MARITIME REPORTER
AND
ENGINEERING NEWS

Vancouver Tugs And Barges Move And Install Huge Canadian Railroad Bridge Spans

(SEE PAGE 6)

MARCH 1, 1969

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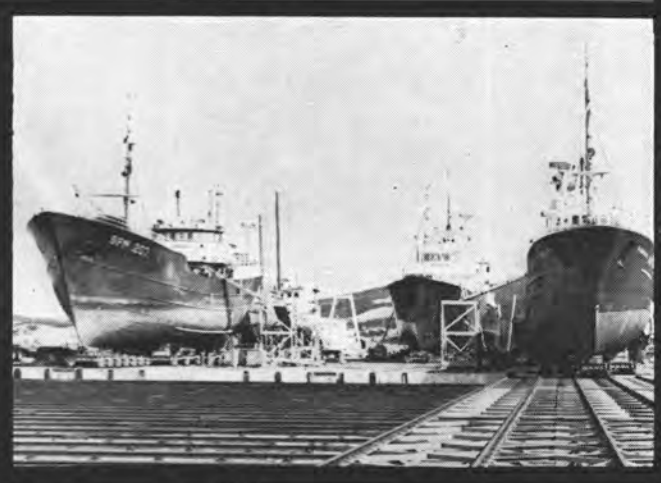

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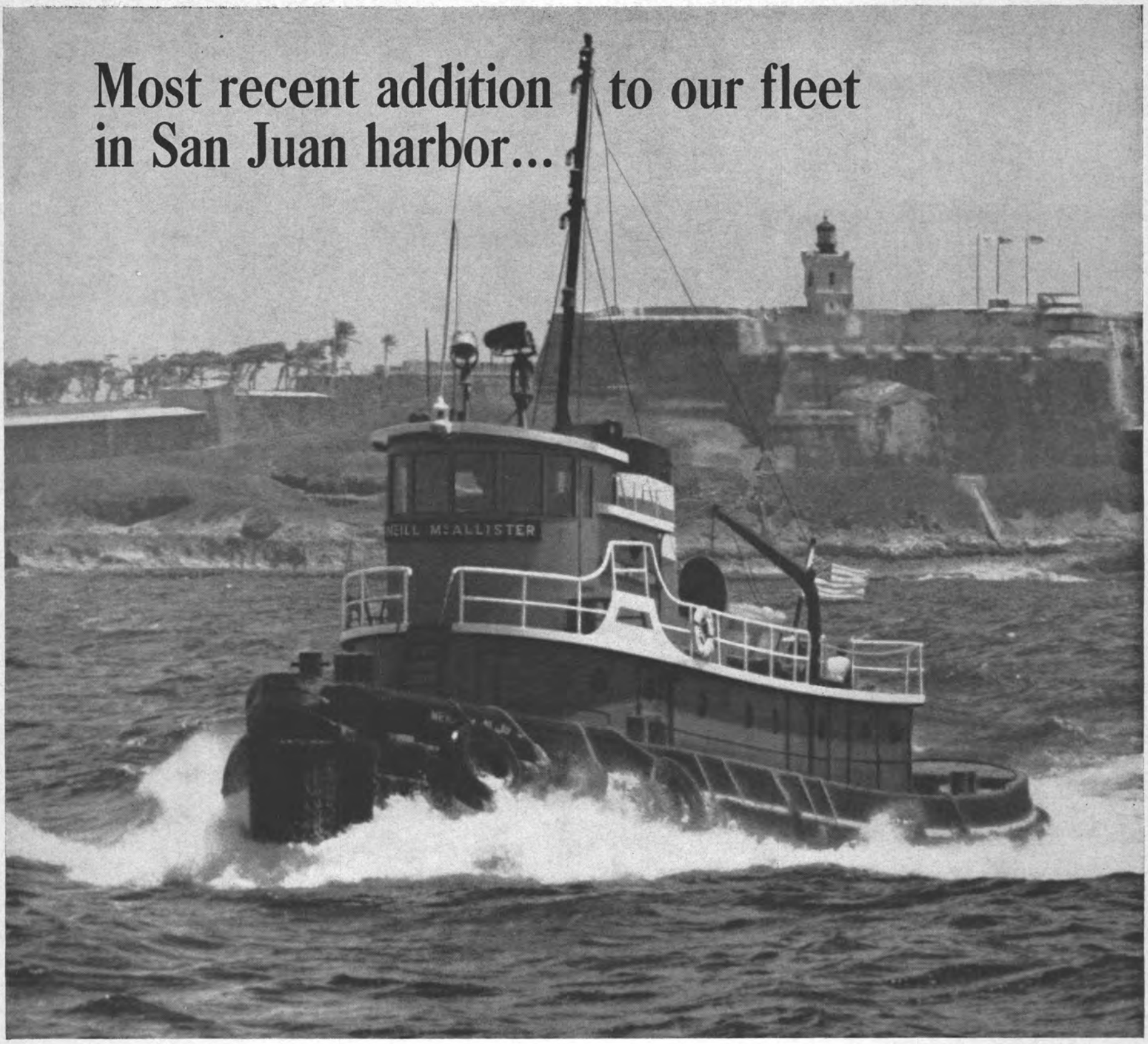

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McAllister is on the move in the Caribbean

U.S. Lines Applies For Subsidy To Enlarge New Containerships

The United States Lines has applied for government subsidy to enlarge the container capacities of three new ships delivered and put into service only last year.

The company estimated it will cost $125,000 each to install permanent ballast and extended bulwark protection on the American Lancer and the American Legion, and $130,000 for the same work on the American Liberty.

The reconstruction would raise the ships' capacity, in terms of 20-foot container equivalents, from the present 1,000 to 1,200, or about 16 percent, U.S. Lines said.

Wiley Wins Contract From West Coast Firm For Two Dump Scows

E. R. Rice, president of Smith-Rice Company, 835 China Basin Street, San Francisco, and **C. M. Keeney,** vice-president, Equipment Systems, Inc., a subsidiary of Vare Corporation, New York City, have announced a contract for the construction of two 1,000-cubic-yard bottom dump scows.

Designed by Wiley Manufacturing Co., Port Deposit, Md., a division of Equipment Systems, Inc., the scows will have principal dimensions of 150 feet by 38 feet by 15 feet 6 inches, with four cargo hoppers. Cargo will be discharged by means of Wiley's patented hydraulic system actuating the hopper doors.

This contract has been awarded to Equipment Systems, Inc. on the basis of design and cost competition.

Following completion of the scows at Wiley's Port Deposit shipyard, they will be towed to San Francisco for delivery to Smith-Rice Company in June.

The Smtih-Rice Company is a prominent West Coast contractor.

Fredeman's Building Twin-Screw Towboat

Fredeman's Calcasieu Locks Shipyard, Inc., of Port Arthur, has received an order from Port Arthur Towing Co., Port Arthur, Texas, for the construction of a twin-screw towboat. Powered with 1,150-total-bhp diesels, this towboat is to have the following dimensions: 68 feet by 26 feet by 8 feet 6 inches.

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Vancouver Tug Puts Canadian Railway Bridge In Place

1. Vancouver Tug Boat Co. Ltd. scored a major tugboating feat in Vancouver Harbor recently as it floated the new Canadian National Railways bridge into place at 2nd Narrows in three sections. Shown above, the south tower, weighing 2,000 tons and measuring 200 feet high and 250 feet long, is being moved by Vantug.

3. At the waiting pier supports, the span was gently eased into alignment with the matching structure at high tide. All of Vancouver Tug's skill and experience were needed to float the massive structure into the gap between the north and south tower spans, with only 2 or 3 inches of clearance at either end.

2. The lift span, weighing 2,400 tons and 503 feet long, is the largest of its type in Canada and the fifth largest in the world. It is believed to be the first time that a lift span of such size has been floated into place by this method. The sections were assembled on ways by Canron Limited, about 4½ miles from bridge site.

4. As the tide fell, ballast was pumped into the barges and the bridge section lowered onto the supports. The new bridge is scheduled to commence carrying railway trains this spring. Tugs, La Belle, Le Prince, La Fille, and La Lutte, were used for this operation together with the 260-foot VT 152 and 180-foot VT 52 barges.

Burrard Lengthening British Columbia Ferry Queen Of Esquimalt

The British Columbia Ferries Division has announced the awarding of the 84-foot lengthening of the Queen of Esquimalt to Burrard Dry Dock Company Limited of North Vancouver. The $2,198,225 contract includes a sewage-control system, an additional restaurant on the sun deck and a new self service cafeteria in place of the present restaurant on the promenade deck. Restaurant seating capacity has been increased from 144 persons to 238 persons.

The 84-foot increase in length, to an overall length of 426 feet 4½ inches, will increase the car-carrying capacity from 138 cars to over 200 standard American cars.

Overall consultation, design, and working drawings were accomplished by Case Existological Laboratories Limited (C.E.L.L.) of Victoria, B.C. C.E.L.L. studied vibration, maneuverability, speed and power, structural and weather and wave problems associated with the route and lengthened vessel before proceeding with the detail design. Dun-Dar Design Associates of Vancouver produced the interior design for both the new self-service cafeteria on the promenade deck and the restaurant on the sun deck. The model tests to determine final speed were run by Teddington's National Physical Laboratory in the United Kingdom.

The lengthened vessel has approval of both the Canadian Steamship Inspection and American Bureau of Shipping. The lengthened vessel will be classed with the American Bureau of Shipping. The vessel's route will be the Tsawwasen-Swartz Bay run. The vessel is scheduled for completion by June 9, 1969.

The vessel originally cost $3.8-million when built in 1963. Replacement costs for a vessel of the lengthened version are estimated at $8.5-million.

The persons instrumental within the government for concept and coordination with C.E.L.L. are **W. B. Weston,** operations manager, and **W. Phillips,** construction supervisor.

Port Arthur Opens $9.5-Million Terminal For General Cargoes

Port Arthur, Texas has opened a $9.5-million terminal for use of general cargo ships. The opening of this terminal marks the end of years of planning by civic and business leaders who have sought a public shipping area to go with the private docks geared almost exclusively to the handling of petroleum products. The terminal was built from the ground up on the combined planning of all segments of the transportation industry.

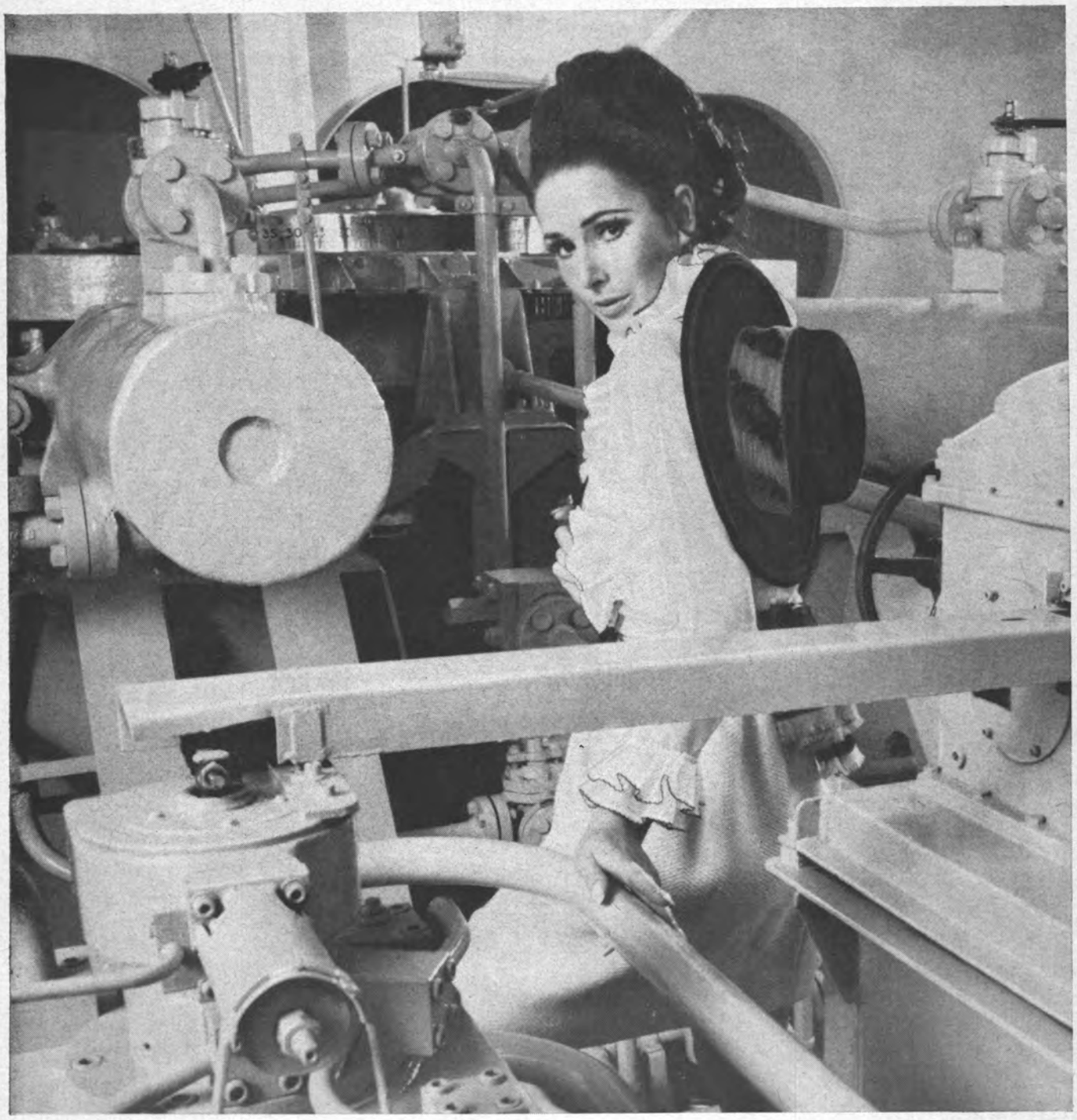
Port Director **Dow Wynn** stated that the terminal complex is adaptable for container handling, even though few shipping lines have shown an interest in using the port for container cargoes. Cranes and other equipment necessary to handle containers, plus paved storage areas, have been included in the new terminal. Provisions have been made for the quickest vessel-rail-car-truck turnabout.

Felixstowe May Be European Terminus For Seatrain Lines

Felixstowe, England — the third largest container port in Europe — hopes to add another large containership operation to its roster of port users. Negotiations are being conducted with Seatrain Lines Inc. to induce this expanding containership operator to make Felixstowe the terminus for European operation.

At present, American Export Isbrandtsen Lines and Sea-Land Service Inc. are using the port for container operations.

This rapidly expanding British port has increased the amount of freight passing through it by 20 percent in the last two years. While pushing for additional container operations, Felixstowe does a flourishing business in general cargo and roll-on/roll-off traffic. Trade through this privately owned port has grown from 62,000 tons in 1956 to 1,510,929 tons in 1968.



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Value Engineering

J. T. Nichols*

The cumulative savings since inception of the Maritime Administration's Value Engineering Program in 1957 has totaled more than $13-million as of fiscal year ending June 30, 1968. This saving is greater than the commercial ship contract award price of certain types of cargo ships. The program has provided a 'free' cargo ship since its start. Of that total, $1.5-million were saved in fiscal year 1968 alone. During this year, subsidized ship contract awards were limited to 12 ships. The ratio of savings to cost is almost $30 to $1 in this period. The national average of savings is better than 10 to 1 or ten dollars of savings realized for every dollar spent on value engineering.

The term 'value engineering' (V.E.) is relatively new, although its concept by many other names is somewhat older. It is generally believed to have been started in its present form at General Electric Co. about 1940.

Value Engineering is a technique for eliminating unnecessary costs. It is an organized cost reduction effort. It utilizes specially developed analytic techniques to achieve the necessary function at the lowest overall cost, consistent with requirements for performance, reliability and acceptance. Its major objective is a desired function at a predetermined level of reliability at a minimum cost.

There are many different ways of doing value engineering and the Maritime Administration has concentrated, with some success, on the principle that elimination of unnecessary apparatus would be to the government's and owner's greatest advantage and thus provide more for the dollar. The advantage generally would be three fold—(1) saving the original cost of procurement and installation, (2) omission of maintenance costs on the equipment eliminated, and (3) savings in weight.

MarAd's value engineering program can hardly be mentioned without some credit being given to the Department of Defense, especially the former Bureau of Ships' program. This group pioneered value engineering as it is presently known in the federal government. The success of the Navy program in reducing shipbuilding costs led to establishing MarAd's modest program in 1957. This program, with the single goal of reducing subsidized shipbuilding costs, paralleled the Navy's with respect to the 50 percent incentive to the originating shipyard, for each of its value engineering proposals accepted. The remaining 50 percent was split equally between the owner or operating company, and MarAd. This liberal incentive was considered most important in promoting participation by the shipbuilders to submit new reduced cost suggestions which could be used on subsequent contracts and the bonus recovered many, many times.

The General Accounting Office was highly critical of MarAd's earlier V.E. program and reported to Congress with strong recommendation that the program must be made mandatory to become more effective. This criticism was instrumental in development of the current value engineering contracts language. The contracts now reflect two mandatory requirements: (1) mandatory V.E. letters must be adequately covered in all specifications for ships built with subsidy aid, (2) shipyard value engineering proposals, when approved by the Maritime Subsidy Board, must be either accepted by the owner or he must pay a penalty. This penalty is 25 percent of the value of the shipyard proposal submitted and it is divided equally between the shipyard and MarAd.

A comparison of the effectiveness of the four successive MarAd programs is given in Table 1, and includes value engineering items covered in the contract specifications review. It can be seen that as the contract requirements become more compelling or mandatory for consideration of value engineering, the savings have sharply increased.

The impact of the latest program, reflecting the strongest mandatory contract requirements, cannot be fully assessed at this time due to the status of construction of ships under the first contract of this type. However, although the first keel has not been laid, savings, when compared with earlier contracts, are sharply upward. Included in type 4 contract savings shown in Table 1 are the shipyard's accepted value engineering proposals aggregating more than $141,000 per ship.

The MarAd Value Engineering Branch is involved in many different ways to reduce shipbuilding costs, such as:

1. A critical pre-contract review of all plans and specifications of all applicants for construction subsidy aid prior to release for bidding. One recent pre-contract review resulted in savings estimated to be more than $300,000 per ship on a two-ship contract.

2. A sustained post contract review of each contract which contributes to further cost reductions. Suggestions to the owner on one contract resulted in adjudicated reduced cost change orders of more than $50,000 per ship on a five-ship contract.

3. A constant screening and analyses of value engineering proposals developed by the contracting shipyards. In a recent two-month period, one shipyard obtained approval of value engineering projects aggregating more than $86,000 per ship on a contract for three ships. Another shipyard has received approval on value engineering projects totaling more than $141,000 per ship on a contract for eleven ships.

4. A continued effort in seeking clarification and/or changes in existing regulations that appear to add unnecessarily to costs.

5. Active participation in the Shipbuilders Council of America Value Engineering Committee and cooperation with that group in seeking lower shipbuilding costs and the solutions to other mutual problems.

6. A close scrutiny of specifications to identify high-cost systems and installations, and attempts to simplify construction and reduce costs in these areas.

The Value Engineering Branch has investigated more than 500 projects which resulted in the issuance of 112 Value Engineering Informational Letters. These letters are developed and distributed from time to time as new techniques, materials, or methods are developed that tend to reduce shipbuilding costs or simplify construction.

These letters represent only a few of the many items that have been investigated during the value engineering program. Many other change items, such as one of a kind that would apply to only one contract or have other limited application, have not been developed into V.E. Letters.

What kind of ship was obtained by obtaining the savings listed? Was it cheapened beyond being useful or was its maintenance and operation critically affected?

Critics of successful value engineering programs often contend that such changes 'cheapen' a product and lowers its performance capabilities. As a result of such criticism the Department of Defense made a check on the effectiveness of their value engineering program. It has been proven conclusively and to the satisfaction of the Department of Defense that there is no degradation of performance, reliability or quality requirements in their value engineering programs.

The record is not bad: neither is it good. But, what savings have been accomplished are insignificant when compared to the potential that exists for value engineering in the marine industry today.

The potential for technical improvement and cost reduction is as great as the willingness to abandon the fixed practices of the past. New techniques and methods of building ships and components must be sought. More specifically, the costly outmoded items retained by tradition must be eliminated. Let us change our existing habits and attitudes by overcoming the marine-equipment complex. Get rid of the unnecessary features found in ships that are not duplicated in similar commercial installations.

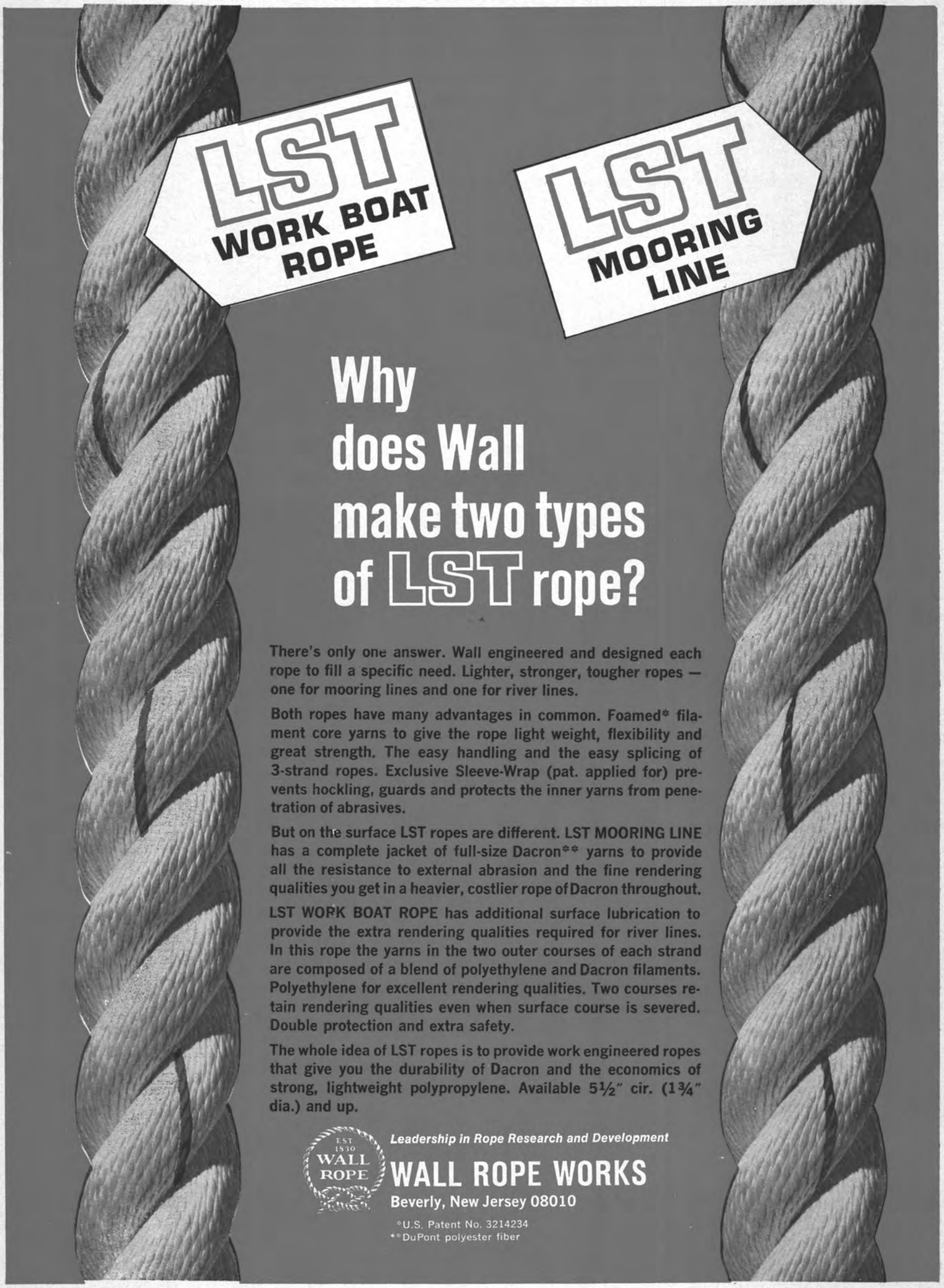
Industry ashore, with large value engineering programs, has made remarkable strides in reducing costs. Therefore, let us take whatever action is needed to use, where feasible, commercial or land-based industry standards, techniques, regulations and equipment for ships equipment and construction. With few exceptions, there are enough such standards in being without the necessity of special marine standards.

Also consider the unnecessary redundancy of equipment and apparatus aboard ship. How many of these duplicate equipments are really necessary? Similar equipment ashore runs for years without interruption, and without the benefit of operating experts at hand capable of making repairs.

Table 1—Effectiveness of Value Engineering Programs

	Average Savings Per Ship	Increased Savings Over #1	Increased Savings Over #2	Increased Savings Over #3
1. Contract without Value Engineering Provisions	$ 39,800			
2. Contract with voluntary Value Engineering Provisions	$ 54,600	37½ %		
3. Contract with permissive Value Engineering Provisions	$ 78,000	96 %	42 %	
4. Contract (current) with Mandatory Value Engineering Provisions	$235,000	490 %	230 %	197 %

*Mr. **Nichols,** chief of the Value Engineering Branch, Maritime Administration, recently presented the paper condensed here before the Northern California Section of The Society of Naval Architects and Marine Engineers.



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R.J. Shephard Elected Trident Vice-President

Mitchell A. Kapland, president of Trident Engineering Associates of Annapolis, Md., has announced the election of **Robert J. Shephard** as the firm's vice-president.

Mr. **Shephard** graduated from the Massachusetts Maritime Academy in 1954 with a B.S. degree in marine engineering. After serving three years as an officer in the Navy, he joined Westinghouse field engineering and services, and became manager of customer requirements in 1964. In 1965, he joined the systems operations division of Westinghouse as sales manager for deep submergence systems, and in 1966 was appointed to the underseas division as manager-market planning.

In 1967, Mr. **Shephard** was appointed to work with the support group of the Commission on Marine Science, Engineering and Resources. The Commission recently submitted to the president and to Congress the result of a comprehensive investigation of marine science and made recommendations for an adequate national program for present and future needs.

Mr. **Shephard** joined Trident Engineering Associates in November of 1968 as technical director—the position from which he was elected vice-president.

McMullen Elected To Board Of Directors Of Walter Kidde & Co.

John J. McMullen

The election of **John J. McMullen** to the board of Walter Kidde & Co., Inc., has been announced. He will continue as president and chief executive of the United States Lines Company, which was merged with Kidde recently.

A graduate of the United States Naval Academy, Mr. **McMullen** holds a master's degree from the Massachusetts Institute of Technology and a doctorate from the Swiss Federal Institute of Technology. He is a former United States Navy officer, who has also served as chief of The Office of Ship Construction and Repairs of the U.S. Maritime Administration.

C-E Names Robertson Manager Of Marine Service And Erection

David H. Robertson

David H. Robertson has been appointed manager - service and erection of Combustion Engineering's Marine Department, it was announced. He succeeds **Charles S. Church,** recently made consultant to the general manager.

In his new post, Mr. **Robertson** will be responsible for C-E's worldwide marine service and erection activities. He will report to **William C. Freeman,** general manager of C-E's Marine Department.

Starting as an erector with C-E in 1955, Mr. **Robertson** has served in various positions in the Marine Department. He is a licensed marine engineer, and was an engineer with Furness Withy Shipping Company for five years prior to joining C-E.

Mr. **Robertson** attended Dundee Technical College at Dundee, Scotland. He is a member of the American Society of Naval Engineers and The Society of Naval Architects and Marine Engineers.

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Construction Of Eight Or More High-Speed Containerships Being Planned By Sea-Land

Sea-Land Service, Inc. is planning on constructing eight or more 944-foot, 33-knot containerships. Twin-screw propulsion will develop approximately 120,000 shp.

The ships will be constructed in U.S. shipyards and abroad, depending on prices received. At the present time, Sea-Land has held conferences with U.S. shipyards and foreign shipyards describing its plans, showing the plans and specifications to shipyard managers, and discussing delivery schedules and contract terms. Following these preliminary conferences, the plans and specifications will be sent out for bids. An award or awards of contracts for construction are scheduled for September of this year.

Sea-Land is planning on placing some of these huge containerships in service on the North Atlantic and Pacific runs from the U.S. The others would be entered in domestic-trade. The ships for the domestic runs would have to be built in the United States. All of the ships, according to Sea-Land officials, will be registered under the U.S. flag. Further, Sea-Land stated that all machinery would be of U.S. manufacture.

The plans and specifications for these new high-speed containerships were prepared by the J. J. Henry Co., Inc., New York and Philadelphia naval architects and marine engineers.

SES Testcraft Program Awarded To Bell And Aerojet By MarAd

Artist's conception of 100-ton SES proposed by Bell Aerosystems. This testcraft measures approximately 72 feet long and has a width of 33 feet. It is being designed for speeds in excess of 80 knots.

The Maritime Administration of the U.S. Department of Commerce and the Navy Department have announced, the award of Maritime Administration contracts for the implementation of the Joint 100-ton surface-effect-ship (SES) testcraft program to both the Aerojet-General Corporation, El Monte, Calif., and the Bell Aerosystems Company, Buffalo, N.Y.

These cost-plus-incentive-fee (CPIF) type R&D contracts will be incrementally funded. Funding for each contractor in the current fiscal year is $1.55-million and will cover detailed engineering design.

The contracts will be managed by the Joint Surface Effect Ships Program Office (JSESPO). This office reports to both the Commerce and Navy Departments. The 100-ton testcraft programs are a major phase in JSESPO's long-range efforts to determine the feasibility of building and operating large, high-speed SES of 4,000 to 5,000 tons and capable of 80 knots or higher speed.

These testcraft will provide developmental testing on a major scale in actual sea conditions. In addition they will provide vitally required information on alternate design configurations, structural, lift, propulsion and flexible seal systems. This type of surface effect ship rides on a cushion or bubble of air rather than cutting through the water like displacement ships. This bubble of air will be contained by rigid sidewalls, and by bow and stern seals of flexible material similar to that used by today's air cushion vehicles. These configurations will allow the testcraft to achieve very high water speeds of 80 knots or more.

Artist's rendering of SES proposed by Aerojet-General. The design calls for a vessel 80 feet long and 37 feet wide. When built, construction would be at Tacoma Boat Building Company, with testing on Puget Sound.

The Bell craft will be propelled by supercavitating propellers driven by gas turbine engines, whereas the Aerojet craft will use waterjet propulsion units driven by gas turbines.

W.R. Grace Agrees To Sell Steamship Line To Skouras

J. Peter Grace, president of W. R. Grace & Co. and **Spyros P. Skouras** and **Spyros S. Skouras,** chairman and president, respectively, of Admiralty Enterprises, Inc., have jointly announced that an agreement in principle has been reached for the sale of Grace Line, Inc. to Admiralty Enterprises. Of the $44.5-million purchase price, approximately $42-million will be paid in cash.

The agreement is subject to the execution of a formal contract and to the approval of the United States Maritime Administration and the board of directors of both companies.

Admiralty Enterprises owns Prudential Lines, Inc., a subsidized line founded in 1933. Mr. **Skouras'** son, **Spyros S. Skouras,** is president of Admiralty Enterprises and Prudential Lines, Inc. The Prudential Line operates five American-flag cargo ships in the Mediterranean service from New York. In addition to being chairman of both Admiralty Enterprises and Prudential Lines, the senior Mr. **Skouras** is also chairman of Twentieth-Century-Fox Film Corp.

Grace Line, Inc. operates six passenger-cargo ships and 18 freighters on regularly scheduled American-flag service on four trade routes between the United States and the Caribbean and Central and South America.

The decision to sell Grace Line, a wholly-owned subsidiary of W. R. Grace & Co., has been made in order to concentrate on the parent company's expansion in its growing industrial, specialty chemicals and consumer products operations.

In 1967, the total sales of W. R. Grace & Co. exceeded $1.5-billion. This included more than $900-million in chemical sales, $410-milion in consumer products, and $100-million in Latin American manufacturing and commercial operations. Grace Line's 1967 revenues of $99-million were 6.3 percent of W. R. Grace & Co.'s total revenues.

MSTS Awards Central Gulf Charter For Nine Tankers To Be Built By Bethlehem

The Military Sea Transportation Service has announced that it will charter nine new tankers from Central Gulf Steamship Company of New Orleans. The initial charter contract is for five years with renewal options of up to 25 years.

Central Gulf has placed a contract totaling $115-million for construction of the approximately 25,000-dwt tankers with Bethlehem Steel Corporation's Sparrows Point, Md. shipyard for the nine ships. All nine ships are expected to be in service within three years. They will replace 16 tankers now in the MSTS fleet.

The initial five-year bareboat charter is valued at approximately $850,000 annually for each ship.

Troopships To Be Converted By Albina For Waterman

The Maritime Administration and Waterman Steamship Corporation have reached agreement on a trade-in/trade-out deal involving trading in two ferryboats for two troopships for upgrading.

The conversion work will be done at Portland, Ore., by Albina Engine & Machine Works at a cost for each of the two ships of between two and three million dollars. The troopers will be converted to dry cargo vessels with a capability of handling 116 20-foot containers on deck.

To be traded in are the ferryboats, Binghampton and Elmira, both built by Newport News Shipbuilding and Dry Dock Company in 1905.

The ships that Waterman will acquire are the General Leroy Eltinge and General R. M. Blatchford, both located at the Suisun Bay reserve fleet.

The General Leroy Eltinge and General R. M. Blatchford have unadjusted fair and reasonable values of $518,000 each; the Binghampton and the Elmira have unadjusted fair and reasonable values of $6,800 and $6,700, respectively.

Waterman is to pay the difference in the values of the traded out ships and those traded in—$1,022,550, less cash deposits of $50,000 per ship. The two troopers were built by Kaiser Company in Richmond, Calif., and delivered in 1945.

Maryland Ship To Build Baltimore's Largest Drydock

William E. Grace, president and chief executive officer of the Fruehauf Corporation, told the Baltimore Chamber of Commerce that Fruehauf management had recently approved the request of its Maryland Shipbuilding subsidiary to install an additional drydock in Baltimore. It will be the largest in the area and will cost in excess of $6-million.

Mr. **Grace** also told Chamber members that his company is seriously considering the construction of an intermodal container manufacturing plant in the Baltimore area. Maryland Shipbuilidng has a large amount of surplus land adjoining its operation in the city. This property is ideally located for the manufacture and servicing of containers for the shipping industry.

"One of the problems that has plagued Maryland Shipbuilding down through the years," said Mr. **Grace,** "has been unstable employment due to its type of business. We are exploring ways to help them solve this problem, and a container manufacturing plant may prove to be one of the answers."

Maryland Shipbuilding and Drydock Company was acquired by Fruehauf in April, 1968, to expand its total transportation concept of serving all phases of the transportation industry—road, rail, sea and air. The Baltimore-based firm specializes in ship repairs and conversions, and the construction of container carriers and special purpose cargo ships.

With tankers and freighters becoming larger and larger and with turn around time and prompt port schedules more often than not spelling the difference between profit and loss, Moran's designers are keeping pace with the needs of the Maritime Industry.

Moran's fleet today is the most modern afloat and designed to meet the most demanding requirements. New and more powerful tugs currently under construction will soon augment this fleet.

Efforts are constantly being directed toward providing the ultimate in economy, safety and performance. The needs of the future are being anticipated and incorporated in plans now on Moran's drawing boards.

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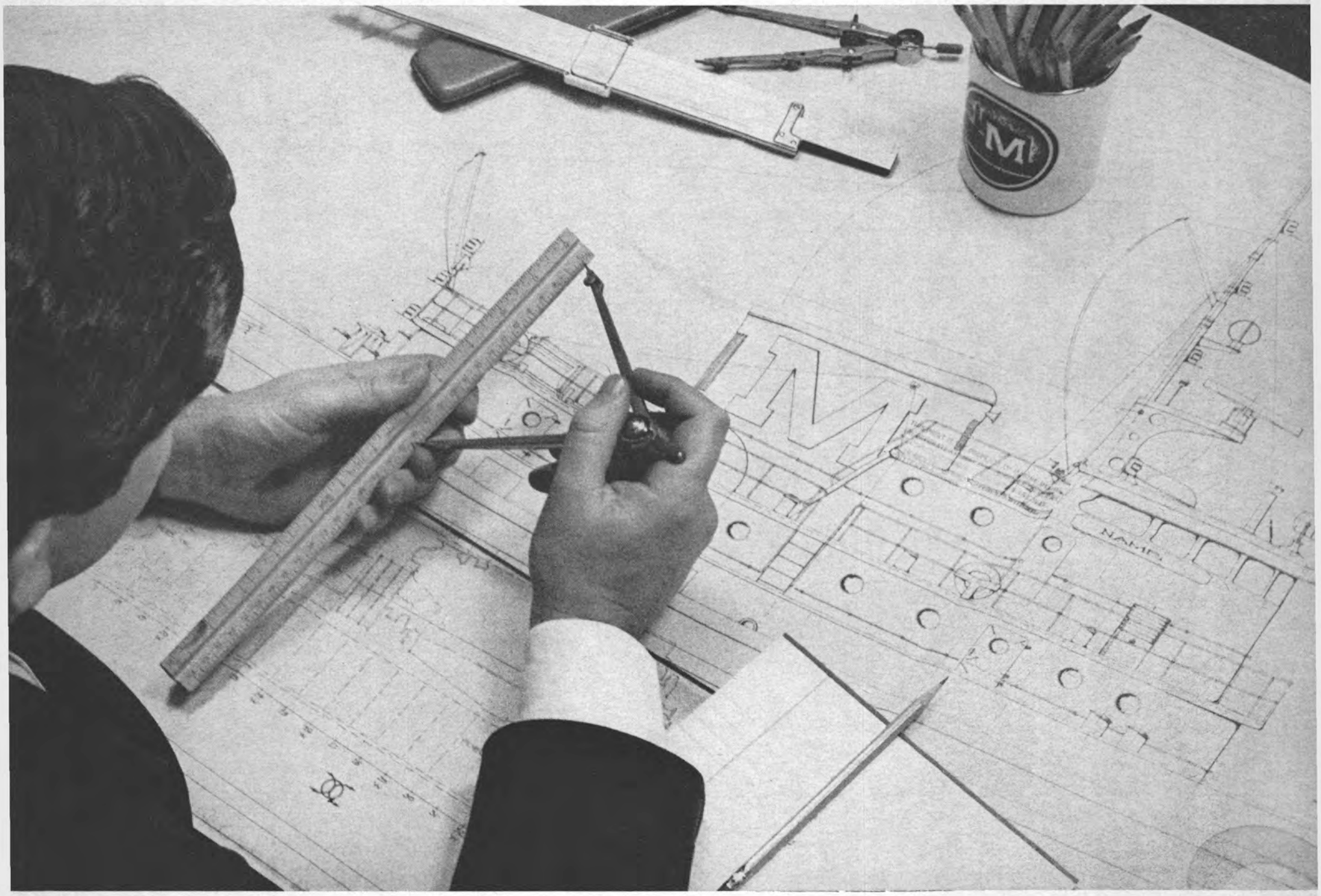

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New Barge Service Between Baltimore And Puerto Rico

Regular barge service for breakbulk cargo between Baltimore and Puerto Rico was inaugurated in February by the South Atlantic Barge Lines, supplementing the container services now offered by Sea-Land Services Inc.

For the time being, according to the Cymeon Shipping and Trading Company, of New York, the barge operator's general agent, the service will be on a monthly basis, but a tri-weekly service is anticipated with the growth of cargoes.

The tug-towed barges will call at San Juan, Ponce, Mayaguez, and possibly Arecibo. Officials of the barge line have already described Baltimore's response to the new service as "extraordinary." In Baltimore, South Atlantic's barges will discharge and load cargo at the Maryland Port Authority's Clinton Street Terminal. Terminal Shipping Company is the local agent, 1002 Garrett Building, Baltimore, Md. 21202.

Southbound, the barges will carry cargoes that are bulky, generally not suited to containers, and with a published tariff with rates of less than the container tariff. Already offered are loads of aluminum sulfate, firebrick, timber pilings, tin plate, structural steel, pipe, as well as less bulky items such as beer and glassware.

Northbound, South Atlantic's barges will carry bulk sugar and cement, and possibly petroleum coke.

The line's modern barges, equipped with their own cargo-handling cranes, range in size from 3,000 to 6,500 tons in capacity.

Rhine Barge Operators Form Container Line

Barge operators on the Rhine River have formed a firm to handle container shipments into the heart of Europe. Called the Rhine Container Line (RCL), it currently includes two Belgian, two Swiss, one French, four Dutch and four German barge-operating firms.

RCL has scheduled daily departures from Amsterdam, Antwerp and Rotterdam to major inland ports along the Rhine. Mannheim, Strassbourg and Basel are already equipped to handle containers.

To start operations, containers will be shipped on conventional barges. The partners in RCL are currently operating more than 1,000 barges.

RCL will offer shippers, forwarders and ocean containership lines a joint time schedule. The new firm will not carry on individual acquisition of cargo.

48-CAR CAPACITY HYDROTRAIN rail barge was launched recently at Bethlehem Steel Corporation's San Francisco, (Calif.) shipyard. The barge is 400-feet long, 76-feet wide and 20-feet deep, and is one of the largest to be built in the Bay Area. Named Nikiski, the new barge is the fourth of five of this size being built by the yard and will operate between Seattle and Alaska. It is being constructed for the Harbor Tug & Barge Company, San Francisco, and will be operated by Puget Sound-Alaska Van Lines. The fifth barge, McKinley, will be launched in May.

Large And Small Vessels Discussed At Winter Meeting Of Lakes And Rivers Section

Taking part in the Great Lakes and Great Rivers Section, SNAME, meeting were, left to right, standing: **H. Benford,** author; **R. C. Doane,** Section chairman and superintendent engineer, Great Lakes Fleet, United States Steel Corp., and **T. White,** author. Seated: **D. Beach,** author, and **C. J. Baum,** substitute for author **M. C. Kelsey Jr.**

The winter meeting of the Great Lakes and Great Rivers Section of The Society of Naval Architects and Marine Engineers was held in Cleveland, Ohio, in January. The all-day meeting was held in the Cleveland Sheraton Hotel.

Five technical papers were presented. These were:

"Lad—A New Family of Devices for the Avoidance of Collisions at Sea" by **Robert F. Riggs,** research engineer, Sperry Marine Systems Division, Sperry Rand Corporation, and **John L. Horton,** assistant marine manager, Cleveland Cliffs Iron Company.

"Measures of Merit for Ship Design" by **Harry Benford,** chairman, Department of Naval Architecture and Marine Engineering, The University of Michigan.

"Three Dimensional Enlargement of Great Lakes Bulk Carriers" by **Trevor White,** director of engineering, Fraser Shipyards, Inc.

"Recreation Boating—Survey" by **David Beach,** manager of Yacht Engineering, Boating Industry Association.

"Trends in Yachting Brought About by New Manufacturing Materials and Techniques" by **Martin C. Kelsey Jr.,** president, Palmer Johnson Boats, Inc. This paper was presented by **Charles J. Baum.**

At the conclusion of the technical sessions, complimentary tickets to the Cleveland Boat Show were avaliable. In the evening a reception and dinner was held at the hotel.

The Great Lakes and Great Rivers Section will hold its spring meeting on May 15 at the LaSalle Hotel in Chicago, Ill. The fall meeting will be in Sturgeon Bay, Wis. on October 2.

Port Everglades Commission Elects Officers For 1969

George S. McIntosh, a Fort Lauderdale investment banker and president of McIntosh & Co., has been elected chairman for 1969 of the port commission of Port Everglades, Fla., it was recently announced.

Elected as commission vice-chairman was **Jack Clark,** retired Dania businessman, and elected to the commission was **W. Phil McConaghey,** construction executive from Hollywood. Other members of the board include **Fred J. Stevens** from Fort Lauderdale and **Lester A. Culverson** from Hallandale.

The port commission appointed **Michael K. Tewksbury,** former steamship official, to the position of port manager. In other action, **J. H. Ferris Jr.** was appointed assistant port manager; **Gilmer McDougald,** port secretary; **Henry N. Holdren Jr.,** managing director of trade development, and **Robert A. Canon,** liaison representative.

Conversion of R1-M-AV3 Ship To Deepwater Drilling Ship Set For Bethlehem-Beaumont

A refrigerated cargo vessel constructed by the Bethlehem-Beaumont Yard for the U.S. Government during World War II has returned to the shipyard for conversion into a self-propelled deepwater oil drilling ship.

J. O. Crooke, general manager of Bethlehem Steel Corporation's Beaumont yard, has announced receipt of a contract from the Storm Drilling Company of Houston, Texas, for conversion of the motor vessel Karin into the first self-propelled drilling ship in Stormdrill's expanding fleet of craft for the exploitation of marine oil fields.

The MV Karin returned to the Beaumont yard January 17, 1969, 24 years after her birth at the yard, in 1945. She was one of 105 C1 and allied type vessels constructed for the government by the Beaumont yard before it was acquired by Bethlehem in December 1947 from Pennsylvania Shipyards, Inc. Specifically, she was one of 17 R1-M-AV3 craft delivered by this yard to the government during the second World War. Built for the Maritime Commission, she served in the U.S. Navy.

The big conversion job will entail jumboizing of the Karin as well as complete refitting for her new role Mr. **Crooke** said.

The Karin has a present overall length of 338 feet and width of 50 feet. Upon completion of the conversion, scheduled for mid-summer this year, she will have an overall length of more than 380 feet and width of 70 feet. Enlargement of the vessel will require the yard to build and install a new midbody section about 40 feet in length. Two 10-foot-wide sponsons, about 250 feet long, also will be constructed and welded to the vessel's sides.

The new midbody section will contain the drill well, the drilling substructure, derrick, drawworks and rotary table.

In addition to enlarging the vessel's size and removing her refrigeration machinery and insulated cargo spaces, the job will include fitting her out with drilling equipment and a mooring system to permit drilling at sea in a floating condition.

The Karin, officials of the Storm Drilling Company said, will be assigned to a "foreign drilling operation" after completion of the conversion.

George G. Sharp Inc. Realigns Corporate And Technical Staff

George G. Sharp, Inc., a leading New York naval architectural firm, has announced a realignment of its top corporate and technical management personnel. **Douglas C. MacMillan** was made chairman of the board of directors, a position that has been vacant since the death of Mr. Sharp in 1960. **Robert P. Giblon** was named president and chief executive officer, **Robert J. Tapscott** was made vice-president, **Thomas P. Nacinovich** will remain as treasurer, and **Kenneth M. Shauer** was named secretary.

Lorentz Hansen remains in his position as principal naval architect and **Vladimir U. Minorsky, John McDougall, Alf. J. Stromsted** and **Norman R. Farmer** remain in their positions of chief naval architect, basic design; chief naval architect, contract design; chief electrical engineer, and manager, systems analysis, respectively. Dr. **I. Hilary Rolih** was appointed chief marine engineer, succeeding Mr. **Shauer.**

Mr. **MacMillan** is a graduate of Massachusetts Institute of Technology, a member of the National Academy of Engineering, a vice-president of The Society of Naval Architects and Marine Engineers, a member of the American Bureau of Shipping and has served on many government and professional committees. Mr. **Giblon** is a graduate of Stevens Institute of Technology and has been active in both The Society of Naval Architects and Marine Engineers and the American Society of Mechanical Engineers and has served on technical committees, including the American Bureau of Shipping. Mr. **Tapscott** is a graduate of Massachusetts Institute of Technology and has served on committees of The Society of Naval Architects and Marine Engineers, American Bureau of Shipping, and is a member of the U.S. Coast Guard Committee on Safety of Life at Sea.

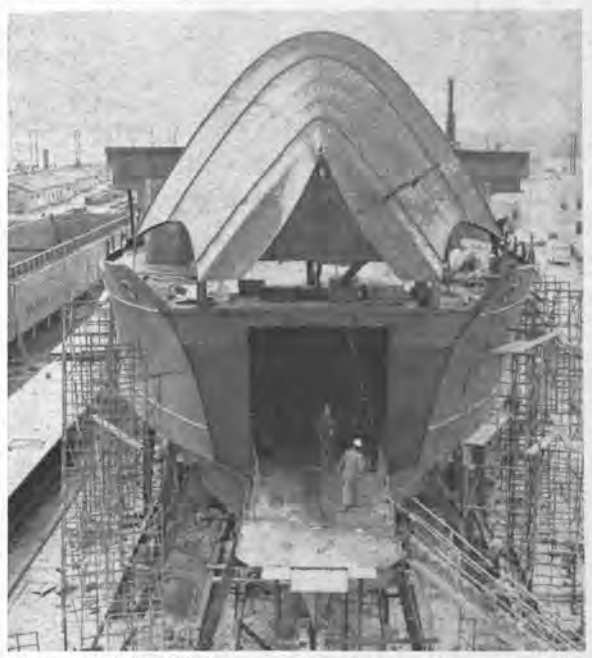
Mr. **Nacinovich** is a graduate of Polytechnic Institute of Brooklyn and has been active on committees of the Institute of Electrical and Electronic Engineers including that of chairman of the New York Section Transportation Division. Mr. **Shauer** is a graduate of California Institute of Technology and New York University, and has served on committees of The Society of Naval Architects and Marine Engineers. Dr. **Rolih** is a graduate of the University of Trieste, Italy, and Polytechnic Institute of Brooklyn, and has served on the marine committee of the American Society of Mechanical Engineers.

All are licensed professional engineers, authors of many technical papers, and have at least 25 years of service with Sharp, except Mr. **Shauer** and Dr. **Rolih** who have 12 years.

SNAME Philadelphia Section Sets Dinner-Dance For May 17

The Nineteenth Annual Dinner-Dance of the Philadelphia Section of The Society of Naval Architects and Marine Engineers will be held on Saturday, May 17, 1969 at the Cherry Hill Inn, Cherry Hill, N.J. This formal social affair climaxes the Section's year of technical meetings and affords members and wives from other sections the opportunity to meet with their Philadelphia friends.

Those from other sections, wishing to attend may contact **L. B. Bennett,** DeLaval Turbine Inc., Trenton, N.J. 08062; phone 609 587-5000. A block of rooms is being held until May 1 at Cherry Hill Inn for guaranteed reservations. Out-of-towners should contact the Inn directly for accommodations.



KNIGHTHEAD BOW, opened to allow workmen easy access for construction, of the new 1,500-ton ferryboat being built by Jeffboat, Inc., Jeffersonville, Ind. Designed by Philip F. Spaulding and Associates for the State of Alaska, the 193-foot ferry will accommodate 165 passengers and 38 autos, or trucks and trailers with fewer autos on board. Propulsion is provided by twin 1,700-hp direct-reversing diesel engines, giving a speed of 15 knots. Later this year, upon completion, the ferry will make the run from Indiana to Alaska by way of the Panama Canal. Steel for the vessel's construction was produced by United States Steel Corporation. The vessel will be classed by the American Bureau of Shipping.

Nilo Barge Line Promotes J.R. Black And T.A. Kayser

John R. Black

Theodore A. Kayser

Two executive appointments have been announced by Nilo Barge Lines, Inc. **John R. Black** has been named director of operations and **Theodore A. Kayser** has been appointed general traffic manager.

Mr. **Black** joined Nilo Barge Line in 1965 as manager of chemical operations. Previously he held a number of key management positions in the transportation department of Olin Mathieson Chemical Corporation. He came to Olin in 1952 as rate clerk. In 1953 he was named transportation analyst and four years later he became marine supervisor. From 1960 through 1964 he advanced from transportation supervisor to manager of marine services for Olin.

A graduate of Shurtleff College at Alton, Ill., Mr. **Black** holds a B.S. in business administration. From 1946 through 1949 he served with the U.S. Army Transport Service.

Mr. **Black** is a member of the Propeller Club of the Port of St. Louis, and serves on the U.S. Coast Guard's Chemical Transportation Advisory Panel.

Mr. **Kayser** first became associated with Nilo Barge Lines in 1965 as an accountant. He had previously served as an accountant for Lunnemann, Slais & Co., and office manager of Hart Printing Co. at St. Louis. In 1966 he was named dispatcher for Nilo.

He is a graduate of Washington University, at St. Louis, with a B.S. degree in business administration. He is a member of the Propeller Club of the Port of St. Louis and the St. Louis Milling and Grain Club.

AWO Re-Elects Robert Hughes VP

Robert J. Hughes, president of James Hughes, Inc., was re-elected vice-president of American Waterways Operators in Region 5 at the annual meeting of members of the region in New York recently. Mr. **Hughes** is currently serving the second year of a two-year term as a director of the Association, representing regulated carriers.

Three directors, whose terms were expiring, were re-elected to two-year terms. They are **J. Frank Belford Jr.,** president, Seaboard Shipping Company, Division of Moran Towing & Transportation Company, Inc., representing other carriers for hire; **Robert F. Lynch,** manager, Inland Waterways Operations, Mobil Oil Corporation, Marine Transportation Department, representing private carriers; and **James P. McAllister,** president, McAllister Lighterage Line, Inc., representing regulated carriers.

Two other directors in Region 5, in addition to Mr. **Hughes,** continue in office another year. They are **George H. Blohm,** vice-president and general manager, Cities Service Tankers Corporation, and **Francis B. Bushey,** president, Spentonbush Transport Service, Inc. Mr. **Blohm** represents private carriers and Mr. **Bushey** represents other carriers for hire.

The business meeting of members was well attended as was the luncheon which followed with numerous guests in attendance, including representatives of the Army Corps of Engineers and the U.S. Coast Guard.

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For good reasons: time and money. We save you time and you make money.

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Products are supplied by barge, at our "Sea Island" product pier, or at an offshore submarine pipeline in deep, calm and sheltered water.

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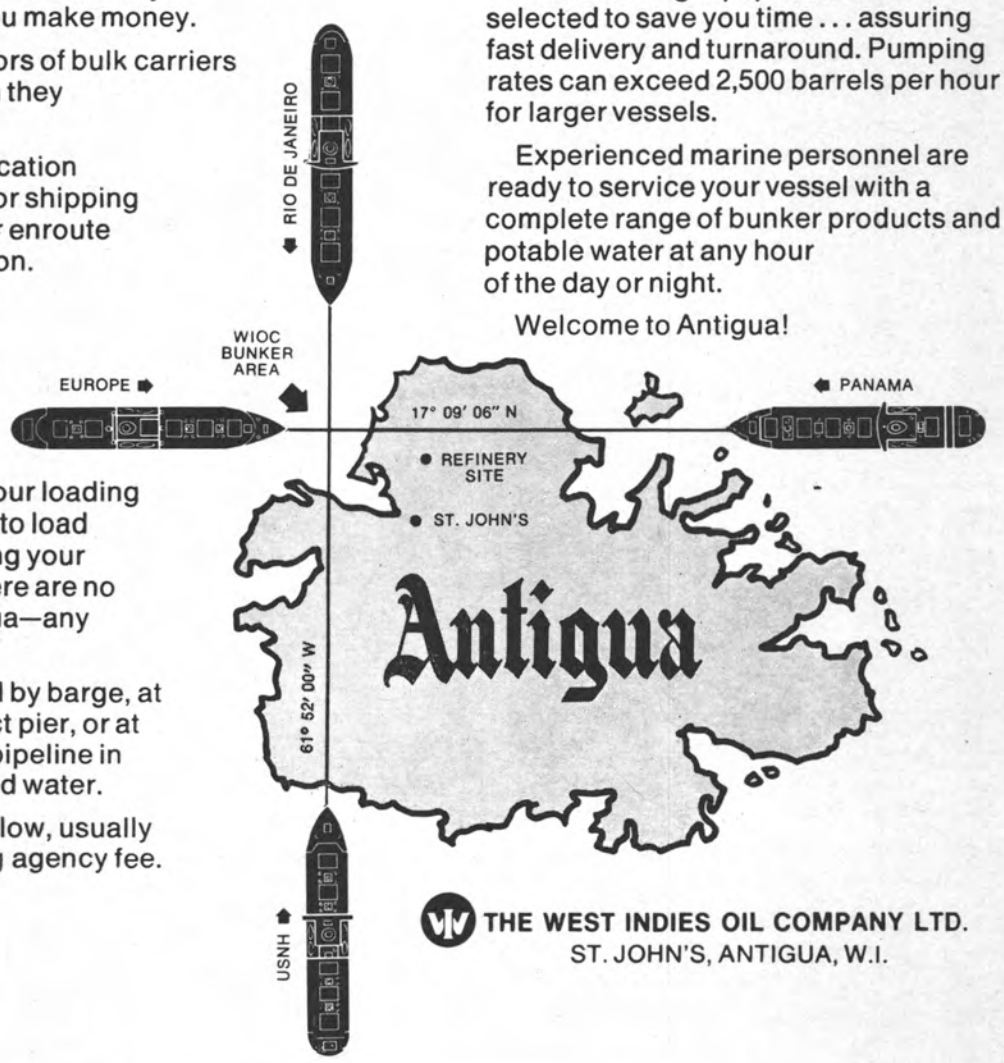
Experienced marine personnel are ready to service your vessel with a complete range of bunker products and potable water at any hour of the day or night.

Welcome to Antigua!



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Pascagoula Pilot Boat Built By Halter Marine

Pilot No. 2, built by Halter, operating in Pascagoula River.

Bar pilots of the Pascagoula Bar Pilots Association, Pascagoula, Miss., now ride to work in a new high-speed boat of special design built by Halter Marine Services, Inc., New Orleans, builder of vessels for the offshore petroleum, towing and ocean engineering industries.

The vessel is the 35-foot, all-welded aluminum Pilot No. 2. It is powered by a single General Motors 8V71N diesel engine, and has a deep V-flared hull for maneuvering in rough seas. Its construction is extra heavy for coming alongside ships in the Pascagoula seaway, and for extreme boarding conditions in seas as high as 12 feet. An M4 rubber bumpering system surrounds the vessel for added protection.

The design of Pilot No. 2 also permits boarding off the forward quarter, with the pilothouse positioned aft and amidships for better visibility and control when approaching ships at anchorage.

Auxiliary and navigational equipment installed on the boat includes a Decca 202 radar, radio, Onan 5-kw generator, central air conditioning, a completely outfitted galley and bunks for two.

The propeller turns on a 17-4ph stainless-steel shaft. Speed of the Pilot No. 2 is 25 miles per hour.

The Pilot No. 2 is one of three different types of pilot boats developed by Halter Marine Services, Inc., and offered from stock with either single- or twin-screw propulsion. Recently, the company delivered two pilot boats to the government of Pakistan.

The hull and superstructure was built by Halter Marine Services and outfitting was done by Halter Marine Fabricators, Inc., Moss Point, Miss.

Houston Mariners Elect Sydney Wire President

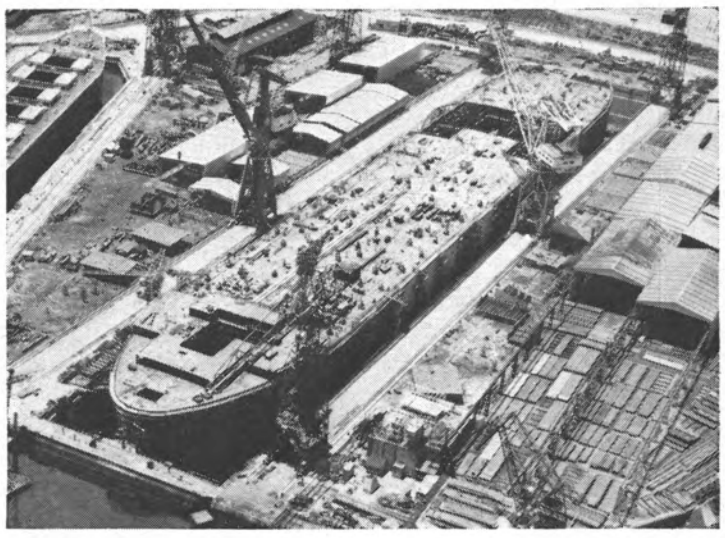
The Port of Houston Chapter of The Council of American Master Mariners elected Capt. **Sydney Wire** its president at a recent meeting at Houston's World Trade Club.

Captain **Wire**, assistant general manager of the Marine Department of Humble Oil & Refining Co., started his maritime career as a seaman 40 years ago. He joined Humble's marine affiliate as a third mate in 1933 and served in the tanker fleet until 1941.

Coming ashore as an industrial relations assistant, he had several staff and executive positions, including secretary of Esso Shipping Co. and general manager of Esso Standard's Inland Waterways Department. He was appointed to his present post in 1959.

The Council of American Master Mariners is a fast-growing organization of licensed ship masters dedicated to promoting the best interests of the American merchant marine. It has 750 members nationwide with 74 in the Port of Houston chapter and 200 in the Port of New York. Other chapters are being formed by regional vice-presidents; Capt. **Robert Stap** of the Humble Marine Department is the Gulf area vice-president.

Foster Wheeler sells two more reheat boilers to Island Navigation



Just like those being installed at Sasebo.

The two reheat boilers make a total of four that Island Navigation Corp. has purchased from Foster Wheeler for steam reheat-powered tankers.

All of these tankers will be built at Sasebo. Each is rated at 175,000 DWT and 30,000 shp.

The first will go to sea in October, 1968. The second in the spring of 1969. The two new units are for ships to be delivered late in '69 or early '70.

Each of these vessels will save its operators as much as $175,000 a year over a diesel system. And up to $45,000 over a conventional system. (Guaranteed fuel rate is less than 0.4 lb/shp hour when FW reheat boiler is used with GE MST-14 propulsion system or equivalent.)

This is the first modern boiler to offer shipowners a practical, fail-safe reheat cycle.

During maneuvering or in-port operations, when no steam is in the reheater, completely automatic shut-off and by-pass dampers direct the flow of hot gases away from the reheat zone to a by-pass zone cooled by bare tube economizers.

Simultaneously, cooling dampers, operating on the same shaft as the shut-off dampers, direct air from the burner wind-box through the reheater. This protects the reheater from thermal shock when steam flow is resumed.

Further fail-safe protection comes from the reheater's strategic location in a low gas-temperature zone. Even without by-passing, the boiler can operate for extended periods without reheater tube failure. Fan speed changes are not required during ahead-astern operation.

If you'd like to know more about how our new reheat boiler can increase efficiency and decrease operating costs of your propulsion system, talk to Foster Wheeler. We've got a lot of engineering worth talking about. Foster Wheeler Corporation, 666 Fifth Avenue, N.Y., N.Y. 10019.

FOSTER WHEELER

Mississippi River Ranks First In New Waterside Facilities

The Mississippi River ranked first among the nation's waterways in attracting new construction and expansion of industrial production and service facilities in the fourth quarter of 1968, **Braxton B. Carr**, president of The American Waterways Operators, Inc., recently reported.

Data collected by the association, which represents the nation's barge and towing industry, indicate that 23 production industries selected sites on the Mississippi River for construction or expansion of plant facilities during the quarter. Most of these went to the lower Mississippi River area.

The AWO survey shows that production and service industries constructed or announced plans to construct or expand 109 plant facilities along the navigable waterways during the fourth quarter of 1968. This is the same number of such facilities built or announced in the third quarter of 1968.

Terminals, docks and wharves designed to handle the movement of freight to and from barges and for the exchange of freight by water carriers and other modes of transportation led the field in the fourth quarter of 1968 with 34 installations. This represents 31 percent of all new waterside plant facilities reported in the association's survey for the period.

Forty-seven of the 109 production and service industries constructed or expanded or for which plans were announced during the fourth quarter reported investment expenditures of more than $398,562,000.

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

Analysis of the 109 waterside sites that were developed in the fourth quarter of 1968 shows that in addition to the 34 terminals, docks and wharves, 24 were metal producing units, 22 were chemical facilities, 11 were paper production and processing facilities, 11 were general manufacturing units, three were grain installations, one was a powerplant, one was a fertilizer unit, one was a petroleum facility, one was a rubber installation, and one was a shipyard addition.

The waterways where the greatest activity took place in new plant starts and expansions in the fourth quarter, in addition to the Mississippi River with 23, were Arkansas-Verdigris River System with six, Gulf Intracoastal Waterway with six, Ohio River with six, Tennessee River with six, Illinois Waterway with five, Atlantic Intracoastal Waterway with four, Houston Ship Channel with four, Lake Michigan with four, Columbia River with three, Lake Erie with three, Missouri River with three, and Monongahela River with three.

The American Waterways Operators, Inc., first began keeping waterside plant site construction and expansion records in 1952. Since then, 7,112 such developments have been reported.

Tulane Schedules Institute On Foreign Transportation And Port Operations For March 24

The twentieth annual Institute on Foreign Transportation and Port Operations will be held in New Orleans on March 24 through 28 The Institute is sponsored by the Graduate School of Business Administration of Tulane University.

The Institute was the recipient of the 1963 National Defense Transportation Award—the only organization in the history of the association to win this award.

The Institute conducts an educational program on handling exports and imports, designed to improve the competence of executives (present and prospective), including junior executives in charge of actual operations and senior executives responsible for planning and directing operations.

A copy of the program for the forthcoming Institute may be obtained by writing to **Mrs. Doris G. Campbell**, executive secretary, Institute on Foreign Transportation and Port Operations, Norman Mayer Building, Tulane University, New Orleans, La. 70118.

Marquardt Names Marconi Representative For Doppler Sonar Navigation System

The Marquardt Corp. of Van Nuys, Calif., has named the Marconi International Marine Co. Ltd. of Great Britain as its authorized sales and service representatives for its new line of Doppler sonar navigation systems and related marine electronic products. The announcement of the appointment, which was made by **J. D. Wethe**, president of Marquardt, noted that Marconi Marine and its subsidiaries operate more than 70 facilities at major seaports throughout the world. Marquardt Corp. is a subsidiary of CCI Marquardt.

Engelhard Industries Promotes G.L. Tugwell And R.C. Glogau

Gilbert L. Tugwell

Richard C. Glogau

Gilbert L. Tugwell has been appointed president of the Engelhard Industries Division of Engelhard Minerals & Chemicals Corporation.

Mr. **Tugwell,** who has been with the company 33 years, also serves as a director, member of the executive committee and executive vice-president of the parent corporation.

Richard C. Glogau, who joined the firm in 1967, after 27 years with E. I. Du Pont de Nemours, succeeds Mr. **Tugwell** as executive vice-president of the Engelhard Division. Mr. **Glogau** also was elected a director, member of the executive committee and senior vice-president of the corporation.

Newport News To Aid Boeing On ASMS Program

Newport News Shipbuilding and Drydock Company of Newport News, Va., has been awarded a $200,000 contract by The Boeing Company in connection with the Navy's Advanced Surface Missile System (ASMS) program.

Under the contract, the company will provide naval architectural and marine engineering assistance and consultation for integration of the ASMS aboard operational-class ships.

Newport News Shipbuilding, with an extensive background in naval engineering and construction, was made a member of the Boeing ASMS industrial team because of its experience in initial design work of the naval defense system.

The program's production phase will be scheduled to coincide with the construction of a new class of guided missile ships (known as the DXG project) during the next decade.

Currently, Boeing is one of three firms competing in a Navy contract definition phase on ASMS. In August 1969, the Navy will select a single contractor to continue into engineering development work on the system.

Kocks Pittsburgh Furnishing Philadelphia Container Crane

A contract covering a 45-ton capacity container crane has been received by Kocks Pittsburgh Corporation, Pittsburgh, Pa., from the City of Philadelphia. The giant crane will be among the largest of its type in the world, and will be installed and ready for operation before the end of this year.

This Kocks container crane will be similar to Kocks installations in Antwerp, Breman and Bremerhaven. The unit will serve a land backup area of 94 feet, compared with 30 to 40 feet backup areas for conventional container cranes.

The crane will handle 20- and 40-foot containers and also will provide for quick adaptation to general cargo use, bucket handling and scrap handling by magnet.

The Kocks crane for Philadelphia will feature a hoisting unit attached directly to the trolley. This design feature is said to reduce maintenance costs substantially. The unit is a wide-gauge model with 90 feet between the tracks. The wide gauge design eliminates need for counterweights.

Detroit Diesel Sets Gas-Turbine Schedule

Detroit Diesel Engine Division of General Motors Corporation has reported that its 280-hp industrial gas-turbine is scheduled for initial production in mid-1971 following extensive field testing. Long-run plans call for a series of four basic gas-turbine models ranging up to 2,000-hp.

In making the announcement, **C. W. Truxell,** the division's general manager stated, "Eventually the turbine will supplement our diesel engine sales which reached record shipments of over 95,000 units in 1968. Our future outlook for diesel engine sales is so strong that we fully expect new records for 1969."

From the beginning of the gas-turbine project, Detroit Diesel has designed its industrial gas-turbine for use in a variety of industries ranging from construction equipment and marine applications to generator sets and highway trucks and buses. Currently, diesels are sold to these markets through 630 manufacturers for use in more than 3,800 different applications; Detroit Diesel's gas-turbine is intended to enhance and broaden the division's power coverage in all markets.

The time from now until the scheduled initial production date of mid-1971 will be taken up by an extensive field testing program. It is expected that initial sales would be to the markets most in need of the turbine's unique advantages. Among these unique advantages are: compact size, light weight, vibrationless operation, low exhaust emissions, low noise level, low oil consumption and easy starting.

A Sound Investment

Three Dimensional Enlargement Of Great Lakes Bulk Carriers

Trevor White*

Existing Great Lakes bulk carriers may be economically enlarged since the new Poe Lock at Sault Ste Marie has removed the previous size restraint. It is now possible for a vessel of 1,000-foot overall length and 105-foot beam to transit the new lock. Two new vessels in the building stage will take advantage of the new lock size. One vessel has an average trip capacity close to 41,000 tons and the second vessel has an average trip capacity of about 52,000 tons. The largest vessels presently in service have an average trip capacity of about 25,000 tons.

By using a three dimensional (3-D) enlargement of an existing vessel, this disparity can be partially eliminated. Three dimensional enlargement consists of enlarging an existing vessel by increasing its length, beam, and depth.

There are 24 U.S.-flag Great Lakes bulk carriers which are prime candidates for 3-D enlargement, all built since 1950. There are also many vessels built prior to 1950 which have suitable powerplants, or have been repowered, and which are also suitable for 3-D enlargement. There are 31 vessels in this category.

Three dimensional enlargement of any Great Lakes bulk carrier now in service will increase its average trip capacity by about 60 percent. Operating expenses increase slightly and are comprised primarily of increased insurance and fuel costs.

Several 3-D enlargement projects have been investigated in some detail. They have all proved to make sound investments.

Investigated in greater detail was an existing vessel with a length of 710 feet, a 75-foot beam and 37-foot 6-inch depth, with an 8,500-shp steam turbine powerplant.

Economics

Table 1 compares the investment in an existing vessel with those for various enlargements. It includes in addition the investment in a new vessel. An arbitrary 1969 market value of $8,000,000 has been assigned to the existing vessel.

The economic comparison is a simple one, since the intent is to compare investments, and not to make a detailed analysis of each. Straight line depreciation over 20 years has been used. The effects of income surtax and investment credit have been ignored, since each investment will be affected equally by considering them. Accelerated depreciation will improve each investment. The method of financing will be significant, and may vary with the size of investment. None of these refinements will affect the standings.

In Table 1 the average annual gross revenue (line 3) is based on annual carrying capacity (line 1) at a freight rate of $1.90 per ton, except that $2.05 per ton has been used for the new vessel, which is a self unloader, and average annual operating costs (line 4) is an average figure for the 20-year period. It is about 30 percent in excess of current annual operating costs.

Using capital recovery factor as an index it is shown that the 3-D enlargement makes the best investment. Circumstances could justify an owner choosing an investment other than the best, but Table 1 clearly indicates the sacrifices he would make.

Choosing the New Dimensions

Existing vessel dimensions, proportions, lines, powerplant, and construction determine the maximum size to which a vessel may be three dimensionally enlarged.

Cargo hatch arrangement, and vessel shape at the cut points, help determine the amount of lengthening and widening possible. The increase in length will also be dependent upon existing bottom shell thickness and other existing structure.

The only purpose of deepening a vessel with adequate existing draft is to permit the maximum possible lengthening. For instance the 710-foot vessel may be lengthened about 96 feet maximum if the depth is not changed; the addition of large amounts of steel in the form of straps or doublers might permit a greater increase than this, but the cost becomes prohibitive. The same vessel may be economically lengthened by 168 feet if the depth is suitably increased. Each existing vessel will have its own particular maximum increases for each of the three dimensions.

It is generally possible to provide sufficient longitudinal strength to suit the increased vessel dimensions. Widening the vessel by cutting just inboard of the gunwale angle is particularly attractive, since it permits a large increase in spar deck stringer plate width, which provides a large increase in longitudinal strength. If the longitudinal cut for widening is made near the centerline of the vessel, the hatches will increase in size with the extra width, but no increase in spar deck stringer plate width is obtained. This means that the extra steel for required longitudinal strength must be added as straps, doublers, etc. Cutting near the centerline creates another problem; because of the quickly changing beam, the hatch crane is un-

(Continued on page 27)

Table 1. Comparison Of Investments
(All figures, except percentages, in 1,000 units)

Line	Item	3-D Enlarged Vessel	New Vessel	Lengthened & Widened Vessel	Lengthened & Deepened Vessel	Lengthened Vessel	Existing Vessel
1	Annual (L.T.) Capacity	1,514	1,715	1,315	1,216	1,117	966
2	Investment	14,200	19,000	12,800	11,400	9,500	8,000
3	Average Annual Gross Revenue for 20 Years	2,877	3,516	2,499	2,310	2,122	1,835
4	Average Annual Operating Costs for 20 Years	1,500	1,800	1,474	1,434	1,408	1,380
5	Average Annual Net Revenue for 20 Years	1,377	1,716	1,025	876	714	455
6	Depreciation = Investment / 20	710	950	640	570	475	400
7	Taxable Income = Line 4 − Line 5	667	766	385	306	239	55
8	Tax 48%	320	368	185	147	115	26
9	Cash Flow = Line 4 − Line 7	1,057	1,348	840	729	599	429
10	Capital Recovery Factor After Tax = Cash Flow x 100% / Investment	7.44%	7.09%	6.56%	6.39%	6.31%	5.36%

*Mr. **White,** director of engineering, Fraser Shipyards, Inc., Superior, Wis., presented the paper condensed here before a recent meeting of Great Lakes and Great Rivers Section of The Society of Naval Architects and Marine Engineers.

Three Dimensional Enlargement

(Continued from page 22)

able to travel sufficiently far forward and aft to handle hatch covers at the ends.

If the widening is performed within the ballast tanks the total ballast capacity of the enlarged vessel is considerably increased. In fact, for the vessel considered, ballast capacity increases almost 100 percent. It should not be necessary to increase the ballast pumping rate exactly in proportion to the increase in ballast capacity, but it may be advantageous to make some increase to the pumping rate to minimize time spent at the loading docks.

A three dimensionally enlarged vessel requires an increase in rudder area to maintain satisfactory maneuverability. The additional area may be abtained by cutting the rudder a few feet forward of the trailing edge and fairing in new double plate construction to give added length.

Increased rudder area results in increased rudder torque which necessitates modifications to the upper rudder stock and steering gear. It may also be necessary to make changes to the lower pintle and to the rudder coupling bolts. Replacing mild steel with low alloy steel is the most economical means of achieving the increased strength.

An increase in steering gear torque may be achieved, in many cases, by an increase in hydraulic pressure and a resetting of the relief valves. For the vessel under consideration a 20 percent increase in torque may be achieved in this way.

Three dimensional enlargement increases the equipment tonnage of a vessel and may require heavier anchors. An increase of anchor chain strength may also be necessary. For the vessel considered, only the anchor weight requires an increase. A change in chain size would mean an expensive anchor windlass modification or renewal.

A 60 percent increase in displacement will have some effect on vessel speed. For most 3-D enlargements a decrease in speed of about ¾ mph should be expected, at the same shaft horsepower.

Any change in propeller pitch, found necessary as a result of 3-D enlargement, may be readily accomplished on most Great Lakes vessels.

Enlargement Procedure

The 3-D enlargement of a vessel appears at first to be a formidable job. When the process is examined step by step, it proves to be much less fearsome. Precise burning, accurate alignment, careful welding and the provision, prior to cutting, of means to hold the vessel's shape, are the essentials for a successful 3-D enlargement. These are exactly the same requirements to successfully build a new hull.

There are a number of different methods for accomplishing each stage of the enlargement. The method shown in Figures 1 to 6 is one satisfactory method.

The widening may be accomplished by different means. It is possible, for instance, to horizontally jack the side shell section of the cargo hold outboard the distance required for widening.

Loading

A three dimensionally enlarged vessel will be able to load at a number of the existing pocket docks. Predictions indicate that by 1970 two-thirds of the iron ore shipped on the Great Lakes will be in the form of pellets. By 1980, the tonnage of pellets is expected to increase to about 90 percent of the total. At many loading points, belt conveyors will be used to load the vessel. Belt loaders will decrease the overall time at the loading port.

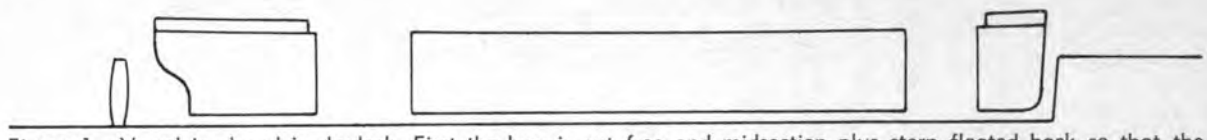


Figure 1—Vessel is placed in drydock. First the bow is cut free and midsection plus stern floated back so that the distance from the bow to the stern is the final length of the enlarged vessel. Then the drydock is emptied and the stern cut loose from the midsection. In another floating operation the midsection is floated to its predetermined spot in the dock and the dock again pumped dry.

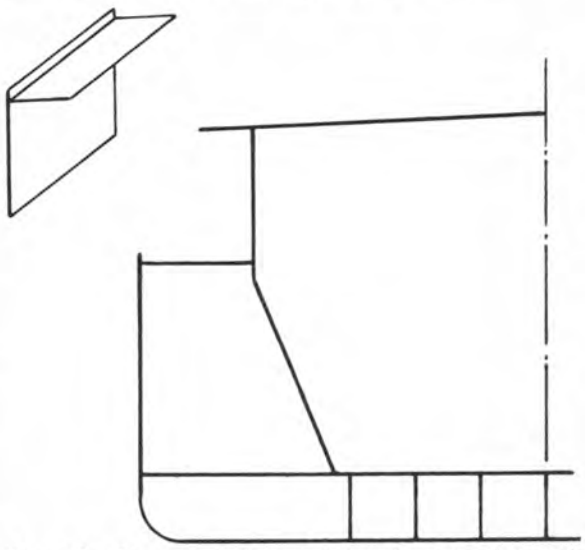


Figure 2—The spar deck and side shell are cut longitudinally and transversely so that sections can be lifted free and put on the ground alongside the dock.

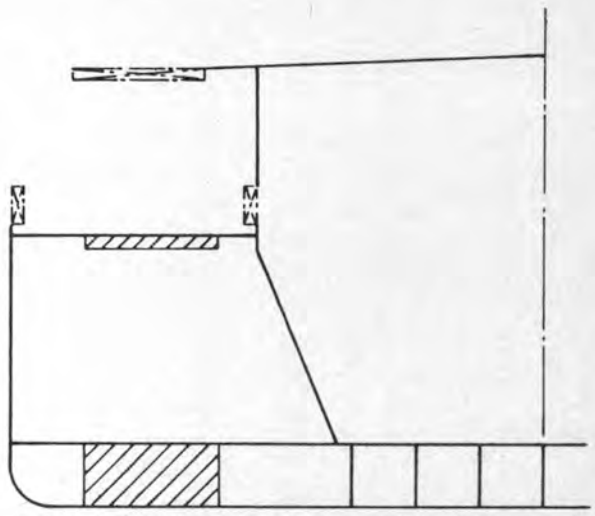


Figure 4—Cut longitudinal tunnel bulkhead above main deck, jack up the spar deck to required height and insert new longitudinal sections in tunnel bulkhead and shell.

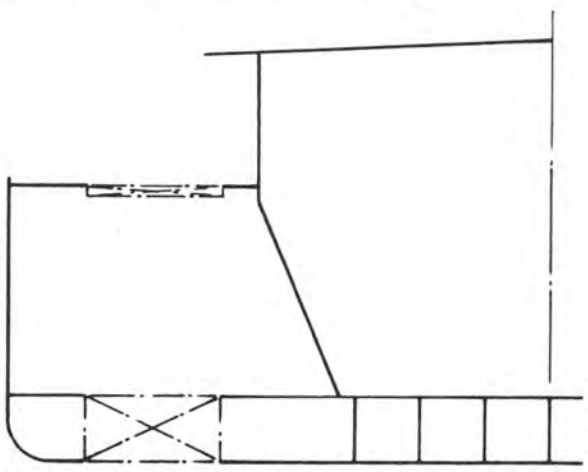


Figure 3—The main deck and bottom shell are cut longitudinally and girth cuts are made so that side shell sections can be moved outboard. Install new bottom shell, main deck sections, etc.

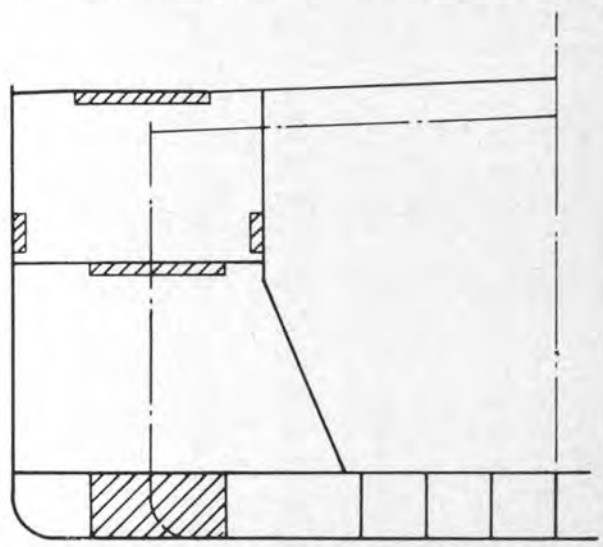


Figure 5—Install new spar deck section and lift removed side shell and spar deck sections into place.

Unloading

A Hulett unloader may not be able to reach out to the outboard side of the cargo hold of a three dimensionally enlarged vessel. Cargo remaining in the outboard portion of the cargo hold must be bulldozed into the reach of the Hulett unloader, requiring some increase in total unloading time.

Conclusion

It is technically and constructionally feasible to enlarge an existing Great Lakes bulk carrier three dimensionally. Such a 3-D enlargement is an attractive investment where increased capacity is required. Even if additional tonnage is not required, a 3-D enlargement would permit the retirement of an older less economical vessel. A fleet owner who has vessels suitable for 3-D enlargement should thoroughly investigate the merits of such an enlargement before choosing any other means of providing additional capacity.

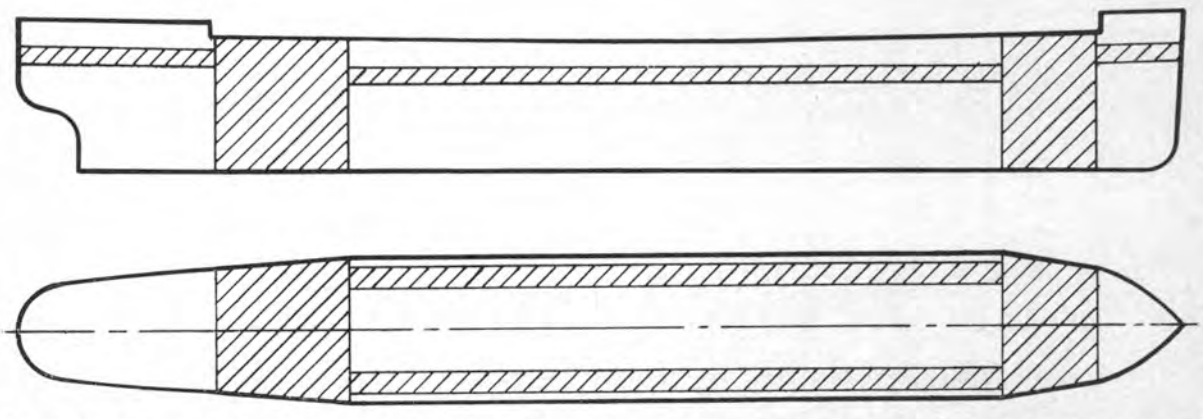


Figure 6—Deepen the bow and stern section by cutting, jacking up and installing new steel. Erect new structure between bow and midsection, and stern and midsection. This completes the structural part of the 3-D enlargement.

Barge Construction

Equitable Equipment Co., Inc. of New Orleans, La., was contracted by Moore Terminal & Barge Co., Monroe, La., to build a deck barge. The 1,900-dwt deck barge will measure 200 feet by 50 feet by 11 feet.

Hillman Barge & Construction Co., Pittsburgh, Pa., will build 20 deck cargo barges for undisclosed interests. Each of the 20 barges will have dimensions of 140 feet by 39 feet by 9 feet and be of 800 dwt.

Jansen Marine Corp., Troutdale, Ore., will build a 148 foot by 50 foot by 12 foot crane barge for Schnitzer Leasing, Inc., Portland, Ore. The 1,600-dwt barge has been designated Hull No. 2024.

R. G. Le Tourneau, Inc., Vicksburg, Miss., is to build an offshore, oil-well drilling barge for Reading & Bates Offshore Drilling Co., Tulsa, Okla. The barge will be equipped with 5,000-bhp diesel electric machinery and will be about 5,000 gt.

Maxon Construction Co., Tell City, Ind., will build four 1,400-dwt deck cargo barges for Kanawha Sand Co., Parkersburg, W. Va. Designated Hull Nos. 1105, 1106, 1099 and 1100, each will have dimensions of 160 feet by 50 feet by 12 feet.

Reliance Marine Transportation & Construction Corp., Kingston, N.Y., will build a 1,000-dwt deck cargo barge for stock purposes. Designated Hull No. 775, it will have dimensions of 130 feet by 40 feet by 11 feet 3 inches.

Zigler Shipyards, Inc., Jennings, La., was contracted to build six deck cargo barges by J. Ray McDermott & Co., Inc., Harvey, La. Each barge is to be of 2,000-dwt and will have dimensions of 160 feet by 54 feet by 13 feet. The barges have been designated Hull Nos. 197 through 202.

Moore And McCormack Co., Inc. Elects Three New Directors

William T. Moore, chairman of the board of Moore and McCormack Co., Inc., has announced the election of the following three new directors to the board: **Geo. T. Scharffenberger,** president and chief executive officer, City Investing Company; **A. Lightfoot Walker,** chairman and chief executive officer, Rheem Manufacturing Company, and **William E. Stockhausen,** partner in the law firm of Satterlee, Warfeild & Stephens.

In addition to the newly elected members, the present board consists of **William T. Moore,** chairman; **Lawrence F. Fiske; Thornton Hall; Lawrence C. Marshall** and **Robert E. O'Brien.**

Mr. **Scharffenberger** is chairman of the board of the Gateway National Bank, El Segundo, Calif., a director of General Development Corp., Wabash Magnetic Inc., Metro-Goldwyn-Mayer, Computer Sciences Corp., Management Science Corp., Diebold Technology Venture Fund, Property Corp., and Cayman Corp.

Mr. **Walker** is president and a director of Rheem International Inc., director of City Investing Company, Marine Midland Grace Trust Co., a trustee of the U.S. Council of the International Chamber of Commerce and a member of the advisory board of the Institute of World Affairs.

William E. Stockhausen is president and director of Nassau Hospital and a member of the American Bar Association and Association of the Bar of the City of New York.

N.Y. City Now Owns Brooklyn Navy Yard

Ownership of the New York Naval Shipyard (better known as the Brooklyn Navy Yard) was officially transferred to the City of New York by the U.S. Government in mid-February. The ceremonies marking the transfer brought to culmination over two years of negotiations between the city and the government.

Mayor **John Lindsay** gave Secretary of Commerce **Maurice H. Stans** the city's formal offer to pay $23.5-million for the base, its 40 large buildings and its enormous drydocks, cranes and piers. However, negotiations are being conducted in Washington in an attempt to have the title transferred to the city on a 'no-cost' basis.

Presently, four small industries are functioning in the yard on occupancy permits granted by the Navy.

The big operation for the facility is the previously announced shipbuilding project by Seatrain Lines Inc. This operation would use 45 percent of the yard's facilities.

Actual control of the facilities has been assigned by the city to Commerce, Labor, and Industry Corporation of the County of King, to be known as CLICK. This group will develop the complex as an industrial park.

The Navy is retaining 25 acres within the 265-acre facility including the barracks and parade grounds.

Steamship Agent And Line Being Acquired By Food Firm

Chester, Blackburn & Roder, Inc., steamship agents and brokers, and Atlantic Lines, Ltd., an affiliate, will become part of Proteus Foods & Industries, Inc., a fishing and seafood processing concern. Shareholders of Proteus and the Chester-Atlantic group must approve the proposed merger and a favorable tax ruling must be obtained.

Under the agreement approved by directors of the two groups, Proteus would pay a maximum price of $13.5-million in cash and Proteus shares, in return for all shares of the Chester-Atlantic companies.

Fruehauf Forms New Container Sales Section

Clark E. Abbott

Walter C. Kavanaugh

In order to meet the demands of the ever expanding container industry, the Fruehauf Division has formed a new container sales force to handle all of the Division's container sales operations, according to **T. J. Reghanti,** vice-president, general sales manager.

Made up of container sales specialists, the new sales section will provide greater development and administrative assistance for container operators and prospective container handlers in the U.S. and Europe.

The new section is under the direction of **Clark E. Abbott,** who assumes the position of vice-president, container sales, with headquarters in South Kearny, N.J. Mr. **Abbott,** formerly the branch manager of the firm's South Kearny, N.J. and Maspeth, Long Island, facilities, has been closely associated with all aspects of containerization for several years.

Walter C. Kavanaugh, formerly director of container sales, takes on expanded responsibilities as director of container sales and administration. A pioneer in the container industry, Mr. **Kavanaugh** is responsible for the administration of Fruehauf's container sales programs, the coordination between plants and sales, and for specialized sales duty. Mr. **Kavanaugh** is based at the Fruehauf headquarters in Detroit, Mich.

Michael E. Cascone, Martin Glickman and **Frank B. Pigeon** have been appointed container development representatives. Messrs. **Cascone** and **Glickman,** headquartered in S. Kearny, N.J., are responsible for Fruehauf container sales on the East and Gulf Coasts. Mr. **Pigeon,** based in Oakland, Calif., is responsible for the handling of the firm's container accounts on the West Coast.

Dero Research To Provide Control Systems To Ingalls

Gerald S. Loecher, president and chairman of Dero Research and Development Corporation, Huntington, N.Y., has announced receipt of a contract award of approximately $2-million from Ingalls Shipbuilding Corporation. The award covers the design and manufacture of seven marine centralized control systems which will be installed on seven vessels. The contract requires delivery of the first system by January 1970.

Each centralized operation system will monitor principal operating characteristics of the ship's main propulsion plant and its auxiliaries, and the ship's service systems, refrigeration and air-conditioning systems. In addition, the control systems, which will incorporate solid-state electronics, will automatically monitor faults and indicate and log operating data, such as bridge throttle position, time, shaft direction, rpm, and propulsion control.

Dero Research is a leading manufacturer of marine direction finding systems, shipboard radar systems and radar display systems. The company intends to further expand its marine product line to accommodate requirements for advanced electronic marine systems for commercial shipbuilding companies and governmental agencies.

Capt. Grodzicki Named To Marine Transportation Post By W.R. Grace & Co.

W. M. Rohrer, vice-president of foreign fertilizer operations, has announced the appointment of Capt. **Janusz Grodzicki** as director of marine transportation for W. R. Grace & Co.'s Agricultural Chemicals Group. He replaces **W. T. McLaughlin** who has resigned.

Captain **Grodzicki** is responsible for coordinating ocean transport of all Grace fertilizer materials to ports throughout the world. The company operates three specially-designed ammonia tankers between its major ammonia producing facility at Point Lisas, Trinidad, and terminals around the world. Dry fertilizer materials are moved in chartered vessels from this location and U.S. ports.

Captain **Grodzicki** has been affiliated with the maritime industry for 25 years, most recently as manager of marine transportation for W. R. Grace & Co. He held a similar position with Federation Chemicals, Ltd., a company subsidiary in Trinidad, prior to joining Grace in New York in 1964.

Born and educated in Poland, Captain **Grodzicki** obtained an M.A. in economics at the University of Warsaw where he also studied for his doctorate. He joined the Polish Army during World War II, was wounded and twice decorated for bravery. During the occupation, he escaped to England and joined the Polish merchant navy where he obtained his master's ticket.

After the war, Captain **Grodzicki** served as a ship's master for five years, and obtained management experience while engaged in the fishing industry in Trinidad for a similar period.

New York Conference Tries To Solve "The Path Of The Container Hurricane"

Is containerization the answer to the spiraling costs of ocean transportation, and what problems do ship owners and shippers face in the rapid changeover to containers? The pros and cons to these questions were discussed in detail at the Ninth Annual Conference on Containerization sponsored by The Containerization Institute, Inc., held recently in New York City.

The theme of the conference was "The Path of the Container Hurricane—1969." The conference program was set by Dr. **John J. McMullen,** president, United States Lines, who served as program chairman; **Richard Craw,** assistant to the president, Grace Line, who served as assistant chairman, and **Glenn Mather,** The Containerization Institute, who served as coordinator.

The two-day conference consisted of three panel discussions—"Is Containerization the Total Panacea?"; "Conferences and Containerization, Can This Marriage Last?" and "The Defoliation of the Paperwork Jungle."

The conference theme was set by **Arthur C. Novacek,** president of Grace Line and president of The Containerization Institute, in his introductory remarks. He commented that "The participants in this conference comprise one of the most knowledgeable groups on the subject yet to be assembled" and should be able to pinpoint problems and answers which will be useful to the world community.

John J. McMullen, president of United States Lines, spoke at the first-day luncheon on the overall subject of containerization. Mr. **McMullen** traced briefly the history and development of the present-day containerization system. He noted that shipowners "experimented with palletization and small unit loads, but these halfway measures simply wasted time and solved nothing. Only the container and a ship designed for large volume and quick cargo handling could provide economies sufficient to satisfy the shipper and successfully help trade, as well as provide a profitable business for the owner."

Mr. **McMullen** called for a "truly integrated transportation system" which might find the trucking firms better suited to operating the container transport than the steamship operator.

In closing he stated "the new role of the owner will become more and more that of the financial manager investing in newer, faster and larger equipment to maintain profitability. Obviously, this can only lead to a concentration of through international transport systems in fewer companies possessing the resources of finance and management necessary to implement these changes."

During the first panel discussion, **Edward E. Bridges,** transportation analyst for Moller Steamship Company, expressed the opinion that "neither containerization nor palletization by themselves are panaceas." The reasoning behind this feeling was that while U.S.-Europe and U.S.-Japan routes may be ideal for containerization, steamships travel all over the world and most countries are not physically setup to handle containers.

Mr. **Bridges** did feel that changes are coming because of transportation economics. "It is apparent that almost all steamship companies have at last either partially or fully," noted the panelist, "exposed their own operations to the harsh light of transportation economics, resulting in the inescapable conclusion that break-bulk operation must go. Whether it be palletization, containerization, or some other 'tool' not yet dreamed up, their economic survival demands automation of some kind."

Another panelist, **Joseph G. Barkan,** executive vice-president of Prudential Lines, described the lighter-aboard-ship concept which Prudential will be using. He stated that his firm is not anti-container and is anxious to carry them, but "what we do question is the magnitude and the economic feasibility of keeping an expensive container vessel operating in a limited market. This is precisely one of the reasons why Prudential has developed the LASH system." He supported this statement with cost figures for break-bulk, container, and LASH operations.

Carl G. Moberg, export manager for Westinghouse Electric International Co., took the shippers viewpoint on this panel. He pointed out that most shippers were not consulted on containerization and that "containers are not the total panacea." He felt that the present-day container-size standards are wrong and also questioned how an exporter will ship equipment that cannot be put in containers, when containerships have driven the break-bulk ship out of service.

This first panel was moderated by **M. S. Pennington,** chief, Office of Maritime Promotion, Maritime Administration. Panelists other than those mentioned previously were: **Donald L. Loftus,** assistant vice-president, intermodal services, Western Pacific Railroad; **James B. Rose,** European manager, container operations, U.S. Lines, and **Frank M. Winterholler,** vice-president, Bell Lines, Inc.

The second panel discussion, covering conferences, was moderated by **George H. Hearn,** commissioner, Federal Maritime Commission. The panelists were: Capt. **George Legnos,** manager of Farrell Lines containerization development program; **M. J. Kelly,** vice-president, Moore-McCormack Lines; **Henry V. Kantzer,** president, Puerto Rican Forwarding Company, and **A. E. Bowen,** president, Consolidated Forwarders Intermodel Container Corporation.

The third panel, discussing paperwork, was moderated by **Robert Blackwell,** Department of Transportation. The panelists were: **Arthur Bardenhagen,** vice-president, Irving Trust Company; **Arthur E. Baylis,** national director, National Committee on International Trade Documentation; **Robert L. Dausend,** director, industry and regulatory affairs, Sea-Land Service Inc.; **C. Haxthausen,** manager, cargo services, Pan American Airways, and **Robert E. Traut,** transport section, Resources and Transport Division, United Nations.

Ogden Acquires Bulk Transport

Ogden Corporation has announced the acquisition of Bulk Transport and affiliated companies in a transaction involving more than $25-million in Ogden stock, according to **Ralph E. Ablon,** chairman of Ogden.

The acquisition of Bulk, according to Mr. **Ablon,** is an important addition to the systems capability of Ogden's Engineered Transportation group. This group now comprises International Terminal Operating Co. Inc., major marine terminal operators; Logistics Systems, Inc., a company engaged in creative systems analysis for transportation logistics; and, pending a favorable tax ruling, Soros Associates, Inc., an engineering consulting firm, specializing in engineering of integrated transportation facilities.

Bulk Transport will enable Ogden to offer a more complete systems service to industry. Bulk owns and operates 15 American-flag vessels, including nine bulk carriers, two tankers, and four freighters, as well as three foreign-flag bulk carriers. In addition, two 37,500-dwt American-flag tankers are under construction and scheduled for delivery during the first half of 1969.

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

Bethlehem Steel Expanding Sparrows Point To Provide For Building 200,000-Dwt Ships

Aerial view of Bethlehem Steel Company's Sparrows Point, Md. shipyard with steel mill in background. Broken white line indicates location and size of new shipbuilding basin for constructing ships of 200,000 dwt or more and over 1,000 feet long.

Edmund F. Martin, chairman and chief executive officer of Bethlehem Steel Corporation, has announced that directors have approved the expenditure of more than $15-million for the construction of a large shipbuilding basin at the Sparrows Point, Md., shipyard.

The new facility, Mr. **Martin** said, will enable the yard to construct tankers ranging to more than 200,000 dwt in capacity. It will have a length of more than 1,000 feet and a width greater than any ship built to date, and is scheduled for completion late in 1970.

"The present active market for new ship construction and favorable forecasts for new business indicate a trend toward ship sizes beyond the dimensions of our present shipways at Sparrows Point," Mr. **Martin** said. "We must now plan for the construction of ships with greater lengths and beams to participate in the market we foresee for the next 10 years."

To be built in the southern area of the yard, the new basin will complement the existing five major launching ways at the yard which are capable of handling ships up to 830 feet in length.

The huge capital expenditure also provides for a new sandblasting and painting building, and comes on top of a multi-million dollar program already underway at the yard. That program will provide a system in which precoated plates, shapes and webs will be transported by conveyors and assembled in large units.

The Sparrows Point yard is now building ships ranging up to almost 70,000 dwt. This program, which includes deliveries extending to 1971, consists of 16 tankers, two containerships and two U.S. Navy ammunition ships, or a total of 20 vessels.

Steady she goes with Gulf.

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

Gulf®

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

Plasma Chemical Co. To Produce And Sell Magna-Bond Coatings

Magna-Bond marine coatings are again available to the marine trade after three years of being off the market. Plasma Chemical Systems, Inc., 13909 Lee Jackson Highway, Chantilly, Va. 22021, has purchased the patents, formulas and processes pertinent to the Magna-Bond product line from the MB Coatings Company.

Plasma Chemical Systems is a relatively new manufacturer of synthetic bituminous products that are used for various applications. Its primary product is known as 'Plasmofalt.' In an expansion move, the firm purchased all the rights to Magna-Bond.

Magna-Bond marine metallic coatings, which were widely used for many years and gave excellent results, are available in two color tints for film identification. They are a one-package blend of vinyl copolymers with fortifiers and filled with atomized aluminum powder.

Magna-Bond marine decorative coating is also a one-package, high solid content blend of vinyl copolymers with fortifying resins and pigmented with chemical and weather resistant pigments.

Plasma Chemical Systems does not plan to have distributors, but rather intends to maintain its own direct sales force and work through local representatives. Two such representatives have agreed to handle the Magna-Bond line. They are Magnabond Sales Corp., 82 Beaver Street, New York, N.Y., and Varn and Brower Company of Tampa, Fla. Additional representative agreements in southern and western areas are presently being considered.

Oceanographic Society Elects John Thomas

John H. Thomas

The enlarged headquarters of the Oceanographic Society, 17 Battery Place, New York City, was the scene of the annual meeting of the Society when **John H. Thomas** was elected president. This election confirmed the earlier special meeting elections following the death of the president, **Lloyd Dalzell.** Mr. **Thomas** is president of John H. Thomas, Inc., ocean engineers and marine consultants, Tarrytown, N.Y. The Oceanographic Society is an incoroprated non-profit organization devoted to advancing the exploitative values of the marine sciences for human betterment.

In his acceptance speech, which supplemented the program developed since the special meeting, he confirmed that the Society would continue their student information program, encourage re-evaluation of merchant marine officer training programs, expand their affiliations with correspondents now numbering 47 in countries throughout the world, and continue site evaluation for the world center of oceanography.

Mr. **Thomas** also expanded upon the progress achieved as a result of the $50,000 evaluation study and program proposal for a world center of oceanography published by the Society in 1965. He exhibited to the board the recent topographic and cartographic workups relating to the present site evaluations.

Elections were also held to fill the vacancies resulting from the expiring terms of the following trustees: Dr. **R. Buckminster Fuller,** Dr. **Athelstan Spilhaus,** Adm. **John M. Will,** USN, (ret.), as well as the vacancy caused by the death of trustee and founding president, **Homer H. Evans Jr.**

The new trustees elected were: Capt. **Richard A. Cahill,** Comdr. **William D. Derr,** USCG, **Max C. McLean, Ted A. Short,** and **Robert J. Lawton,** who was also elected secretary. Mr. **McLean** also was elected vice-president.

World's Largest Catamarans To Be Built By Nippon Kokan

Model of world's largest catamaran ferry to be built by Nippon Kokon's Shimizu yard.

The world's largest catamaran ferries, two 2,200-gt vessels, will be built for Kansai Steamship Co. of Osaka, Japan, by Nippon Kokan, the nation's only integrated shipbuilder-steelmaker and only builder of the twin-hulled ferries.

Hiroo Ikematsu, NKK's New York naval architect, said the vessels will each have a capacity for 50 large trucks, 10 small trucks, 50 passenger cars and accommodations for 450 passengers. Vehicles will be driven on and off the ferries over wide ramps.

To be built at NKK's Shimizu Shipyard near Tokyo, the vessels will have a speed of 19.2 knots. They will enter service in the fall of this year, between Kobe and Takamatsu, a distance of some 112.5 miles on Japan's Inland Sea.

Since 1960, Nippon Kokan has delivered 20 catamarans, including two exported to Burma in 1965. All of these are in the less-than-500-gt category, so the 2,200-gt vessels represent a significant advance in capacity and speed.

The Kansai catamarans will have four ballast pumps, each with a rated capacity of 450 tons per hour for rapid attainment of optimum vessel trim.

Litton Elects Gray Senior Executive V-P

Harry J. Gray

Harry J. Gray has been elected to the new position of senior executive vice-president of Litton Industries, it was announced by president **Roy L. Ash.**

Mr. **Gray** in his new capacity will have the following activities reporting to him: the Marine Group, headed by Senior Vice-President **Ellis Gardner;** Industrial Systems and Equipment Group headed by Senior Vice-President **Austin Goodyear;** and the Machine Tool Systems and Products Group headed by Vice-President **Thomas Morris.**

Mr. **Gray** was previously responsible, as executive vice-president, for the business systems and equipment activities which will now be directed by **Ralph H. O'Brien,** Litton senior vice-president. Mr. **Gray** is in his 15th year with the company and is a member of the Litton board of directors. Prior to his appointment as executive vice-president in October 1967, he served the company as senior vice-president for finance and administration.

He joined Litton in 1954, and he became a corporate vice-president in 1959. At that time he organized Litton's Components Group, and under his direction until 1965, component operations expanded from a single facility to a multi-divisional operation encompassing many advanced areas of component technology.

Mr. **Gray** received a bachelor of science degree at the University of Illinois in 1941 and an M.S. degree at the same University in 1947.

He served four and a half years in the U.S. Army during World War II, three and a half of which were overseas. He attained the rank of captain and received both the Silver Star and the Bronze Star for gallantry in action.

Roling Named Manager Marine Development For Maxim Silencers

Herb D. Roling

Joseph LaBarbera, president of AMF Beaird, Inc., a subsidiary of American Machine & Foundry Company, Shreveport, La., announced recently the appointment of **Herb D. Roling** as manager of marine market development for Maxim silencer products.

Mr. **LaBarbera** stated that AMF Beaird has long recognized its obligation to the marine industry, since its acquisition of the Maxim Silencer Company in 1960. Mr. **Roling** will begin a new effort toward improved products for the industry.

Mr. **Roling** previously was associated with AMF Cuno Division, Meriden, Conn., as manager of Maxim evaporator marine sales. From 1937 to 1952 he was associated with Gibbs & Cox, naval architects in New York.

Maxim silencer products manufactured by AMF Beaird are known the world over and include wet- and dry-type marine engine sound-attenuation devices, spark arrestor and heat-recovery silencers.

Electric Boat Forms Engineering Department For Quality Assurance

Harry E. Peterson Jr.

A new department of engineering quality assurance has been established at Electric Boat division of General Dynamics. It will be responsible for the accuracy and adequacy of data produced by the division's engineering department and for conformance of data to specifications, standards and contracts.

Covered by the new activity are such items as drawings, technical reports, technical manuals, material purchase specifications, design reviews, and standards governing the design work itself.

Named to head the new department is **Harry E. Peterson Jr.**

In announcing the step, **Joseph D. Pierce,** Electric Boat division general manager, noted that "the Navy is increasing its emphasis on assurance of the quality of engineering technical data. It is necessary that a program be established to fulfill the engineering quality assurance requirements in existing contracts and the expected more rigorous requirements in future contracts."

Mr. **Peterson,** joined Electric Boat division in 1957 after 12 years as a naval officer in the submarine service. He has held various positions in engineering including propulsion systems design supervisor, division value engineer and most recently assistant manager of overhaul systems management. He holds engineering degrees from the U.S. Merchant Marine Academy and George Washington University and is presently enrolled in the master of business administration graduate program at the University of Connecticut.

PAST CHAIRMEN'S NIGHT at the New York Metropolitan Section of The Society of Naval Architects and Marine Engineers saw 13 past chairmen in attendance. Shown above are, left to right, seated: **W. I. Signell,** Section secretary-treasurer; **H. de Luce,** chairman of SNAME committee on sections; **H. J. Karsch,** Section papers' chairman; **W. W. Robinson,** editor of Yachting, author of the paper presented at this meeting entitled "What to Look for in Pleasure Craft—Sail and Power"; **R. G. Mende,** Section chairman; **J. J. Henry,** president, SNAME; **M. D. Macpherson,** Section vice-chairman, and Capt. **M. H. Gluntz,** USN (ret.), secretary, SNAME. Standing (dates given are years each person served as chairman): **N. R. Farmer,** Section meetings committee chairman; **L. Rosenblatt** (61-62), **R. Schoen, 3rd** (67-68), **P. H. Hadley** (63-64), **E. D. Story** (65-66), **H. L. Walker Jr.** (59-60), **D. C. MacMillan** (51-52), **W. Lumbard** (50-51), Capt. **L. S. McCready,** USMS (54-55), **G. H. Copenhaver** (53-54), **R. P. Giblon** (55-56), **H. R. Glennon Jr.** (60-61), **E. A. Catlin** (62-63), **C. A. Narwicz** (64-65), and **C.W. Wilson,** Section membership committee chairman.

Bethlehem Appoints Collins General Mgr. Of Boston Repair Yard

William H. Collins

Daniel D. Strohmeier, vice-president of shipbuilding for Bethlehem Steel Corporation, has announced that **William H. Collins** has been appointed general manager of the corporation's Boston ship repair yard to succeed **Lawrence J. McInnis** who has retired.

Mr. **Collins,** who has been with Bethlehem since 1941, except for a four-year period when he served with the U.S. Navy during World War II, has been assistant manager of the Boston yard since November 1965.

In announcing Mr. **McInnis'** retirement, Mr. **Strohmeier** lauded him for "39 years of loyal and efficient service."

A graduate of Brown University, class of '41, Mr. **Collins** began his career as a shipfitter at the Bethlehem Boston yard. In 1949 he was transferred to the then Quincy, Mass. yard of the corporation as assistant to the general superintendent, and in 1950 he was appointed a salesman in the ship-repair sales department in New York City. He returned to Quincy in 1952 as assistant to manager, and early in 1955 was appointed superintendent of sales for special products.

In October 1957 he was assigned to special duties as a member of the general manager's staff on the yard's nuclear-power project, which preceded construction by the Quincy yard of the nuclear-powered missile-cruiser USS Long Beach, the world's first atomic surface warship, and the frigate USS Bainbridge, the world's first nuclear vessel of that class.

Mr. **Collins** was transferred to the Boston yard in 1964 as assistant to manager, and late in 1965 was named assistant manager.

He is a member of The Society of Naval Architects and Marine Engineers, the Maritime Association of Boston, the International Trade Center of Boston and the Emergency Planning Committee of the Port of Boston.

Colt Appoints Jacobs Marketing Manager For Advanced Systems

Richard D. Jacobs

Richard D. Jacobs has been appointed to the new post of manager-advanced systems marketing, it was announced by **Phil Wallach,** vice-president-marketing,Fairbanks Morse Power Systems Division, Colt Industries.

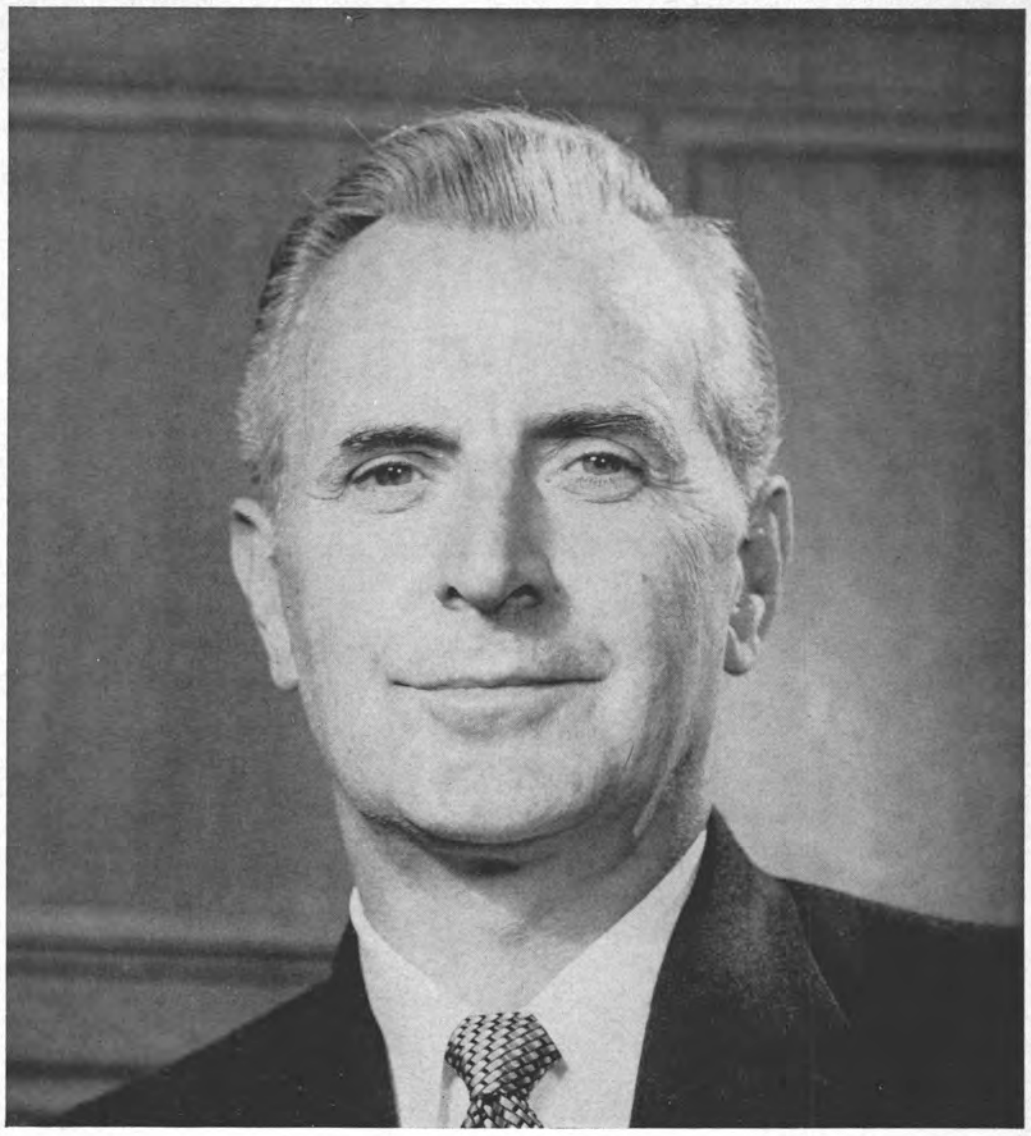
Mr. **Wallach** stated that, "The appointment of Mr. **Jacobs** will serve to expand and broaden our approach to complete power systems marketing. This expanded systems-service approach is a vital improvement because of the introduction of more powerful and more sophisticated prime movers, the increased use of automated control systems, plus Colt Industries' ability to provide single source proposals for new and complex projects. Such proposals, integrating larger blocks of machinery and equipment for complex mechanical and power equipment systems, require coordinated marketing action by Colt Industries."

Mr. **Jacobs** holds a B.S. degree in marine engineering and naval architecture from the University of Michigan. He served for eight years as marine sales manager for Nordberg Manufacturing Company in Milwaukee and as district manager in their Cleveland office.

He is a registered professional engineer and a member of The Society of Naval Architects and Marine Engineers, the Society of American Military Engineers, Propeller Club of the United States, the American Society of Naval Engineers, and the Society of Automotive Engineers.

Burton To Build Oil-Well Supply Boats

Burton Shipyard, Inc., of Port Arthur, Texas is to construct two offshore oil-well supply boats for Caspary-Wendell Marine Equipment, Rockport, Texas. Designated Hull Nos. 448 and 451, the boats will have the following dimensions: 170 feet by 40 feet by 15 feet, and each will be powered with 2000-total-bhp diesels.



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Grafton Boat Delivers Joliet Harbor Towboat For Switching And Fleeting Service

The retractable pilothouse on the John Alexa gives the pilot a 23-foot eye level when raised and only a 15-foot overall height when retracted.

Capt. **Herbert V. Schreiner,** operator of the Joliet Harbor Tug Service, has just placed in service his new 80-foot towboat the MV John Alexa, built by Grafton Boat Co., Inc., Grafton, Ill. Captain **Schreiner,** a well-known Illinois River pilot, operates a harbor switching and fleeting service in the Joliet-Lemont area.

His new craft is the largest vessel yet built by Grafton Boat Co., Inc. Two Caterpillar D-353 Series E turbocharged and aftercooled engines, developing a total of 850-hp, turn 58-inch diameter, four-blade Kahlenberg propellers. The hull, measuring 80 feet by 24 feet by 8 feet, is built of ⅜-inch plate with ½-inch plate over the propellers. Having double chine construction and very steep deadrise, the craft has exceptional maneuverability and develops a high thrust for the installed horsepower.

The retractable pilothouse design, essential on the upper Illinois River, gives the operator a 23-foot eye level when in its raised position, with the advantages of only 15-foot-overall height when retracted. A very roomy pilothouse is mounted atop a Joyce 10-foot-stroke hydraulic ram and is provided with doors and stairs on both sides allowing access to the pilothouse when in any position of elevation. Catwalks on either side allow ready access to the 14-inch, 25-amp. Carlisle and Finch carbon-arc searchlights, and the large forward-sloping Humco windshield opens for easy communication with the deck. Engine instruments are installed above the windshield. Steering is controlled by dual sets of levers for the separate followup steering and flanking systems. Morse controls operate the governors, throttles and pilothouse lift. Captain **Schreiner** has installed a Kaar ten-channel VHF radio, Bogen public-address system and an intercom system. The pilothouse is heated electrically and is heavily insulated throughout.

On the main deck forward are two 5-hp Beebe remote-controlled electric barge winches operable from the pilothouse or the deck. The 12-foot-high towknees are faced with B. J. Marine Products 'Pushnee'. Roller chocks, button chocks and 36-inch cast-steel kevels complete the deck outfit.

The spacious deckhouse accommodates an owner's cabin forward of the engine room with a galley, washrooms and three staterooms aft.

The upper engine room provides a light and air space above the two main engines with double doors and a chain hoist trolley athwartship. Forward in the engine room are found two Kohler Model 30R067 120/208 volt 3-phase diesel generators. The main engines drive two Vickers steering pumps while an emergency electric pump is available for standby use. There are two Curtiss 12-cfm air compressors: one electric and one engine driven, and an air receiver which supplies the pilothouse lift, windshield wiper, air horn and engine starting. A 5-hp Jacuzzi centrifugal bilge and fire pump is installed.

In a watertight compartment abaft the engine room are installed two freshwater tanks, two Jacuzzi pressure water-pump sets, Cooper split-roller shaft bearings and hot-water heater.

Thirteen thousand gallons of fuel oil, 1,800 gallons of potable water and 175 gallons of lube oil are carried.

On the maiden voyage from Grafton to Joliet, the John Alexa pushed a 1,400-ton tow of phosphate rock at a speed of 7½ mph over the bottom. Making up the delivery crew in addition to Captain **Schreiner** were: **Mrs. Mary Lou Schreiner,** engineer **Paul Vitali,** deckhand **Ray Nofftz,** and **Timothy Graul,** designer of the John Alexa.

Grafton Boat Co., Inc., under President **Edward Fry,** has expanded facilities over 50 percent in the last year and is presently building LCM-6's for the U.S. Navy, crewboats for U.S. Army Corps of Engineers and workboats for commercial interests.

Construction of the towboat was under the direction of vice-president-manufacturing, **M. E. Thompson,** shift superintendents **Robert Kappler** and **Robert Driver,** and the Grafton production force.

Maryland Ship Appoints R.F. Lamcke Estimating And Contract Manager

Ronald F. Lamcke

Ronald F. Lamcke has been appointed manager of estimating and contract administration for Maryland Shipbuilding & Drydock Company, Baltimore, Md., according to an announcement by **A. P. McIlwain,** president of the company.

Mr. **Lamcke** started sailing on United States merchant ships in 1931 on the West Coast/North Europe run. He also worked for his father's marine consulting firm and in 1940 joined a steel company in the engineering department. He joined Maryland Shipbuilding & Drydock Company in 1947, since that time he has worked in the planning and estimating departments.

He is a member of The Society of Naval Architects and Marine Engineers, Maritime Association of the Port of New York and Turf Valley Country Club, Baltimore.

The Maryland Shipbuilding & Drydock Company, a subsidiary of Fruehauf Corporation, is located on a 96-acre tract on the south bank of the Patapsco River in the Port of Baltimore. It is one of the most modern east coast shipyards with complete facilities for large ship construction and repair. The yard has four floating drydocks capable of handling vessels up to 70,000 dwt. Twenty-four hour service, seven days a week is provided by the company.

Whittaker Acquires Kettenburg Marine

Whittaker Corporation, Los Angeles, has announced the acquisition of Kettenburg Marine, a privately held company located in San Diego, Calif.

Kettenburg is engaged in the manufacture, sale and reconditioning of sailing and power craft, and is a major distributor of marine hardware and supplies. The company's boat repair yard is one of the largest in the United States, servicing craft up to 100 feet in length and 75 tons in weight.

Kettenburg will be operated under present management as a subsidiary member of Whittaker's Marine and Leisure Time Products Group.

Whittaker Corporation, listed on the New York and Pacific Coast stock exchanges, is engaged in the development, production and distribution of high-performance materials and in the fabrication of aircraft, aerospace, marine, industrial and architectural products.

SSI Container Corp. Names Hofmeister Sales Manager

Hasko W. Hofmeister

Hasko W. Hofmeister has been appointed sales manager of SSI Container Corporation, with headquarters at 22 Battery Street, San Francisco, Calif. SSI is engaged in leasing and selling dry and refrigerated containers to steamship lines as well as shippers, and also provides orientation to shippers who wish to move their cargo by means of containers.

Prior to joining SSI, Mr. **Hofmeister** was associated with Bakke Steamship Corporation, San Francisco, where as Pacific Coast operations manager he coordinated all container operations for Knutsen Line and Columbus Line trading between the Pacific Coast and the Far East, Australia, and New Zealand. He started his shipping career in 1957.

Chandris Lines Names Lesh Port Captain

The appointment of Capt. **George B. Lesh** as port captain to manage Chandris Lines Inc. vessel operations, has been announced by **James C. Murphy,** executive vice-president.

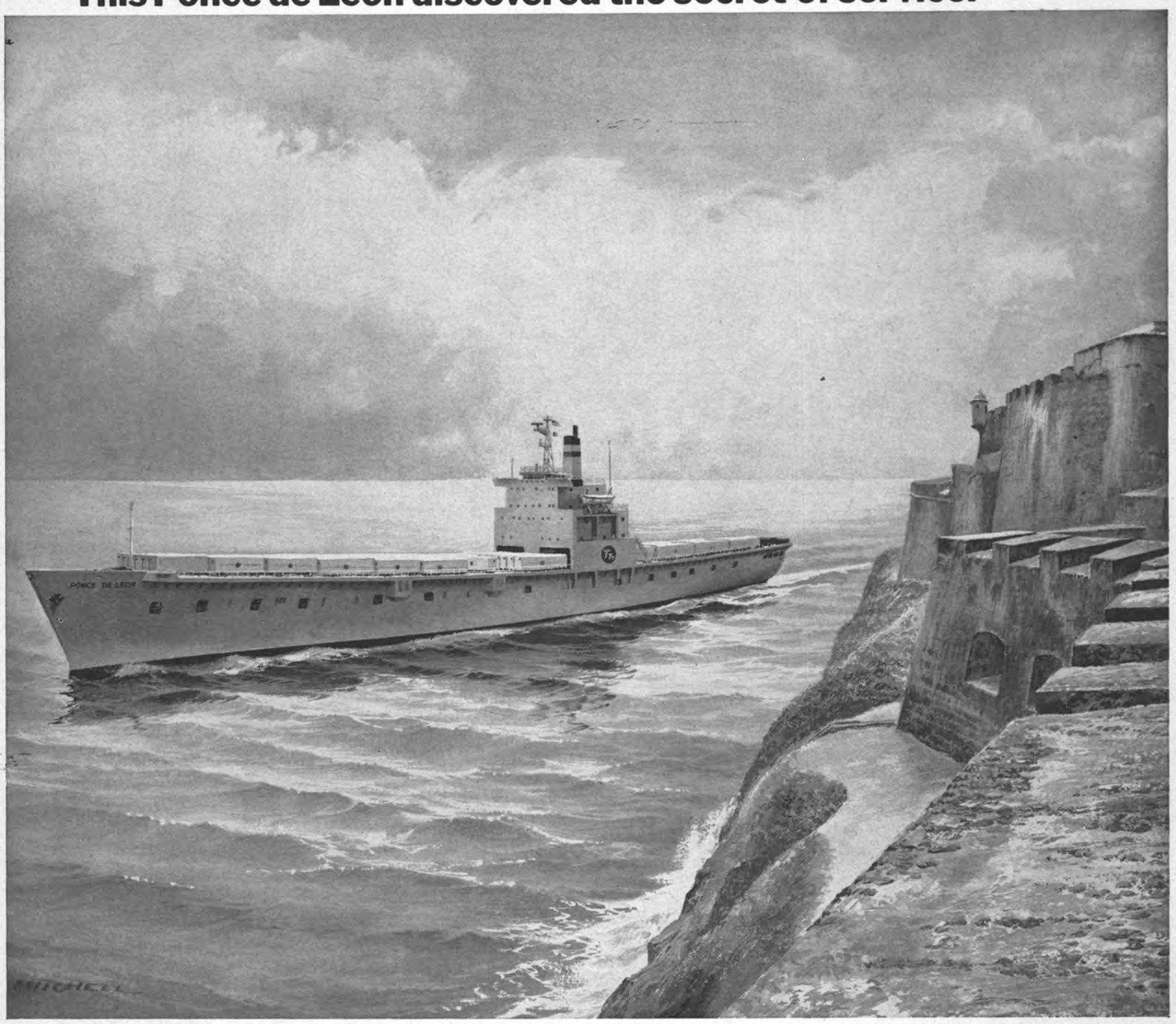
Captain **Lesh** has been associated with the shipping industry since 1936. He served as manager of operations for Penn Shipping Co., and also for Trans-World Marine Corp. He will be responsible for Chandris Lines' expanded cruise, trans-Atlantic and around-the-world operations at New York, Boston and Port Everglades, as well as the dry cargo and tanker operations in the U.S.

A graduate of the Pennsylvania Schoolship, Captain **Lesh** commanded merchant ships during World War II. He is a member of the American Council of Master Mariners and an officer and director of the Internatioinal Cargo Gear Bureau.

Burton To Build Two Oil-Well Supply Boats

Marine Service, Inc. has contracted Burton Shipyard, Inc., Port Arthur, Texas, to build two offshore, oil-well supply boats. Designated Hull Nos. 446 and 452, the dimensions for each boat are as follows: 165 feet by 38 feet by 13 feet and will be equipped with 1,700-total-bhp twin-screw diesels.

This Ponce de Leon discovered the secret of service.



She makes the San Juan-to-New York trip in a record-setting 57 hours.

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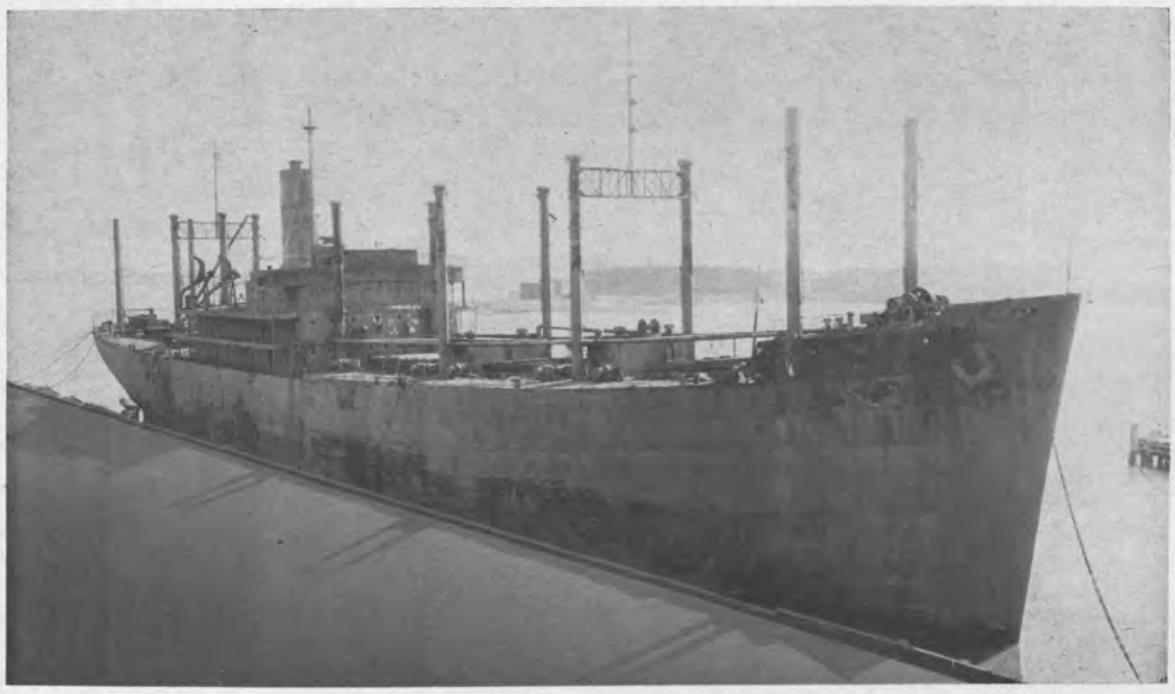

EQUIPMENT FROM MOORE DRYDOCK C-3 EX-MORMACSEA — HULL 197

350 KW TURBO GENERATORS: **Turbine**—De Laval 503 HP—10,000 RPM—6-stage—440#—282° superheat—28½" exhaust. **Gear**—De Laval—10,000/1200 RPM. **Generator**—Crocker-Wheeler 350 KW—120/240 DC—1458 amps—1200 RPM—compound wound—#230194 & 230195. Also fits Federal Hull 198. BOILERS: Foster-Wheeler type D—2-pass design —525# pressure. FORCED DRAFT FAN MOTORS: Westinghouse SK—46.5/13.81—2400/1660/960 RPM—230 VDC. PROPELLERS: 21'8" diameter—21.669 pitch. REDUCTION GEAR: De Laval 5015/3461/729/85—serial 228972. SHAFTING: 24'x19" diam. STEADY BEARINGS: 19¼" o.d. EVAPORATOR: Paracoil 36-17/48-23/28-11. MAIN FEED TRIPLEX: Worthington—4½"x8"—160 GPM @ 510#—72 HP—230 VDC—975/1750. MAIN CIRCULATOR: Worthington 20" LAS—12,000 GPM—19' head—100 HP Westinghouse motor—frame 184.5—230 VDC—485/645—365 RPM. ALSO TAILSHAFT & RUDDER, KINGPOSTS, 16" PORTLIGHTS, BOOMS, DOORS, WINCHES, WINDLASSES, STEERING GEAR.

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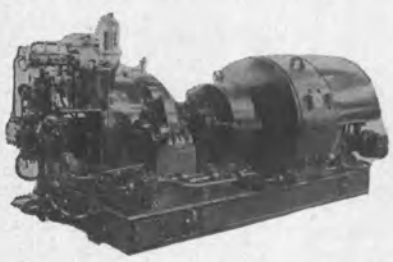
Specification class C2-S-B1—Maritime Commission Hull #1184. **Main Turbine Rotors:** HP & LP—HP serial 75382—LP serial 75363. ALSO, ALL MOTORS FOR FEED PUMPS, BILGE, CIRCULATORS, ETC.

TURBO-GENERATORS



300 KW — From AP2 Ex-Medina Victory

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

300 KW — From AP3 Ex-Ridgefield Victory

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

300 KW Murray

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

300 KW GENERAL ELECTRIC

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

TURN TO 3RD PAGE FOLLOWING FOR 300 KW SPARE ARMATURES

BOILER SOOT BLOWER ELEMENTS

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

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

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

ENTIRE LOT $450.00

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

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

Aux. Condenser Water Box & Return Cover

Reconditioned ABS—Graham design—mfg. by Ross.

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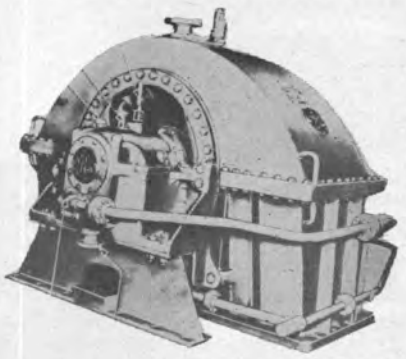

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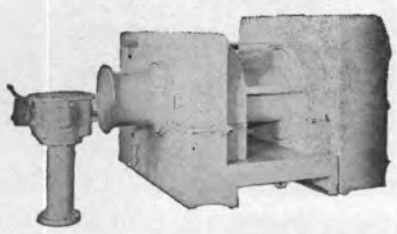
VICTORY SHIP UNIT WINCHES



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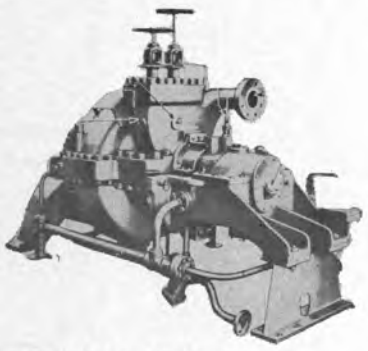
on HP & LP Turbines



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NE ASSEMBLIES

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

LVES – $6750.00
Koerting

TURBINE BEARINGS
—labyrinth packing—diaphragms.

0 H. P. WESTINGHOUSE
PULSION TURBINES
HULL 586—BUILDERS HULL 586
L.P. Turbine—complete—serial 4A-1619.
CTORY—OFFICIAL NO. 81752
L.P. Turbine—complete—serial 4A-2265.

CTORY
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NEW H. P. & L. P. FLEXIBLE COUPLING

NEW SPARE BLADING FOR WESTINGHOUSE L. P. TURBINE

e Delivery
PM: H.P. pin-
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9157 — from
tory serial 4A-

DC—Westing-
cker-Wheeler.
speed—7450
M; U-2, U-5
9,000 lbs. @
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FOR AP2
FORCED DRAFT BLOWERS–22-TD-18
Westinghouse—230 PSI—430° TT—back pressure 15 lbs.—normal capacity 8900 CFM—4.8" of water pressure. RPM 2875—9.6 HP—total steam 697—overload capacity—13,700 CFM at 10.7.
WILL SELL FAN OR TURBINE SEPARATELY

MISCELLANEOUS PUMPS & PUMP MOTORS

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

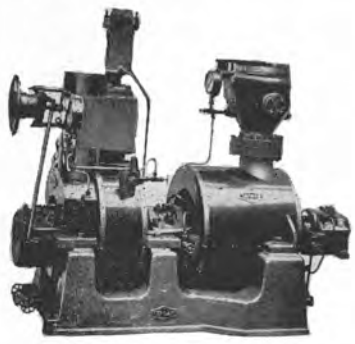
MAIN CIRCULATOR & MOTOR FOR AP2 VICTORY
Ingersoll-Rand 18VCM bronze pump—20" suction—18" discharge—vertical. Flanges opposite each other. Distance flange-to-flange 4'5". Suction bolt circle 25"—discharge bolt circle 22¾". Suction (20) ¼" holes—discharge (16) ¼" holes. PUMP WEIGHT: 5100 lbs. MOTOR: 5700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

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

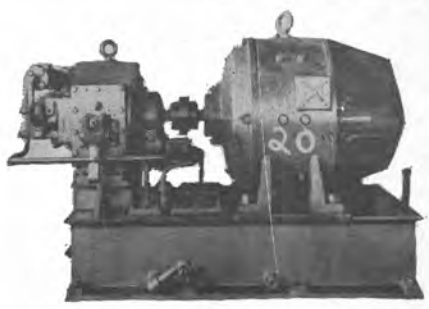
INGERSOLL-RAND 2VHM MAIN CONDENSATE PUMP
120 GPM—85 PSI—Pump only

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

INQUIRE ABOUT ANY UNLISTED ITEMS THAT YOU NEED



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



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

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

BUY COMPLETE UNITS OR PUMPS & MOTORS SEPARATELY

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

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

COMPLETE WITH MOTOR STARTER

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

LUBE OIL STANDBY
Vertical Duplex—Worthington—7½x9x12.

FEED PUMPS
Worthington—vertical simplex—11x7x24.

HORIZONTAL DUPLEX PUMPS
Size 6x6x6 pumps.

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

AP3 LARGE VICTORY MATERIAL

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

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

SPECIAL FROM RIDGEFIELD VICTORY

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

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

PACIFIC FEED PUMPS – TYPE JB

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

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dway, New York, N.Y. 10004—(212) 943-2640

A 300 KW VICTORY SHIP & C-2 GENERATOR ARMATURES

CROCKER-WHEELER

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

ALLIS-CHALMERS

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

WESTINGHOUSE

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

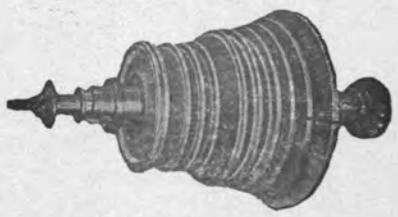
GENERAL ELECTRIC

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

C-2 ARMATURES

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

T2-SEA-1 TANKER MAIN STEAM & AUXILIARY EQUIPMENT



B MAIN TURBINE ROTORS

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

C G.E. MAIN PROPULSION GENERATOR REVOLVING FIELD

G.E. reconditioned—June 1967

D G.E. MAIN GENERATOR STATORS

E REWOUND WESTINGHOUSE MAIN PROPULSION GENERATOR REVOLVING FIELD

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

WRITE FOR COMPLETE INFORMATION

F WESTINGHOUSE MAIN GENERATOR STATOR WITH OR WITHOUT COOLER

G WESTINGHOUSE MAIN MOTOR FIELD COILS

COMPLETE SET

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

H T2 RUDDER

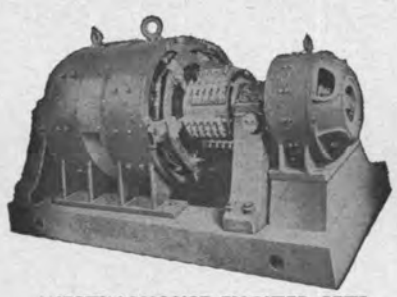
Reconditioned—ready to go.

T2 TAILSHAFTS

Reconditioned

PROPELLERS

T2 propellers



I WESTINGHOUSE EXCITER SETS

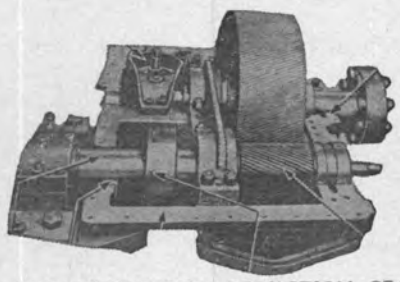
110 KW—28 KW—5 KW available
110 KW—32.5 KW—5 KW available

J LORIMER

Emergency Generator Engine and Generator Parts

K MAIN CIRCULATING PUMP MOTOR

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



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

Bull gear & pinion. With ABS.

M WESTINGHOUSE AUXILIARY GENERATOR REDUCTION GEARS AND BEARINGS

COOLERS

N MAIN MOTOR AIR COOLER

Westinghouse—ABS—ready to ship

O MAIN GENERATOR AIR COOLER

Westinghouse — reconditioned with ABS—ready to ship

P G.E. MAIN GENERATOR COOLER

type G4—bronze heads—AL brass tubes

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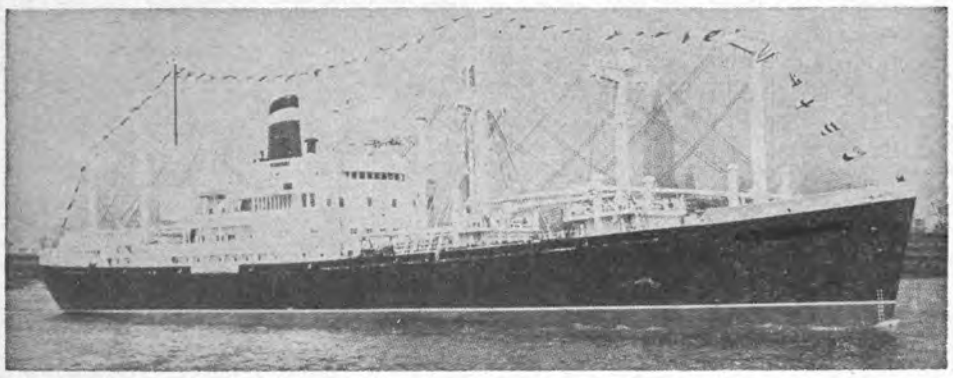
ALL MACHINERY FROM U.S.M.C. NORTH CAROLINA C2-S-AJ1



INCLUDING MASTS, BOOMS, KINGPOSTS, AND RIGGING

Send us your inquiries

CENTRIFUGAL PUMPS

— ALLIS-CHALMERS —

MAIN CIRC. PUMP

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

TURBINE DRIVEN MAIN FEED PUMP

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

AUXILIARY CIRCULATOR

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

MAIN CONDENSATE

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

AUXILIARY CONDENSATE

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

FIRE PUMP

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

CIRCULATING PUMPS

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

— WORTHINGTON —

MAIN FEED PUMP

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

MAIN CIRCULATOR

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

6-L-1 AUXILIARY CIRCULATING

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

2½UZS-1 MAIN CONDENSATE

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

3-UB1—FIRE SERVICE

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

AUX. SALT & HOT WATER CIRCULATING

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

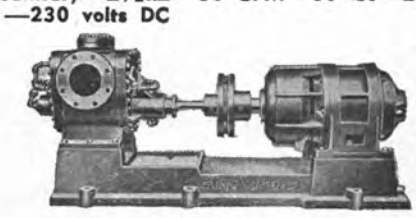
RECIPROCATING STEAM PUMPS

— WORTHINGTON —

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

— POWER RECIPROCATORS —

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



KINNEY MOLASSES PUMP

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

STEERING GEAR

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

— REFRIGERATION EQUIPMENT —

• CARGO REFRIGERATION PLANT

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

• SHIP SERVICE REFRIGERATOR

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

• COLD DIFFUSER

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

• CARGO WINCHES

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

• BAILEY BOARD COMPONENTS

G.E. 300 KW TURBO GENERATORS

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

SPRAY DEAERATING HEATER

54000 lbs. water/hour. Elliott Co.

FEED WATER HEATERS

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

EVAPORATORS

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

EMERGENCY DIESEL GENERATOR SET

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

M.G. SET

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

AIR EJECTORS

Ingersoll-Rand main air ejector and auxiliary air ejector.

AIR COMPRESSOR

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

COMBUSTION CONTROL

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

FORCED DRAFT BLOWER

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

FUEL OIL BURNER

Todd HexPress—3 per boiler.

FUEL OIL HEATERS

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

FUEL OIL METER

2"—DVHP—30 GPM—Buffalo.

SEPARATOR

Oil and water—50-ton—McNab Victor.

DeLAVAL OIL PURIFIERS

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

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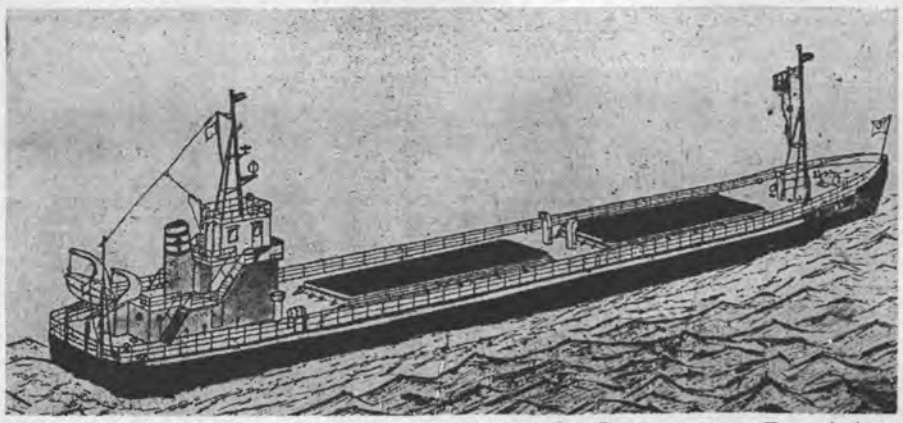


MINI BULK CARRIERS will soon start operation in Far Eastern waters. Ten of these 215-foot, twin-screw motorships are being constructed in Japan for Ceres Hellenic Shipping Enterprises Ltd. of Piraeus, Greece, according to **George P. Livanos,** president of Seres Shipping Inc., the New York representative for Ceres. These ships will rendezvous with a large bulk carrier and take on or discharge 3,100 tons of cargo. The smaller ship will be capable of picking up or delivering dry bulk cargoes from inland areas of underdeveloped countries. Ceres has an option to build ten more ships of this type and can see the need for 100 such ships. The first ship will be delivered this month.

Zapata Announces Two Key Appointments

Zapata Norness, Inc., has announced the election of **Hugh Robertson** to the position of financial vice-president and treasurer, and **Peter C. Knudtzon** to assistant vice - president - corporate development.

Mr. **Robertson** joined Zapata in March, 1967, as controller and was elected treasurer in August, 1968. He was graduated from Rice University in 1961 and is a member of the University of Texas Accounting Advisory Council, American Institute of Certified Public Accountants and state and local CPA societies. Prior to joining Zapata, he was associated with Price Waterhouse & Co. in Houston, Texas.

Mr. **Knudtzon** joined Zapata in June, 1967 as assistant controller and was elected controller in August, 1968. Prior to joining Zapata, he was in public accounting in England, Switzerland and the Bahamas.

Zapata Norness, a Houston-based diversified offshore drilling, shipping and marine services firm, is listed on the New York Stock Exchange.

NKK's Tsu Super-Efficient Shipyard To Start Building Tankers In July

Tsu shipyard takes shape in Japan. Will be able to build ships up to 500,000-dwt.

A remarkable 22 months from site reclamation to laying of the first keel will be recorded by Nippon Kokan, Japan's only integrated shipbuilder-steelmaker, in construction of its super efficient $42-million Tsu Yard in central Japan.

In October 1966 the huge reclaimed area of 148 acres was part of the sea. **Hiroo Ikematsu,** NKK-New York's naval architect, said the keel for Tsu's first vessel, a 104,700-dwt ore/oil carrier ordered by Vale do Rio Doce Navegacao S.A. of Brasil, will be laid in July 1969.

Contracts have already been signed with NKK for four more vessels to be built at Tsu—two 250,000-dwt tankers for Canadian Pacific (Bermuda) and two 256,000-dwt tankers for Anders Jahre A/S of Norway.

The yard will feature two huge docks. Now under construction, they will have a capacity of 500,000 dwt each—one for building, the other for repair.

Tsu also features a T-type layout for minimizing materials transportation and docks with both ends open to the sea for facilitating semi-tandem building.

Operations will be speeded by NKK-developed computer systems for various functions including ship designing, work processing and administrative activities. Building facilities will also be highly automated.

Prussing Appointed General Sales Manager For Detroit Diesel

Raymond F. Prussing

The appointment of **Raymond F. Prussing** as general sales manager of Detroit Diesel Engine Division of General Motors Corporation was announced recently by **C. W. Truxell,** general manager of the division. Mr. **Prussing,** who has been assistant general sales manager since 1963, succeeds **Lauren H. Wells,** who retired because of personal reasons.

In his new capacity, Mr. **Prussing** will be responsible for engine and parts sales to original equipment manufacturers, distributors, government and overseas markets.

Mr. **Prussing,** educated in New York, started his business career with a GMC truck distributor. During World War II, he served with the 8th U.S. Air Force in England, following which he joined the Foreign Distributors Division of General Motors Overseas Operation, where he gained experience in the sale of many of the corporation's non-vehicle products which included Detroit Diesels, Allison, Electro-Motive and Delco. As executive assistant with Foreign Distributors Division he was in charge of sales of these products as well as Frigidaire sales and service.

Steamship Management Names Evju Manager

Steamship Management Corp., New York-based ship charterers, has appointed **Tore Evju** as operations manager, according to an announcement by Capt. **N. G. Karadaras,** executive vice-president of the firm. Mr. **Evju** was previously associated with Peraco Chartering and Cypher Shipping.

Matson Reassigns E.L. Maynard

Edward L. Maynard, previously regional sales manager for the Far East service of Matson Navigation Co., has been named eastern regional sales manager of its new Freight Marketing and Sales Division, according to an announcement by **George F. Collins,** director of sales.

Three More Specialized Tankers Ordered By Stolt Tankers—For A Total Of Seven

Artist's conception of Stolt-Nielsen tankers designed for special liquid bulk cargoes.

Three 24,000-dwt specialty tankers have been ordered by the Stolt-Nielsen Group, it was announced by **Per Ditlevsen,** president of Stolt-Nielsen Chartering, Inc., New York, N.Y. These three tankers are in addition to four 17,600-dwt similar ships ordered last June. All seven ships will be built by Boelwerf N.V. in Temse, Belgium.

The increasing worldwide demand for an assortment of liquid cargoes require specialty carriers, according to Mr. **Ditlevsen.** Improved systems for pumping, stripping, cleaning and cargo segregation will be provided on the new ships together with stainless-coated and double-skinned tanks.

The actual construction contracts call for the sale of two 17,000-dwt ships to a subsidiary of Anglo Norness Ltd. and two to Per Victor Liljegren of Sweden. One of the two 24,000 tonners will be owned by Exmar N.V., Antwerp, Belgium and two by Jacob Stolt-Nielsen A-S of Norway. All will be time-chartered back to Stolt-Nielsen for 15 years.

At the same time, Mr. **Ditlevsen** announced the promotion of **Carroll N. Bjornson,** New York chartering vice-president, to manager of Stolt-Nielsen Japan. **Palle S. Bistrup** has been promoted to manager of services between U.S., Europe and Far East with offices in New York. **Jan Stromsted** has been named to supervise vessel operations in the same service.

Barges for sale!

Immediate delivery

195′ x 35′ x 12′ Covered Hoppers
200′ x 35′ x 12′ Covered Hoppers
195′ x 35′ x 12′ Double-skin Tankers

If you need barges in a hurry, why not order the best? Dravo has a stock available for immediate delivery, just a phone call away. Call:

N. B. Mortimer, Pittsburgh 412 771-1200
R. D. Anderson, New York 212 687-4414
W. R. Cumming, New Orleans 504 522-1511
F. W. Schulte, St. Louis 314 726-6670

Dravo

A company of uncommon enterprise

Bethlehem Appoints Halsey Shipbuilding Contract Manager

Daniel D. Strohmeier, vice-president of shipbuilding for Bethlehem Steel Corporation, has announced the appointment of **LeRoy B. Halsey** as manager of contracts for the shipbuilding department.

A graduate of the U.S. Naval Academy, class of '32, Mr. **Halsey** has been with Bethlehem since 1941 except for a period during 1950-51 when he was a member of the American mission for the study and reorganization of the Turkish merchant marine. For the past six years he served as coordinator of ship repair sales on the staff of the vice-president.

Prior to his association with Bethlehem, Mr. **Halsey** served briefly as an ensign with the U.S. Navy and then as an officer on vessels of Socony-Vacuum, United States Lines and United Fruit. After six years of sea experience with the merchant marine, he won his master's license.

He began his career with Bethlehem at its then Brooklyn, N.Y., 27th Street ship repair yard as chief draftsman, was later transferred to the Hoboken, N.J., yard as an estimator, and late in 1951 was appointed a sales representative for the New York District.

In August 1953 he was named assistant to the general manager in charge of Bethlehem's New York District shipyards, and early in 1956 was appointed manager of sales for the district. From April 1960 to March 1963 he was assistant to the general manager of the Eastern Ship Repair District, which included all of Bethlehem's yards on the Atlantic Coast. He was named coordinator of ship repair sales in April 1963.

Mr. **Halsey** is a member of The Society of Naval Architects and Marine Engineers, and since 1962 has served with the ship repair committee of the Shipbuilders Council of America and of the ship operations committee of the American Bureau of Shipping.

Mowbray Submits High Bid For Five N.Y. City Tugboats

New York City's Sanitation Department's fleet of five tugboats drew a high bid of $758,055 when auctioned recently. The Mowbray's Tug & Barge Sales Corporation of New York submitted this bid. The initial cost of the five tugboats was $1.36-million.

The city is using private contractors to perform the services previously rendered by the tugs.

Lisnave Reports 1,060 Vessels Repaired During 1968

The year 1968 was an important and busy year for Lisnave, Estaleiros Navais de Lisbon, located in Lisbon, Portugal. In a special report issued by **Thorsten Andersson** and **Joao Rocheta**, managing directors, they outlined the work performed during the year and plans for the future.

Lisnave has two shipyards in Lisbon. One yard, called the north yard, is owned by the Port of Lisbon Authority and is operated by Lisnave. This facility can handle vessels up to 18,000 dwt and employs 2,000 workers. The other yard, known as the south yard, is a new facility recently built and owned by Lisnave. In this latter plant, there are two drydocks, one for ships up to 300,000 dwt and the other for ships up to 100,000 dwt. There are 2,600 employees in the south yard.

During 1968 the north yard repaired a total of 878 vessels, of these 414 required drydocking. The total tonnage of vessels docked was 671,584 gross tons. Of this quantity, 87 were foreign vessels, with 42 requiring drydocking.

In the south yard 182 ships were repaired. Of this total 157 were foreign ships. The total tonnage handled by the yard in 1968 was 10,173,519 dwt. The largest vessel repaired was the Macoma of 207,000 dwt. Also included were a series of 11 ships, each with a deadweight of 71,000 tons. Included in this group was the Vanja, which was the 200th vessel docked since the south yard started operating, less than three years ago. Total drydockings amounted to 153 ships with a gross deadweight of 9,055,557 tons. The largest vessel drydocked was the Esso Mercia of 171,000 dwt.

Shipbuilding at the yards included one ocean-going trawler, 262 feet 6 inches long, and two ships for transporting liquefied petroleum gases, both with 86,520-cubic-feet capacity.

Lisnave conducts a training program for shipyard workers. A good portion of the 2,300 jobs created by the shipyard's expansion between 1964 and 1967 were filled by personnel so trained.

At the present time, Lisnave is studying the advisability of building another drydock in the south yard which would be capable of handling ships up to 750,000 dwt. Also, expansion of shops and piers is underway so that the firm can increase its capacity.

The managing directors credit the expansion of this ship-repairing facility from a fishing boat yard to a large repair yard on its ideal location with respect to the normal sealanes and to the cooperation received from the Port of Lisbon Authority.

First Of Freedom-Class Ships Launched By Astilleros

The first ship of the Freedom Hispania class ever built in Spain was recently launched at the Seville yards of Astilleros De Cadiz, S.A. This vessel was built for Atlantska Plovidba of Yugoslavia.

Christened the Gundulic, the ship is the first in a series of vessels of this type which have been ordered from Astilleros by a consortium composed of Algoship International, Canadian Algonquin Maritime and Ishikawajima Harima Heavy Industries. A sistership is under construction for the same owner and three others of the class are on order for Chilean interests.

The 471-foot 5-inch, 15,500-dwt Gundulic is designed to transport general and bulk cargoes. It features the essential characteristics of a bulk carrier with those of a closed shelter-deck vessel. However, the design envisaged its use for general cargo, vehicles and containers, also.

The propulsion machinery is a Manises-Sulzer, 8,000-bhp, 6RD-68 deisel engine built at the Manises works of Astilleros. The majority of the other machinery components were also built at this plant.

The launching was sponsored by **Mrs. Neva de Zidaric,** wife of the advisor to the Yugoslav Chamber of Commerce. Officiating at the ceremonies was **O. Scharfhausen,** naval commandant of Seville. Attending for the owners were **S. Savin** and **D. J. Betner,** general manager and general administrator, respectively. **R. B. Mendez,** vice-president and managing director of Astilleros, and **J. M. Marco Fayren,** manager of the Seville yard, represented the builder.

C. Brewer And Co. Acquires Kelso Marine

Kelso Marine Inc., Galveston, Texas, has become a wholly-owned subsidiary of C. Brewer and Co., Honolulu, following closing of documents providing for an exchange of stock, it was announced.

Kelso Marine is engaged in the sale and distribution of concrete, sand, gravel and other building materials along with the construction of barges and motor vessels. The company is expected to begin construction shortly on a 16,000-ton barge for Ultramar Chemical Co., another Brewer division. The vessel will be used for the transportation of fertilizer products from the West Coast to Hawaii.

Catalina Cruise Ship Construction Underway At Martinolich Shipyard

Sleek new passenger ferry designed for ocean travel between the Port of Los Angeles and Avalon City, Catalina Island, is now under construction at Tacoma, Wash. The all-aluminum liner, using more than 157,000 pounds of Kaiser Aluminum in its 160-foot hull and superstructure, will carry 500 passengers at speeds up to 30 knots.

The keel has been laid and construction is now underway at Martinolich Shipbuilding Company, Tacoma, Wash., of a super-modern $2-million, 500-passenger cruise ship scheduled for service between the mainland and Catalina Island, it was announced recently by an official of the Catalina Terminals, Inc.

The newly designed, 160-foot luxury liner will be placed in public service at the beginning of the 1969 summer season, according to **Charley Stillwell,** general manager of the Catalina transportation company.

The 30-knot, all-aluminum liner, powered by four 1,250-hp General Electric gas turbine engines, will make the cross-channel trip in one hour, which the operators claim "will make it the fastest vessel to ever serve the public in transportation to Catalina Island." Over 157,000 pounds of Kaiser Aluminum's Nos. 5086 and 6061 marine alloys will be used in the hull and superstructure.

The new vessel, described as a turbo liner, will operate year-round service between the Catalina Terminal in the San Pedro section of the Port of Los Angeles and Avalon City, situated near the east end of Catalina Island, according to Mr. **Stillwell.**

"The vessel will have built-in passenger comforts, including stabilizers to reduce roll," the passenger liner executive said.

The vessel will have an observation lounge, a unique type of bar service and cocktail lounge area, a snack bar, comfortable seating, stereo music and, for special charters, a dance-deck area.

The turbo liner will be named the Catalina, after the famous 'Big White Steamer' which was retired after serving the general public and tourist trade for 43 years.

Plans and specifications for the vessel were prepared by Philip F. Spaulding and Associates, naval architects and marine engineers in Seattle, Wash.

Avondale Expanding Standard Paint And Propeller Divisions

Henry Zac Carter, president of Avondale Shipyards, has announced that the corporation's Standard Paint and Varnish Division will be expanded to offer high quality paints and service to a much wider area in the marine industry.

George T. Bacalakis has been appointed general manager of sales for the New York district with offices at 29 Broadway. In this capacity he will handle the promotion of sales and distribution of all paint products manufactured by Standard Paint and Varnish. Mr. **Bacalakis** is well acquainted with the shipping community in that he was president of the G. M. Livanos Shipping Corporation from 1958 to 1964 and head of his own company since December of 1964.

Con Bacalakis, formerly with Hempel's Marine Paints, Inc., will head the sales force concentrating initially on supplies throughout the North American continent and eventually expanding to all prominent ports of the world.

Jack B. Valley, vice-president of Avondale Shipyards and manager of the Standard Paint Division, has planned this new expansion as part of a progressive program emphasizing service along with a quality product.

According to **J. Melton Garrett,** Avondale's executive vice-president in charge of divisions, the corporation's Service Foundry Division will increase its facilities for the manufacture of bronze propeller castings. The addition, to be located on the River Road at Waggaman about 3 miles above Avondale's main plant, will be capable of producing bronze propeller castings up to 30 feet in diameter and having a weight of as much as 10,000 pounds.

The need for the addition was instigated by Service Foundry receiving a contract to furnish propeller castings for the 11 LASH ships presently being built at Avondale. These propellers will be engineered and machined by Avondale's Harvey Division.

Global Marine Appoints M.E. Smith Treasurer

Maurice E. Smith

A. J. Field, president of Global Marine Inc., Los Angeles-based marine oil and gas contract drilling company, has announced that **Maurice E. Smith** has assumed the post of treasurer of Global Marine Inc. Mr. **Smith's** responsibilities will include all financial aspects of Global Marine's business. Mr. **Smith's** background in the oil industry includes 11 years with Husky Oil Company, Cody, Wy., where he was financial vice-president.

Mr. **Smith** is a certified public accountant and a lawyer. He obtained his undergraduate degree from the University of Denver and his law degree from Stanford University.

Mr. **Smith** was a U.S. Navy pilot lieutenant in World War II.

Apollo Chemical Expands Marine Dept.

Richard E. Weiss

Dr. **Ira Kukin,** president of Apollo Chemical Corp., Clifton, N.J., has announced key personnel additions and changes as part of the rapid growth of the company in its marine department.

Richard E. Weiss has been promoted to technical manager, Marine Department. Mr. **Weiss** was formerly a marine sales engineer for Apollo.

Additionally, **Ron Harper,** Apollo Gulf Coast sales engineer, and **Harry Popiel,** Apollo West Coast sales engineer, will handle marine sales in their respective areas.

Mr. **Weiss** previously was a production manager for U.S. Steel Company. He is a graduate of Thiel College, Greenville, Pa., with a B.S. in chemistry.

Dr. **Kukin** also announced that as part of Apollo's worldwide program for terminal and marine service engineer locations, the following sales agents will handle the Apollo line of patented slag inhibitors and combustion catalysts: Contivema N.V. in Rotterdam, Holland; Seagulf Marine and Industrial Products, Ltd., in Montreal, Canada; Etablissements Tilley in Marseilles, France, and Stedman Marine Supply Co. in the Gulf Coast areas.

Raytheon Appoints Griswold Design Mgr.

John H. Griswold has been named manager of the design engineering laboratory at Raytheon Co.'s Submarine Signal Division in Portsmouth, R.I., it was announced.

Mr. **Griswold** previously served as the director of radar programs at the Fairchild Hiller Corp.

Stern Section Of 210,000-Dwt Tanker Launched By NDSM—Bow Section Started

Stern section of 210,000-dwt tanker is launched at the Amsterdam yard of NDSM.

The Netherlands Dock and Shipbuilding Company in Amsterdam, recently merged in Verolme United Shipyards, launched the stern section of the 210,000-dwt turbine tanker Dagmar Maersk late in January. The ship is under construction for the Danish owner A. P. Moller, Copenhagen.

The after part has a length of approximately 568 feet, slightly more than half the overall length of the ship which will be 1,067 feet. The launching weight was approximately 16,000 tons.

On the vacated berth, the keel was laid for the forward section, which is due to be launched in April. Shortly afterwards, both parts will be joined up, which will be done afloat by a special technique developed by NDSM. The christening ceremony will take place after joining has been completed.

Delivery of the Dagmar Maersk is scheduled by the end of June 1969. The Amsterdam yard will build two other ships of this size, both for Shell Tankers (U.K.) Ltd., and a 225,000-dwt tanker for Petrofina. The Rotterdam Verolme yard has even larger ships under construction: a 255,000-dwt Esso tanker, first of three, will be launched there in May.

A Leading Canadian Shipyard Modernizes

Marine Industries Limited

On Its Own Initiative, Marine Industries Combined Arendal And Its Own Know-How To Build a Competitive Shipyard.

The Hon. **D. C. Jamieson,** minister of defense production of Canada, has officially inaugurated the new steel facilities at the shipyard of Marine Industries Limited, Sorel, Quebec.

The construction of the new steel shops marks an important step in the program of modernization and expansion, which Marine Industries initiated in 1962. This event is one of several important steps being taken by this shipyard to improve its facilities. However, at this point, the first main improvement objective has been achieved, which was the establishment of truly efficient and up-to-date steelwork facilities for the company's shipbuilding operations.

With these new resources, Marine Industries expects to achieve not only more efficient and economic production, but also to produce a better product in a shorter construction time.

The steel-work process starts when raw materials in the form of plates are delivered to the shipyard and are unloaded and stored by a magnet crane in the mechanized steel-storage area. The steel is then carried by a mechanized conveyor through shotblasting and priming equipment. This equipment performs the functions of snow removal, washing, drying, shotblasting, priming and final drying, in a continuous automated operation.

The conveyor then moves the steel to the fabrication shop for an orderly flow of material through the successive stages of preparing the steel prior to assembly. Picked up by a magnetic crane, the plates are cut to shape on an automatic 1/10 scale cutting machine and then bent, rolled or otherwise formed on the rolls, press or breaker.

Steel shapes enter the shop in the same manner and are marked, cut and bent on the cold frame bender. The fabricated steel parts are then grouped and stored on pallets in the buffer storage area. The provision of properly designed buffer storage is an important consideration and ensures a continuous flow of material to the next production step in the panel shop.

Production flow in the panel shop is divided basically into two parts: flat panels and curved panels. Plates making up flat panels are placed on a conveyor and welded together by means of the automatic one-side-welder. This equipment was designed and developed by Marine Industries and the company considers it is second to no other shipyard in achieving this breakthrough.

In the case of flat panels, stiffeners are automatically welded to the plates by means of the double-fillet welder, which also was designed and built by the company.

Curved panels are assembled and welded in assigned areas of the shop, using telescopic supports which are adjustable to the form of panels. The entire area of the panel-shop is served by remotely controlled overhead cranes. Completed panels are taken by handling trucks to a buffer storage area before going to the erection shop where the panels are assembled into hull sections.

The capacity of the erection shop is such that complete transverse sections can be assembled for vessels as wide as 75 feet. Marine Industries' method of handling these large sections ensures that a maximum amount of steelwork is done undercover, with optimum working conditions. As each large section is completed, it is moved to the assigned building berth by means of a track and roller system.

Overall view of Marine Industries Limited shipyard in Sorel, Quebec, showing in the foreground the new steel storage and painting facilities and the fabrication shop.

When the erection of the hull has been completed on the berth, the ship is ready to launch and the entire hull is transferred sideways onto the marine railway platform. The vessel is then launched and towed to the outfitting wharf for completion and trials.

Gerard Filion, president of Marine Industries, spoke during the inaugural ceremonies, describing the efforts of the firm to be the No. 1 shipyard in Canada. He said: "In inaugurating our new facilities, we introduced building processes and planning methods that were developed in European and Japanese shipyards. It is, therefore, with justifiable pride that Marine Industries Limited can now lay claim to technical leadership in shipbuilding in Canada, if not on this continent.

"We are honored by the presence of the man who is responsible for our taking this giant stride in the short space of two years. Dr. **Nils Svensson,** president of Gotaverken A.B., the man who designed and built Arendal, agreed to place at the disposal of Marine Industries the results of his own personal thinking and research, as well as the experience of his group of engineers. I wish to take this opportunity to express to him our gratitude. Of course, the agreement between our firm and Gotaverken was first and foremost a business transaction, but this relationship has ripened into a warm friendship.

"The program to expand our shipbuilding facilities could not have been justified without our winning the contract to build two destroyer escort vessels.

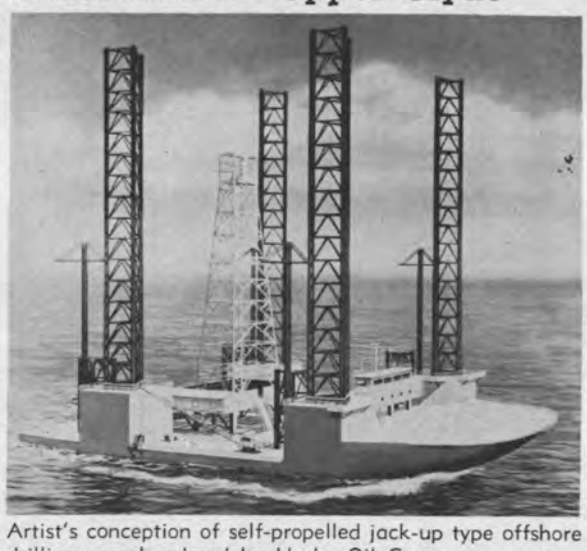
"We are pleased and proud as 'leadyard' to have the opportunity to demonstrate our ability and the strength of our operation.

"The provincial Department of Trade and Industry has always shown deep interest in the expansion undertaken by Marine Industries, not only in Sorel but also in St. Hyacinthe, Plessisville, Paspebiac, Halifax, N.S., and more recently on Montreal Island.

"With close to $100-million worth of business already entered in our order books for 1969, with emphasis on the production of capital goods and on maritime operations, with the backing of our parent company, General Investment Corporation, and with the many links to a substantial number of industrial and financial firms supplied through the Simard interests, who though minority shareholders, are very active, the Marine Group is an important element of the economic structure of Quebec and Canada."

Artist's conception of helicopter-equipped Canadian destroyers for which Marine Industries has been selected as lead yard. These ships will have gas-turbine propulsion.

Self-Propelled Drilling Rig Ordered From Upper Clyde



Artist's conception of self-propelled jack-up type offshore drilling vessel ordered by Husky Oil Group.

An order for a self-propelled jack-up drilling vessel, valued at over $4.8-million, has been placed with Upper Clyde Shipbuilders by Rimrock (U.K.), Ltd., London, who are associated with the Husky Oil Group.

This is only the second of this jack-up type of drilling vessel to be ordered in the world. The first is at present under construction at the Clydebank Division of U.C.S. who have already built four highly successful jack-up type drilling rigs.

Self-propulsion gives these new drilling vessels the combined advantages of the jack-up drilling platform and the mobility of a ship. They will be able to maneuver in the drilling area and also undertake long international voyages without tugs.

The drilling vessel now ordered will be a repeat of that placed by International Drilling Company (Contracts), Ltd., of London in May last year. It will have an overall length of 276 feet, and depth of 22 feet. The main propulsion will be diesel-electric with twin-screws, each driven by two 2,000-hp motors to give a speed of about 7 knots. When on drilling location, the vessel will be jacked up on four triangular lattice tower legs 355 feet long, which will allow operation in water up to about 250 feet deep.

The drilling derrick will be mounted on a movable substructure and will be moved over the aft end for drilling operations by means of a hydraulic ram system. Air-conditioned accommodations will be provided for a total crew of 75, and there will be a helicopter platform over the accommodations.

"IT'S BEEN LIKE THIS EVER SINCE WE HAULED A CARGO OF FISH TEN YEARS AGO!"

Technical Brochure From Moffitt Describes Ceramaloy Sleeves

A newly published four-page technical brochure on Ceramaloy coated sleeves, directed to ship designers, owners and maintenance engineers is available from Lucian Q. Moffitt, Inc., national and international distributor of Ceramaloy coatings by Daman Industries, division of Heppenstall Company.

The brochure, produced in color, details how Ceramaloy coatings solve shaft-sleeve wear problems. Also featured are several types of Ceramaloy sleeves developed especially for use in propeller-shaft assemblies. Complete application instructions are contained in the brochure.

Copies of the new Ceramaloy brochure may be obtained by writing Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309. The company is also the national and international distributor of B. F. Goodrich Cutless bearings and special marine products.

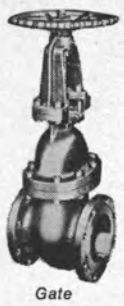
MMC Issues New Data Sheet On Electric Bilge Alarm

A new data sheet on its magnetic-electric bilge alarm has been issued by the Marine Moisture Control Company.

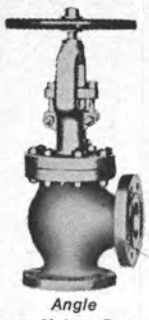
The audio visual alarm indicator is actuated when the bilge level reaches a preset high level. When this occurs, the indicator lights and a silenceable horn sounds. The visual indicator cannot be turned off until the bilge is restored to a safe level. Use of this sounding device eliminates the need for constantly checking the bilge level.

The data sheet includes a schematic drawing of the indicator.

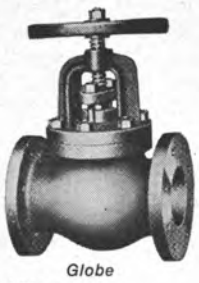
To obtain a copy of this data sheet, write Marine Moisture Control Company, Inc., 449 Sheridan Boulevard, Inwood, N.Y. 11696.



Gate

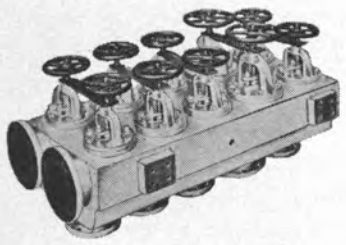


Angle

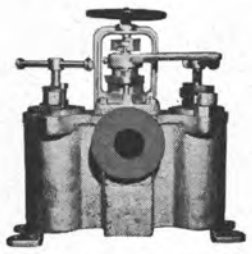


Globe

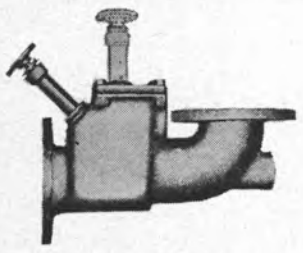
Overboard Discharge Valves Bronze and Cast Steel.

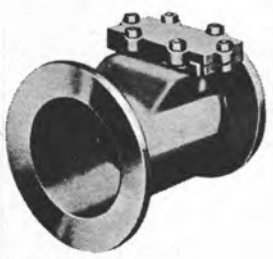


Cast Iron or Steel Manifold Valves . . . all types, sizes and trims.



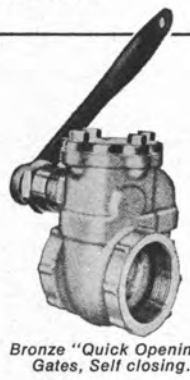
Bronze or Cast Steel Duplex Strainers, all pressures—Baskets to suit Specs.



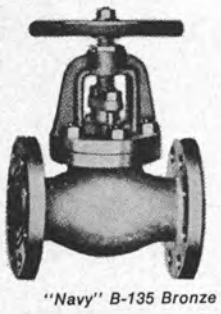


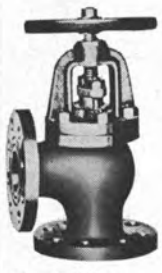
Bronze or Cast Steel 90° or 180° Scupper Valves with or without control.

Bronze Fireline Hose Angles, Globes and Gates, 150# and 300#.

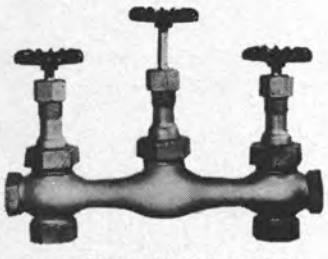


Bronze "Quick Opening" Gates, Self closing.

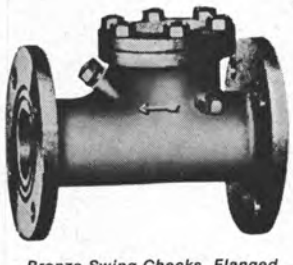




"Navy" B-135 Bronze Globes and Angle Valves



Bronze Simplex Manifold or Shaffer type By-pass ½" through 3".



Bronze Swing Checks, Flanged and Screwed ends.

We can't show them all . . . it would take pages and pages, but here's a convincing partial showing!

ZIDELL MARINE VALVES

What we show here are only a very few of the almost limitless variety of Marine Valves stocked by Zidell . . . Our stock is the largest in the nation, and it's strategically spotted at warehouses on the Atlantic, Pacific and Gulf Coasts for faster delivery . . . We're faster, too, on modifications to your exact specs. And all our valves are sold with Zidell's "Factory-Par" Warranty.

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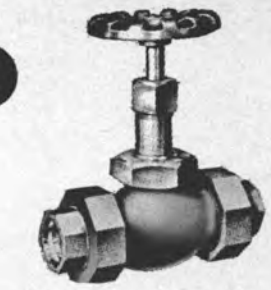
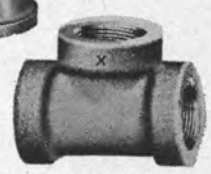


Bronze Silbraz Globes, Gates, Angles and Checks.

Inverted Vent Checks with or without lid.

Bronze Silbraz Fittings, all pressures.



Forged Steel Fittings, 2000#, 3000#, 6000#.

600# Flanged Boiler Valve, non-return . . . also feed line Valves.

NOTE:
Valves listed can be furnished in Bronze, Stainless or Monel trim. Globes and Angles listed can be furnished in "Screw Down Check".

FREE BROCHURE
to learn about the Zidell Valve Division . . . how we can save you time and money!

Also: Complete Stock of VICTORY SHIP VALVES!

J.T. Crowley Appointed Director Of Marketing For Moore-McCormack

Moore-McCormack Lines, Incorporated has announced the appointment of **James T. Crowley** to the position of director of marketing services.

Mr. **Crowley** joined Mooremack as a licensed officer in 1946 upon completion of World War II services as a naval officer. In 1947 he came ashore and since then has served in varying capacities in chartering, traffic, operations and sales; his most recent position was manager of the Container Division.

A graduate of the University of Notre Dame, he is a member of the Foreign Commerce Club of New York, the Downtown Athletic Club, and was recently elected as a member of the board of trustees of the Medical-Surgical Plan of New Jersey.

C.S. Francis Named Executive Secretary Of Marine Library

Charles S. Francis has been named executive secretary of the American Merchant Marine Library Association, according to an announcement by **Mrs. George Emlen Roosevelt,** chairman of the association's board of trustees. Mr. **Francis,** who succeeds the late William P. Bollman III, is a former member of the public relations staff of American Export Lines, and was also active in public relations activities for the American Merchant Marine Institute and the Propeller Club of the United States, Port of New York.

The association, headquartered at 45 Broadway, New York City, was established in 1921 to assure American seamen of a ready supply of reading material on voyages.

Great Dane Trailers Appoints Hammond Marine Sales Manager

C. F. Hammond III

In a move to strengthen service and liaison with the railroad and marine industries, **C. F. Hammond III** has been appointed manager-railroad and marine sales for Great Dane Trailers, Inc., Savannah, Ga. **Henry T. Skipper Jr.,** vice-president, sales, of the trailer and container manufacturer, made the announcement with the comment, "This promotion will enable Mr. **Hammond** to devote his full time to the rapidly growing and increasingly important railroad and marine fields. For several years now, Great Dane has been expanding its production facilities to more efficiently manufacture piggyback trailers and containers for these industries. The appointment of Mr. **Hammond** is another step indicating our interest in these markets."

Before his recent appointment, Mr. **Hammond** was assistant sales manager, working in all areas of trailer and container sales. He joined Great Dane Trailers in 1963 as a research engineer and was made assistant sales manager in 1966. A graduate of Auburn University with a degree in mechanical engineering, he was associated with Alcoa Aluminum Company as a design engineer before joining Great Dane Trailers.

Mr. **Hammond** will continue to work out of the headquarters office and plant of Great Dane Trailers in Savannah, Ga.

Sutton To Build Oceanographic Vessel

Sutton Boat Works of Tarpon Springs, Fla., has received a contract from Novia University, Fort Lauderdale, Fla., for the construction of an oceanographic survey vessel. This boat will be powered by twin 800-total-bhp diesels and will have the following dimensions: 63 feet in length, 25 feet in beam, and 12 feet in depth.

York Air Conditioning cools crew's quarters and computer equipment on Coast Guard Cutter HAMILTON

USCGC HAMILTON, WHEC-715—one of nine similar vessels designed by the U.S. Coast Guard. All of these ships, built by Avondale Shipyards, Inc., have York air conditioning equipment. Three York hermetic cooling plants provide crew comfort—and cooling for computers and related equipment. Two smaller York machines are used in ship stores facilities.

York's Marine Division is a special group of Marine air conditioning and refrigeration specialists—expert in planning and applying the correct equipment for naval, cargo and passenger vessels.

The ship shown here is one of the United States Coast Guard Cutters —and York cooling units are used to assure comfort for the ship's crew, and to maintain the required temperature and humidity for delicate electronic computers and other equipment.

The York Marine Division works closely with shipowners and builders—and their consultants. And, the Division offers world-wide service, with trained personnel and ample facilities in every major port in the world.

For an interesting brochure on York's Marine Division and its capabilities, just write York Division of Borg-Warner Corporation; York, Pennsylvania 17405.

YORK
DIVISION OF BORG-WARNER CORPORATION
BORG WARNER®

Edo Supplying Navy Survey Ships' Sonar

Edo Western Corporation is supplying several long range scanning sonars to the U.S. Navy Oceanographic Office for use on survey ships. The Model 378 scanning sonar will provide obstacle avoidance information over a maximum range of 4,000 yards and will also be employed in search missions for locating lost or sunken objects. Configured from Standard Edo Western components and utilizing a time tested transducer, the Model 378 offers maximum reliability. In addition, its modular construction provides ease of service and a unique flexibility for variable operating parameters or interface with other equipments.

The Model 248A transceiver and the Model 333 precision bathymetric recorder, fundamental building blocks of this system, are standard instruments on many navy ships and this redundancy will greatly ease the logistics problem of spares for many varied equipments.

This new scanning sonar is now available for commercial sale and literature is available on request from Edo Western Corporation, 2645 South 2nd West, Salt Lake City, Utah 84115.

Brown & Root Brochure Describes Strengthening Of Drill Platform Piles

"Concrete Structural Surgery" is a four-page, full-color brochure describing Brown & Root's unique method of repairing and strengthening old, weak offshore platforms. The Houston-based subsidiary of the Halliburton Company has joined forces with cementing experts at Halliburton. A newly-formulated, super-strength, non-shrinkable grouting material is pumped into weak platform piles and cross members, to make them as strong or stronger than the original. For your copy write Platform Repair Services Department, Brown & Root, Inc., P.O. Box 3, Houston, Texas 77001.

Fishing Vessel Lubrication Covered In New Mobil Booklet

"Marine Lubrication Fishing Vessels," a 36-page booklet, has just been published by the Marine Trade Department of Mobil Sales and Supply Corporation.

The booklet covers the lubrication and maintenance of all types of machinery normally found in fishing ships. It provides daily help and guidance to operating personnel in servicing not only main engine systems but also auxiliaries, hydraulic machinery, refrigerators, gearing, etc.

Copies may be obtained through Mobil sales representatives or directly from the Marine Trade Department, Mobil Sales and Supply Corporation, 150 East 42nd Street, New York, N.Y. 10017.

Steam Turbine Orders Totaling 1,000,000 Shp Given Stal-Laval In 1968

The success of the Stal-Laval AP Marine Steam Turbine design is now a matter of statistical record. In 1968 alone, orders were placed for units developing over 1,000,000 shp. This brings the total number of AP units in service and on order to 112, with an output exceeding 3-million horsepower.

The Swedish turbine manufacturer has made a major contribution to meet the demand for higher powers to propel larger tankers and faster containerships, with its standard single-plane powerplant utilizing planetary gearing. The Matson Navigation Company now has four such machines on order for new containerships, the first two of which will be installed in 1969 at the Bethlehem Steel Shipyard in Baltimore, Md. Considering all the turbine-powered containerships on order, Stal-Laval will deliver 42 percent of the propulsion plants.

Even more impressive is the large number of AP units scheduled for tankers, combination, and bulk carriers of the 100,000-dwt class and over. A check of the worldwide order book for ships in this category shows 32.2 percent of the steam-driven vessels will use Stal-Laval. The next closest turbine builder holds 21.3 percent of the available market, and the combined order book for the three leading Japanese turbine manufacturers only slightly exceeds that of Stal-Laval.

Campbell Machine Inc.— San Diego-Based Shipyard To Purchase Nuttall-Styris

Campbell Machine, Inc. has agreed to purchase the business of Nuttall-Styris Co. for approximately 61,000 shares of Campbell common stock, it was announced.

Nuttall-Styris has been engaged in the ship chandlery business in San Diego since 1912. It is now the largest distributor of marine hardware and equipment in the area. Gross sales for the fiscal year ended September 30, 1968, were approximately $2-million.

Campbell Machine is a San Diego-based shipyard with 484,428 shares listed on the American Stock Exchange. Last October, Campbell purchased Bradston Rattan Products Inc., which operates manufacturing plants in National City, Calif., and Tampa, Fla., and serves a nationwide market for rattan furniture.

The announcement was made jointly by **George J. Soares,** president of Campbell, and **Robert J. Cleator** and **Thomas L. Perry,** managing partners of Nuttall-Styris. It emphasized that the agreement is subject to financial audit, permission of the California Corporations Commissioner, and completion of all legal formalities.

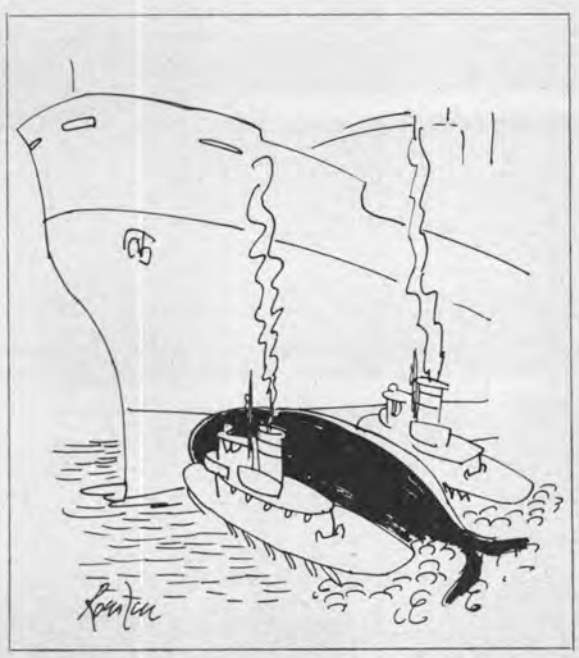
The ship chandlery business will be operated by its present management as a wholly owned subsidiary of Campbell, to be known as Nuttall-Styris, Inc.

Ohio Barge Names Thompson Supervisor Of Chemical Traffic

Ohio Barge Line, Inc., Dravosburg, Pa. has announced the appointment of **Howard A. Thompson** to the new post of supervisor of chemical traffic. In this assignment, Mr. **Thompson** will be responsible for coordinating the movement of all chemical traffic.

Mr. **Thompson** started his traffic career in 1959 as a barge coordinator for the Koppers Co., Inc., Pittsburgh, Pa. For the past five years he has served as traffic manager for Seneca Oil and Transport Co. in Cleveland, Ohio.

Mr. **Thompson** is a graduate of the University of Pittsburg and he has been a member of the Pittsburgh Propeller Club since 1964.



Giardino To Chair Maritime Night Dinner

The appointment of **Thomas J. Giardino,** traffic manager of the Marchessini Steamship Lines, as general chairman for the Rudder Club's "Fifth Annual International Maritime Night Dinner" was announced by **Donald Quinn,** vice-president of Boise-Griffin Steamship Co. and commodore of the club.

Mr. **Giardino** said that, as in the past, this is the evening dedicated to honor the top executives of the steamship lines, both American and foreign, serving the Port of New York.

The dinner will be held on Wednesday evening, March 12, in the Grand Ballroom of the Hotel St. George, Brooklyn, New York.

Tickets are $14.00 each, gratuities included, and reservations may be obtained from **Anthony D' Ambrosio,** president of Atlantic Coast Industries (UL. 8-8910) or **Robert Hannon** of Marchessini Lines (WH. 3-7550).

High-Strength Ladder On New Bauer Dredge Made With Armco SSS 100 Steel Plate

The 'working end' of the dredge Bill Bauer shows the suction ladder after installation. The ladder, weighing 350 tons, including the suction head, is made of Armco SSS 100 steel plate, with yield strength of 100,000 psi.

The powerful new steam dredge 'Bill Bauer,' now on location at its first job in Pascagoula, Miss., has set an industry standard by using 100,000-psi yield strength steel in critical structures.

Recently constructed by Bauer Dredging Co., the dredge is the 14th in the company fleet. Besides being the company's largest, it is the first with steam power. It is 316 feet long, including the ladder, and has a beam of 50 feet.

Two working components of the dredge are unusual. The suction ladder and the spuds are made of Armco Steel's SSS 100, a quenched and tempered alloy steel with minimum yield strength of 100,000 psi and tensile strength ranging from 115,000 to 135,000. SSS 100 is about three times stronger than the steel normally used for such construction.

Strength and reliability were two of the prime requirements for the ladder and spuds. The SSS 100 steel plate not only provided the extra strength, it actually reduced the weight of ladder and spuds as compared to conventional steel construction.

Total weight of the 86-foot-long suction ladder and the cutter head is 350 tons. The head is powered by two 1,000-hp electric motors through a 17-inch-diameter drive shaft. The ladder, made of twin box sections, was fabricated of 1¾-inch-thick SSS 100 plate by the Wyatt Division, U.S. Industries, Inc., Port Houston Shipyard.

Internal baffles in the twin-box structure are ¾-inch SSS 100 plates. Sections of the structural boxes are 96 inches tall and 32 inches wide.

The 42-inch-diameter spuds are 96 feet long and weigh 40 tons each. Fabricating the cylindrical spuds of SSS 100 gives them strength and resistance to bending and flexing.

Welding was a critical step in fabrication because of the stresses and strains in the ladder and spuds. Tacking and manual fillet welding was done with E 8018 electrodes. Submerged arc—used for butt and fillet welds — used Armco's W-15 welding wire with a neutral flux. The wire contains nickel, chromium and molybdenum. The welded joints have a strength level slightly lower than the SSS 100 steel, but have exceptional ductility.

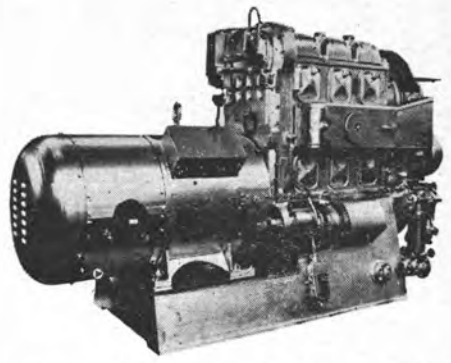
Bethlehem Appoints Hamilton Ass't Manager Of Boston Repair Yard

George S. Hamilton has been appointed assistant manager of Bethlehem Steel Corporation's Boston repair yard, according to **William H. Collins,** general manager of the facility.

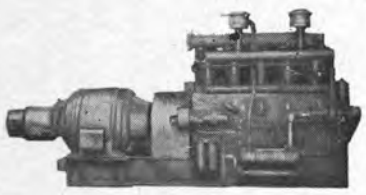
Mr. **Hamilton** succeeds Mr. **Collins** who was named manager on February 1. The new assistant manager was previously general manager of Seatrain Line, Inc.'s marine operations and terminal facilities at Edgewater, N.J. He had earlier been associated with Bethlehem's former operation at Quincy, Mass.

MARINE DIESEL GENERATORS

SUPERIOR, 10 KW, 120 Volts DC.
HERCULES, D0OC, 10 KW, 120 DC, Radiator cooled.
BUDA, radiator cooled, 15 KW, 120/240 Volts DC.
FAIRBANKS-MORSE, radiator cooled, 25 KW Continental Generator, 120/208/3/60.
Hercules DJXC, 25 KW, 120 DC.
GM 3-71, 30 KW, 120 DC.
Cummins A1, 30 KW, 120 DC.
MURPHY, Model ME 66, radiator cooled, 75 KW, 120/240 Volts DC.
CATERPILLAR DIESEL ENGINE, Model D17000, 167 HP, 900 RPM, Heat Exchanger cooled, with Louis-Allis Generator, 85 KW, 220/3/60.
LORIMER, F5SS, 75 KW, 120/240 DC, radiator cooled.
COOPER-BESSEMER, JS-5, 250 KW, 240 DC.



LORIMER 100 KW
450/3/60 Volts DC.



BUDA 6DHG691, 60 KW, 120 Volts DC.

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

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

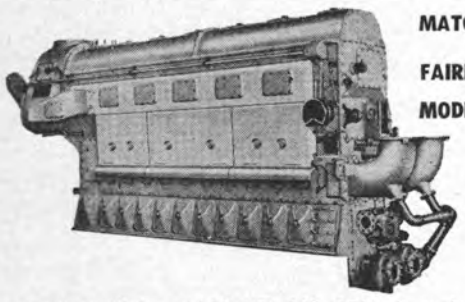
SUPERIOR, Model IDB-8, 100 KW, 450/3/60.

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

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

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

MARINE DIESEL ENGINES



MATCHED PAIR . . .

FAIRBANKS-MORSE

MODEL 38D8-⅛

1 Port;

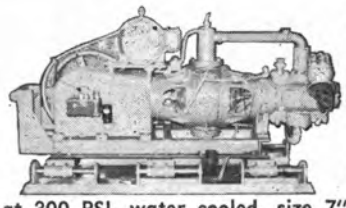
1 Starboard

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

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

HYDRAULIC PUMPS (STEERING)
Hele Shaw, Type JLP 12, 1000 PSI, 850 RPM. Northern radial piston. Size 5430, 44 GPM, 1500 PSI, 350 RPM.

AIR COMPRESSORS



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

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

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

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

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

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

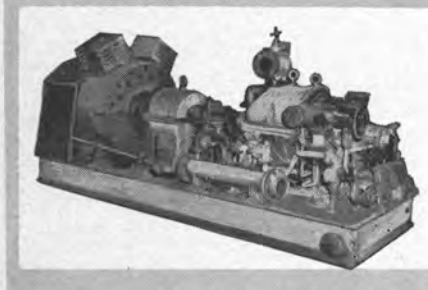
STEAM AIR COMPRESSORS
Westinghouse Air Brake Company, Size 11 x 11 x 12, Vertical, rated 66 CFM at 100 PSI (2 available).

REDUCTION GEARS . . .

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

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

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



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

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

TURBINE GENERATORS

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

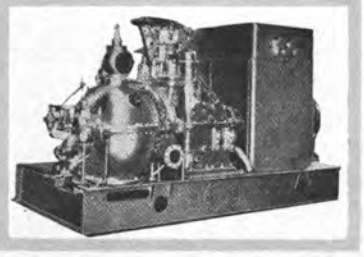
WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, driving on same comman shaft a 250 KW Generator, 440/3/60, and a 90 KW Generator, 125 Volts DC.

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

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

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

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



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Save over new replacement costs as shown in the **"Typical Price"** listing below . . .
26" x 48"—4 dog type $ 60.00 ea.
26" x 66"—6 dog type $ 85.00 ea.
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USED, GOOD STEEL
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(503) 228-8691

Hundreds of other pumps in our stock
Phone or mail required specifications.

AC PUMPS—Horizontal Centrifugal

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

AC PUMPS—Vertical Centrifugal

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

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

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

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

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

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

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

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

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

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

AC PUMPS—Horizontal Rotary

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

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

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

AC PUMPS—Vertical Rotary

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

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

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

DC PUMPS—Horizontal Centrifugal

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

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

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

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

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

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

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

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

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

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

DC PUMPS—Horizontal Centrifugal

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

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

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

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

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

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

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

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

DC PUMPS—Horizontal Centrifugal

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

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

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

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

DC PUMPS—Vertical Centrifugal

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

DC PUMPS—Horizontal Rotary

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

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

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

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

DC PUMPS—Vertical Rotary

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

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

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

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

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

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

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

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

BOILER FEED PUMPS — TURBINE & ELECTRIC

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

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

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

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

TURBINE DRIVEN PUMPS — Various

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

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

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

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

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

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

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

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

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

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

STOCKLESS ANCHORS

USED, GOOD QUALITY . . . SAVE!

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

ANCHORS... Unused, surplus 3000 # size Danforth

ANCHOR CHAIN . . . Used, good, with or without test certificate . . .

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

ANCHOR WINDLASS

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

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

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

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

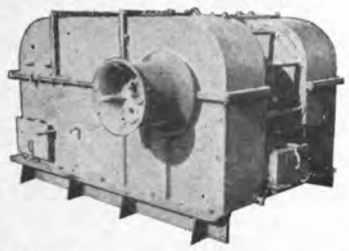
3—Hesse-Ersted, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

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

ANCHOR WINCHES

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

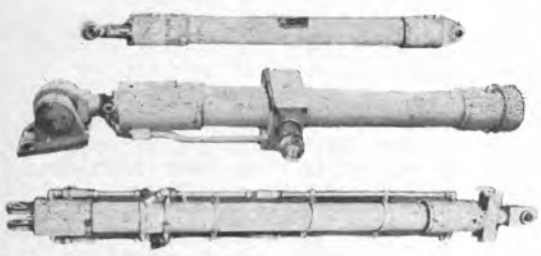
UNIWINCHES



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

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

HYDRAULIC CYLINDERS



3000 PSI

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

STEERING STANDS

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

$149.50 each

CAPSTAN WINDLASSES

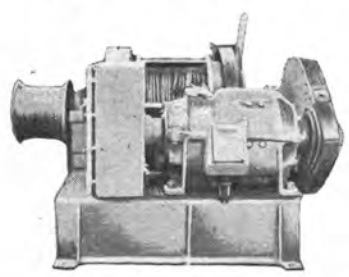
Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1¼" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

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

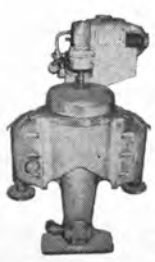
Hyde, Vertical, Single Wildcat, for 1⅛" Anchor Chain, single gypsy, with 20/5 HP Motor, 440/3/60.

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

CARGO WINCHES



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



CENTRIFUGES

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

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

FAIRLEADS

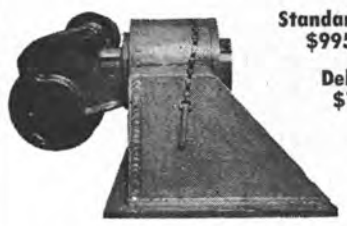
Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

To Give You These Features:

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

Self Aligning, Swivel Type Head.

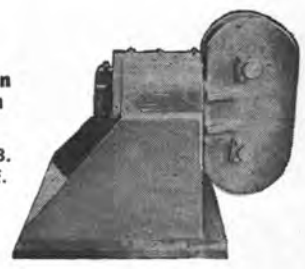
Dependable and Ruggedly built to perform consistently year after year with minimum maintenance.



Standard Design $995 each

Deluxe Design $1250 each

Model Design $1350 each



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SPECIAL MARINE ITEMS

HIGH SPEED COUPLINGS

(Flexible Couplings between Turbines and Reducing Gear)

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

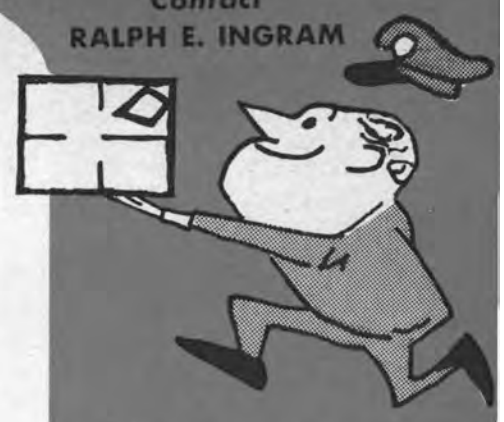
PROPELLERS

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

PROPELLER SHAFTS

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

Contact
RALPH E. INGRAM



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Rebuilt—Guaranteed

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

PRICES ARE F.O.B. PORTLAND, OREGON

SPERRY GYRO COMPASSES

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

SK. FR. 93.

Machinery and EQUIPMENT

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

for Immediate Sale!

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Ralph E. Ingram
503/228-8691

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

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

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

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

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

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

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

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

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

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

FUEL OIL STANDBY PUMP, Worthington, hori-

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

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

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

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

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

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

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

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

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

ICE WATER CIRCULATING PUMP, Allis-Chalmers, Type SS-RH, 10 GPM, 81' head, 1" x 3/4" vertical volute, 1 HP, 230 DC.

Attention Shipbuilders!

FORGED STEEL LINE SHAFTING

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

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

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

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

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

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

2—Sections 14⅛" diameter, 18'—6" long, flanged

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

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

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

1 Only, Model 17-DE-90

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responsible for the supervision and coordination of production work on the hull to which assigned. Qualified candidates must have strong management and fabrication experience in the shipbuilding industry. Candidates should have a college engineering background. Equivalent experience will be considered.

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candidates must have ample supervision experience in outfitting of ships and abilities to coordinate with crafts to meet production schedules. College engineering background preferred. Equivalent experience will be considered.

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

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USED, GOOD QUALITY . . . SAVE!

ANCHORS... Unused, surplus 3000 # size Danforth

ANCHOR CHAIN . . . Used, good, with or without test certificate . . .

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

ANCHOR WINDLASS

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

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

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

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

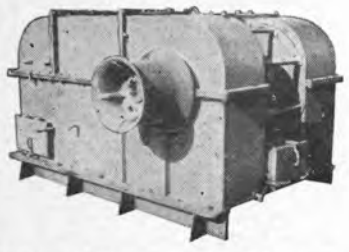
3—Hesse-Ersted, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

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

ANCHOR WINCHES

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

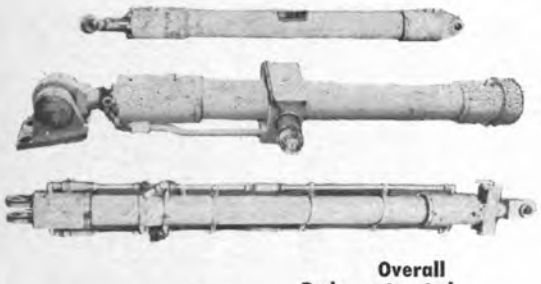
UNIWINCHES



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

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

HYDRAULIC CYLINDERS



3000 PSI

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

STEERING STANDS

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

$149.50 each

CAPSTAN WINDLASSES

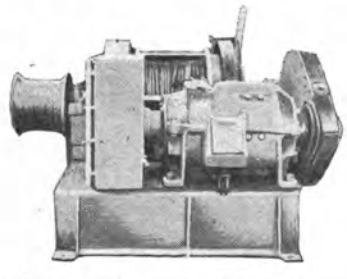
Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1¼" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

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

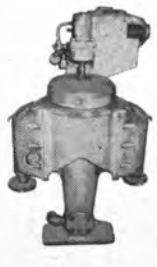
Hyde, Vertical, Single Wildcat, for 1⅛" Anchor Chain, single gypsy, with 20/5 HP Motor, 440/3/60.

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

CARGO WINCHES



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



CENTRIFUGES

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

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

FAIRLEADS

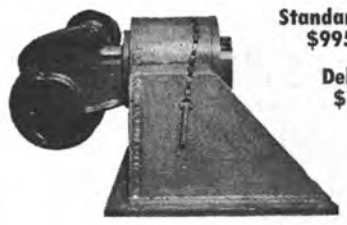
Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

To Give You These Features:

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

Self Aligning, Swivel Type Head.

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



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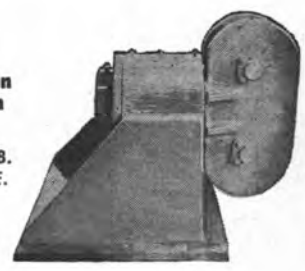

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(Flexible Couplings between Turbines and Reducing Gear)

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

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

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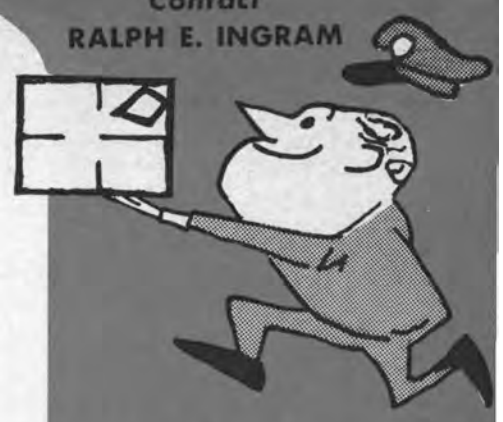
RALPH E. INGRAM



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

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2—Parkersburg, 2 drum, 1 speed, 50 HP, 230 DC.
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2—American Hoist & Derrick, 1 speed, 1 drum, 50 HP, 230 DC.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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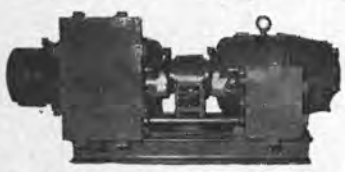

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2—250 KW, 120/240 V, Westinghouse, 1200 RPM, Single Pedestal Bearings. Balance Coils not available, Type 12S18P107PH, removed from Turbines.

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

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

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

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

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

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

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

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

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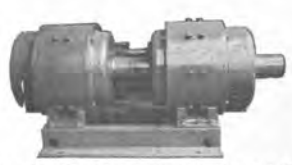

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Hertner. Input: 230 V, DC, 28A. Output: 5 KVA, PF .85, 115 V, 60 cy., Ø1.
Continental. Input: 230 V, DC, 28A. Output: 7.5 KVA, 3.5 KW, 120 V, 1Ø, 60 cy., 62.5A.
Century. Input: 10 HP, 230 V, DC. Output: 7.5 KVA, 3.75 KW, 120/1/60.
Bogue. Input: 230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

115 VOLTS D.C. TO A.C.

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

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

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

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

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

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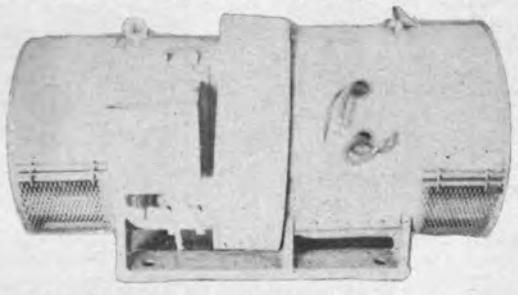
Motor: 30 hp 230V DC 110 amp. 1,800 RPM
Generator: 20 KW 25 KVA .8pf 120V AC 1 Phase 60 Cycle 208 Amps. with Switchboard (4 each)



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DIMENSIONS: 417′-8″ x 56′-10″ x 37′-4″ DRAFT: 27′-8″ (approx.) TONNAGE: Gross 7176, Net 4380, Dwt. 10,800 (approx.) STORAGE CAP: 2,750,000 to 3,000,000 gallons.

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Drum 8500 lbs @ not less than 120 FPM; 13,000 lbs at no specified speed. Gypsy head 22,500 lbs. static pull. Foot brake to hold 17,000 lb. pull. Steam cylinders with standard 250 PSI.
DIMENSIONS:
9' 5¾" wide over winch heads
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4' 1" deep over bedplate
6' 5" overall—brake pedal, etc.
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Drums 16" diameter—20" wide—33 13/16" over flanges. Rebuilt by U.S.N. equal to new.

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Shipboard Use
Duty 10,000 lbs @ 60 FPM

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

6 IN STOCK FOR IMMEDIATE DELIVERY

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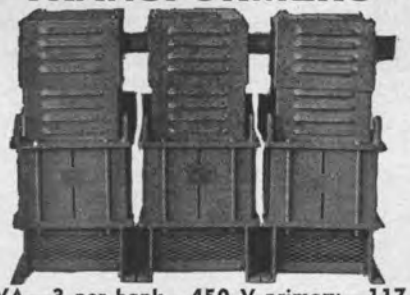

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From Ex-Naval Vessels

FIRE & FLUSHING PUMP

200 GPM—total head 224'—discharge pressure 100 PSI — 3½" suction — 3" discharge — 3500 RPM—bronze construction—flanged. MOTOR: 20 HP — 440/3/60/3600 RPM — G.E. type K.F.—frame 326 — full load amps 28 — fan cooled — ambient 50°C—class B insulation—totally enclosed — Navy Service A. DIMENSIONS: OAL 37¼"—OAW 18 31/32"—OAH 18½"—total weight 1225 lbs. Reconditioned.

$397.50

FIRE & BILGE PUMP

Self-Priming

200 GPM—bronze—224' head—90/100 lbs fire service—suction lift 23'—3500 RPM. MOTOR: 20 HP—440/3/60/3500 RPM—28 amps—G.E. type KF—frame 326—class B—totally enclosed—Navy Service A — 3½" suction — 3" discharge. PRIMER MOTOR: 1½ HP — 440/3/60/3600 RPM—fan cooled—totally enclosed—2.2 amps. Nash priming pump complete with priming valve. Reconditioned.

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T-2 TANKER VALVES

24" OVERBOARD DISCHARGE VALVES

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Rebuilt to ABS and Coast Guard requirements

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30000 C.F.M.

A30A4W5—25 HP—440/3/60. 30000 CFM @ 3" static; 40000 CFM @ 1" static. I.D. 44¼"

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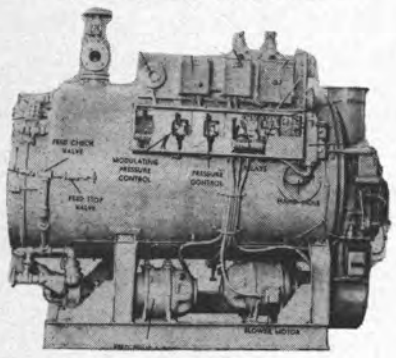
SELF-CONTAINED MC-90 CYCLOTHERM STEAM GENERATOR



OUTPUT 2600 lbs/hour—design pressure 125 PSI—working pressure 100 PSI—2-pass—1-burner—pressure atomizing. Burner capacity 26 gallons per hour—fuel pressure at nozzle 200 PSI—fuel pump capacity 75 gallons per hour against 200 PSI. BLOWER MOTOR 5 HP—440/3/60—3400 RPM. FEED PUMP MOTOR 3 HP—440/3/60—1725 RPM. FUEL PUMP MOTOR ½ HP—220 volts single phase—1725 RPM. FEED PUMP CAPACITY 10 GPM @ 300' head. IGNITION electric—transformer primary 200 volts—secondary 10,000 volts. BURNER pressure atomizing type. Shell plate 5/16" thick—heads ½" thick—furnace 16" OD x ⅜" thick. Return tubes: 22 @ 2½" x 0.110 wall and 22 @ 2" x 0.095 wall. Boiler shell hydro-tested 188 lbs/inch. Hand holes 3½" x 4½". Fusible plug—one in rear.

THESE BOILERS ARE ALL EQUIPPED PACKAGE UNITS

The boiler is mounted on a rugged structural base—easily bolted down. Boiler heating surface so arranged to provide rapid circulation of surrounding water. DIMENSIONS: 8' OAL—8' OAH over safety valves—43" OAW. Dry weight 5035 lbs. Flue outlet 10" ID. Control cabinet mounted on top of boiler. Boilers carefully removed from Naval vessels. You have to see them to appreciate them.

READY TO OPERATE $3950

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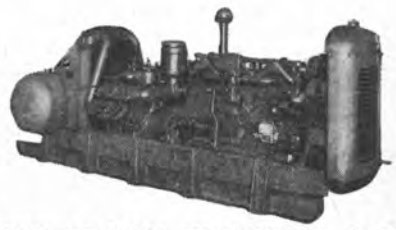
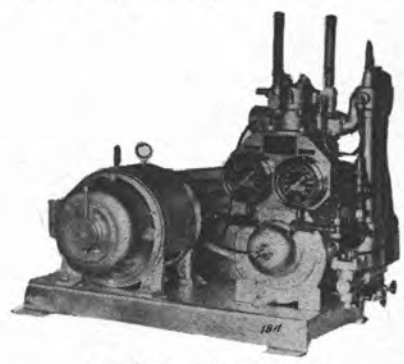
SHIPBOARD AIR COMPRESSORS



DIESEL-DRIVEN INGERSOLL RAND

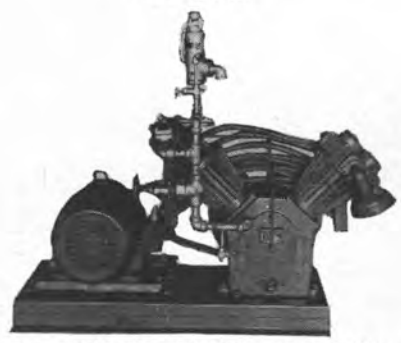
Ingersoll-Rand compressor—315 cu. ft. at 125 lbs.—driven by International Harvester UD-18 diesel. Tank mounted on skid—radiator cooled—from Corps of Engineers salvage vessel.



DIESEL STARTING

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

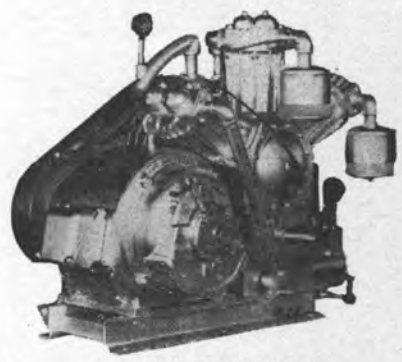
$1750



T2 TANKER SHIPS SERVICE

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

$695



SHIPS SERVICE

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

$1250

T2 TANKER SHIPS SERVICE

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

$695

T2 TANKER COMBUSTION CONTROL

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

$995

T2 TANKER COMBUSTION CONTROL

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

$995

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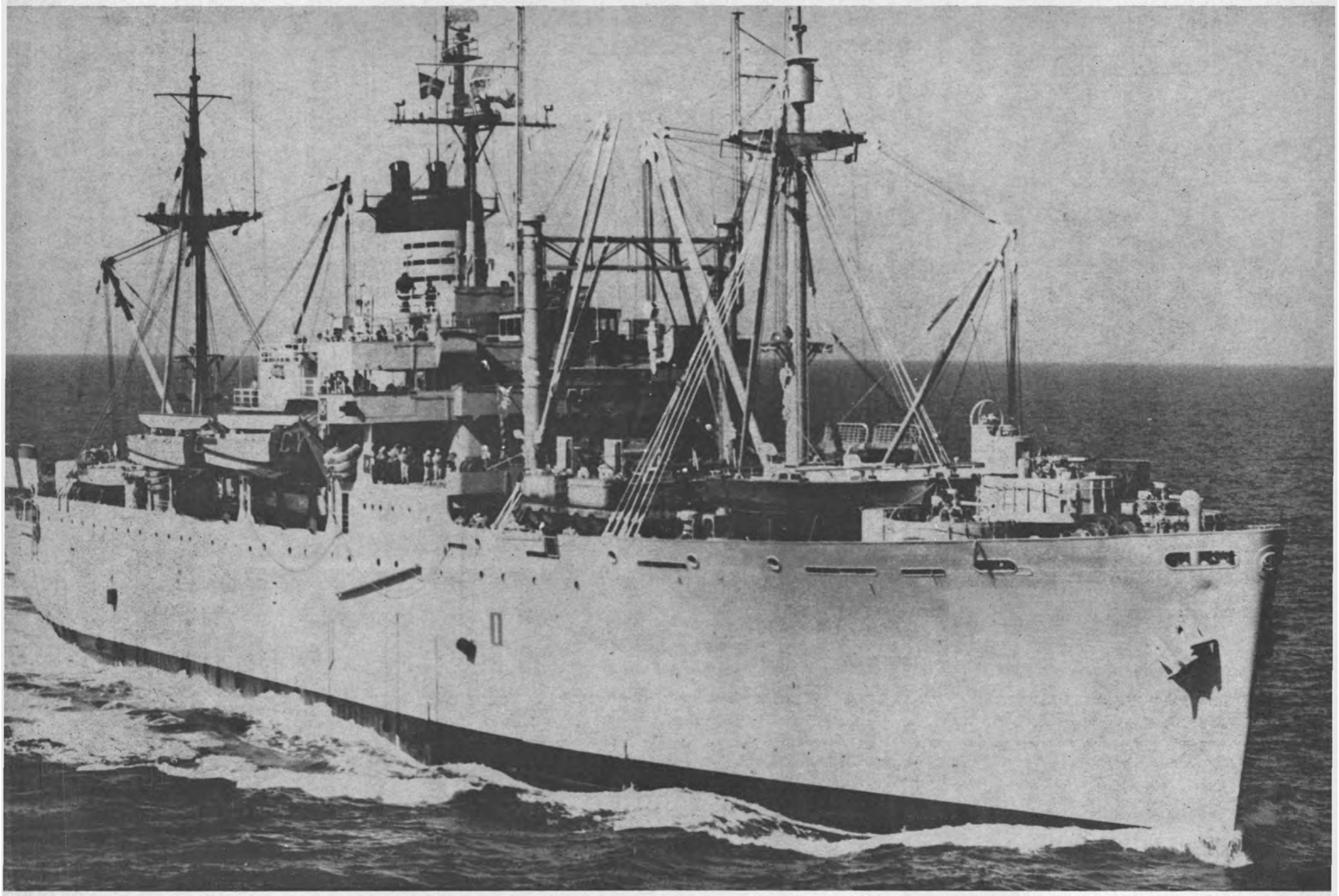
C-3 SHIP



USS GEORGE CLYMER

"EX-AFRICAN PLANET BASIC TYPE C3P (P&C)"

Constructed by Ingalls Shipbuilding Corp.

Hull Number 267
General Electric Cross Compound Turbine with Double Pinion
Double Reduction Locked Reduction Gear
Single Screw 8500 SHP, 2 Foster Wheeler Type D Boilers

MAIN PROPULSION TURBINES
General Electric 8500 S.H.P.

High Pressure Turbine: 6159 RPM, 440 lbs., 740 F., 8 Stage non-condensing, Serial Number 45733, Instruction book 11729.

Low Pressure Turbine: 3509 RPM, 39.6 lbs., 360 F., 8-2 Stages, Condensing, Serial Number 45734, Instruction Book 11729.

General Electric Main Reduction Gear: Ratio 6159/3509/763/85 RPM, Double Reduction, Forced Lubrication.

BOILERS (2)

Main Boilers: Foster Wheeler Type "D" Boilers, 2 Drum, Designed Pressure, 525 PSI, 765 F., 37,000 lbs.

GENERAL ELECTRIC
300 KW DC TURBO SETS (3)

Generators: 300 KW DC, 120/240 Volts, 1200 RPM, 1250 Amps, Type MPC, Model 24G869, 3 Wire, Compound Wound, Serial Numbers 1772432, 1759090 and 1759105.

Turbines: Type DS 60-25 , 5636 RPM, 440 PSI, 740 F., Serial Numbers 44387, 44388, and 44389.

Reduction Gears: Ratio: 5636/1200 RPM, Serial Numbers 44765, 44766 and 44767.

CONDENSERS

Main Condenser: Worthington, 7800 Sq. Ft., Two Pass, 54000 lbs. Exhaust Steam Per Hour, 28.5" Vacuum. Will sell water box or return head separately.

Auxiliary Condensers (3): Worthington, 605 Sq. Ft., Two Pass, 3675" Exhaust Steam Per Hour, 28.5" Vacuum. Will sell water box or return head separately.

MACHINE TOOLS

Shaper, Western Machine, Steptoe, 24", 40" Col. 65" Ram. 7.5 HP, Electro Dynamic Motor 230 Volts DC, 1800 RPM.
Drill Press, Helpern Co., Back Geared, Type 20", 1 HP Dynamic Motor 230 Volts DC, 1750 RPM.

PUMPS MOTOR DRIVEN

Main Condensate 1 Pump: Worthington 2½ UZS-1 Pump, 12.7 H.P. Driver, 1750 RPM, 180 TDH, 140 GPM, Serial Number 997584.
Motor: Electro Dynamic Works D-326 Frame, 7.5-12.7 H.P., 1310-1750 RPM motor, 230 Volts, S.O. 20-D-7359, DP 40°C. Continuous, 29-48 Amps, Shunt Stab. Winding, Serial Number 52109 - 52110.

Main Condensate 2 Pump: Worthington 2½ UZS-1 Pump, 12.7 H.P. Driver, 1750 RPM, 180 TDH, 140 GPM, Serial Number 997582.
Motor: Electro Dynamic Works D-326 Frame, 7.5-12.7 H.P., 1310-1750 RPM, 230 Volts, S.O. 20-D-7359, DP 40°C. Continuous, 29-48 Amps, Shunt Stab. Winding, Serial Number 52112 - 52114.

Fire and Sanitary Pump: Worthington 3UB-1 Pump, 50 H.P. Driver, 1750 RPM, 280 TDH, 400 GPM, Serial Number 997601.
Motor: Electro Dynamic Works 10-S Frame, 28-50 H.P. 1310-1750 RPM, 230 Volts, S.O. 20-D-7365, DP 40°C., Continuous, 100A-180A Amps, Shunt Stab. Winding, Serial Number 51966 - 51965 - 73291.

Fresh Water Washing 1 Pump: Worthington 1½ DE Pump, 7.5 H.P. Driver, 3500 RPM, 173 TDH, 80 GPM, Serial Number 1009178.
Motor: Electro Dynamic Works D-254 Frame, 7.5 H.P., 3500 RPM, 230 Volts, S.O. 20-D-7803, DP 40°C. Continuous, 29 Amps, Shunt Stab. Winding, Serial Number 53780.

Fresh Water Washing 2 Pump: Worthington 7.5 H.P. Driver, 3500 RPM, 173 TDH, 80 GPM, Serial Number 1009180.
Motor: Electro Dynamic Works D-254 Frame, 7.5 H.P., 3500 RPM, 230 Volt, S.O. 20-D-7803, DP 40°C. Continuous, 29 Amps, Shunt Stab. Winding, Serial Number 73778.

Refrig. Condenser Circulating 2 Pump: Worthington 3LI Pump, 7½ H.P., 1800 RPM, 78.5 Ft. TDH, 200 GPM, Serial Number 1009225.
Motor: Electro Dynamic Works D-324 Frame, 4.5-7.5 H.P., 1250-1800 RPM, 230 Volts, S.O. 20-D-7804, DP 40°C. Continuous, 18-28 Amps, Shunt Stab. Winding, Serial Number 53741 - 53735.

Refrig. Condenser Circulating 3 Pump: Worthington 3LI Pump, 7½ H.P., 1800 RPM, 78.5 Ft. TDH, 200 GPM, Serial Number 1009220.
Motor: Electro Dynamic Works D-324 Frame, 4.5-7.5 H.P., 1250-1800 RPM, 230 Volts, S.O. 20-D-7804, DP 40°C. Continuous, 18-28 Amps, Shunt Stab. Winding, Serial Number 53742 - 53738.

Drinking and Culinary Water 1 Pump: Worthington, 1½ x 2 Size, Serial Number 1023528.
Motor: Electro Dynamic Works D-804 Frame, .75 H.P., 1310-1750 RPM, 230 Volts, S.O. D-7807, DP 40°C. Continuous, 3.3 Amps, Shunt Stab. Winding, Serial Number 53789.

Fire Pump: Worthington 3" UBS-1, 50 H.P. Driver, 1750 RPM, 280 Ft. TDH, 400 GPM, Serial Number 1009281.
Motor: Electro Dynamic Works 10.5 Frame, 28-50 H.P., 1310-1750 RPM, 230 Volts, S.O. 20-D-7805, DP 40°C. Continuous, 100-180 Amps, Shunt Stab. Winding, Serial Number 53718.

Main Circulating Pump: Worthington 20" LAS-1 Pump, 100 H.P. Driver, 645 RPM, 24.5 TDH, 12,200 GPM, Serial Number 997526.
Motor: Electro Dynamic Works 40-5 Frame, 60-100 H.P., 485-645 RPM, 230 Volts, S.O. 20-D-7358, DP 40°C. Continuous, 220-358 Amps, Shunt Stab. Winding, Serial Number 51942 - 51943.

Fuel Oil Service Pump: Worthington, Serial Number 090507, Size 2 GRVS.
Motor: Electro Dynamic Works D-365 Frame, 5/10 H.P., 875/1750 RPM, 230 Volts, 20/38 Amps, Shunt Stab. Winding, Type D.P., Serial Number 54001 - 54002.

Fuel Oil Service Standby Steam: Worthington, Serial Number 996919, Size 6" x 3½" x 12".

Fuel Oil Transfer Pump: Worthington, Serial Number 990508, Size 5 GRVS.
Motor: Electro Dynamic Works D-365 Frame, 12-15 H.P., 1310-1750 RPM, 230 Volts, S.O. 20-D-7368, DP 40°C. Continuous, 44-56 Amps, Shunt Stab. Winding, Serial Number 51983 - 51981.

General Service Pump: Worthington 20 HP Driver, 5L1 Pump, 1750 RPM, 56 TDH, 800 GPM, Serial Number 1009275.

Refrig. Condenser Circulating Pump: Worthington 3LI Pump, 7½ Driver H.P., 1800 RPM, 78.5 TDH, 200 GPM, Serial Number 1009218.
Motor: Electro Dynamic Works D-324 Frame, 4.5-7.5 H.P., 1250-1800 RPM, 230 Volts, S.O. 20-D-7804, DP 40°C. Continuous, 18-28 Amps, Shunt Stab. Winding, Serial Number 53737 - 53736.

Ballast Pump: Worthington 5LI Pump, 15 H.P Driver. 1750 RPM, 56 TDH, 600 GPM, Serial Number 997607.
Motor: Electro Dynamic Works D-363 Frame, 9-15 H.P., 1310-1750 RPM, 230 Volts, S.O. 20-D-7366, DP 40°C. Continuous, 34-56 Amps, Shunt Stab. Winding, Serial Number 51975 - 51978.

Submersible Bilge Pump Pump: Worthington 5" J.A.S. Pump, 20 H.P. Driver, 56 Ft. TDH, 600 GPM, 1150 RPM, Serial Number 1019103.
Motor: Electro Dynamic Works D-445 Frame, 20 H.P., 1150 RPM, 230 Volts, S.O. 20-D-7808, Open 45°C. Continuous, 75 Amps, Shunt Stab. Winding, Serial Number 53799 - 53801.

Auxiliary Condensate 1 Pump: Worthington 1-½-2 Stage, 3/5 Driver H.P., 3500 RPM, 180 TDH, 30 GPM, Serial Number 1018240.
Motor: Electro Dynamic Works D-254 Frame, 3/5 H.P., 2620-3500 RPM, 230 Volts, S.O. 20-D-7360, DP 40°C. Continuous, 11/20 Amps, Shunt Stab. Winding, Serial Number 51946 - 54320.

Auxiliary Condensate 2 Pump: Worthington 1-½-2 Stage, 5 Driver H.P., 3500 RPM, 180 TDH, 30 GPM, Serial Number 1028267.
Motor: Electro Dynamic Works D-254 Frame, 3/5 H.P., 2620-3500 RPM, 230 Volts, S.O. 20-D-7360, DP 40°C. Continuous, 11/20 Amps, Shunt Stab. Winding, Serial Number 71432.

Hot Water Circulating Pump: Worthington 1½DxS Pump, ¾ H.P. Driver, 1950 RPM, 15 Ft. TDH, 25 GPM, Serial Number 1027115.
Motor: Electro Dynamic Works D-204 Frame, ¾ H.P., 1460-1950 RPM, 230 Volts, S.O. 20-D-7808, DP 40°C. Continuous, 3.3 Amps, Shunt Stab. Winding, Serial Number 53784 - 71497.

PUMPS STEAM DRIVEN

Auxiliary Feed Steam: Worthington Pump & Machinery Corp. Simplex Vertical Steam Type, 14" x 9" x 24" Size, 550-575 Discharge Press, 60 Ft. Per Minute Piston Speed, Serial Number 996976.

Port Feed Worthington Pump & Machinery Co., Simplex Vertical Steam Type, 11" x 7" x 24" Size, 550-575 Lb./Sq. Inch Discharge Press, Serial Number 997011.

Priming Pump Pump: Nash Engineering Co. (Nash Hytor Vacuum Pump), 1750 RPM, Size M.D. 574, Test Number 2664.
Motor: Electro Dynamic Works D-225 Frame, 2 H.P. 1750 RPM, 230 Volts, S.O. 20-D-8235, DP 40°C. Continuous, 8 Amps, Shunt Stab. Winding, Serial Number 71494 - 71493.

FEED WATER HEATERS

1st Stage: Davis Engineering Company, 6N-97D, 18533 S.D., 50 lbs., Shell Test, 150 lbs. Tube Test.

Direct Contact: 2 Each, Worthington, 75, 580 lbs. per hour Size, 50 lbs. Shell Test, T.H.C. B.M.I.N., Feed Water Heater Vent Condenser, Serial Number 997557.

DIESEL GENERATOR SETS

2 — General Motors Model 8-268A, 450 HP at 1200 RPM, Direct Connected to 290 KW, 525 BHP, Serial Number 50393 and 7249.
Directed Connected To:
1 — 290 KW General Electric Generator, 120/240 Volts DC, 1200 RPM, Type CDM, Model 1647Y, Serial Number 1862418.
1 — 290 KW Westinghouse Electric Generator, Frame DP 810.6, Serial Number 7-S-22-9-780, 120/240 Volts DC, 1200 RPM.

AIR CONDITIONING EQUIPMENT

Compressors: 8 Each, Carrier Corp., 7G8-250EF Model, S.O. Number 7G8 444. Approximately 25 Ton.

Motors: Electro Dynamic Works, Form 7½S, Compound Wound, 18/25 HP, 1225/1750 RPM, 67-97 Amps, 230 Volts DC, 50 C. Duty Cont., Serial Number 54402 - 54422.

AIR COMPRESSOR

Worthington, Model V3A2, 66CFM at 110 PSI, 500 RPM, 6x6x5 with 16 HP Electro Dynamic Motor, 230 Volts DC, 1750 RPM, Compound Wound.

DECK MACHINERY

Winches — 8 Each: Model U6A, American Hoist & Derrick Co., 3720 lbs. Pull at 287 ft. per minute.
Motors: Model U6, General Electric, 50 HP, Compound Wound, 230 Volts DC, 183 Amps, 525 RPM, 1900 RPM, Model Number-26B737 - 16N710.

Winches — 2 Each: Model "Uniwinch" U3H, American Hoist & Derrick Co., 3720 lbs. Pull at 289 ft. per minute.
Motors: Same as above.

Winches — 2 Each: Model Two Speed, 50 Ton, McKiernan-Terry Corp.
Motors: Same as above.

Winches — 2 Each: Ten Ton Type, Model 75M, American Hoist & Derrick Co., 3720 lbs. Pull at 287 ft. per minute.
Motors: Same as above.

Winches — 2 Each: 50 H.P. Tow Speed, Cargo Handling Winch, Vulcan Iron Works (Hyde Windlass Co.), 7500 lbs. Pull at 185 ft. per minute.
Motors: Same as above.

Anchor Windlass: Mfr. McKirnan-Terry, two 16,000 lbs. Anchor depth at 30 FPM. Motor G.E. 70 HP 230 volt D.C. 600 RPM.

Warping Capstan: Mfr. McKirnan-Terry, 30 FPM line pull 20,000#. Motor G.E. 34 HP 230 volt D.C. 600 RPM.

M.G. SETS

NEW JANETTE 1 KVA SETS

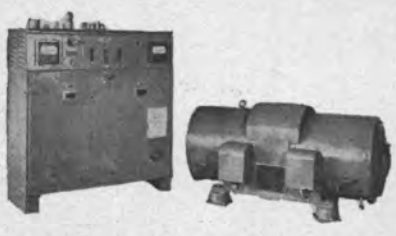
2-Bearing Sets—type D.E.—3L. MOTOR INPUT: 2 HP—115 volts DC—3.5 amps—1800 RPM. OUTPUT: type C.E.I.—120 volts 60 cycle single phase. 8.3 amps—40°C Temp rise—0.8 P.F.

$179.50

1.24 KW G.E. MG SETS

G.E. Motor—3 HP—115 volts DC—1800 RPM. OUTPUT: G.E. generator—1.24 KW—1.56 KVA—120/60/1—0.8 PF—14.2 amps—1800 RPM. With spare armature. Overspeed trip on motor side.

$339.50



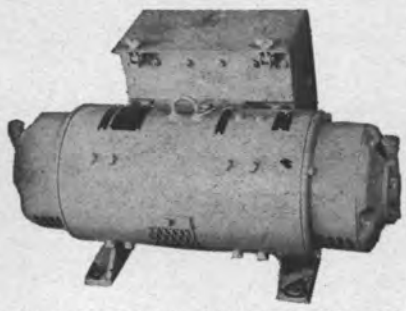
25 KW IDEAL M.G. SETS

INPUT: 40 HP—115 volts DC—290 amps—1800 RPM—frame 445. OUTPUT: Generator 31.5 KVA—25KW—440/3/60—1800 RPM. Control cabinet includes motor starter & generator control.

UNUSED SURPLUS 1 KVA SETS

INPUT: 1.75 HP—115 Volts DC—17 amps—1800 RPM. OUTPUT: 1 KVA—115 volts—8.7 amps—60 cycle single phase—0.9 PF. Unit is self-excited and will carry load immediately on starting. Regulation ±5%. Complete with magnetic starter & spare parts. Units designed and built to rigid Navy specs. SIZE: 19.5" long—26.5" wide—16" high. Weight 285 lbs. SPARES: 85 lbs. CONTROL: 20"X15"X10"—75 lbs.

$189.50



NEW 0.5 KVA HERTNER SETS

Type CHT-211761. INPUT: Motor 115 volts DC—9.0 amps—1800 RPM—1 HP. OUTPUT: 0.5 KVA—115 volts single phase 60 cycle—4.3 amps—.85 PF.

$127.50

CONTINENTAL: 3.7 KW—Input: 7½ HP 230 volts DC/28 amps/1800 RPM. Type D-324X—continuous. Output: Generator type DS-324XB 3.7 KW/7.5 KVA/120/1/60—62.5 amps—0.5 PF compound wound.

THE BOSTON METALS COMPANY

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

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

CARRIER REFRIGERATION UNITS

40-Ton Air Conditioning & Cargo Refrigeration Units

Carrier compressor—model 7G8-EF—freon compressor with manual cylinder cut-out—426 RPM—39.4 tons—suction temp. 45°F—cond. temp.—105°F—35 HP—230 volt DC motor. Complete with motor control—refrigeration condenser—receiver — fittings. 8 Complete units. Dimensions: Compressor 6'8½" long—4' 10½" OAW—approx. 6' high over suction connection. Condenser about 14' long—approx. 12" diameter. Just removed from Grace Line vessels. Excellent for fishing industry, banana boats, air-conditioning quarters, etc.

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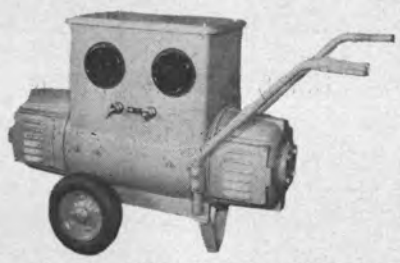
FACTORY-NEW

200 AMP WELDERS



Motor: 10 HP—230 volts DC—2800 RPM. 200 amps max. continuous welding. Range regulation 15/200 amps. Dimensions: 38" X 30" X 20". Weight: 514 lbs. Shipping case—48" X 35" X 25". Complete with 100 ft. welding cable—ground clamp & electrode holder. Built to Lloyd's—Register BS 638—1954.

$1175 EACH

ASK FOR FLEET PRICE

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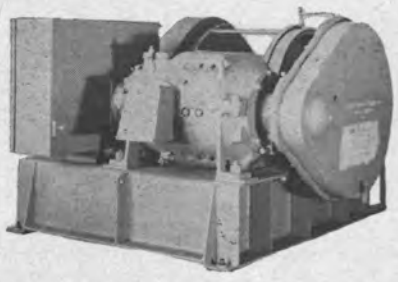
AH & D CARGO WINCH



American Hoist & Derrick—single speed—single drum—all steel cargo winches. 7250 lbs @ 220 FPM based on first layer of ¾" rope. Drum 18" diameter—20" wire. G. E. Motor—50 HP—230 volts—600 RPM. Excellent condition. Priced with controls.

ALL REBUILT BY USMC

$1950 EACH

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NEW BERGER

Self-Aligning

MARINE FAIRLEADS

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

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NEW-UNUSED LIBERTY SHIP

Troy-Enberg 20 KW Generators

WHILE THEY LAST

$695 CLOSE OUT PRICE

Factory Packages

120 volts DC—400 RPM—drip-proof marine type. 2-Wire direct connected set. Reciprocating 6 x 7 type E vertical self-oiling steam engine—plug & piston valve—220 lbs PSI—80 lbs. BP.

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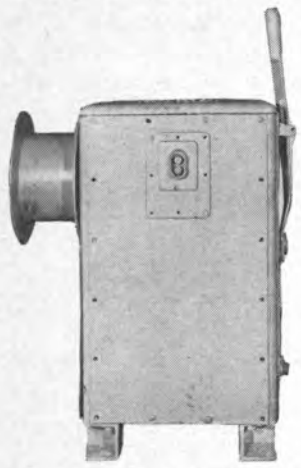
OCEANOGRAPHIC TYPE WINCH



Designed for use with Bathythermograph—Submarine Signal Co.—type E/2/S—without cables—single speed 300 lb. pull @ 360 FPM—single drum 9" X 6¾"—with 14⅞" flanges—clutch controlled with pawl & ratchet. Designed for use with 1200 ft. of ⅛" stainless cable. Motor: 3 HP—440/3/60—1700 RPM—intermittent. 5 Availabe—Navy surplus—show little use.

$349.50 EACH

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DUPLEX STRAINERS

in good condition

4" $349.00
22" x 3" between mounting holes

2" $249.00
15" x 3" between mounting holes

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DIESEL PROPULSION UNITS

MURRAY & TREGURTHA

HARBORMASTER

3 Model 0-7 units in stock. Powered by twin GM 6-71 diesels with hydraulic clutch & electric steering. Propeller diam. 64" pitch 48". Tailfin raised & lowered mechanically. 7' from bottom of unit to propeller hub center. Weight about 20,000 lbs. Propeller speed 308 RPM. Unit can develop up to 500 HP. Formerly used on Cargill Grain Co. barge "Carpolis". Actual photo on request. Can be demonstrated running in shop.

1—0-6 Series — Single engine — GM 6-71. Hydraulic controls—electric steering. PROPELLER: Maximum RPM 308—64" diameter—48" pitch. Deck to centerline of propeller 7½'.

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VERTICAL BOILER

Suitable for

Pile Drivers
Steam Cranes
Hoists

etc.

100 HP @ 100 PSI. Water heating surface 747 sq. ft. — total heating surface 1144 sq. ft. A.S.M.E. Built by International Boiler Works—East Stroudsburg, Pa. Height to top of cylinder 12' 0"—diameter 66"—4" main steam line—2 1½" safety valves—practically new—very little if any use. Oil burning. Boiler stamped Mass.—Standard—100#—5290—National Board No. 6395.

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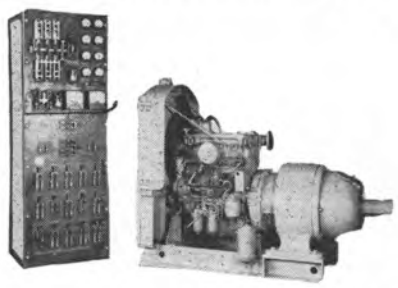
15 KW DIESEL GENERATOR SET



Hercules DOCC 4" X 4½" diesel engine. Generator: Fidelity Electric — LCD3 — 15 KW — 120/240 Volts DC—62.5 amps. With switchboard and automatic transfer switch. From C2-S-AJ2—North Carolina built. Good operating condition.

$1450

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New Watertight Doors

FOR IMMEDIATE DELIVERY

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

SIZES:
26" x 48"
26" x 57"
26" x 60"
26" x 66"
30" x 60"

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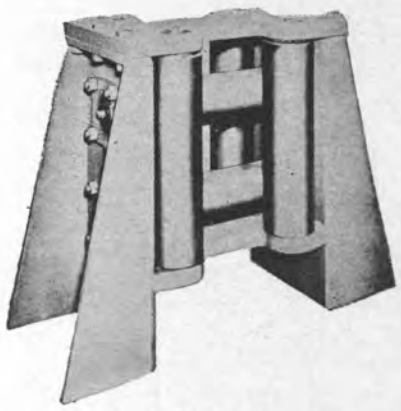
NEW 7" RADIUS PANAMA CHOCKS

(Meet Panama Regulations)

With Extended Legs For Welding To Deck

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

IMMEDIATE DELIVERY FROM STOCK



NEW UNIVERSAL CHOCKS

6 Rollers—2 horizontal and 4 vertical. For fairleads in all directions — inboard and outboard. Strong construction—easy to maintain. Fulfills all requirements of St. Lawrence Seaway, etc. Excellent for container chips. 5½" Rollers for vessels up to 20,000 tons. For vessels from 20,000 to 150,000 tons, series L with 7⅝" rollers. OAH 30"—OAL 30"—OAW 17".

BULWARK-MOUNTED CHOCKS

for curved or flat plate

7" RADIUS—14" x 10" opening

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Griffith Marine Electronics, Inc., 79 Fourth Street, New Rochelle, N. Y. 10801
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
RF Communications, Inc., 1680 University Ave., Rochester, N.Y. 14610
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

MARINE EQUIPMENT
Beaver Tool & Machine Co., P.O. Box 94717, 525 S.E. 29th St., Oklahoma City, Okla. 73109
Brazos Engineering, a div. of Metallic Bldg. Co., 4625 Holmes Road, Box 14240, Houston, Texas 77021
Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
H & H Engineering Co., 430 So. Navajo, Denver, Colo. 80223
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Kearfott Marine (Div. of The Singer Co.) 21 West St., New York, N.Y. 10006
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
Vokes Filter Div. (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221
Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029

MARINE FURNITURE
Bailey Joiner Co., 115 King Street, Brooklyn, N.Y. 11231

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

MARINE PROPULSION
The Buehler Corp., 9000 Precision Drive, Indianapolis, Ind. 46236
Combustion Engineering, Inc., Windsor, Connecticut 06095
De Laval Turbine, Inc., 853 Nottingham Way, Trenton, N.J. 08602
Foster Wheeler Corp., 666 Fifth Ave., New York, N.Y. 10019
General Electric Co., Schenectady, N.Y. 12305
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York 10014
Stal-Laval, Inc., 147 E. 50th St., New York, N.Y. 10022
Western Gear Corp., Precision Products Div., P.O. Box 190, Lynwood, Calif. 90262

MARINE RADIO COMMUNICATIONS EQUIPMENT
Collins Radio Co., M/S 416-118, Dallas, Texas 75207
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Motorola Communications & Electronics, Inc., 4935 W. LeMoyne Ave., Chicago, Ill. 60651
RF Communications, Inc., 1680 University Ave., Rochester, N.Y. 14610
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101

NAVAL ARCHITECTS AND MARINE ENGINEERS
BG Marine Services, Div. of Genge Industries, Inc., 4419 Van Nuys Blvd., Sherman Oaks, Calif. 91403
Coast Engineering Co., 711 West 21 St., Norfolk, Va. 23517
Commercial Radio Sound Corp., 652 First Avenue, N.Y., N.Y. 10016
Consultec, 1725 K St., N.W., Washington, D.C. 20036
Crandall Dry Dock Engineers, Inc., 238 Main St., Cambridge 42, Mass.
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
Morris Guralnick, Associates, Inc., 74 New Montgomery St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
L. K. Homyer, Box 408, Corona Del Mar, California 92625
James S. Krogen, 1460 Brickell Ave., Miami, Fla. 33131
Littleton Research and Engineering Corp., 95 Russell Street, Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Applications Co., Inc., P.O. Box 167, Mineola, N.Y. 11502
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 1180 Ave. of Americas, N.Y., N.Y. 10036
Rudolph F. Matzer & Associates, Route 1 - Box 314 D, Jacksonville, Fla. 32211
John J. McMullen Associates, Inc., 17 Battery Pl., New York, N.Y.
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Gunnar Nelson, 2185 Lemoine Ave., Ft. Lee, N.J. 07024
Pearlson Engineering Co., Inc., 2825 Oak Ave., Miami, Florida 33133
Research & Design Corp., 17 Battery Place, Suite 1227 New York, N.Y. 10004
Philip L. Rhodes, 369 Lexington Ave., New York, N.Y. 10017
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 45 Second St., San Francisco, Calif.
Sanders & Thomas, Inc., 1st-Federal Bldg., Pottstown, Pa. 19464
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
George Slifer, 1422 Lakewood Rd., Jacksonville, Fla. 32207
Philip F. Spaulding & Associates, 65 Marion St., Seattle, Wash. 98104
R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
Transcaribbean Shipping & Trading Corp., Panam Docks, Isle Grande, P.O. Box 564, San Juan, P.R. 00902
H. Newton Whittelsey, Inc., 17 Battery Pl., New York, N.Y. 10004

OIL & POLLUTANT DISPOSAL
Spentonbush Fuel Transport Service, 500 Fifth Ave., N.Y. 10036
OIL PURIFIERS—Repair
Norse Electric Mfg. Co., Inc., 57-59 Commerce St., Bklyn, N.Y. 11230
OILS—Marine—Additives
Esso International Inc., Esso Bldg., 15 West 51 St., New York, N.Y.
Gulf Oil Trading Co., 1290 Ave. of the Americas, New York, N.Y.
Mobil Oil Co., Inc., 26 Broadway, New York, N.Y. 10004
Refineria Panama, S. A., 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., 50 W. 50 St., New York 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017
PAINT—Marine—Protective Coatings
Amercoat Corp., 201 N. Berry St., Brea, Calif. 92621
Devoe & Raynolds Co., Inc., Marine Division, Newark, N.J. 07105
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
International Paint Co., 21 West St., New York, N.Y. 10006
Mobil Chemical Company, Metuchen, N.J. 08840
PETROLEUM SUPPLIES
Independent Petroleum Supply Co., 277 Park Ave., New York 10017
Refineria Panama, S. A. 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., W. 50 St., New York 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017
The West Indies Oil Co., Ltd. St. John's, Antigua, W. I.
PLASTICS—Marine Applications
Atlas Minerals & Chemical Div., ESB, Inc., Mertztown, Pa. 19539
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231
Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936
POLLUTION CONTROL
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
Tretolite Div., Petrolite Corp., 369 Marshall Ave., St. Louis, Mo. 63119.
PROPELLERS—New and Reconditioned
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Baldwin-Lima-Hamilton Corp., Phila., Pa. 19142
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Bird-Johnson Co., 883 Main Street, Walpole, Mass. 02081
Escher Wyss, G.M.B.H., 798 Ravensburg, Germany
PUMPS
Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City. Kansas 66110
De Laval Turbine, Inc., 853 Nottingham Way, Trenton, N.J. 08602
RATCHETS
American Forge & Mfg. Co., McKees Rocks, Pa. 15136
W. W. Patterson Co., 830 Broket St., Pittsburgh, Pa. 15233
REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Frigitemp Corp., 329 Herzl St., Brooklyn, N.Y. 11212
Thermo King Corp., 314 W. 90 Street, Minneapolis, Minn. 55420
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., Auburn, N.Y. 13022
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604
Plymouth Cordage Company, Plymouth, Mass. 02364
Tubbs Cordage Company, 200 Bush St., San Francisco, Calif.
Wall Rope Works, Inc., Beverly, N. J. 08010
RUBBER PRODUCTS—Dock Fenders, Hose, Life Preservers
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
RUDDER ANGLE INDICATORS
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
SEALS
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
Syntron, a division of FMC Corp., 398 Lexington Ave., Homer City, Pa. 15748
SEARCHLIGHTS
Portable Light Co., Inc., 67 Passaic Ave., Kearny, N.J. 07032
Snelson Oilfield Lighting Co., 1201 E. Daggett St., Forth Worth, Texas 76104
SEWAGE DISPOSAL
Youngstown Welding & Engineering Co., 3708 Oakwood Ave., Youngstown, Ohio 44509
SHIPBREAKING—Salvage
The Boston Metals Co., 313 E. Baltimore, Md. 21202
National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731
Northern Metal Co., Minor & Bleigh Sts., Philadelphia, Pa. 19136
Peck Equipment Co., 3500 Elm Ave., Portsmouth, Va. 23704
Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201
SHIP BROKERS
Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119
SHIPBUILDING—Repairs, Maintenance, Drydocking
Albina Engine & Machine Works, 2100 N. Albina Ave., Portland, Ore. 97227
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Astilleros de Codiz, S.A., Zurhono 72, Madrid 10, Spain
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Barbour Boat Works, Inc., P.O. Box 1069, New Bern, N.C. 28560
Bender Ship Repair, Inc., 265 So. Water St., Mobile, Ala. 36602
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885
Brewer Dry Dock Co., Mariners Harbor, Staten Island, N.Y.
Ira S. Bushey & Sons, Inc., 764 Court St., Brooklyn, N.Y. 11231
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.
Equitable Equipment Co., Inc., 410 Camp St., New Orleans, La. 70130
Furness-Smiths Dock (Trinidad) Ltd., P.O. Box 893, Chaguaramas Dockyard, Port Chaguaramas, Trinidad, West Indies.
Gotaverken American Corp., 39 Broadway, New York 6, N.Y.
Groignard Shipyards, P.O. Box 829 Colbert, Marseilles, France.
Halifax Shipyards, Ltd., P.O. Box 640, Halifax, Nova Scotia, Canada
Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.
Hitachi Shipbuilding Co.,25 Nakanoshima2-chomeKitaku,Osaka-Japan
Ishikawajima-Harima Heavy Industries Co., Ltd., 50 Broad Street New York, N.Y. 10004
Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla.
Jeffboat, Inc., Jeffersonville, Ind. 47130
Kawasaki Dockyard Co., 8 Kaigan-dori, Ikuta-ku, Kobe, Japan
LISNAVE, P.O. Box 2138, Lisbon, Portugual
Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
Lone Star Marine Salvage Co., 7200 S. Harbor Drive, Houston, Texas 77001
Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047
Mitsui Shipbuilding & Eng. Co., Ltd., Nihonbashi-Muromachi, Chuo-ku, Tokyo, Japan
Nashville Bridge Co., P.O. Box 239, Nashville 1, Tenn.
National Steel & Shipbuilding Corp., San Diego 12, Cal.
Newport News Shipbuilding and Dry Dock Co., Newport News, Va.
Nippon Kokan Kabushiki Kaisha, 2, 1-chome, Otemachi, Chivoda-ku, Tokyo, Japan
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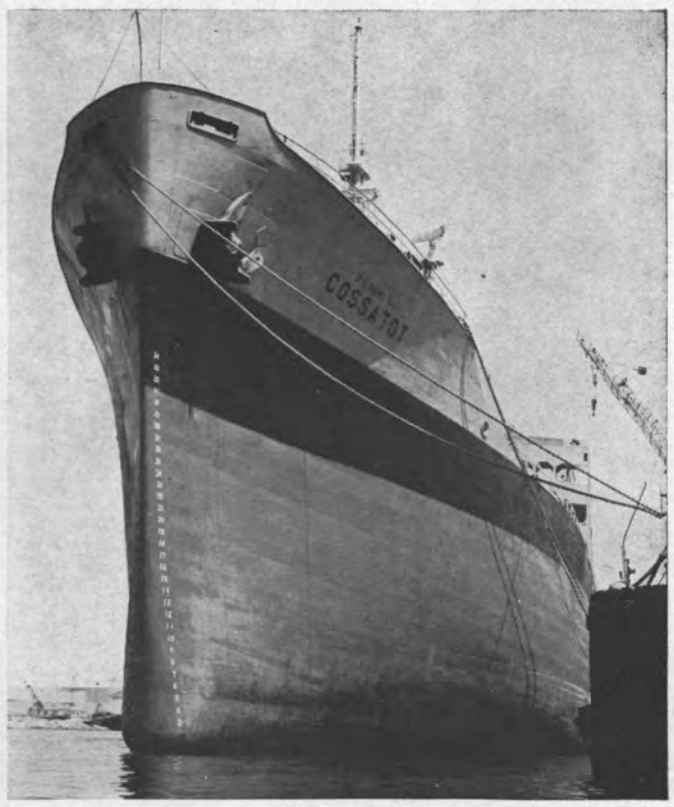
Pacific Coast Engineering Co., P.O. Drawer 6, Alameda, Calif. 94506
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J.
Puerto Rico Drydock and Marine Terminals, Inc., P.O. Box 2209, San Juan, Puerto Rico 00903
Rodermond Industries, Foot of Henderson St., Jersey City, N.J. 07302
L. Rodriquez Shipyard, 24 Molo Norimberga, Messina, Italy.
St. Louis Shipbuilding—Federal Barge, Inc.
611 East Marceau, St. Louis 11, Mo.
Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan
Tampa Ship Repair & Dry Dock Co., Inc., P.O. Box 1277, Tampa, Florida 33601
Terrin Agency, Inc., 17 Battery Place, New York, N.Y. 10004
Todd Shipyards Corp., 1 Broadway, New York City
Vare Corp., Equipment Systems Div., 516 Sylvan Ave., Englewood Cliffs, N.J. 07632
Vickers Ltd., 222 London Rd., St. Albans, Herts, England
Wiley Mfg. Co., Port Deposit, Md.
Wyatt Industries Inc., Port Houston Shipyard Div., P.O. Box 3052, Houston, Texas 77001
SHIP MODELS
Boucher-Lewis Precision Models, Inc., 36 E. 12 St., N.Y., N.Y. 10003
SHIP STABILIZERS
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 7 Dey Street, New York, N.Y. 10007
John J. McMullen Associates, Inc., 17 Battery Pl., N.Y., N.Y. 10004
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
STEAM GENERATING EQUIPMENT
Combustion Engineering, Inc., Windsor, Connecticut 06095
STEVEDORING
M. P. Howlett, Inc., 415 32nd St., Union City, N.J.
Luckenbach Steamship Co., 120 Wall St., New York 5, N.Y.
SWITCHBOARDS
Hose McCann Telephone Co., Inc., 524 23rd St., N.Y. 10011
SYNTHETICS
E. I. Dupont De Nemours & Co., Inc., Textile Fibers Dept., Wilmington, Delaware
TANK CONTAINERS
Fruehauf Trailer Div., Fruehauf Corp., 10940 Harper Ave., Detroit, Mich. 48232
TOWING—Lighterage, Transportations, Barge Chartering
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Curtis Bay Towing Co., Mercantile Bldg., Baltimore 2, Md.
G & H Towing Company, 509 Texas Building, Galveston, Texas 77550
Henry Gillen's Sons Lighterage, 140 Cedar St., New York, N.Y. 10006
James Hughes, Inc., 17 Battery Pl., New York, N.Y.
Jackson Marine Corp., P.O. Box 1087, Aransas Pass, Texas 78336
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y.
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
P. F. Martin, Inc., Mall Bldg., 325 Chestnut St., Philadelphia, Pa.
Moran Towing & Transportation Co., Inc., 17 Battery Place, N.Y.
Nickerson Marine Towing Co., 1670 Southeast 17th Street, Ft. Lauderdale, Fla. 33316
Red Star Towing & Transportation Co., 500 Fifth Ave., N.Y. 10036
L. Smit & Co., 11 Broadway, New York 4, N.Y.
Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002
M. & J. Tracy, Inc., 1 Broadway, New York, N.Y.
Turecamo Coastal and Harbor Towing Corp., 1752 Shore Parkway, Brooklyn, N.Y.
Vancouver Tug Boat Co., Ltd., 10 Pemberton Ave., No. Vancouver, B.C., Canada
VALVES AND FITTINGS—Hydraulic—Safety Flanges
Hooper Valve & Engineering Corp., 24th St. & Virginia Ave., Newport News, Va.
Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn 31, N.Y.
Hydrasearch Co., Inc., Riva Rd., Annapolis, Md. 21401
Kerotest Mfg., Corp., 2516 Liberty Ave., Pittsburgh, Pa. 15222
Marine Moisture Control Co., 39 Redfern Ave., Inwood 96, L.I., N.Y.
Mechanical Marine Company, 45-15 37th St., Long Island City, N.Y.
Todd Products, Div. of Todd Shipyards Corp., Halleck St., Brooklyn, N.Y. 11231
VAN CONTAINERS—Insulated, Refrigerated, General Commodity
Fruehauf Trailer Div., Fruehauf Corp., 10940 Harper Ave., Detroit 32, Mich.
WEATHER ROUTING
Weather Routing, Inc., 90 Broad St., New York 4, N.Y.
WIRE ROPE
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., Bethlehem, Pa. 18018
DiMattina Supply Co., 59-61 Seabring St., Brooklyn, N.Y. 11231
United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230
ZINC
Smith & McCrorken, 153 Franklin St., New York, N.Y. 10013



Bethlehem Yards Can Do ...and Quickly

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

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

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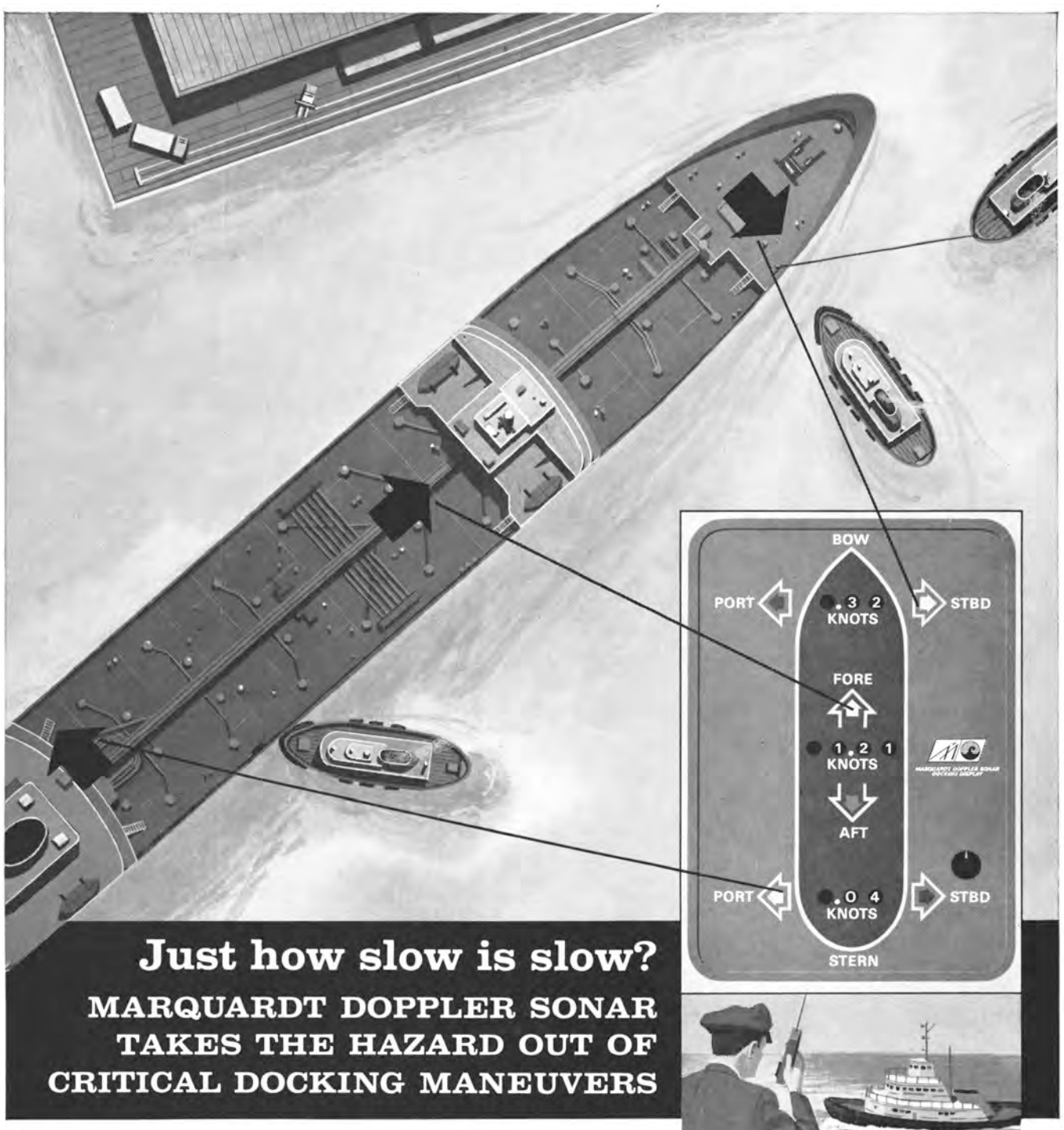

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