851 Sepulveda Blvd., Los Angeles, Calif. 90009  
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 1010 Third Ave., New York, N.Y. 10021  
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134  
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202  
Pacific Pipe Co., 49 Fremont St., San Francisco, Calif. 94080  
Pine Tree Engineering, Subsidiary Rice Barton Corp., P.O. Box 654, Brunswick, Maine 04011  
Red Fox Machine & Supply Co., P.O. Drawer 640, New Iberia, La. 70560  
A. G. Weser, Seebeckwerft, 2850 Bremerhaven 1, Germany  
Western Gear Corp., Heavy Machinery Div., Everett, Wash. 98201

## 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  
United Filtration Corp., 9600 John St., Santa Fe Springs, Calif. 90670

## DIESEL ENGINES

Bruce GM Diesel, Inc., 180 Route #17 S. at Interstate 80, Lodi, N.J. 07644  
Caterpillar Tractor Co., Industrial Div., 100 N.E. Adams St., Peoria, Ill. 61602  
Colt Industries Inc., Power Systems Div., Beloit, Wisc. 53511  
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. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany  
H. O. Penn Machinery Co., 1561 Stewart Ave., Westbury, N.Y. 11590

## DIESEL ENGINE MUFFLERS

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

## DOORS—Watertight—Bulkhead

Overbeke-Kain Co., 209 Aurora Rd., Bedford, Ohio 44014  
Walz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

## ELECTRICAL EQUIPMENT

Arnessen Electric Co., Inc., 335 Bond St., Brooklyn, N.Y.  
Galbraith-Pilot Marine Corp., 600 4th Ave., Brooklyn, N.Y. 11215  
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150  
Marine Industrial Products Co., 195 Patterson Ave., Little Falls, N.J. 07424  
Merrin Electric, 162 Chambers St., New York, N.Y. 10007  
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014  
Pauluhn Electrical Mfg. Co. Inc., P.O. Box 12805, Houston, Tex. 77017

## EVAPORATORS

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

Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202  
Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

## FLOATING EQUIPMENT—Steel—Aluminum Pontoons

Dravo Corporation, Neville Island, Pittsburgh 25, Pa.

## GALLEY RANGES

S. Blickman, Inc., 536 Gregory Ave., Weehawken, N.J. 07087  
Elisha Webb & Son Co., 136 So. Front St., Philadelphia, Pa. 19106

## HEATERS—Ship

Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231

## HYDRAULICS

Bird Johnson Co., 883 Main St., Walpole, Mass. 02081  
Bond Hydraulic Equip. Service, Inc., 117 Monroe St., Hoboken, N.J. 07030  
Universal Hydraulics, Div. of Ohio Brass Co., 4500 Beidler Road, Willoughby, Ohio 44094  
Vickers, M&O Div., Troy, Mich. 48084

## INSULATION—Marine

Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brklyn, N.Y. 11231

## LININGS

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

## MACHINERY MONITORS

IRD Mechanalysis, Inc., 6150 Huntley Rd., Columbus, Ohio 43229

## 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., 55 Brixton Rd., Garden City, N.Y. 11530  
Edo Western Corp., 2645 So. 2nd St., W. Salt Lake City, Utah 84115  
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016  
ITT Mackay Marine, 133 Terminal Ave., Clark, N.J. 07066  
Magnavox Navigation Systems, 2829 Maricopa St., Torrance, Calif. 90503

Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406  
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.  
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701  
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101  
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.  
Star Lifeline, Ltd., 1148 W. 15th St., No. Vancouver, B.C., Canada  
Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721

## MARINE EQUIPMENT

Adco Div., 34 Milburn St., Buffalo, N.Y. 14212  
Nicolai Jaffe 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  
Merrin Electric, 162 Chambers St., New York, N.Y. 10007  
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742  
Stow Mfg. Co., 225 Shear St., Binghamton, N.Y. 13902  
Vokes Filter Div. (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221

## MARINE FURNITURE

Bailey Joiner Co., 115 King Street, Brooklyn, N.Y. 11231

## MARINE INSURANCE

Adams & Porter, Cotton Exchange Bldg., Houston, Texas  
Midland Insurance Co., 29 Broadway, New York, N.Y. 10006

## MARINE PROPULSION

Buehler Corp., 9000 Precision Drive, Indianapolis, Ind. 46236  
Combustion Engineering, Inc., Windsor, Connecticut 06095  
General Electric Co., Marine Turbine & Gear Dept., Lynn, Mass. 01910  
General Electric Co., Gas Turbine Dept., Schenectady, N.Y. 12305  
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171  
Port Electric Turbine Div., 155-157 Perry St., New York 10014  
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523  
Western Gear Corp., Precision Products Div., P.O. Box 190, Lynwood, Calif. 90262

## MARINE RADIO COMMUNICATIONS EQUIPMENT

Collins Radio Co., M/S 416-118, Dallas, Texas 75207  
Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746  
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011  
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016  
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701  
Raytheon Co. Marine Products, 676 Island Pond Rd., Manchester, N.H. 03103  
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101  
RF Communications, Inc., 1676 University Ave., Rochester, N.Y. 14610

## NAVAL ARCHITECTS AND MARINE ENGINEERS

Best & Associates, 9870 S. W. 81 St., Miami, Florida 33143  
Breit Engrg. Inc., 441 Gravier St., New Orleans, La. 70130  
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517  
Crandall Dry Dock Engrs., Inc., 238 Main St., Cambridge, Mass. 02142  
Cushing & Nordstrom, 50 Trinity Place, New York, N.Y. 10006  
Arthur D. Darden, Inc., 1040 International Trade Mart, New Orleans, La. 70130

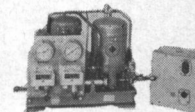
Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119  
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011  
M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228  
Christopher J. Foster, 17 Battery Place, New York, N.Y. 10004  
14 Vanderventer Ave., Port Washington, N.Y. 11050  
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112  
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006  
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110  
Morris Guralnick Associates, Inc., 583 Market St., San Francisco, Calif. 94105

J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006  
L. K. Homyer, Box 408, Corona Del Mar, California 92625  
C. T. Ilariucci & Associates, Tourism Pier #3, San Juan, Porto Rico 00902  
James S. Krogen, 1460 Brickell Ave., Miami, Fla. 33131  
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460

Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567  
Marine Applications Co., Inc., P.O. Box 167, Mineola, N.Y. 11502  
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114  
Marine Design Inc., 1180 Ave. of Americas, N.Y., N.Y. 10036  
Marine Design Associates, P.O. Box 2674, Palm Beach, Florida  
Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143  
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225  
John J. McMullen Associates, Inc., 110 Wall St., N.Y., N.Y. 10005  
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403  
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742  
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050  
Gunnar Nelson, 2185 Lemoine Ave., Ft. Lee, N.J. 07024  
Nickum & Spaulding Associates, Inc., 71 Columbia St., Seattle, Wash. 98104  
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156

Philip L. Rhodes, Inc., 369 Lexington Ave., New York, N.Y. 10017  
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013  
and 657 Mission St., San Francisco, Calif.  
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007  
T. W. Spaetgens, 156 West 8th Ave., Vancouver 10, Canada

## YORK 2-TON SEALED REFRIGERATION UNITS

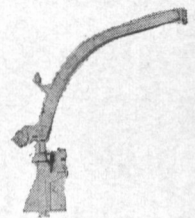


Self-contained — hermetically sealed — sea-water cooled. 2 HP — 440/3/60 with magnetic starter. Suitable for portable reefer boxes, small craft, etc.

**\$489.50 EACH**

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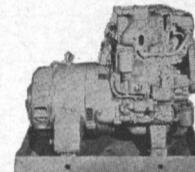
## STORES DAVIT NEW — UNUSED

Mfg by Welin—with hand winch & rotary winch. Welin davit H-20 — hand winch 1750 lbs working load. Drum 7 1/2" diameter — 1 1/4" flange — 9" drum width. Equipped with hand brake. Height 15" 3" — radius 5" 6".

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## DIESEL GENERATOR SETS 20KW — 120 V.D.C. G.M. 2-71

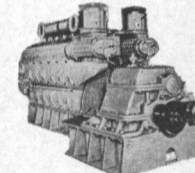


GEN: 20 KW 120 VDC 1200 RPM. ENGINE: GM 2-71 diesel — 2-cycle — 4 1/4 x 5 — 142 cu inch — clockwise — 24 volt start.

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## MATCHED PAIR DIESEL ENGINES



**900 H.P. G.M. 12-567A with Falk reverse and reduction gear**

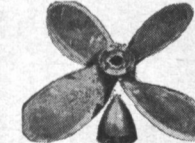
ENGINE: 12-567A — 8 1/2 x 10 — VEE type — 2-cycle — 747 RPM — electric starting — serial Nos. 1041 & 1060. GEAR: Falk Air Flex — reverse & reduction — 2.48:1 forward — 2.52:1 reverse. Units just removed from Navy LST 551.

**ALSO ROSS COOLERS**  
Oil-to-water—model 1460.  
Water-to-water—model 1496.

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## PROPELLERS, TAILSHAFTS, RUDDERS



**PROPELLERS**  
AP3—Victory—with ABS—located Baltimore.  
C-1MAV-1—with ABS—located Beaumont, Texas

## TAILSHAFTS

C-3—reconditioned—with ABS—located Baltimore  
C-1MAV-1—with ABS—located Beaumont, Texas

## RUDDERS

C-1MAV-1—new—unused  
**VICTORY—reconditioned**  
T-2 As removed from vessel. Good. Subject to your survey.

## THE BOSTON METALS COMPANY

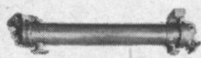
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AXIAL FLOW FANS  
115 & 230 VDC—440 AC—ALL SIZES

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## ROSS COOLERS LST — 12-567A DIESEL TYPES



3 Model 1596  
3 Model 1566  
3 Model 860

VERY GOOD CONDITION—TESTED  
1 UNUSED MODEL 1060

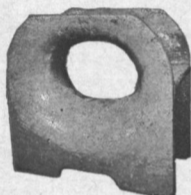
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## NEW 7" RADIUS PANAMA CHOCKS

(Meet Panama Regulations)

With Extended Legs for Welding to Deck  
IMMEDIATE DELIVERY FROM STOCK

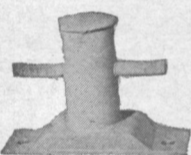


Clear opening 10" x 14"—  
7" radius. Use as double or  
single bow chock. OAL 28"  
on base—OAW 14 3/4"—  
cast steel.

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## UNUSED BITTS



Single bitts—6" diameter—  
24 1/2" long—8" wide. Not  
shown is 90° bracket. While  
they last.

BUY IN QUANTITY

**\$1995 EACH**

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## NEW BERGER SELF-ALIGNING MARINE FAIRLEADS



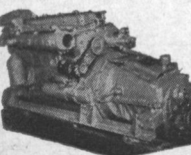
Model 620 — 1 5/8"—sheave  
diameter 20"—shank open-  
ing 8"—weight 2680 lbs.

**\$1250**

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## GRAY MARINE ENGINES



Government reconditioned Gray  
Marine 64-HN9 (6-71) — rated  
225 HP — with Twin Disc Gear  
— 1.54:1.

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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  
H. Newton Whittelsey, 17 Battery Pl., New York, N.Y. 10004  
Alan Winkley, 6420 Colby St., Oakland, Calif. 94618

**OIL PURIFIERS—Repair**  
Peck Equipment Co., 3500 Elm Avenue, Portsmouth, Virginia 23704

**OILS—Marine—Additives**  
Esso International Inc., 15 West 51 St., New York, N.Y. 10019  
Ethyl Corp. Marine Div. Perolin Co., New York, N.Y. 10001  
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019  
Humble Oil & Refining Co., Humble Building, Houston, Texas 77002  
Mobil Oil Corp., 26 Broadway, New York, N.Y. 10004  
Refineria Panama, S. A., 277 Park Ave., New York, N.Y. 10017  
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017

**PAINT—Marine—Protective Coatings**  
Ameron Corrosion Control Div., Brea, Calif. 92621  
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144  
Devco & Reynolds Co., Inc., Subsidiary Celanese Coatings Co., 414  
Wilson Ave., Newark, N.J. 07105  
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020  
Farboil Company, 90 West St., New York, N.Y. 10006  
International Paint Co., 21 West St., New York, N.Y. 10006  
Mobil Chemical Company, Metuchen, N.J. 08840  
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.  
Woolsey Marine Industries Inc., 201 E. 42nd St., New York, N.Y. 10017

**PETROLEUM SUPPLIES**  
Independent Petroleum Supply Co., 1345 Ave. of Americas, New York,  
N.Y. 10019

Refineria Panama, S. A. 277 Park Ave., New York, N.Y. 10017  
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017  
The West Indies Oil Co., Ltd. St. John's, Antigua, W. I.

**PLASTICS—Marine Applications**  
Ameron Corrosion Control Div., Brea, Calif. 92621  
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231  
Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936  
Rotocast Plastic Products, Inc., 6700 N.W. 36th Ave., Miami,  
Florida 33147

**POLLUTION CONTROL**  
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020  
Uniroyal, Inc., 10 Eagle St., Providence, R.I. 02901

**PORTS**  
Port of Galveston, P.O. Box 328, Galveston, Texas  
Jacksonville Port Authority, 2701 Tallyrand Ave., Jacksonville, Fla.

**PROPELLERS: NEW AND RECONDITIONED**  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004  
Bird-Johnson Co., 883 Main Street, Walpole, Mass. 02081  
Coolidge Propeller Co., 1608 Fairview Ave. E., Seattle, Wash. 98102  
Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich.  
49502  
Ferguson Propeller, 1132 Clinton St., Hoboken, N.J. 07030

**PUMPS**  
Coffin Turbo Pump/FMC Corp. 326 So. Dean St., Englewood, N.J.  
97631  
Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601  
Kansas Ave., Kansas City, Kansas 66110

M. T. Davidson Co., 1010 3rd Ave., New York, N.Y. 10021  
Goulds Pumps, Seneca Falls, N.Y. 13148  
Houttin-Pompen N. V. Sophialaan 4, Utrecht, Holland  
Worthington Corporation, Harrison, New Jersey 07029

**RATCHETS**  
American Engineered Products Co., Box 74, McKees Rocks, Pa. 15136  
W. W. Patterson Co., 830 Bracket St., Pittsburgh, Pa. 15233

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

**ROPE—Manila—Nylon—Hawsers—Wire**  
American Mfg. Co., Inc., Noble & West Sts., Brooklyn, N.Y. 11222  
Cating Rope Co., 309 Genesee St., Auburn, N.Y. 13022  
Columbian Rope Co., 309 Genesee St., Auburn, N.Y. 13022  
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604  
Samson Cordage Works, 470 Atlantic Ave., Boston, Mass. 02210  
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  
Schuyler's Engineered Products Co., Box 87, Staten Island, N.Y.  
Yokohama Rubber Co. Ltd., P.O. Box 46, Shiba, Tokyo 105, Japan

**RUDDER ANGLE INDICATORS**  
Electric Tachometer Corp., 68th & Upland Street, Phila., Pa. 19142  
Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215  
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011  
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of  
Sperry Rand Corp.

**SCAFFOLDING**  
Patent Scaffolding Co., 11-11 - 34th Ave., Long Island City, N.Y.  
11106

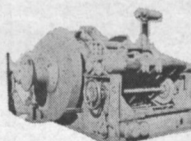
**SEALS**  
Gallen Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231  
Syntron, Div. FMC Corp., 398 Lexington Ave., Homer City, Pa. 15748

**SEARCHLIGHTS**  
Snelson Oilfield Lighting Co., 1201 E. Doggett St., Fort Worth,  
Texas 76104

**SEWAGE DISPOSAL**  
Seapax, Inc., 3645 Warrensville Center Rd., Cleveland, Ohio 44122

**SHAFT REVOLUTION INDICATOR EQUIP.**  
Electric Tachometer Corp., 68th & Upland Sts., Phila., Pa. 19142  
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

## ALMON JOHNSON CONSTANT TENSION LST STERN ANCHOR WINCHES



Drum capacity—900 ft. of  
1 5/8" wire. Gypsy perform-  
ance—12,000 lbs. at 125  
FPM. OAL 12'—OAW 10'1"  
Driven by 50 HP—230 VDC  
—181 amps motor. 2 avail-  
able with controls.

### PERFORMANCE

	Max. Control	Auto. Tension Control
Line Speed	100,000 lbs.	26,000 lbs. 3000 lbs.
Line Tension	10 FPM	Stall 400 FPM

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### SHIPBREAKING—Salvage

The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202  
National Metal & Steel Corp., 1251 New Dock St., Terminal Island,  
Cal. 90731

Northern Metal Co., Mingr & Bleigh Sts., Philadelphia, Pa. 19136  
Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

### SHIP BROKERS

Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004  
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006  
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle,  
Wash. 98119

### SHIPBUILDING STEEL

Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh, Pa. 15219  
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
Bethlehem Steel Corp., 25 Broadway, New York, N.Y. 10004  
Huntington Alloy Products, Div. International Nickel Co., Inc.,  
Huntington, W. Va. 25720  
International Nickel Co., 1 New York Plaza, New York, N.Y. 10004  
United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230

### SHIPBUILDING—Repairs, Maintenance, Drydocking

Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
Astilleros Espanoles, S.A. Zurbano, 70, Madrid 10, Spain  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
Beliard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium  
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004  
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885  
Brodogradiliste "SPLIT" P.O. Box 107, Split, Yugoslavia  
Conrad Industries, P.O. Box 790, Morgan City, La. 70380  
Drillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801  
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.  
Equitable Equipment Co., Inc., P.O. Box 8001, New Orleans, La. 70122  
General Dynamics, Electric Boat Division, 99M Eastern Point Road,  
Groton, Conn. 06340

General Dynamics, Quincy Division, Quincy, Mass. 02169  
Gotaverken American Corp., 39 Broadway, New York, N.Y. 10006  
Grafton Boat Co., Inc., Grafton, Ill. 62037  
Graiguard Shipyards, P.O. Box 829 Colbert, Marseilles, France  
Gunderson Bros. Engrg. Corp., 4700 N.W. Front St., Portland,  
Oregon 97208

Halter Marine Services, Inc., Route 6, Box 287H, New Orleans,  
La. 70126

Havre de Grace, Havre de Grace, Md.  
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.  
Hongkong & Whampoa Dock Co. Ltd., Kowloon Docks, Hong Kong  
Industrial Steel & Mach. Works, Inc., P.O. Box 2217, Guilford,  
Miss. 39501

Ishikawajima-Harima Heavy Industries Co., Ltd., 15 William St.,  
New York, N.Y. 10005

Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla. 32203

Jeffboat, Inc., Jeffersonville, Ind. 47130

Kawasaki Dockyard Co., 8 Kaigan-dori, Ikuta-ku, Kobe, Japan

Kelso Marine, Inc., P.O. Box 268, Galveston, Texas 77550

Kockums Malmo, Fack, Malmo, Sweden

Livingston Shipbuilding Co., P.O. Box 968, Orange, Texas 77630

LISNAVE, P.O. Box 2138, Lisbon, Portugal

Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230

Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W.,  
Seattle, Wash. 98134

Maryland Shipbuilding & Drydock, P.O. Box 537, Baltimore, Md. 21203

Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047

Mitsubishi Heavy Industries, Ltd., 5-1 Marunouchi 2-chome, Chiyoda-  
ku, Tokyo, Japan

Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202

National Steel & Shipbuilding Corp., San Diego, Calif. 92112

Newport News Shipbuilding and Dry Dock Co., Newport News, Va.

Northwest Marine Iron Works, P.O. Box 3109, Swan Island, Port-  
land, Oregon 97208

Nuclear Service & Construction Co., Inc., 9296 Warwick Blvd.,  
Newport News, Va. 23607

O.A.R.N. (officine Allestimento e Riparazioni Navi) Genoa, Italy

Pearson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Fla. 33156

Paccoco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif.  
94501

Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862

St. Louis Shipbuilding—Federal Barge, Inc.  
611 East Marceau, St. Louis, Mo. 63111

Sosebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-  
ku, Tokyo, Japan

Sembawang Shipyard (Pte) Ltd., P.O. Box 3, Sembawang, P.O.  
Singapore, 27

Sumitomo Shipbuilding & Machy. Co., Ltd. 2-1 Ohtemachi 2-chome,  
Chiyoda-ku, Tokyo, Japan

Teledyne Seawort Seacraft, P.O. Box 108, Berwick, La. 70342

Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004

### SHIP MODEL BASIN

Hydronautics, Incorporated, Laurel, Maryland 20810

### SHIP ROUTING

Weather Routing, Inc., 90 Broad Street, New York, N.Y. 10004

### SHIP STABILIZERS

Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 1010  
Third Ave., New York, N.Y. 10021

Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143

John J. McMullen Associates, Inc., 110 Wall St., N.Y., N.Y. 10005

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

### STEAM GENERATING EQUIPMENT

Combustion Engineering, Inc., Windsor, Connecticut 06095

### STEVEDORING

Luckenbach Steamship Co., 120 Wall Street, New York, N.Y. 10004

M. J. Rudolph Corp., 8 Sackett St., Brooklyn, N.Y. 11231

### SWITCHBOARDS

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

### TOWING—Lighterage, Transportations, Barge Chartering

American Waterways, 1250 Connecticut Ave., Washington, D.C.  
20036

Bay-Houston Towing Co., 805 World Trade Bldg., Houston,  
Texas 77002

Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202

Henry Gillen's Sons Lighterage, 140 Cedar St., New York, N.Y. 10006

James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004

Jackson Marine Corp., P.O. Box 1087, Aransas Pass, Texas 78336

McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

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,  
New York, N.Y. 10004

L. Smit & Co., 11 Broadway, New York, N.Y. 10004

Suderman & Young Towing Co., 329 World Trade Center, Houston,  
Texas 77002

M. & J. Tracy, Inc., 1 Broadway, New York, N.Y. 10004

Turecamo Coastal and Harbor Towing Corp., 1752 Shore Parkway,  
Brooklyn, N.Y. 11214

### VALVES AND FITTINGS—Hydraulic—Safety Flanges

Bettis Corp., 3100 Fall at Grand Blvd., Houston, Texas 77021

Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn, N.Y.  
11231

Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696

Mechanical Marine Co., Inc., 900 Fairmount Ave., Elizabeth, N.J.  
07207

### WIRE ROPE

Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042

Bethlehem Steel Corp., Bethlehem, Pa. 18018

United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230

ZINC  
Smith & McCorken, 153 Franklin St., New York, N.Y. 10013

## BFG Cutless Bearings travel in good company

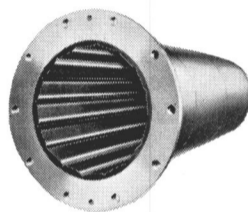
Many big names in the marine industry choose Cutless rubber propeller shaft bearings as traveling companions.

All are cost conscious ship and boat owners who welcome Cutless bearings aboard because they pay their way with years of dependable, trouble-free service.

They also like the fact that Cutless bearings have the unique Water Wedge design to provide maximum lubrication while flushing out abrasives that cause shaft sleeve and bearing wear.

When many of the best names in the marine business move out with Cutless bearings, it's a recommendation you should consider the next time you need propeller shaft bearings.

Go with the best — B.F. Goodrich Cutless Rubber Bearings.



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OHIO RIVER COMPANY  
HAWAIIAN TUG & BARGE COMPANY  
McALLISTER BROTHERS INC.  
CRESCENT TOWING & SALVAGE CO.  
BOOTH FISHERIES CORPORATION  
OFFSHORE TRANSPORTATION CORP.  
CONSOLIDATION COAL COMPANY  
USEN FISHERIES, LTD.  
BROWN & ROOT MARINE OPERATORS, INC.  
CURTIS BAY TOWING COMPANY  
OIL TRANSPORT COMPANY, INC.  
JAHNCKE SERVICE, INC.  
MISSISSIPPI VALLEY BARGE LINE  
PURE OIL COMPANY  
INTERSTATE OIL TRANSPORT  
U. S. ARMY MOBILITY CORPS  
GREAT LAKES DREDGE & DOCK CO.  
HUMBLE OIL & REFINING COMPANY  
HYDROMAR CORPORATION  
ESSO INTERNATIONAL  
NATIONAL BULK CARRIERS, INC.  
DIXIE CARRIERS, INC.  
U. S. ARMY CORPS OF ENGINEERS  
WEST INDIA SHIPPING COMPANY  
CONSTRUCTION AGGREGATES CORP.  
AMERICAN DREDGING COMPANY  
U. S. COAST GUARD  
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