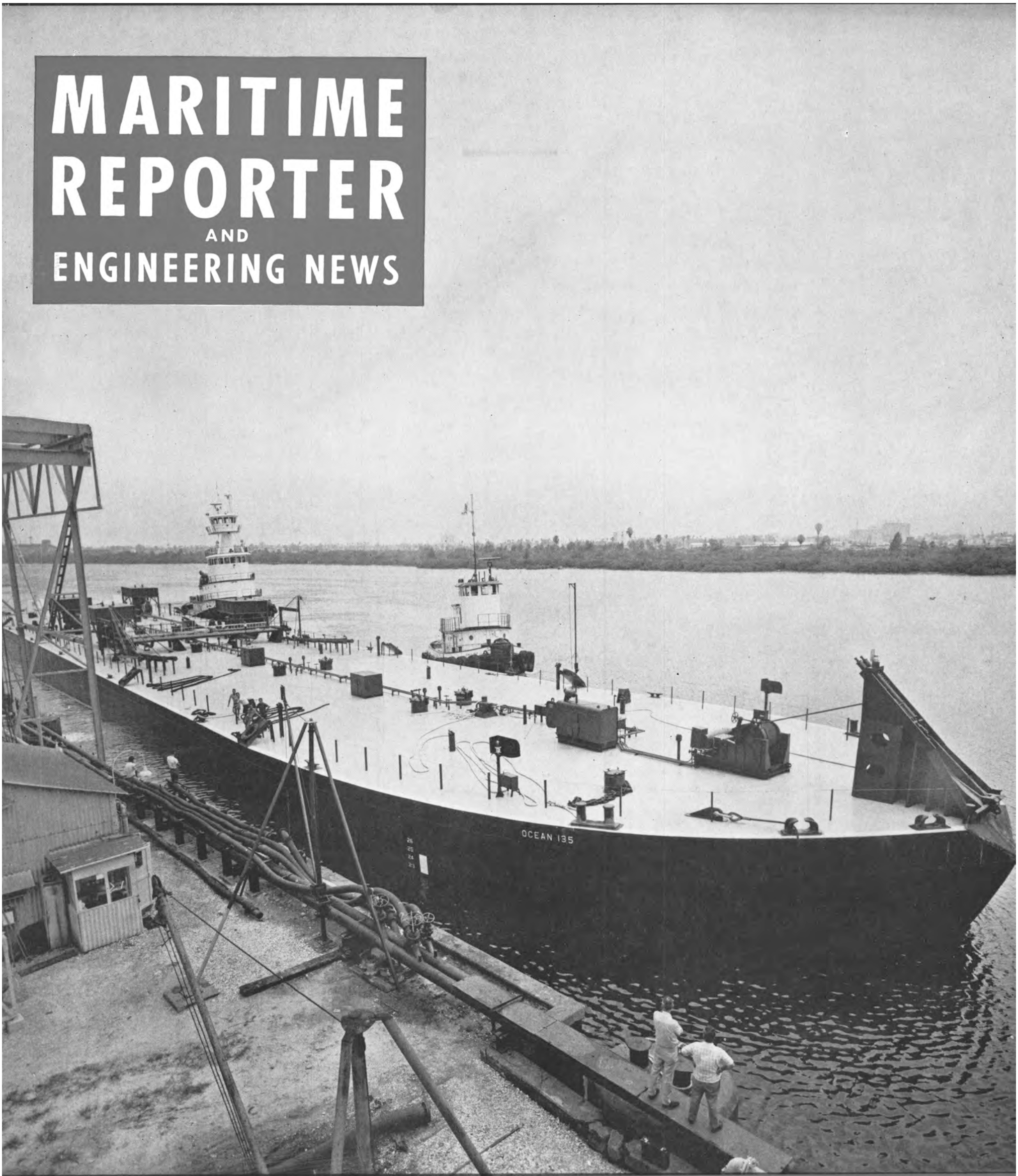
MARITIME REPORTER
AND
ENGINEERING NEWS



Cities Service Places 16,200-DWT Barge And Unique Tug In Trans-Gulf Service

(SEE PAGE 6)

JULY 15, 1969

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AMERICAN OWNS THE PATENT

on this modern construction.

***JETKORE**°* is composed of strands, each of which has a core of straight, untwisted polypropylene fibers that have been compressed into a homogenous mass. What has JETKORE to offer that other ropes do not? Just this . . .

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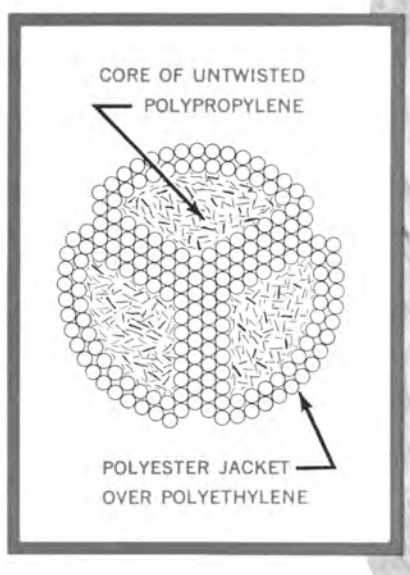
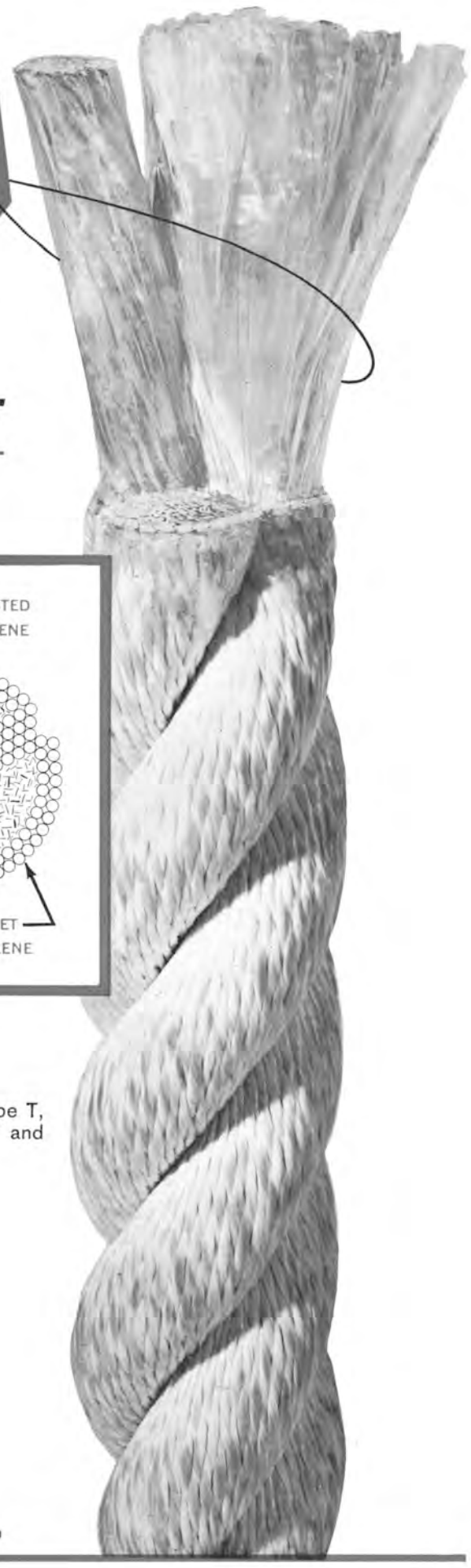
- LONGER LIFE because the core fibers are substantially parallel and do not cause internal nicking or "sawing action" when the rope moves during use.



° Pat. No. 3,380,243



JETKORE construction is available in ropes of SSR, PNX, PNX-Type T, polypropylene and MP (manila covered polypro) in 3 Strand (5″ and up) and 8 Strand Square Braided (6″ and up).

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Newport News Gets NSSC Contract For Ship-Conversion

Newport News Shipbuilding and Dry Dock Co., Newport News, Va., has received a $3,436,000 negotiated letter contract for the advance planning, design, and other preparatory work for the conversion of the USS Nathanael Greene (SSBN 636) to C-3 Poseidon missile capability. The contract (N00024-69-C-0231) was issued by the Naval Ship Systems Command.

Southern Ship To Build Two Twin-Screw Tugs

Southern Shipbuilding Corp., Slidell, La., is scheduled to build two twin-screw tugboats for Nolty J. Theriot, Inc., of Golden Meadow, La. Each tug will have dimensions of 105 feet 9 inches (BP) by 32 feet by 19 feet 8 inches, and will be equipped with 4,300-total-bhp diesels. They have been designated Hull Nos. 86 and 87.

Containership Report Issued By MarAd

The Maritime Administration has announced that copies of its report, "Containerships Under Construction and on Order (Including Conversions) in U.S. and Foreign Shipyards —Oceangoing Ships of 1,000 Gross Tons and Over, As of Dec. 31, 1968," are available from its Public Information Office. The office is located in the GAO Building at 441 G St., N.W., in Washington, D.C. Copies are also available at the Atlantic Coast District Office at 26 Federal Plaza in New York City.

NSSC Requests Bids For VC2 Conversion For Missile Tracking

Naval Ship Systems Command, Washington, D.C., has issued IFB N00024-69-B-0617 to various shipyards for the conversion of a VC2-S-APS troop transport to a T-AGM (FBM) missile tracking ship. The nine yards receiving the IFB are: The American Ship Building Co., Lorain, Ohio; Willamette Iron & Steel Co., Portland, Ore.; Bethlehem-Baltimore Yard; Boland Machine & Manufacturing Co., Inc., New Orleans, La.; National Steel & Shipbuilding Corp., San Diego., Calif.; Maryland Shipbuilding & Drydock Co., Baltimore, Md.; Northwest Marine Iron Works, Portland, Ore.; Avondale Shipyards, Inc., New Orleans, La., and Todd Shipyards Corp., New York.

MARITIME REPORTER AND ENGINEERING NEWS

No. 14 Volume 31

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

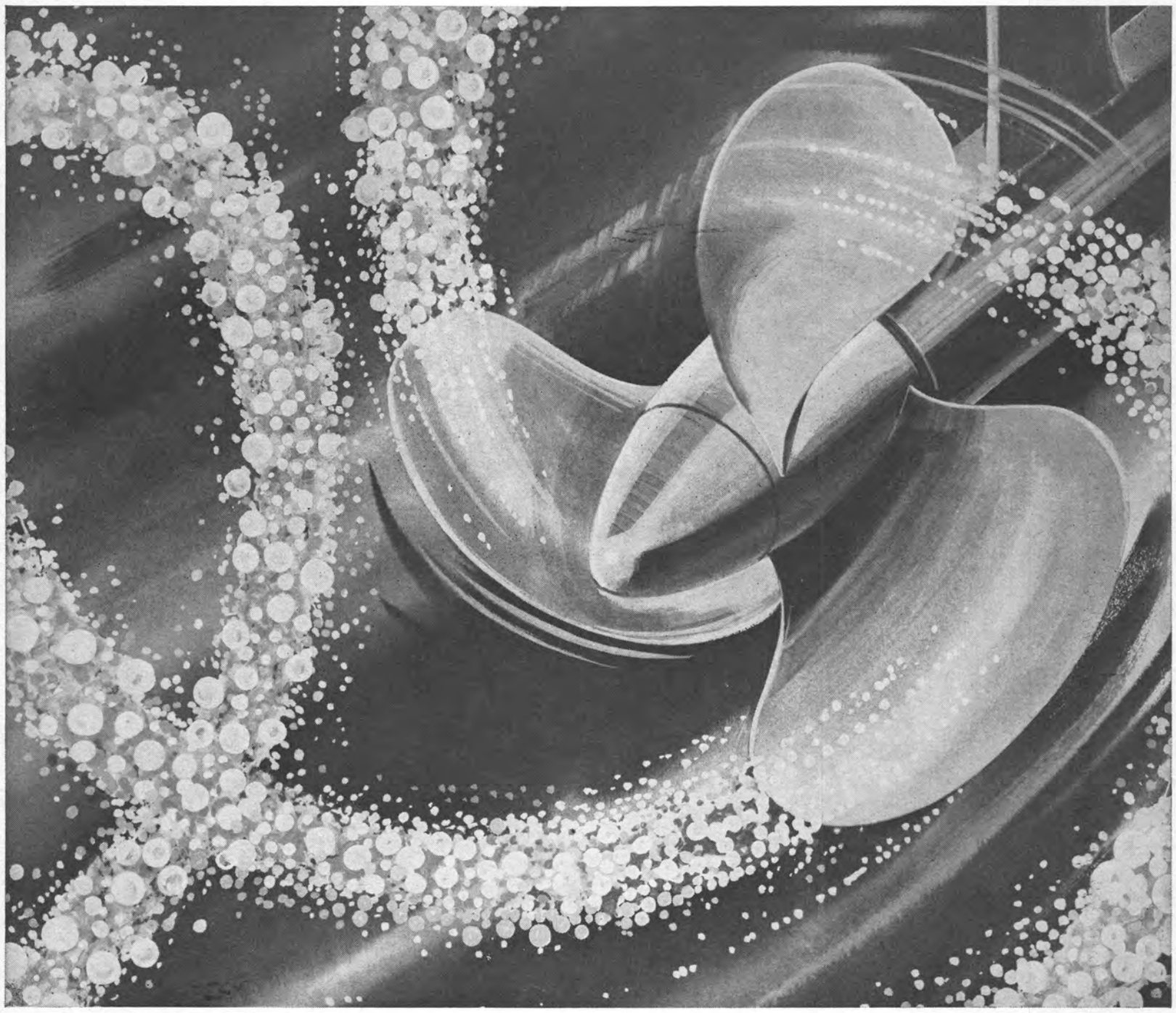
MUrray Hill 9-3266, 3267, 3268, 3269

ESTABLISHED 1939

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

Controlled Circulation postage paid at Hoboken, New Jersey 07030

Member BPA
Business Publications Audit of Circulation, Inc.



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Christening A Giant Team

Ocean 135 And Clipper

Tug Clipper features an elevated pilothouse—a unique installation on a seagoing tug.

In dual ceremonies held in Houston, Texas, the world's largest oceangoing petroleum barge and a 5,600-hp tug were christened. Immediately following the christening, the combination was placed in service by Cities Service Tankers Corporation transporting CITGO petroleum products across the Gulf of Mexico.

The barge, Ocean 135, was sponsored by **Mrs. Charles C. Conrad Jr.,** wife of the astronaut, Commander **Conrad,** USN. The tugboat, Clipper, was christened by **Mrs. Adrian S. Hooper,** wife of the president of Interstate Oil Transport Company of Philadelphia, Pa.

The barge and tug are owned by Interstate Oil Transport and are chartered to Cities Service. They will move approximately six-million barrels of petroleum products per year from Louisiana and Texas ports across the Gulf of Mexico to Tampa, Fla. The round trip will take seven to eight days. Cities Service Tankers Corporation is a subsidiary of Cities Service Company.

Ocean 135 is a 16,200-dwt barge with a capacity of approximately 135,000 barrels. The capacity is equal to that of a T-2 type tankship. The barge has an overall length of 435 feet, a width of 74 feet and a depth at side of 29½ feet.

The barge has six pairs of cargo tanks, a centerline bulkhead and four cargo pumps. Each cargo tank is approximately 60 feet in length. Each pump is rated at 6,000 barrels per hour. It is fully coated with epoxy material inside and outside.

Ocean 135 was designed by **George Drake** of New York. It was built by Gulfport Shipbuilding Company at Port Arthur, Texas.

The barge can be towed or pushed by the specially designed tug, Clipper. The barge has a deep-notched, V-shaped stern, 31 feet in depth. Approximately one-third of the hull of the tug will fit into the notch. Two adjustable skegs are located on the port and starboard sides of the stern of the barge. These can be trimmed to meet the best towing or pushing conditions. There is a remote, radio-controlled anchor-dropping mechanism operated from the pilothouse of the tug.

The tug Clipper is a 5,600-hp twin-screw vessel powered by two 16-cylinder General Motors diesel engines. It is 135 feet long and has a beam of 34½-feet.

The tug is equipped with an automatic pilot, gyro compass, loran offshore navigation system and two navigational radars. One is a short-range radar for harbor operations and the other is for long distances at sea. In addition to the standard marine radio systems, the tug has an FM system, bridge-to-bridge communication system and a single-side-band radio. The vessel is air-conditioned.

The tug was built by Main Iron Works at Houma, La. The propulsion system was designed by **Mathew Kawasaki** of New Orleans.

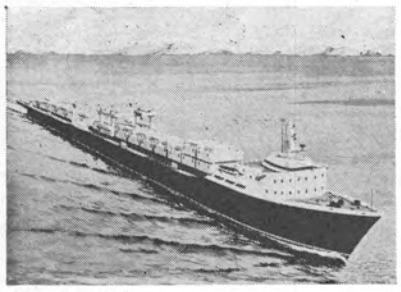
In addition to her regular pilothouse, Clipper is equipped with a unique elevated pilothouse located above the upper deck supported by a tapered, pylon-type structure. The upper pilothouse is fully equipped with all of the controls contained in the regular pilothouse. An internal elevator provides rapid weather-protected access to the upper pilothouse from the regular pilothouse. This is one of the first such installations on a seagoing tug. There is also an outside ladder.

The trans-Gulf service was initiated with the 13,650-dwt barge Ocean 115, which was launched in May, 1968, and at that time was the world's largest oceangoing barge for transporting refined petroleum products.

The barge Ocean 135 and the new tugboat Clipper will replace the Ocean 115 in cross-Gulf of Mexico service.

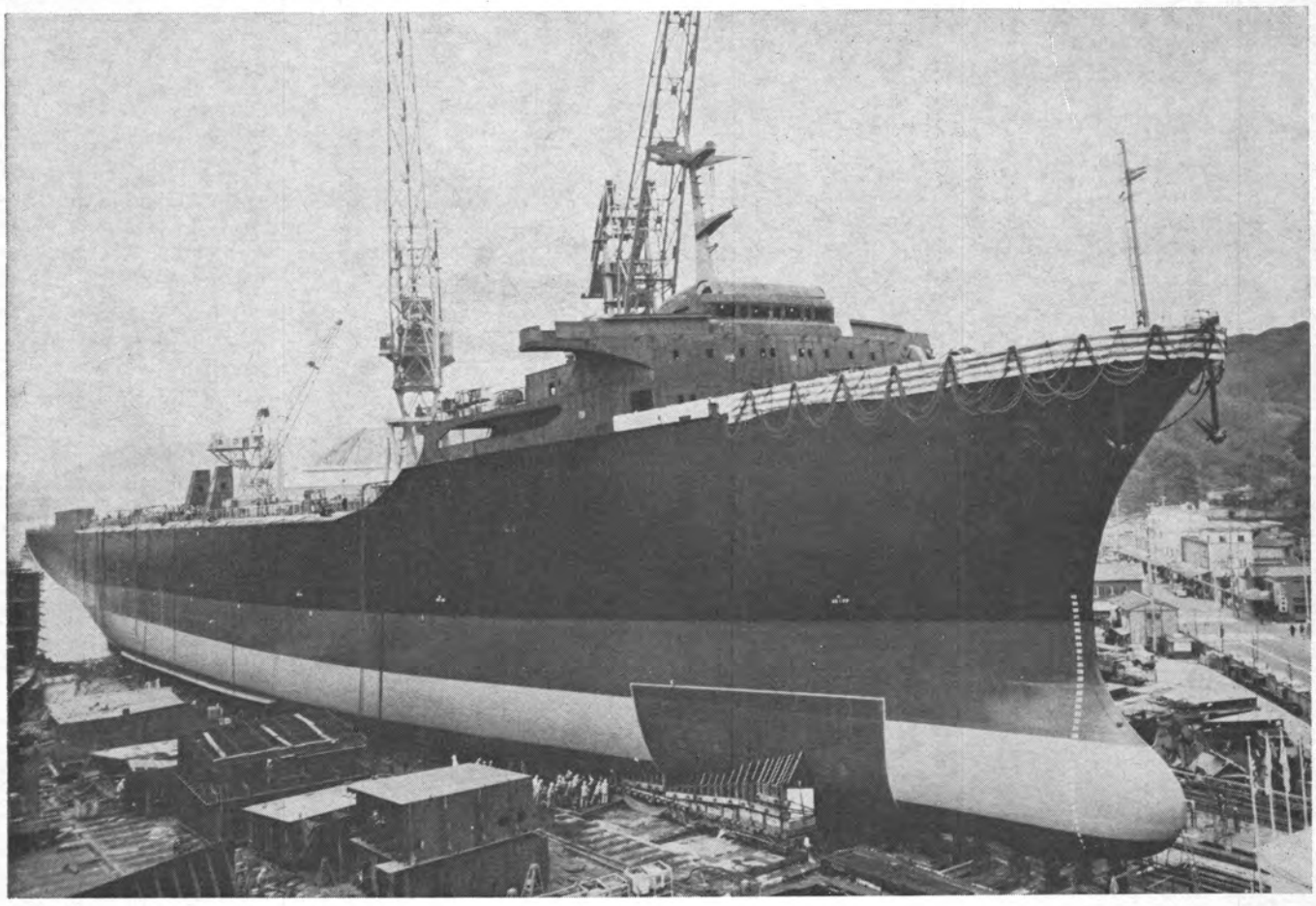

Ocean 135, reported to be the largest oceangoing petroleum barge, being breasted out from the pier on its first trip to Tampa, Fla. Tug Clipper is at the stern.

Mrs. Charles C. Conrad Jr., wife of astronaut Commander **Conrad,** christens the Ocean 135 in Houston, Texas. Commander **Conrad** (wearing sunglasses) looks on.



LASH

CONSTRUCTION PROGRESSES



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SNAME Honors Editor, Authors And Committee Of New Publication "Ship Design And Construction"

Authors, committee and guests at SNAME luncheon, left to right: (seated) **Arthur A. Holzbaur,** Capt. **Robert L. Evans,** USN (ret.), **William H. Hunley, George C. Steinman, Robert J. Tapscott, Raymond P. Devoluy, Daniel T. Mallett, Francis G. Ebel,** Capt. **Benjamin McCarty Jr.,** USCG; (standing) **John R. Blackeby, Robert G. Mende,** Prof. **Amelio M. D'Arcangelo, David B. Bannerman Jr., James J. Henry, Matthew G. Forrest,** Capt. **Edward S. Arentzen,** USN (ret.), **Davad Beges, Thomas M. Buermann,** Capt. **Leonard E. Penso,** USCG, **E. Scott Dillon, Harold G. Acker** and **Robert S. Little.**

The editor, authors, and control committee of The Society of Naval Architects and Marine Engineers' recently published book, "Ship Design and Construction," were honored recently at a ceremonial luncheon at the India House in New York City. **J. J. Henry,** SNAME president, officiated.

Following a reception and luncheon, Mr. **Henry** paid tribute to the editor, Professor **Amelio M. D'Arcangelo,** presenting him with a life membership certificate and a letter of appreciation. The following authors also received life membership certificates and letters of appreciation: **E. Scott Dillon, Robert J. Tapscott, Henry A. Schade, David B. Bannerman Jr., Robert S. Little, Thomas M. Buermann, Richard A. Pomfret, Arthur A. Holzbaur, D. Beges, D. T. Mallett, Donald F. MacNaught, William H. Hunley, E. A. Maier, A. E. Stanford, D'Arcy E. Phillips, John Wiley Jr., Leonard E. Penso, Raymond P. Devoluy, Harold G. Acker, Robert H. Macy, Edward S. Arentzen,** and **R. L. Evans.**

Next, Mr. **Henry** honored the following members of the control committee, presenting each with a letter of appreciation: Chairman **David B. Bannerman Jr., Edward S. Arentzen, Francis G. Ebel, A. Meredith Johnson, Roger G. Kline, J. Benjamin McCarty Jr., Frank L. Pavlik, Maurice L. Sellers, George C. Steinman,** and **Richard H. Suehrstedt.**

President **Henry** then conducted the book-signing ceremony at which all present received an autographed copy of the book.

Invited guests included: **John R. Blackeby,** chairman, public relations committee; **Matthew G. Forrest,** chairman, publications committee, and **Robert G. Mende,** secretary.

"Ship Design and Construction" reports the marine profession's unprecedented strides in the design and construction of merchant ships from 1955 to the present and may be ordered from the publisher, The Society of Naval Architects and Marine Engineers, 74 Trinity Place, New York, N.Y. 10006.

Contracts To Convert Eight U.S. Lines' Cargo Ships Awarded To Four Shipyards

The U.S. Lines Co. and the Maritime Subsidy Board have jointly awarded contracts totaling $66.6-million for conversion of eight U.S. Lines' cargo ships into containerized vessels.

The Alabama Drydock and Shipbuilding Company, with a bid of $16,511,820, was awarded work on two vessels. The contract calls for the first ship to be delivered in 360 days and the second in 420.

The bid of the Bethlehem Steel Corporation, Baltimore Yards, of $16,600,396 for conversion of two ships was accepted, with delivery of the first ship in 360 days and the second in 420.

The Norfolk Shipbuilding and Drydock Company of Norfolk, Va., was awarded a contract on its bid of $8,274,934 for conversion of one vessel, with delivery in 360 days.

Todd Shipyards Corporation received a contract totaling $25,524,000 for the conversion of the remaining three vessels. Two of the vessels will be converted at the Galveston, Texas yard, while the third will be assigned to its shipyard in Brooklyn, N.Y. Todd estimates that the conversion work will take approximately one year.

Overseas Shipping Promotes Magnuson

Overseas Shipping Co. of San Francisco has announced the appointment of **Herbert A. Magnuson Jr.** as vice-president.

ICHCA Re-Elects A. Johnson President—Four From U.S. Elected Council Members

Axel A. Johnson, head of one of the world's major shipping lines and its related group of maritime and related trade and industry firms, has been re-elected president of the International Cargo Handling Coordination Association (ICHCA). He will hold the post of leader of the ICHCA organization for another two-year term, following action by delegates at the group's 9th International Conference, Gothenburg, Sweden.

The delegate assembly also elected members and alternates to the ICHCA Council, which serves as the executive arm of the organization between conventions. A total of 49 council members and 42 alternates was elected.

They represent 19 nations throughout the world including the United States, which elected a total of eight officials. Four other council members from countries without national ICHCA committees were also elected.

Included in the U.S. contingent attending the conference and members of the council are: **R. P. Holubowicz,** of Litton Industries; **A. Theodore De Smedt,** of Isthmian Lines; **P. D. Ohl,** of Penn Central Co., and **J. P. Turner,** of the Port of Houston. The U.S. alternates on the executive committee are: **A. Lyle King,** of the Port of New York Authority; **A. Diamond,** of the Port of Chicago; **B. Nutter,** of the Port of Oakland Authority, and **B. Coughlin** of the Port of Los Angeles.

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Gilbride Advises Stockholders Todd Planning To Participate In Shipbuilding Resurgence

John T. Gilbride, president of Todd Shipyards Corporation, told the annual meeting of Todd stockholders that his company expects, "a long-lasting period of high activity and, we hope, of record profits." He predicted "great increases in volume." These, he said, would be based on the inevitable reconstruction of the U.S. Navy and merchant marine, the rapid advances of containerization, and the great need for American-flag tankers resulting from oil discoveries on the Alaskan North Slope.

The meeting was held at the Chase Manhattan Bank in downtown Manhattan. Stockholders approved a management proposal to increase to nine the number of directors, and elected **William B. Rand** as a new director. Mr. **Rand** is the former president of United States Lines and is now an independent shipping consultant. Re-elected as directors were **John H. Baker** and **Clifford A. Sheldrake,** Todd vice-presidents.

In referring to the company's record profits for the last fiscal year, Mr. **Gilbride** remarked that these could well be exceeded in the present year. He referred to a recent award of a $40-million containership conversion contract from Sea-Land Services, Inc., the nation's leading operator of containerships. This contract, he said, would involve the participation of five of the seven Todd yards. It follows an earlier Sea-Land contract of $25-million for similar work, and the combined contracts result in a great increase in the size of the Sea-Land fleet.

Mr. **Gilbride** spoke of the belief that very soon the beginning steps would be taken in the reconstruction of American sea power. He said such actions would result in great demands on the services of his company. Todd has already received many pressing inquiries calling for the construction of tankers and containerships.

The Todd Corporation is presently spending heavily for capital improvements, upgrading and modernization of all its yards. Mr. **Gilbride** said that the shipbuilding facilities at Todd's Los Angeles Division would be completely modernized in order to accommodate the construction of vessels much larger in size. On completion, this plant will be adequately geared to compete more effectively in the tanker, dry cargo, containership and Navy markets.

Todd's Galveston yard, according to Mr. **Gilbride,** is under consideration for expansion into the ship-construction field. The present Galveston yard specializes in conversion and repair work, but Mr. **Gilbride** said the company has the land available for further expansion at that location. He said the final decision on such a move would depend on the availability of substantial multiple-tanker construction orders which would justify such a facility. Mr. **Gilbride** told the audience that the first of the giant Todd-built 100,000-dwt dry docks would be installed at the company's San Francisco yard. It should be operational there by March of next year. A still larger dry dock is planned for the company's Galveston yard.

Halter Marine To Build Oil-Well Supply Boat

Halter Marine Fabricators, Inc., Moss Point, Miss., is to build an offshore oil-well supply boat for George Engine Co. Designated Hull No. 232, the vessel will have the following dimensions: 166 feet by 38 feet by 13 feet and will be equipped with 1,700-total-bhp diesels.

New President And Directors Named By Marine Exchange Of San Francisco

Newly elected president of the San Francisco Bay Region Marine Exchange, **Chr. L. "Chris" Blom,** admires with Maritime Queen **Evelyn Draper** the just-published "Golden Gate Atlas." Two years in development by the Exchange, the new "Atlas" provides 156 pages of facts, maps and photographs covering every phase of shipping, trade and related services and facilities of the Golden Gate harbor complex.

Five industry and regional leaders were named to the board of directors of the Marine Exchange of the San Francisco Bay Region last month.

Elected for three-year terms by the membership of the 120-year-old maritime service and development agency were: **Harmon Howard,** vice-president, Howard Terminal, Oakland; **John R. Page,** president, General Steamship Corp., Ltd.; **Norman Scott,** executive vice-president, Matson Navigation Co.; **Melvin Shore,** port director and chief engineer, Port of Sacramento, and **Joseph P. McBrien,** county administrator, Contra Costa County.

The directors-elect met later in June with other board members and Exchange President **Robert E. Mayer** to elect a new president and new officers for terms starting immediately.

Named as president to succeed Mr. **Mayer,** coast sales manager of Todd Shipyards Corp., was **Chr. L. "Chris" Blom,** 41-year veteran of shipping in the U.S. and president of Overseas Shipping Co. Headquartered in San Francisco and with offices at principal Pacific Coast ports, the firm was founded by Mr. **Blom** in 1952.

In accepting his new post, Mr. **Blom** said, "Need for change and new services was never greater in our shipping and water navigation-related industries. For over a century, the Marine Exchange has proven responsive to such challenges. Leadership has been given to cutting paperwork red tape, increasing harbor safety, improving maritime intelligence and assuring our channels are improved and maintained. A great deal has been accomplished by our membership and task forces—and we must maintain the pace if Golden Gate commerce is to continue to grow at its high rate."

As examples of the Exchange's promotional efforts, he cited its pending publication of the region's first "Golden Gate Atlas" and a new, expanded chart of Pacific Coast steamship stack insignia.

Also elected to direct the Exchange for the next 12 months were: first vice-president—**Edward L. Ransom,** partner, Lillick, McHose, Wheat, Adams & Charles, admiralty attorneys; second vice-president—**Ernest R. Senn,** executive vice-president, Grace Line, Inc.; third vice-president—**John R. Page,** president, General Steamship Corp., Ltd., and treasurer—**Rae F. Watts,** director of the Port of San Francisco. **Robert H. Langner** was re-elected executive secretary.

GE Aircraft Engine Group Forms Separate DD963 Propulsion System Operation

Robert L. Miles

Samuel J. Levine

General Electric Company's Aircraft Engine Group has announced that it is forming a DD963 Propulsion System Operation to focus GE attention and resources to the DD963 shipbuilding program.

Announcement of formation of the new operation was made by **Raymond E. Small,** GE vice-president and general manager of the Aircraft Engine Support and Service Division. **Robert L. Miles,** previously general manager of the Marine and Industrial Department, is the manager of the new operation. **Samuel J. Levine,** previously manager of the Aircraft Engine Group's Advanced Engineering and Technical Resources Operation, has been named general manager of the Marine and Industrial Department, which will continue its former objectives offering gas-turbine powerplants for marine and industrial applications.

The creation of two separate marine application entities within the Aircraft Engine Group is a result of the growing emphasis the group is placing on the use of aircraft-derived gas turbines for marine utilization. The DD963 Propulsion System Operation will act as the focal point for the all-GE integrated marine propulsion system for the U.S. Navy's DD963 (DX destroyer) program. Heart of this system is the Marine and Industrial Department's 25,000-hp class LM2500 gas turbine.

Mr. **Miles,** a graduate of Duke University, joined General Electric in 1956. In 1967 he was named general manager of Special Products Department. In 1968, when the Marine and Industrial Department was formed, he was named general manager.

Mr. **Levine,** general manager of the Marine and Industrial Department, is responsible for the marine and industrial applications of GE-built aircraft gas turbines. As manager of the Advanced Engineering and Technical Resources Operation, he was responsible for the engineering efforts applied to advanced engines and demonstrator programs for the Aircraft Engine Group.

Mr. **Levine** holds undergraduate and advanced degrees in electric engineering from the Massachusetts Institute of Technology. He joined the company in 1930 and was associated with the company's Air Conditioning Division and the Aircraft Nuclear Propulsion Department. In 1961, he was manager of marketing for the Marine and Industrial Operation. In 1962, he was named manager of engineering, Small Aircraft Engine Department in Lynn, Mass. He holds 10 patents.

First Chemical Barge For Lakes And Rivers Under Construction

With the first barge ever built for chemical service on both the Great Lakes and the Mississippi River, The Dow Chemical Company will start marine shipments of bulk liquid chemicals late this summer between Bay City, Mich., and the Gulf Coast.

The American Marine Corporation at New Orleans is building a 2,400-ton barge to hold both pressurized and non-pressurized liquid chemicals. It will be 260-feet long and 50-feet wide with a nine-foot depth.

Present barge systems necessitate the transfer of cargoes between river and Lake barges at Chicago. Barges now in service on the Great Lakes and Mississippi River are operated by different transportation companies, and river barges are not built to meet the additional requirements of Great Lakes service.

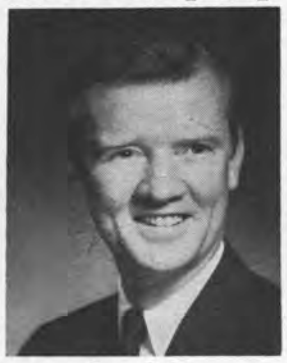
From Bay City the barge will transport chemicals to Freeport, Texas; Plaquemine, La., and Dow's Gulf Coast terminals for sale and for further processing. From Dow plants at Freeport and Plaquemine and from Dow's Gulf Coast suppliers, the barge will transport chemicals for sale and for further processing at the company's plants in Midland and Bay City and at Chicago terminals.

The barge also will provide for transhipment of chemicals between the West Coast and Bay City. At Gulf Coast ports, cargoes will be transferred to and from oceangoing ships for transport via the Panama Canal.

James M. Scovic, manager of Dow's Midland Division Services, said the start of river-Lake barge operations is part of a plan for increased use of water transportation. He said Dow also is shipping products between the East Coast and Bay City via the Great Lakes and the New York State Barge Canal.

In addition to expanded activity in domestic water transportation, the Midland Division expects to reach a new peak in overseas shipments of products to and from Bay City this summer.

Luckenbach Appoints Quinn General Mgr. Of Shaw Company



Don Quinn

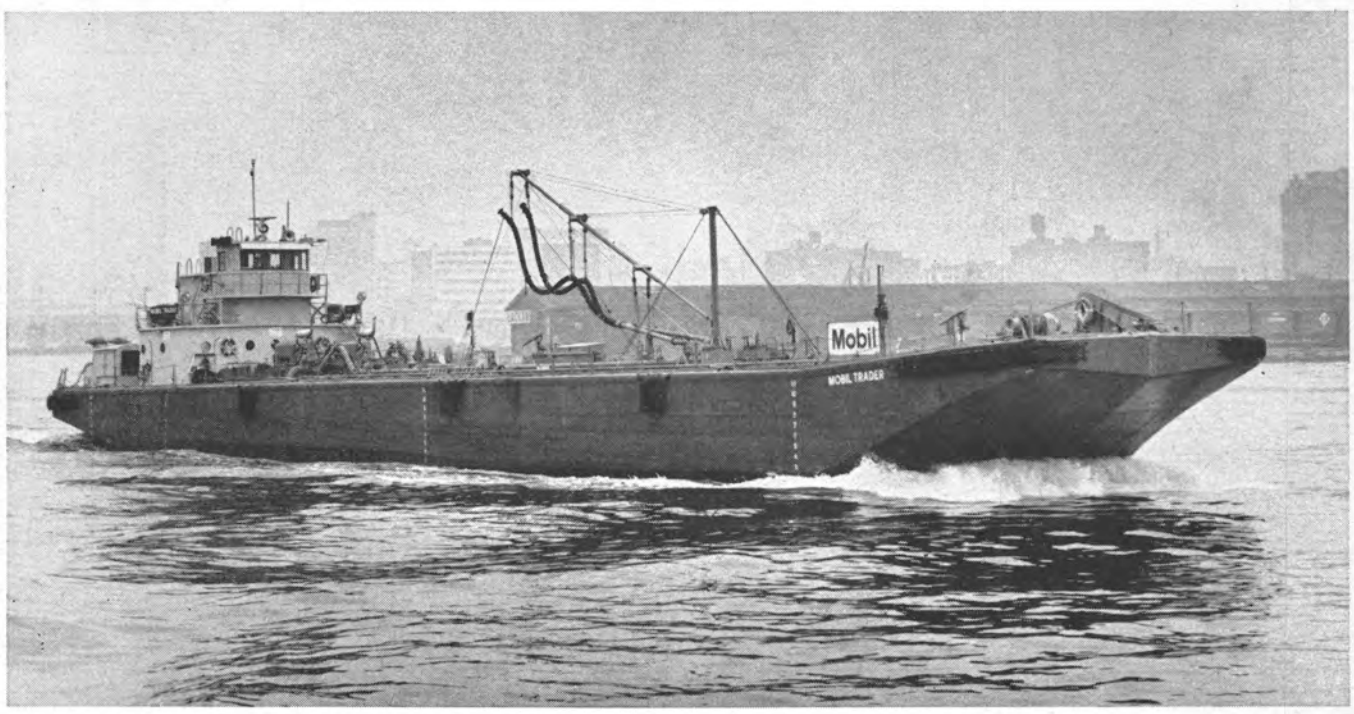
Luckenbach Steamship Co., Inc. has announced the appointment of **Don Quinn** as general manager of Shaw Company, a new division of Luckenbach doing business in the ports of Miami, Port Everglades, West Palm Beach and Port Canaveral.

Edgar F. Luckenbach Jr., president of the firm, stated that Mr. **Quinn** brings to the parent company a youthful vitality and mature judgment that will undoubtedly produce most beneficial results in the new Luckenbach endeavor. Mr. **Quinn** is a graduate of the United States Merchant Marine Academy and has served, since 1958, as vice-president of operations with the firm of Boise-Griffin Steamship Company, handling the operations of three major foreign-flag liner services.

Halter Marine To Build Twin-Screw Tug— Buys Lockport Plant

Halter Marine Services, Inc., Lockpart, La., has purchased the plant of Lockport Barge Line, also in Lockport. A twin-screw tug will be built at the latter plant for Tricomar S.A. of Maracaibo, Venezuela, having dimensions of 82 feet by 26 feet 6 inches by 12 feet 9 inches. Designed Hull No. 225, it will be equipped with 1,700-total-bhp diesel-propelling machinery.

M&T Harbormaster "On the Job"



The MOBIL TRADER is delivering faster service to customers in New York harbor. This new addition to Mobil's fleet is propelled by twin M&T Harbormaster units.

Marine Propulsion Modules

The new MOBIL TRADER is a unique self-propelled fuel tanker and bunkering barge that allows ships to make faster turnarounds in New York harbor. Equipped with twin M&T Harbormaster units, she is able to come alongside, tie-up and get the job done fast and, when the fuel is delivered, get away quickly.

This is but one of many "On the Job" examples of how M&T Harbormaster has helped to answer challenging power and steering problems. Heavy duty M&T Harbormaster units are available from 50 to 1500 h.p. with optional features.

If you have a project that involves marine propulsion, steering, maneuvering or dynamic positioning — M&T Harbormaster has a model to answer your need. If we don't, we'll build one!

Write for complete information.

The 210' x 35' x 12'6", 10,800 bbls capacity, MOBIL TRADER is powered with M&T Harbormaster 466 h.p. F-7 drives.

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Electric Boat Division Of General Dynamics Announces Staff Changes

Robert F. White, an 18-year employee at the Electric Boat division of General Dynamics, Groton, Conn., has been appointed design engineering manager at the division.

The announcement was made by **Edward J. Behney,** engineering director, who said that Mr. **White's** position is being established "to assure coordinated and continuous upgrading of the division's engineering excellence and stature."

Mr. **White** had been chief of marine equipment engineering since 1968 and was chief of mechanical engineering from 1957 to 1968. He joined the division in 1951. He is a graduate of the Massachusetts Institute of Technology and served with the U.S. Army Air Corps.

Mr. **Behney** also announced the appointment of **John R. Hunter** as manager of electrical engineering, succeeding **Jess W. Best,** who was named executive staff assistant to Mr. **White.**

Mr. **Hunter** joined Electric Boat division in 1949 after graduating from Worcester Polytechnic Institute. A Navy veteran, he was previously assistant manager of electrical engineering and held several other supervisory positions in the design and engineering departments.

Mr. **Best** has been with the company since 1955. He had been manager of electrical engineering since 1965 and chief electrical engineer from 1955 to 1965. He is a graduate of Ohio University.

Webb Awards Nine Degrees At 73rd Commencement

Webb Institute of Naval Architecture, Glen Cove, N.Y., held its 73rd Commencement Exercise on June 20 with **Andrew Gibson,** Maritime Administrator, U.S. Department of Commerce, as principal speaker.

Rear Adm. **William A. Brockett,** USN (ret.), president of Webb Institute, and formerly chief of the Navy's Bureau of Ships, presented bachelor of science degrees in naval architecture and marine engineering to the nine graduating members of the Class of 1969.

During the ceremonies, Rear Adm. **Helmer Pearson,** USCG, commissioned six of the men as ensigns in the United States Coast Guard Reserve. One other member of the class has been accepted as an officer candidate of the United States Navy; two will go into industry.

Following the academic procession, President **Brockett** recognized the members of the board of trustees and other honored guests. Among these were Webb graduates in the Golden Anniversary Class of 1919, **John C. Provoost** of Sea Cliff, N.Y., and Capt. **Edward M. Kent** of Seattle, Wash. In presenting **John L. Livingston,** chairman of the board, President **Brockett** noted his years of dedication to Webb Institute and to its interests and, in particular, expressed appreciation for the recently announced gift of $250,000 which Mr. **Livingston** has donated toward construction of Webb's new library.

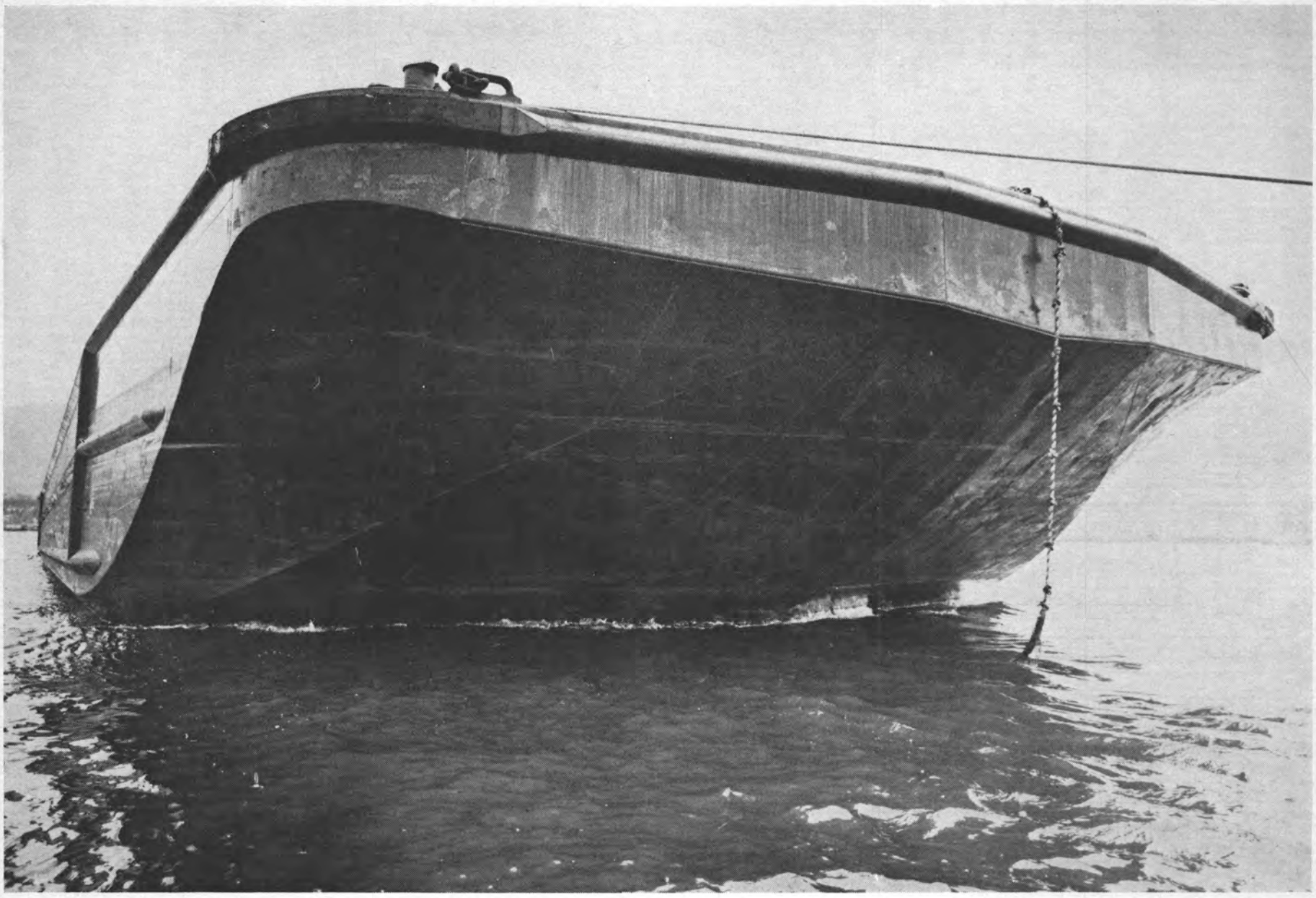
G. Chester Doubleday presented the honor awards to the Class of 1969 recipients.

A feature of the 1969 Commencement was the honoring of **Thomas Marshall Curran,** dean and professor of naval architecture at Webb, who retired on June 30 after being a member of the faculty for 40 years and dean of the college for the past ten years.

Mr. **Gibson** in the commencement address stressed the need for technological advances in marine transportation. He said, "In order to achieve a more effective shipbuilding capability, technological and managerial innovation must be accelerated throughout the industry with Government support and assistance where appropriate."

The maritime administrator advised the new naval architects that they can no longer be concerned only with the transportation vehicle. Naval architects and marine engineers, he said, must consider the investment and logistic problems, cargo flow, packaging, ship schedules, land transportation, shipbuilding methods and specialized manufacturing capabilities of outside industries. He told the graduates that the naval architect stands at the center of the whole system.

LYKES-YOUNGSTOWN CORPORATION is official. **George McCuskey** (left), vice-president-finance of Youngstown Sheet and Tube Company, Youngstown, and **Frank A. Nemec,** president of Lykes Corporation, New Orleans, at signing ceremonies, held recently in New York, consummating merger of the two companies into Lykes-Youngstown Corporation. The new corporation has assets of more than $1.3-billion.



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NSC Marine Section And AIMS Honor Safety Awards Winners

Principals at Safety Awards luncheon who were seated on the dais were, left to right: **Robert J. Blackwell,** deputy maritime administrator; Capt. **Jones F. Devlin Jr.,** maritime consultant; Capt. **Arthur M. Knight,** general chairman, Marine Section, National Safety Council; **James J. Reynolds,** president, American Institute of Merchant Shipping, and Adm. **Willard J. Smith,** U.S. Coast Guard.

Accepting awards for the United Fruit Company were, left to right: Capt. **Charles B. McAuley,** United Fruit vice-president; Capt. **G.F. Beal,** manager of marine operations for United Fruit; **E. Joseph Barr,** executive secretary, Brotherhood of Marine Officers; **R.W. Berry,** United Fruit senior vice-president, and **John M. Fox,** chairman of the board of United Fruit Company.

The Marine Section, National Safety Council, in conjunction with the American Institute of Merchant Shipping (AIMS), recently honored recipients of Safety Awards from the National Safety Council and the Jones F. Devlin Safety Awards sponsored by the American Institute of Merchant Shipping at a luncheon in the Gotham Room of the Downtown Athletic Club, New York City.

The National Safety Council Awards were presented by **Robert J. Blackwell,** deputy maritime administrator, and the Jones F. Devlin Safety Awards were presented by Adm. **Willard J. Smith,** commandant of the United States Coast Guard. **James J. Reynolds,** AIMS president, and Capt. **Arthur M. Knight,** general chairman, Marine Section NSC, presided at the luncheon ceremony.

NSC's 1968 Safety Contest winner in the oceangoing and coastwise dry-cargo and passenger vessel category was the United Fruit Company. In the ocean and coastwise tanker category, the first place winner was the Pure Oil Company. Canada Steamship Lines Limited was the winner in the Great Lakes self-unloader category and Buckeye Steamship Co., Cleveland, Ohio was the winner in the Great Lakes straight-deck vessel category. The Hanna Mining Company, also of Cleveland, is runnerup in the latter class. The NSC awards are given to the contestant having the lowest injury frequency rate at the conclusion of the contest year.

Recipients for the Great Lakes were, left to right: Captain **Knight; H.F. Byron,** superintendent of safety, Canada Steamship; **R.E. Kratzert,** manager, vessel personnel and services, Columbia Transportation; **J.W. Manning,** superintendent of operations, Hanna Mining; **J.L. Horton,** assistant manager, Marine Department, Cleveland Cliffs and vice-chairman, Marine Section, and Capt. **Devlin.**

The Devlin Awards, named for **Jones F. Devlin Jr.,** retired United States Lines' vice-president in charge of operations and leading U.S.-flag ship safety advocate for over half a century, are given to American vessels operating for two consecutive years without a lost-time crew accident. Higher honors go to vessels completing four accident-free years and special awards are presented for exceptional records which, at these ceremonies, extended to eight years. Those given special eight-year awards included the Great Lakes freighters Armco and Edmund Fitzgerald of the Columbia Transportation Division, Oglebay Norton Company and tanker Byron D. Benson of Getty Oil Company. Other winners of special awards (over four accident-free years) were United Fruit Company's freighter Yaque and Texaco, Inc.'s tankers Texaco Minnesota and Texaco Maryland.

There were eight U.S. companies with 29 ships winning Devlin awards. The company names and the number of awards presented to each of them were: Columbia Transportation (3); Getty Oil Company (1); Humble Oil & Refining Company (3); Lykes Bros. Steamship Co., Inc. (5); Mobil Oil Company (1); Texaco, Inc. (10); United Fruit Company (3), and United States Lines, Inc. (3). Total accident free operating time represented by the Devlin Awards conferred added up to 92 years.

Winners of a third award contest . . . the Ship Safety Achievement Awards, conferred on American-flag ships performing outstanding feats of safety in the course of a calendar year, co-sponsored by the American Institute of Merchant Shipping and the National Safety Council's Marine Section, will be announced and presented to the companies and the ships' crews in the near future, Captain **Knight** said.

Recipients of the Jones Devlin Award were, left to right: Capt. **Phillip Neal,** safety advisor, marine transportation, Mobil Company; Capt. **James K. Manry,** safety director, Texaco, Inc.; **Leland A. Smith,** general manager, Marine Department, Texaco, Inc.; **T.J. Fuson,** general manager, Marine Department, Humble Oil and Refining Company; **William J. Squicciarinia,** assistant vice-president, eastern area, Lykes Bros. Steamship Company; **William T. Morris Jr.,** vice-president, eastern area, Lykes Bros. Steamship Company; Capt. **Fritz Borner,** senior captain, Getty Oil Company, and **A.B. Randall Jr.,** safety officer, Marine Department, Humble Oil and Refining Company. Not shown in the picture are the recipients from Columbia Transportation, United Fruit Company, Pure Oil Company and U.S. Lines.

DOT Allocates Funds For N.Y. Ferryboats

The Department of Transportation in Washington has notified the City of New York that $13,382,000 in urban mass transit funds are being reserved to help build three 6,000-passenger ferryboats. New York City had requested federal aid in the construction of these ferries which would replace three smaller, 30-year-old boats on the Manhattan to Staten Island run.

The allocation of funds announced will pay about two-thirds of the $20.1-million estimated cost for designing and building the three ferryboats. The city would provide the remainder of the cost. It is anticipated that the first boat will be ready for service sometime in 1970.

Rucker To Design And Build Seabee Barge Control System For General Dynamics-Quincy

The Rucker Company has received a $4.9-million contract from General Dynamics Corporation to provide control systems for three supersized, oceangoing barge carriers being constructed for Lykes Bros. Steamship Company at General Dynamics' Quincy, Mass., shipyard, **Clarence J. Woodward,** chairman of Rucker, announced.

Rucker equipment will be used to operate the automatic barge loading equipment on the vessels, each of which will be capable of carrying 38 barges on its three decks. The barges can haul a total of 1,216 containers or 17,500 tons of cargo.

The barge carriers, known as Seabees, will be able to handle cargo ten times as rapidly as conventional break-bulk vessels, enabling them to reduce delivery time and to spend more time productively at sea. Seabees need not enter crowded inner ports and will help eliminate problems of port congestion as well as size-of-ship limitations on inland waterways, locks and canals.

The systems will be designed at Rucker's Controls Systems Division in Emeryville, Calif., and produced at the division's manufacturing facility in Berkeley, Calif. The first of the systems is scheduled for delivery next January.

The Rucker Company manufactures automated systems for materials handling, aerospace flight controls, undersea controls for the offshore petroleum industry, control components and electronic safety products.

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Pacific Northwest Section Holds Annual Meeting

Attending the Pacific Northwest Section's annual meeting were, left to right: **Ward Squires,** new chairman; **Glen Jurges,** SNAME scholarship award winner; Rear Adm. **W. S. Petrovic,** commander, Puget Sound Naval Shipyard; Comdr. **James Burgess,** author, and **Michael J. Markey,** retiring chairman.

The annual meeting of the Pacific Northwest Section of The Society of Naval Architects and Marine Engineers was held at the Puget Sound Naval Shipyard, Bremerton, Wash. **Ward Squires,** a supervisor with Todd Shipyards Seattle Division, was elected chairman for the 1969-70 season.

Prior to the meeting, a tour was given the members of the Keyport Naval Torpedo Station. A technical paper, entitled "Methods of Recovery of Sunken Torpedoes," was presented following the dinner at the Officers Club by Comdr. **James A. Burgess,** technical operations officer of the Keyport facility. Rear Adm. **William F. Petrovic,** commander of the Navy yard, spoke briefly to the members and welcomed them to the Naval Shipyard.

The newly elected officers were introduced and plaques in recognition of their services were given to the retiring officers.

Columbian Rope Promotes Executives

Promotions in the executive staff of Columbian Rope Company, Auburn, N. Y., have been announced by **Frank R. Metcalf,** president of the company.

Legare R. Hole has been named vice-president of the Cordage Division, with responsibility for all manufacturing and marketing of the division's products, which are produced in plants at Auburn, N. Y.; Plymouth, Mass.; Warwick, Va.; New Orleans, La., and Maspeth, N. Y. The Cordage Division manufactures rope and twine from various natural and synthetic fibers, as well as shipping bags, paper covered twine, and twisted paper filler cord from paper stock.

A director of Columbian Rope, Mr. **Hole** replaces **Spencer H. Brewster,** who is assuming responsibilities of executive vice-president, Faul-Coradi, Inc., of Skaneateles, N. Y., and Zurich, Switzerland. Mr. **Brewster** remains a vice-president and director of Columbian Rope.

Bartlett B. Bradley has assumed Mr. **Hole's** former position of vice-president of sales for the company's Cordage Division. He was formerly vice-president of sales for the Plymouth Division.

Mr. **Bradley's** previous duties have been absorbed by **James J. Greene,** who was sales manager for the Columbian and Fitler Divisions. His new position is general sales manager for all Cordage Division operations.

Mr. **Hole,** who joined Columbian Rope in 1945, spent several years in manufacturing operations and industrial relations prior to joining the sales staff in 1951. He was named vice-president of sales in 1957. A lieutenant commander in the Navy Reserve, he holds the Navy Cross, earned for service during World War II. A native of Auburn, he received a bachelor of science degree from Hamilton College.

Mr. **Bradley** joined Plymouth in 1931, and was named vice-president of sales for the division in 1951. He served as a lieutenant in the U. S. Navy during World War II. A native of Duxbury, Mass., he received a bachelor of arts degree from Dartmouth College.

Mr. **Greene** joined Columbian in 1941. He was named Fitler Division manager in 1958, and general sales manager for Columbian and Fitler in 1963. A native of Garden City, N. Y., he studied with the American Institute of Banking.

George G. Sharp Part Of Team To Study Canadian Shipping

The New York naval architectural and marine systems firm of George G. Sharp, Inc., has been retained as part of a team to conduct an economic feasibility study of a Canadian deep-sea merchant marine.

Donald C. Jamieson, Canadian minister of transport, made the announcement of the award of the contract in the House of Commons. The prime contractor is Hedlin-Menzies and Associates Limited of Winnipeg and Toronto. Technical support will be provided by Gibson Transportation Limited of Vancouver and Montreal, and George G. Sharp, Inc.

The main purpose of the study is to explore the range of possibilities for privately owned Canadian-flag shipping in the years ahead and to assess the cost and benefits attached to different possibilities.

D.F. Wierda Resigns From U.S. Lines

Dr. **John J. McMullen,** president of United States Lines, Inc., has announced that **D. F. Wierda Sr.,** vice-president-marketing, has for personal reasons, tendered his resignation.

In connection with this announcement, Dr. **McMullen** called attention to the fact that Mr. **Wierda** has been with the company for 23 years and he took note of his long and faithful service during this period. Dr. **McMullen** went on to express his very best wishes to Mr. **Wierda** for continued success in his future endeavors.

Mr. **Wierda** joined the United States Lines in 1946 in the post of operating manager in Belgium.

In 1952, he was named district manager for the Belgium, Netherlands, Luxemburg area, a post he held until he was recalled to this country in 1954 to serve as special assistant to the freight traffic manager.

In June of 1960, Mr. **Wierda** was elected a vice-president in charge of freight traffic and in 1963 he was elected a member of the board of directors of the company. In March of 1969, the board of directors of the company elected Mr. **Wierda** a senior vice-president of marketing and sales.

Mr. **Wierda** is a graduate of the University of California. He is a member of the Executive Committee of the New York Board of Trade; a life member of the National Defense Transportation Association; a member of the Traffic Advisory and Steamship Operation Committees of the Maritime Association of the Port of New York, and a member of the New York Produce Exchange, Foreign Commerce Club and the Manhasset Bay Yacht Club.

Shell Oil Sales Department Moves To New Headquarters

Shell Oil Company's marine sales department, offering bunkers and marine lubricants and greases, moved on July 1 from 50 West 50th Street to 640 Fifth Avenue, New York, N.Y. 10019. The office will handle sales and technical functions related to bunkers and marine lubricants.

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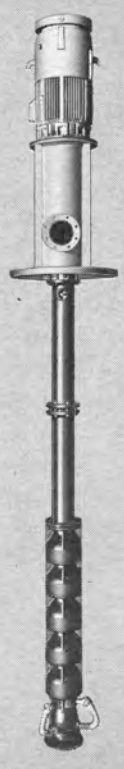

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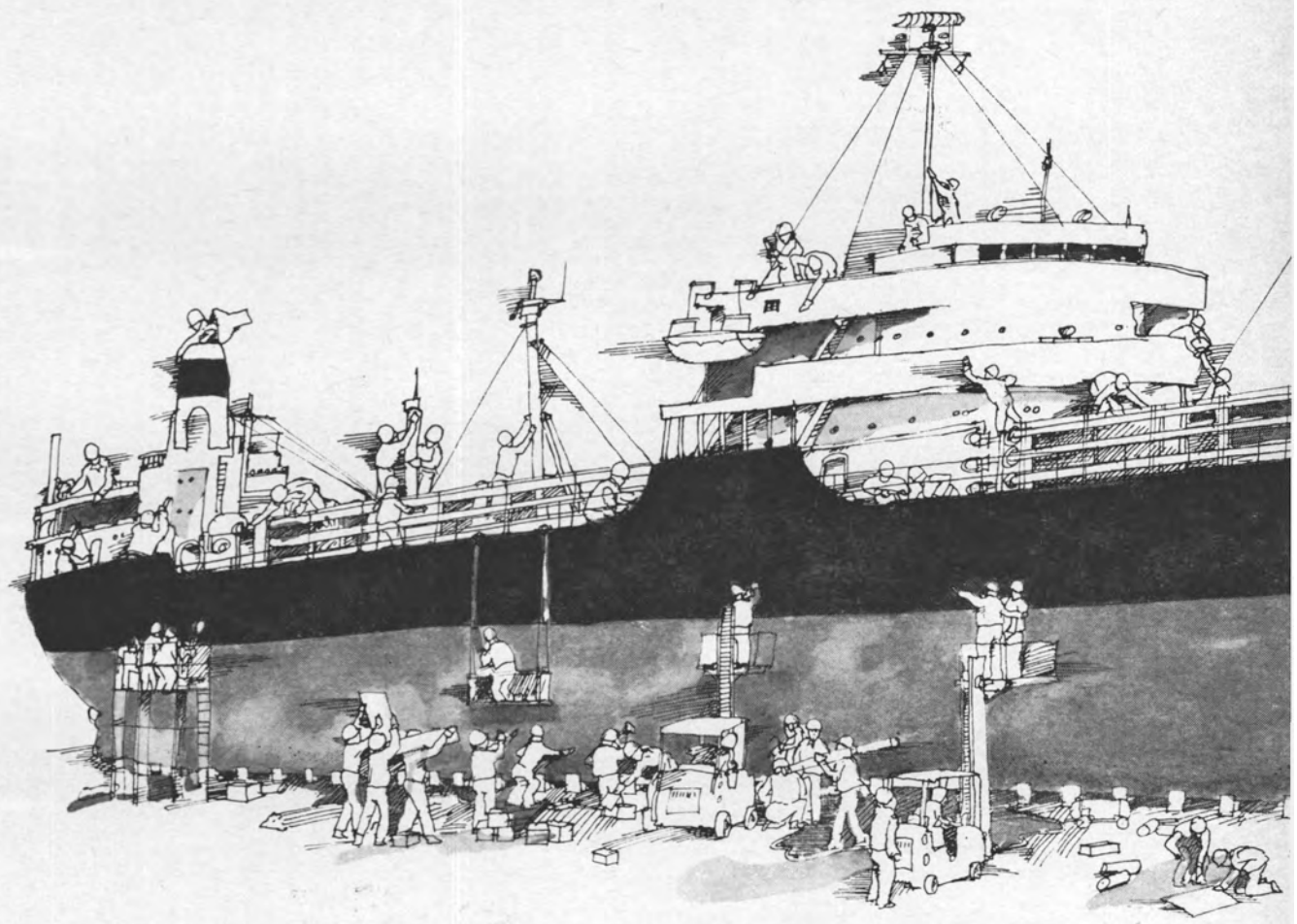

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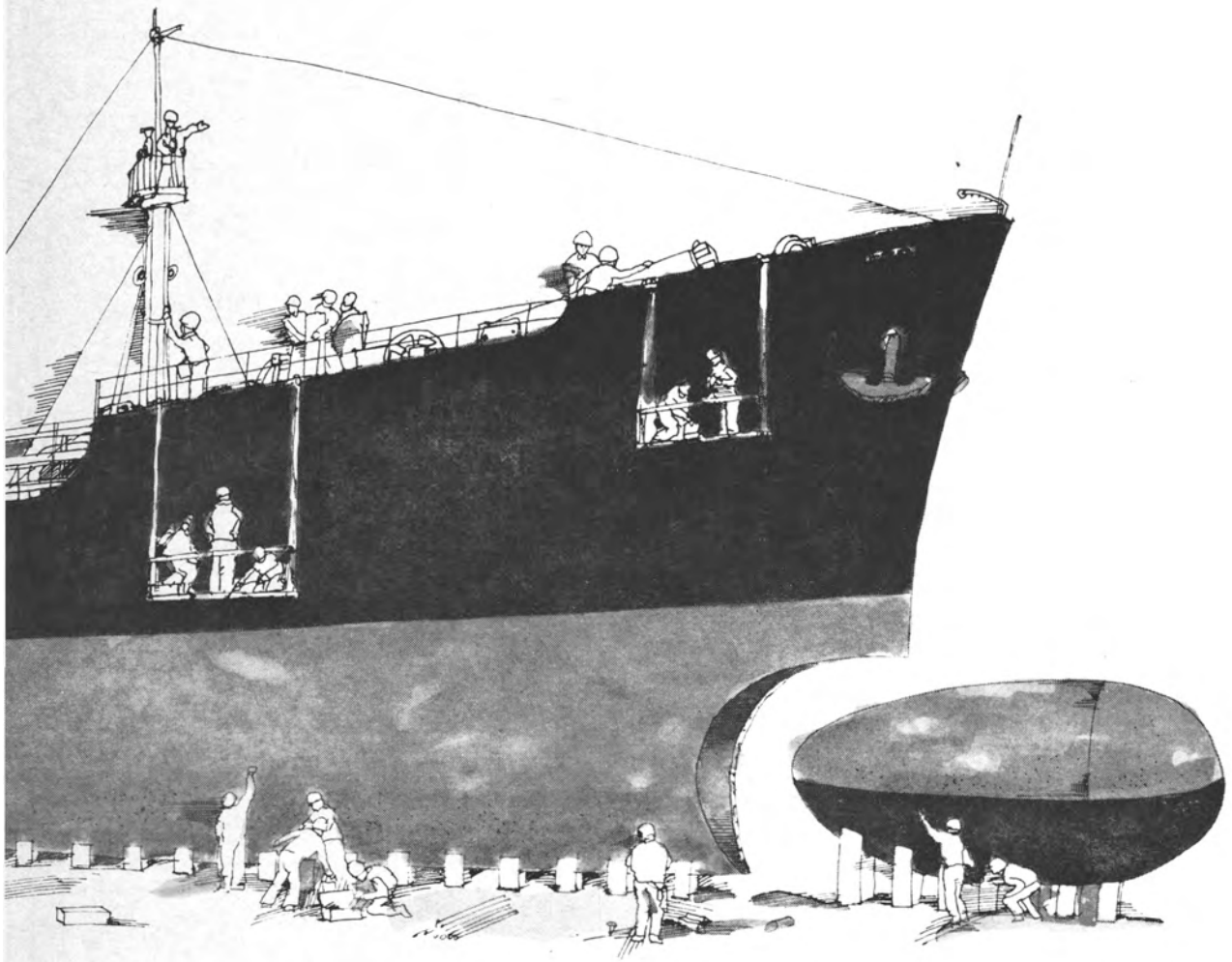

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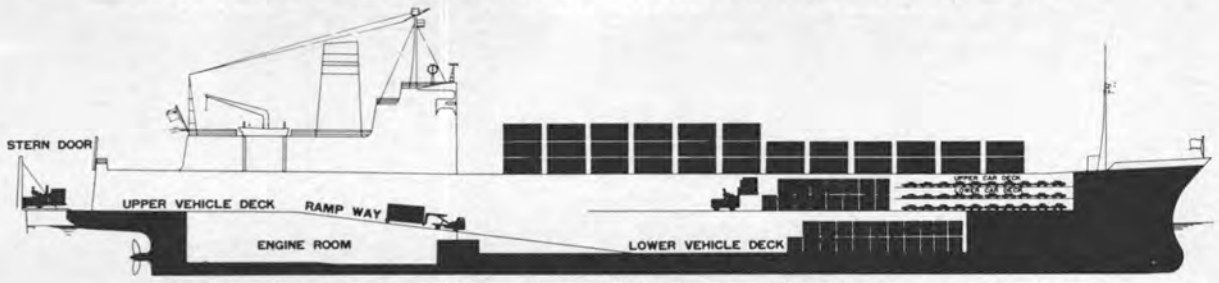

Inboard profile of new Australian roll-on/roll-off containership showing car decks in place.

The first roll-on/roll-off containership built in Japan was launched recently at the Kobe yard of Kawasaki Heavy Industries. The 596-foot, 11,000-dwt ship, Australian Enterprise, is being built for the Australian National Line. It is the first ship built as part of a joint service planned by the Australian National Line, Kawasaki Kisen Kaisha, Ltd. and Flinders Shipping Co. Pty. Ltd. for runs between Australia and Japan.

The ship is designed not only for containers but for heavy vehicles including trailers and cars, and unitized cargo such as flats and pallets. There are two decks for loading containers by the roll-on/roll-off method. Containers and flats are carried onboard by fork-lift trucks and trailers by way of a ramp and stern door. Twenty-foot containers can be carried onto the ship by large fork-lift trucks. Cargo, mainly containers, carried on the upper deck is loaded by wharf cranes.

The upper and lower vehicle decks are provided with a long fixed ramp on the port side. Both vehicle decks are high enough to permit loading eight-foot containers two high.

In order to utilize all cargo space, two additional mezzanine decks are provided in the fore part of the upper vehicle deck. The ramps for these decks can be folded out of the way when not in use. These mezzanine decks are built as sliding pontoons so that they can be stowed at the front of the car space when no autos are being carried.

In order to reduce engine room head space, three sets of Kawasaki-MAN medium-speed diesel engines, Type V8V 40/54, are used. These three engines drive a single propeller through reduction gears. Total engine output is 26,070 hp at 400 rpm, giving the ship a service speed of 21 knots.

The ship must berth stern first in special terminals. In order to improve its handling, a Kawasaki-Escher Wyss-type c-p propeller with the world's largest output is installed. A Kawasaki-Vickers-type bow thruster also is installed.

Two main generators are driven by the propulsion engines since they operate at a constant rpm.

The engine room is automated and allows 16 hours of unmanned operation. It is classed as an unattended machinery space by Lloyd's Register of Shipping.

CCI Marquardt To Acquire Star Iron And Steel Co.

CCI Marquardt Corporation, Tulsa, Okla., and Star Iron and Steel of Tacoma, Wash., a leading manufacturer of container handling systems, have reached an agreement in principle for CCI Marquardt to acquire all of the outstanding stock of Star for cash, it was announced by CCI Marquardt Chairman **Robert L. Zeligson** and Star Chairman **J. H. Galbraith.**

Star, a privately owned firm which was founded in 1913, has pioneered in the design and manufacture of materials handling and container handling systems for the trucking and marine industries. The company supplies complete dockside facility systems, heavy cranes and systems for handling unitized, palletized, bulk and general cargo. A wholly owned shipbuilding subsidiary, Star Marine Industries, manufactures ship components and steel, aluminum and ferro-cement ship hulls.

Mr. **Zeligson** said the materials handling and containerization field represents one of CCI Marquardt's planned areas of growth. "The acquisition of Star will add a number of major capabilities as well as complement and expand several of our commercial activities," he noted.

"CCI Marquardt's Crane Carrier division is a leading manufacturer of customized vehicles for the construction, mining and materials handling industries. The company's Marquardt operations have also recently established a line of marine instrumentation and ship navigation products on a worldwide basis which," Mr. **Zeligson** indicated, "will be further enhanced by the dockside and marine products operations offered by Star."

With approximately $10-million in sales for calendar 1968, "Star provides sound management, breadth of product lines and the innovative skills to achieve substantial growth in the materials handling and marine transportation fields within the next few years," Mr. **Zeligson** said.

Star Chairman **Galbraith** said, "The prospective association with a growth oriented company like CCI Marquardt will enable Star to capitalize on the rapidly expanding markets for our products and services."

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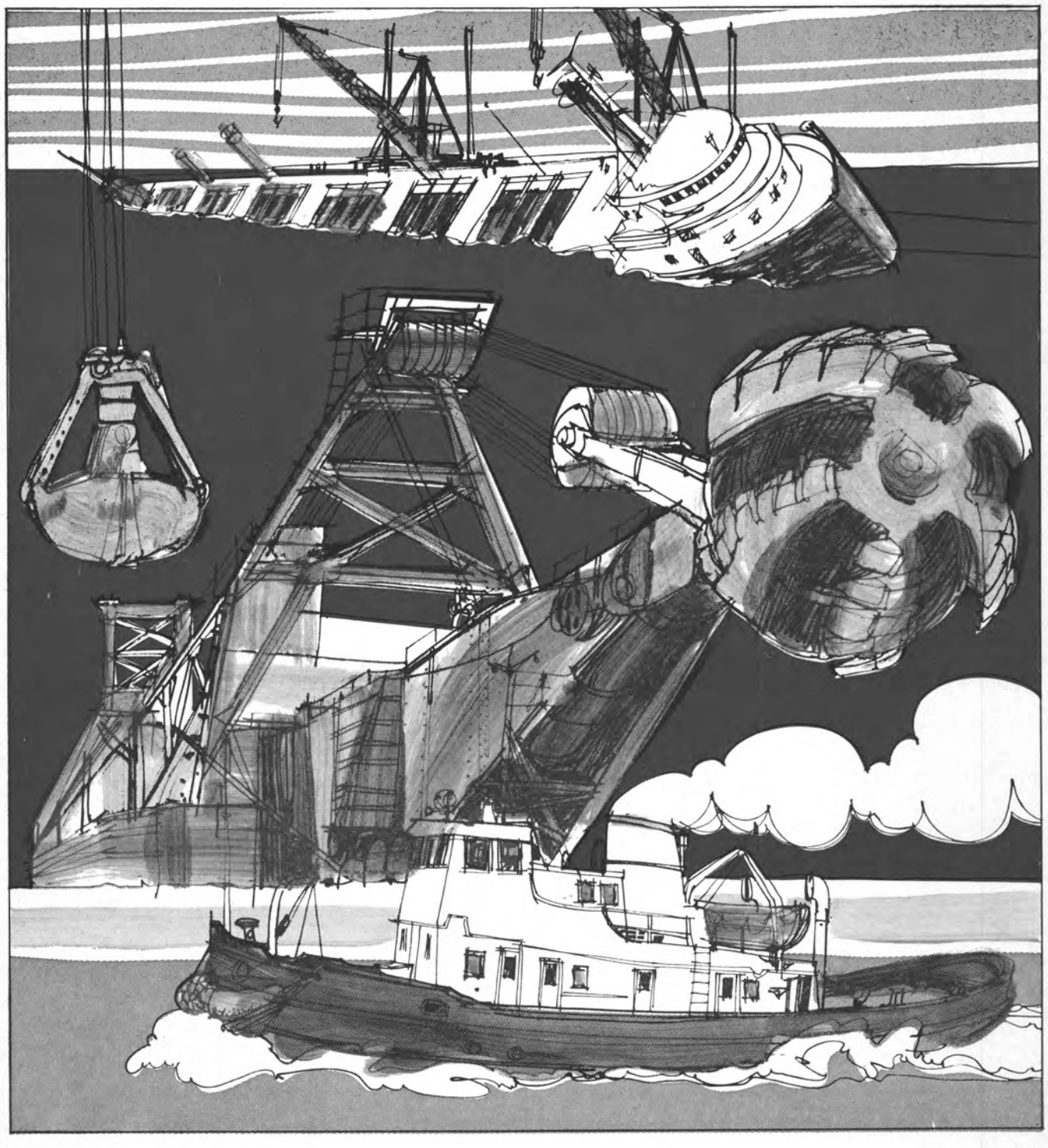


Michigan Students Describe

Ships For Tomorrow

A group of young naval architecture students presented the shipping world of tomorrow in New Orleans recently at a meeting of the Gulf Section of The Society of Naval Architects and Marine Engineers. Thirteen seniors from the University of Michigan's Department of Naval Architecture and Marine Engineering presented ideas ranging from minisubs for fishing to multi-hulled containerships which they developed in a program sponsored by Armco Steel Corporation.

The student program sponsored by Armco is intended to give the graduating designers an opportunity to present their ideas to professional naval architects and marine engineers. According to Armco spokesmen, "these students will be designing the ships of tomorrow, so we provided a forum for them to present their concepts to professionals."

Shaped like a doughnut, this submarine was designed to catch herring efficiently in a net trailed behind the opening. **Paul White,** one of the University of Michigan students on the design team, looks through the opening to show where the trailing net is attached.

Four seniors—**Paul White, Robert Ball, Har Keswani** and **Leighton Pike**—combined their talents to design a minisub system capable of catching herring 600 feet below the ocean surface. The students based their idea on the fact that given species of fish are often found at depths where trawler nets are extremely inefficient and submarines are unaffected by weather and are extremely quiet.

Shaped like doughnuts, the manned subs trail nets behind the openings. The sub's crew is housed in a control capsule encased within part of the total structure. Propulsion is provided by four 250-shp electric motors.

The main hull has a length of 30 feet, an outside diameter of 46 feet (61 feet across the diagonally opposite motors) and an inside diameter of 35 feet. Sonar is used to locate the fish.

The students also prepared a concept of the mother ship which could support ten subs. This support ship would unload the fish from the nets by a unique device called a "fish pump." It would clean, fillet and freeze the fish.

Three other students—**Peter Fisher, Michael Praught** and **James Soden**—designed a 700-foot catamaran containership capable of transporting 2,200 standard containers on deck. This unusually high capacity for containers stems from the deck area provided by the 253-foot beam of the two hulls.

The authors gave considerable thought to the method of loading and unloading the containers since they realized the beam of the ship was well beyond present port capabilities. They proposed that cargo could be unloaded by cranes working from both sides of a specially built slip, cranes could be built to span the slip, and the usual dockside container cranes could be used with the ship turning around during the operation.

The authors concluded that this ship could be built today using present-day knowledge. However, they added, it appears that the extensive weight and cost of the structure preclude, at least for the present, the use of a design similar to this in cargo trades.

A containership system by **Fred Collison, James Macaulay** and **Samuel Posner** is based on vessels 1,149 feet long and displacing 97,000 tons. They are one element of a ship-shore system designed to speed loading and discharging containers.

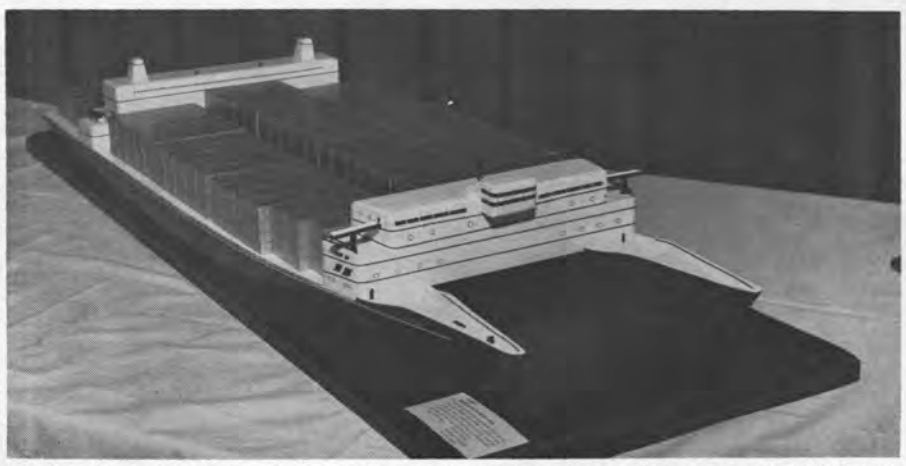
The system is based on the premise that existing container facilities which back up the ships and provide storage and marshalling areas will soon be overloaded. By using a monorail system that is compatible to the container handling cranes, containers can be transported to a storage depot that is not near the waterfront. The system also is based on a container-handling system that will handle 135 forty-foot containers per hour per crane.

The ultra-high-performance hydrofoil designed by three students of the University of Michigan is capable of flying on its hydrofoils at 50 knots.

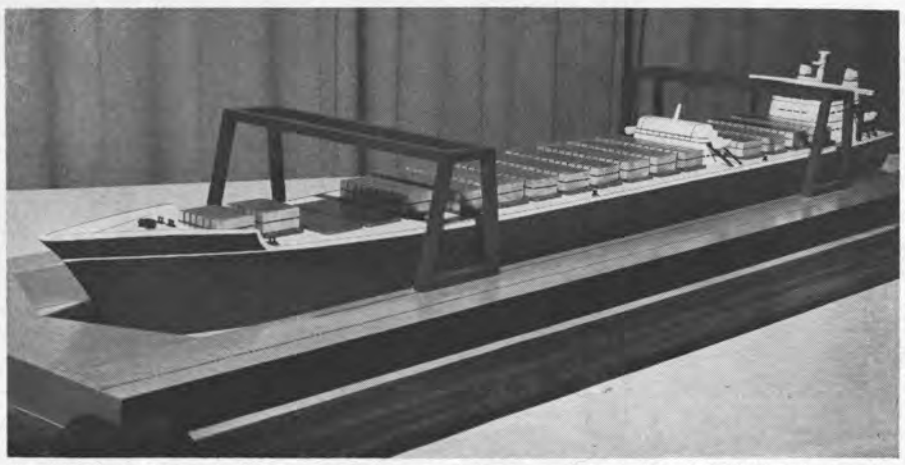
An ultra high performance hydrofoil vessel was designed by **Howard Appolonio, James Grant** and **John Palmer.** The vessel is intended for Coast Guard search and rescue missions, high endurance cutter missions, anti-submarine warfare and crewboat passenger service to remote areas.

The 250-foot-long hydrofoil has a beam of 46 feet and a top speed of 50 knots. Cruising speed is 15 knots and station keeping speed is 5 knots. It would be capable of cruising to its duty station 2,000 miles away at 15 knots, remain on station for 25 days at 5 knots, retain the ability to fly on hydrofoils at 50 knots for 1,500 miles, then return to port at 15 knots. It would retain a 16 percent fuel reserve.

Powered by a 30,000-hp gas turbine for high-speed operations, the vessel would have two other power plants for slower speeds. The engines would use a water-jet system of propulsion rather than propellers.

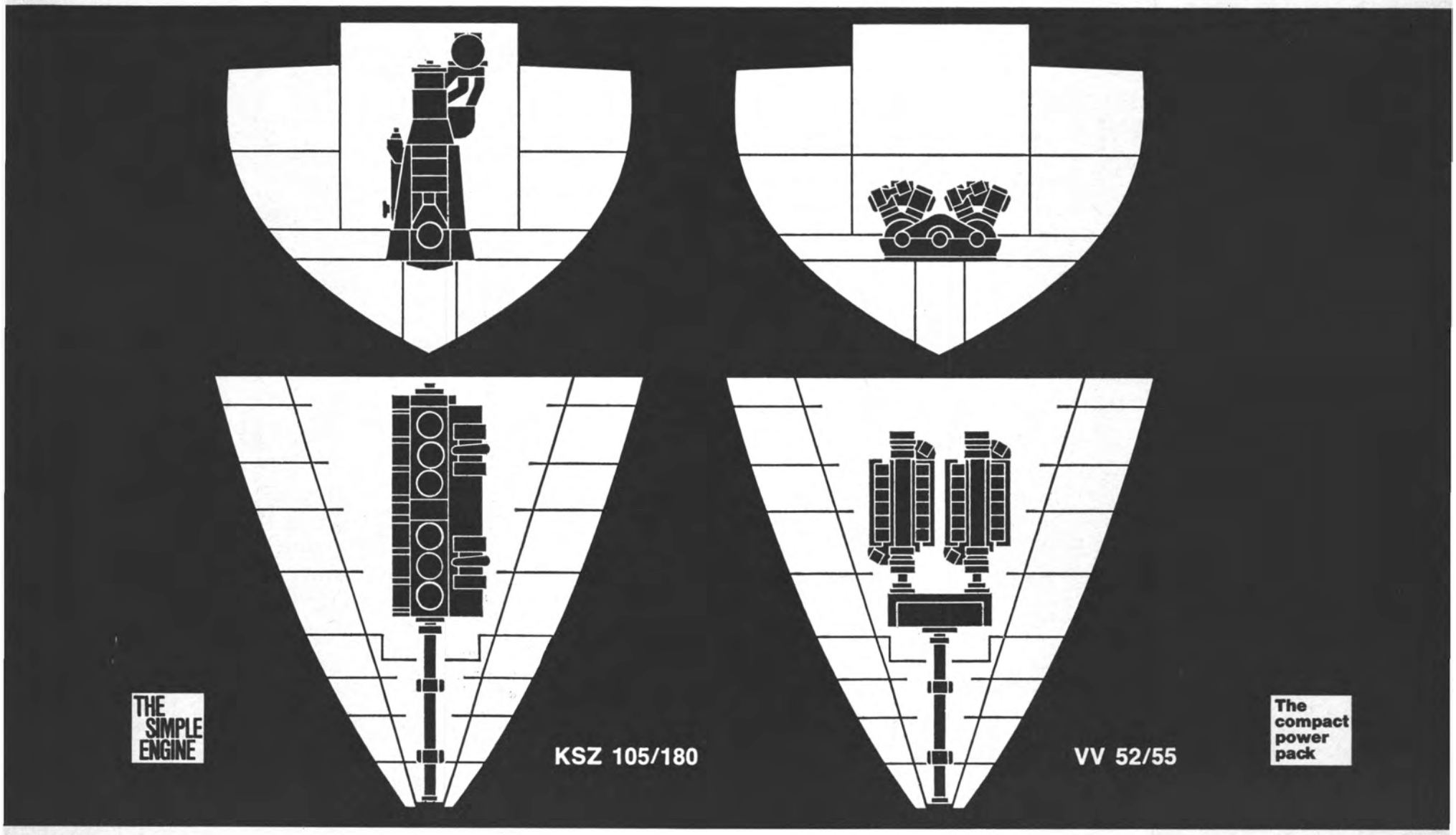


Model of the catamaran containership displayed by a team of three naval architecture students for the Armco Student Design Program which can carry 2,200 containers, all stored on deck. Beam of the vessel is 253 feet.



A ship-shore system for transporting containers includes this 1,150-foot-long ship which displaces 97,000 tons. Key part of onshore system is a monorail crane backed up by an efficient secondary conveyor system.

Tomorrow's Diesels today



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

Two examples of marine propulsion:

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

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

M·A·N

Mitsubishi To Build 261,000-DWT Tankers For Chevron Transport

Mitsubishi Heavy Industries, Ltd., Japan, recently concluded a contract for the construction of two 261,000-dwt tankers with Chevron Transport Corporation in San Francisco.

The two tankers, which will be built at the Nagasaki Shipyard & Engine Works, are scheduled to be completed in April and November, 1971, respectively. After delivery, the tankers will be used to carry crude oil from the Persian Gulf to Europe. These vessels, when completed, will be the second largest vessels to be built by Mitsubishi, following the three tankers for National Bulk Carriers, Inc.

Main features of the tanker will be: first export ship equipped with the Mitsubishi-developed jet stripping system, provision of the Mitsubishi-designed gateway-type tower bridge to prevent the entry of smoke into the bridge, use of high-grade material (cupro-nickel, aluminum-brass) for engine room piping, and extensive use of special paints.

The ships will have a length of 1,049 feet 10½ inches between perpendiculars, a beam of 175 feet 10¼ inches, a depth of 86 feet 7¼ inches and a draft of 67 feet. Propulsion will be by a Mitsubishi-Westinghouse steam turbine-gear unit developing 32,000 shp. Fully loaded service speed will be 15.1 knots.

Griswold Heads New Sperry Marine Dept.

William R. Griswold

James A. Nottingham, vice-president of Sperry Rand Corporation's Sperry Marine Systems Division, Charlottesville, Va., has announced the appointment of **William R. Griswold** to the newly created position of manager for market planning and market development.

Mr. **Griswold,** formerly in marketing at Newport News Shipbuilding and Dry Dock Company, has 20 years of maritime marketing experience and is well-known throughout the marine industry.

"The creation of this new position reflects the new emphasis at Sperry Marine Systems Division on the development, production and sale of marine products for commercial customers," Mr. **Nottingham** said.

Before serving as marketing assistant to the production manager of Newport News Shipbuilding and Dry Dock, Mr. **Griswold** had been associated with Sperry Rand in New York for more than 20 years. Prior to joining Newport News, he was director of marketing for the Radiation Division of Sperry Gyroscope Company and had served as director of marine marketing and manager of the Marine Division of Sperry Gyroscope Company.

Mr. **Griswold** holds degrees in mathematics and physics from Wheaton College in Wheaton, Ill., and in marine transportation, from the United States Merchant Marine Academy, where he was the first Bailey Award winner. He holds an unlimited master's license.

He is a member of The Society of Naval Architects and Marine Engineers, the American Society of Naval Engineers and the Propeller Club.

He was formerly a faculty member at the U.S. Merchant Marine Academy, and has served as an officer for the United States Lines and the Moore-McCormack Lines.

Maryland Ship Appoints Javello Sales Coordinator

Ronald F. Javello

Ronald F. Javello has been appointed coordinator of Greek sales for Maryland Shipbuilding & Drydock Company, Baltimore - New York, subsidiary of Fruehauf Corporation, according to an announcement by **Harry A. Berke,** manager of sales.

Mr. **Javello** embarked upon his career in the shipping industry in 1948 as a seaman with United States Army Transportation Corps. Prior to joining Maryland in 1965, he worked as a project engineer for a New York naval architect firm and before this position he was a marine superintendent for a liner shipping company. He is a graduate of the United States Merchant Marine Academy, Kings Point, N.Y.

Maryland Shipbuilding & Drydock Company is located on a 98-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.

Borg-Warner Using Plastic Construction For Navigation Buoys

Unique plastic construction is featured in a line of buoys being introduced by Borg-Warner's Safety Guide Products. The buoys are brightly colored and reflectorized. The line includes two types of navigation buoys and anchor buoys. Because of their seamless construction, the buoys will not split open or be damaged even if struck by a boat. If hit, the buoys will sink, then return to their normal position.

Filled with rigid urethane foam and ballasted for extra stability, the buoys are made of integrally colored ABS plastic that will not corrode like metal, rot like wood, or chip like foam. They may be lighted for visibility in foul weather. Markings on the buoys conform to the Uniform Waterway Code. Also, standard or custom legends can be placed 120 degrees apart on the buoys.

Complete information on this buoy line is available from Safety Guide Products, Borg-Warner Corporation, Scottsburg, Ind. 47170.

Some plain talk about fighting rust and other marine corrosion

Let's face it! Rust will always be with us. But we can fight it effectively and economically, whenever it occurs and reduce rust to a nuisance rather than a problem.

Corrosion Dynamics and the Development of the Arnessen Chipping Hammer.

Our interest in developing outstanding tools to combat and remove rust; scale and old paint go back many years. We found the marine personnel struggling with several important problems in relation to rust removal hammers.

The Weight Factor.

Some manufacturers of chipping tools incorporate motor and head in one unit. This makes them heavy and unwieldy. So heavy in fact, that workmen handling the tool soon tire and often drop it due to fatigue. This is costly.

Corrosion Dynamics solved this problem with the ARNESSEN CHIPPING HAMMER quite simply:

A) by separating motor and head. Reducing total overall weight, as well as the weight operator must hold and move.

B) Flexible shaft. The flexible shaft and corner head permits the ARNESSEN hammer to get at hard to reach places. The shaft also has a built in safety factor. Shutoff can be made by simple clutch action, preventing possible injuries, damage to unit.

C) Light pass operation. The efficiency of the ARNESSEN hammer permits operation on vertical, horizontal and irregularly shaped surfaces.

THE SUMMING UP: Operator Advantage

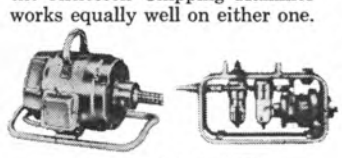
The Arnessen Chipping hammer is easier to operate, with less operator fatigue, greater overall efficiency.

Owner Advantage

In most cases a light pass over vertical, horizontal or bevel-shaped surfaces suffices to remove coatings and impurities. No need to go back over area, again and again. Corner finger heads let you get into hard to reach areas.

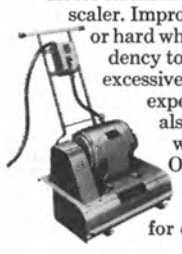
Air or Electric—Take Your Pick

You decide on the power source, the Arnessen Chipping Hammer works equally well on either one.



Arnessen Large Area Production Deck Scalers and Their Benefits

Wearability is an important factor on the multi-wheel deck scaler. Improperly designed or hard wheels have a tendency to crack creating excessive downtime and expense. Streaking also occurs due to wheel breakage. Often wheels are too brittle and not intended for deck operation.



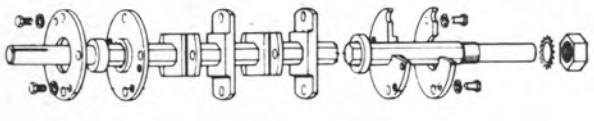
ARNESSEN HAS OVERCOME THESE FACTORS IN SEVERAL WAYS:

Two Cutter Wheel Sizes:

Arnessen uses 66 long life chrome alloy cutter wheels of two sizes, cutting an 11" swath on rust, epoxy undercoatings, cement coating, semihard deck coating, Navy non-skid deck coatings and paint.

Drum Design Prevents Streaking:

Due to its unique design and self aligning shock-mounted roller bearings streaking is eliminated.



Arnessen, a True Marine Production Scaler:

Operating at 2000 RPM through triple belt sheave drive, the Arnessen scaler is a true marine production unit cutting scaling costs 60% as it scales at 300 sq. ft. per hour.

Adjust While You Scale:

Arnessen's scaler is unique in yet another way. It allows you to adjust wheel cut as you approach heavily coated areas without stopping machine to make mechanical adjustments.

To meet varying deck conditions, Arnessen has developed 3 types of cutters, each engineered to let you work in a fast economical manner on a given surface.

Arnessen Users Span the World:

Steamship companies, the U.S. Navy, Coast Guard, Army Corps of Engineers, dredging and towing concerns, drydock and shipbuilding companies have Arnessen chipping hammers and deck scalers. Some ships have as many as 6 units. Machines may be rotated within fleet to meet maintenance requirements.

Arnessen Units Meet All Safety Standards:

We have subjected our scalers and hammers to every safety test and 3 years of sea trials, before offering the unit to marine users.

Call our U.S. and Canadian distributors for full details on all Corrosion Dynamics/Arnessen Units:

CALIFORNIA
Marine Electric Co., San Francisco
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FLORIDA
Tampa Marine Supply, Inc., Tampa

GEORGIA
Southern Marine Supply Co., Inc., Savannah

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The R. J. Taylor Co., Baltimore

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Telex No.: 222028

Paterson, Kearns, Brennan Appointed Bruce GM Diesel N.Y. Area Sales Engineers

William Brennan

Edward R. Paterson

Joseph F. Kearns

Edward R. Paterson, Joseph F. Kearns and **William Brennan** have been appointed sales engineers by Bruce GM Diesel, Inc. for the New York area, it was announced by **Bruce Brown,** the firm's chief executive. The Lodi, New Jersey-based firm is authorized Detroit Diesel distributor for the New York Metropolitan area.

Company President **Bruce Brown** indicated, "it is a matter of policy at Bruce to elevate promising men in the organization as they demonstrate their ability to take on new challenges."

Before joining Bruce, Mr. **Paterson** was sales engineer with Cummins Sales Corporation. His expertise spans military and civilian diesel applications, engineering and sales.

During World War II, Mr. **Paterson** served as chief engineer for Nevins Shipyard, Bronx, N.Y. In subsequent years he has been associated with Daimler Benz of North America; Alpine Geophysical, Norwood, N.J., and Henry Knese Marine College Point, N.Y.

Mr. **Paterson** has won the coveted GM Detroit Diesel Crown Award three years consecutively for engine sales. A past president of the Marine Trades Association, he is also active with the Sea Horse Institute.

Prior to joining Bruce, Mr. **Kearns** was northeast regional sales manager for the Kiekhaefer Corporation. He also has been associated with the Atlantic Refining Company and Trans-World Airlines. A former diesel-engineering officer in the maritime service, Mr. **Kearns** is active with the U.S. Power Squadron, teaching courses in elementary piloting.

Before being named to his new post, Mr. **Brennan** was service manager of Bruce GM's Linden branch.

"Mr. **Brennan,**" **Bruce Brown** stated, "was a fine service manager who we feel will be an asset to our sales engineering team. His knowledge of diesel power and applications has come from years of first hand experience. We're very pleased to have Bill in this new capacity."

Deepsea Ventures Names J. J. Victory To Marketing Post

James J. Victory

John E. Flipse, president, Deepsea Ventures, Inc., Newport News, Va., has announced the appointment of **James J. Victory** as assistant director of marketing for the Virginia-based oceanographic company. Deepsea, a Tenneco company, is actively engaged in developing our nation's natural resources through exploration and commercial development of undersea mining deposits. Mr. **Victory** has 17 years experience in the marine field. During the Korean War, he served with the U.S. Navy as chief engineer aboard the USS Saline County and was involved in many amphibious operations in the far Pacific.

Upon completion of his military service, Mr. **Victory** joined Western Gear Corporation as application engineer in the company headquarters at Los Angeles, Calif. His responsibilities included design and application of power transmission equipment for the petroleum, cement, steel and marine industries. In 1958 he opened the New York office of Western Gear and served as resident sales engineer, specializing in marine deck machinery and steering engines for commercial and naval applications. Since 1961 he has held the position of eastern sales manager, Heavy Machinery Division, of Western, assuming the additional responsibility for marine systems development. This included replenishment at sea, oceanography and cargo handling.

Mr. **Victory** is active in The Society of Naval Architects and Marine Engineers, and the American Society of Naval Engineers. He is a member of the Hague Post of the American Legion, Whitehall Club and New York Athletic Club.

N. D. (Nat) McClure Joins St. Louis Ship

N. D. McClure

N. D. (Nat) McClure has joined the sales staff of St. Louis Ship as assistant sales manager, according to an announcement made by **E. Renshaw,** president of this Division of Pott Industries Inc.

Mr. **McClure,** a native of Alabama, and U.S. Navy veteran of World War II and Korea was released from active service in 1963 at which time he entered the river transportation industry. He was formerly with Nilo Barge Line.

Mr. **Renshaw** indicated that Mr. **McClure** is expected to concentrate his efforts on the sales of marine repair services and new equipment with primary emphasis on the Gulf Coast area.

Savannah Building Full Containership Port

Georgia Ports Authority has announced plans for the construction of a $5-million container terminal in Savannah. Authority Director **J. D. Holt** stated that this was the first step in a drive to make this facility the leading containerport on the South Atlantic coast.

The facility will be built on a site close to the present Garden City wharves. Twenty acres of land have been assigned to the project, with 15 acres being paved for backup storage. The new 734-foot wharf will be served by a 90,000-pound crane. It is expected that the entire facility will be ready by May, 1970. Additional space is available in this location for future expansion.

Arrangements have been completed, according to Mr. **Holt,** with several steamship lines to operate full containerships from the new facility. Presently, only Sea-Land Services, Inc. operates full containerships from southeast ports.

(Seems there's no end to it.)

We've built a big, modern repair dock not too long ago, now we're enlarging it already.
We've just modernized our building dock, now we're modernizing and improving it again. It's quite a task to keep in stride with our super-mammoth age; especially when you're not satisfied with just keeping in stride, but intent on staying ahead. Which is exactly what we had in mind when we started to make good things better: Our No. 3 Repair Dock on the left is growing into a 300,000 DWT mammoth dock covering an impressive 370 x 70m wet-area. It has commenced service at full capacity from the end of May, this year. The adjacent No. 4 Building Dock, where we've just launched the fifth of eighteen 210,000 DWT tankers, will be even more efficient with the addition of two 50-ton goliath cranes, a 120-ton jib crane and a workshop for special coating.
Now what more could one ask for? Information?
Do drop up a line.

Sasebo Heavy Industries Co., Ltd.

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SNAME Philadelphia Section Holds Annual Dinner Dance At Cherry Hill

Attending the SNAME Philadelphia Section's Annual Dinner Dance were, left to right: **James J. Henry,** Society president; **Gordon H. Boyd,** immediate past chairman of the Section; **B.B. Cook Jr.,** Section secretary-treasurer; **Kent C. Thornton,** Section chairman, and **George A. Johnson,** Section vice-chairman.

The Philadelphia Section of The Society of Naval Architects and Marine Engineers recently held its 19th Annual Dinner Dance at Cherry Hill Inn, Cherry Hill, N.J. Five hundred and fifty members and guests representing more than 70 various shipping companies, engineering firms, shipbuilding industries and activities attended the formal affair.

The evening festivities commenced with cocktails in the impressive Skylight Lounge, followed by dinner and dancing in the Inn's Presidential dining room.

Guests included SNAME President, **James J. Henry** and **Mrs. Henry, Sydney Swan,** American Bureau of Shipping and **Mrs. Swan,** Philadelphia Naval Shipyard Commander Capt. **F. W. Gooch Jr.** and **Mrs. Gooch, Gordon H. Boyd,** vice-president Mathiasen's Tanker Industries, and **Mrs. Boyd, Kent C. Thornton,** J. J. Henry Co. and **Mrs. Thornton** and **Fred W. Beltz Jr.** of DeLaval and **Mrs. Beltz.**

Immediate past chairman of the Philadelphia Section, **Gordon H. Boyd** was presented with a certificate for outstanding service by SNAME President, **J. J. Henry.**

T. M. Curran Retires From Webb Institute After 40 Years Service

Thomas M. Curran

Thomas M. Curran, dean and professor of naval architecture at Webb Institute of Naval Architecture in Glen Cove, N.Y., retired on June 30 after being a member of the faculty for 40 years and dean of the college for the past ten years.

Dean **Curran** is a 1925 graduate of Webb and holds advanced degrees from New York University where he has served as visiting professor of naval architecture from 1940 to 1954. He served as special examiner for the municipal Civil Service Commission. He is a New York State licensed professional engineer, a past president of the Webb Alumni Association, chairman of the Webb Alumni Fund, a member of The Society of Naval Architects and Marine Engineers where he serves on the membership and scholarship committees, the American Society for Engineering Education, and the American Association of University Professors. A resident of Tarrytown, N.Y., he serves as an elder in the First Reformed Church of that city.

Webb Institute is a small college with an outstanding reputation for excellence. It is one of only three colleges in North America offering bachelor of science degrees in naval architecture and marine engineering and is unique in its high standard of selectivity, single emphasis curriculum, and an annual program of practical winter work terms integrated with academic teaching.

Berry Elected President Of Propeller Club Port Of New Orleans

J. Clarke Berry, vice-president, Canal Barge Company, Inc., has been elected president of the Propeller Club of the Port of New Orleans. Mr. **Berry's** one-year term as head of the 950-member Propeller Club Port — largest in the country — began on July 1. Mr. **Berry** has long been active in The American Waterways Operators, Inc., having served on the Association's board of directors, as vice-president of Region 3, and as chairman of several Region 3 committees. Region 3 encompasses the Gulf Coast and Lower Mississippi River areas.

Fruehauf Acquires Minority Interest In Rotterdam Firm

Fruehauf Corporation announced in Detroit, Mich. that its fully owned subsidiary, Fruehauf International Ltd., has acquired a minority interest in its licensee, N. V. Nederlandsche Tank Apparaten-en Machinefabriek—NETAM, of Rotterdam, Holland. The announcement was made by **William E. Grace,** president and chief executive officer of Fruehauf.

NETAM, a publicly owned company, the shares of which are traded on the Amsterdam Stock Exchange, has manufactured Fruehauf equipment under license for the past eight years. It ranks among the leading trailer and container manufacturers in Holland.

Alex S. Aranyos, president of Fruehauf International Ltd., said, "This acquisition is a further step in strengthening Fruehauf's position in Europe since Rotterdam is one of Europe's leading container ports."

Fruehauf's trailers and containers are manufactured in England, France, Germany, Sweden, and Spain, as well as in Japan, Australia, South Africa, Mexico and Brazil.

Manitowoc To Build Derrick Barge For Use In Canal Zone

A contract has been awarded to Manitowoc Shipbuilding, Inc., Manitowoc, Wis., for the construction of an all welded steel derrick barge for use at the Panama Canal Zone. The derrick barge will be employed to load and unload ships with the use of a grab bucket and also for dredging and pile driving work on harbor breakwaters. Much of the work will be done in the restricted confines of the approaches to the canal locks; however, the barge will operate at times in rough seas in breakwater work at the entrance to the Cristobal Harbor. The barge will be 105 feet long, 50 feet wide, and 9 feet deep.

A Manitowoc Model 4600 deck mounted crane will be installed on deck on a high turret foundation. The crane will be equipped with a 100-foot boom which will be used for handling a 7½ cubic yard heavy-duty clam dredging bucket and also used for pile driving or lift crane work. As a derrick, the crane will have a capacity of lifting 177,700 pounds at a working radius of 28 feet. For clamshell dredging, the crane will have sufficient capacity to dredge 52 feet below the water level.

Design And Operation Of Fishing Vessels Described To Canadian Maritime Section

Taking part in the Canadian Maritime Section, SNAME, annual meeting were, left to right: **Ronald Allan,** meetings committee chairman; **Robert McArthur,** speaker; **Russell G. Maguire,** chairman, and **William W. Aves,** secretary-treasurer.

The Canadian Maritime Section of The Society of Naval Architects and Marine Engineers heard an interesting paper on the design and operation of fishing vessels at its recent annual meeting. **Robert McArthur,** assistant general manager of the Saint John Shipbuilding & Dry Dock Co. Ltd. presented the paper and illustrated it with models of fishing vessels. He demonstrated the handling of the fishing gear with one of the models.

On behalf of the president of the Society, **Ian H. Bell,** past chairman, presented a certificate of appreciation to the retiring chairman, **Russell G. Maguire.**

Section officers elected for the 1969-70 season were: **James R. Elder,** chairman; **William H. White,** vice-chairman; **William W. W. Aves,** secretary-treasurer; **Christopher West,** papers committee chairman; **Ronald M. Allan,** meetings committee chairman, and **Henry G. Howard, Erich G. Heinze** and **John W. Scott,** members of the executive committee.

Ian H. Bell, (left), past Section chairman, presents Presidential Certificate of Appreciation to **Russell G. Maguire,** retiring Section chairman.

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by Bethlehem

REPAIR, RECONDITIONING, AND CONVERSION
All types and sizes of vessels. Fast, dependable service in American harbors.

PIERSIDE AND ANCHORAGE REPAIRS.

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With specially outfitted barges and tugs. Shorebased plants in New York and Baltimore harbors.

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Approved repairs and spare parts for B&W, Doxford, Fiat, Stork, and Mitsubishi diesels, Napier turboblowers, and Stal-Laval and Bethlehem turbines.

SPECIAL PRODUCTS.
Centralized engine control systems. Deck and engine auxiliary machinery parts.

Fresh water distillers, flash-type and submerged-tube. Condensers and parts.

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Propellers and line shafts. Bronze, iron, and steel castings. Sheet metal, pattern, and machine work. Fabricated steel and weldments.

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Specify "Repairs by Bethlehem."

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SHIP REPAIR FACILITIES

BALTIMORE HARBOR
Baltimore Key Highway Yard
4 drydocks to 22,000 tons
Baltimore Fort McHenry Yard
1 graving dock

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

BOSTON HARBOR
Boston Yard
3 drydocks to 20,000 tons

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

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

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

SHIP-BUILDING FACILITIES

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

BEAUMONT, TEXAS
Beaumont Yard
2 sidelaunching ways over 800 ft each. Offshore mobile drilling platforms, workover rigs, and oil production and storage facilities. Barges. Jumboizing and conversion.

SAN FRANCISCO, CALIF.
San Francisco Yard
1 way for barges up to 550 ft.

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

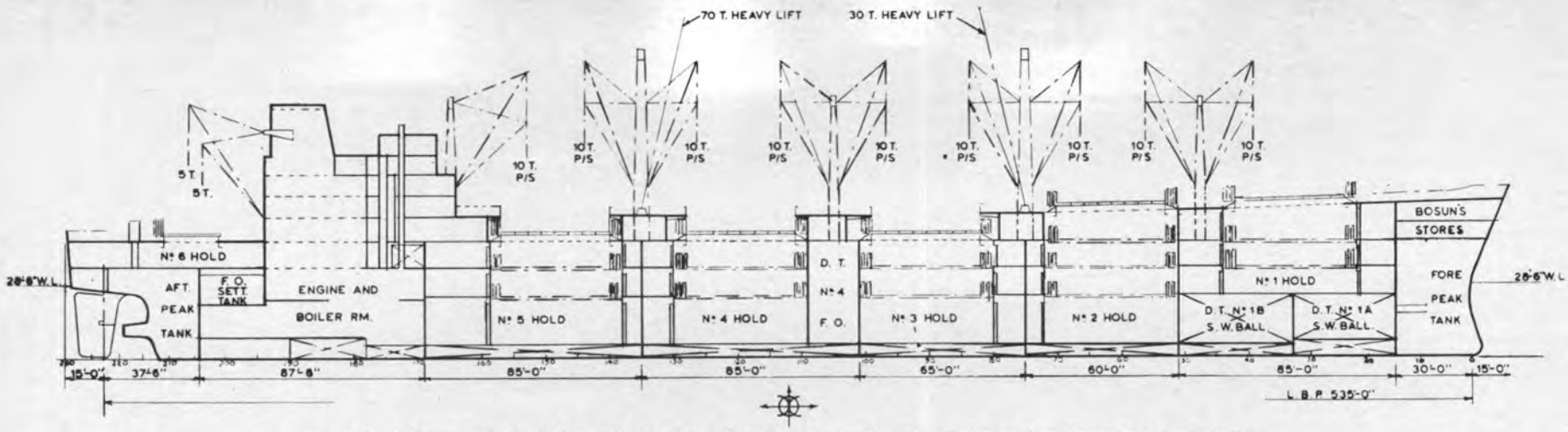


Figure 1—Inboard profile of Pacer-Class cargo ship indicates uniformity of design for economical construction.

An Economical Commercial Cargo Ship

Pacer-Class Design—PD133

Theodore J. Chwirut and Charles B. Cherrix*

Early in 1966 the Office of Ship Construction, Maritime Administration, undertook to develop a ship design, later called the Pacer-class, which could form the basis of a construction program for improving the quality of available ships for national emergencies. Concurrently, the awareness that the vessels in the non-subsidized segment of the American merchant marine, consisting mainly of war-built tonnage, were in need of replacement gave further impetus to these plans and gave rise to the idea that a single concept, with some modifications, could be utilized to fulfill a replacement role in both categories.

The design plan which evolved was to explore any concept enabling the construction of minimum cost ships which could be operated successfully in commercial service and yet have good military supply potential.

During the preliminary stage of the design over 65 ideas for cost cutting were advanced in-house and by two prominent shipyards. These varied widely as to type and significance. About 25 percent were accepted in whole for implementation and 45 percent were accepted in part or were modified.

The design goal of possibly producing ships for the NDRF and/or building them during emergency periods prompted inquiries directed toward the Business and Defense Services Administration of the Department of Commerce and the NDRF custodial personnel of the Maritime Administration to obtain guidance with respect to the specification of materials.

The NDRF custodial staff contributed a list of 34 items. Since many of the suggested betterments had already become standard practice for modern ships their adoption constituted a normal development and were so specified. This input indicated that indiscriminate cost cutting would not necessarily be controlling in the selection of materials.

Characteristics

The Pacer-class design is a six-hold conventional general cargoliner with propulsion machinery and accommodations located aft, Table 1 and Figure 1.

The ship is arranged with twin hatches suitably sized to accommodate standard containers and fitted with boom/winch cargo gear.

Propulsion can be steam turbine of simplified design, or medium-speed geared diesel. Slow-speed diesel and gas-turbine versions are presently under development.

Table 1—Principal Characteristics

	Steam Turbine	Medium Diesel
Length overall, ft.-in.	565-0	565-0
Length bet. perp., ft.-in.	535-0	535-0
Beam, ft-in.	78-0	78-0
Depth to main deck, ft.-in.	45-6	45-6
Draft, full load, ft.-in.	28-6	28-6
Gross tonnage, approx.	10,000	10,000
Net tonnage, approx.	6,000	6,000
Deadweight tonnage	13,050	13,450
Bale cubic, cu. ft.	874,200	874,200
Container capacity, (20 ft. x 8 ft. x 8 ft.)	306	306
Shaft horsepower, ABS	17,500	14,500
Speed @ 28 ft. 6 in. draft knots	20.0	19.4
Fuel consumption, bbls/day	672	404
Range, nautical miles	13,000	13,000
Light ship approx., tons	7,600	7,350
Cargo, tons	10,160	11,113
Displacement, total @ 28 ft. 6 in., tons	20,800	20,800

Hull Design

An investigation of simplified hull forms as a means of cutting steel fabrication costs was carried out in conjunction with the design.

Parent Form—A body plan of the parent form is illustrated in Figure 2. The parent could be described as a fairly conventional moderate U form with a four-percent bulb. Complete resistance and propulsion tests have been carried out on this form at Naval Ships Research and Development Center (NSRDC). The shaft horsepower curves at two displacements are shown in Figure 3.

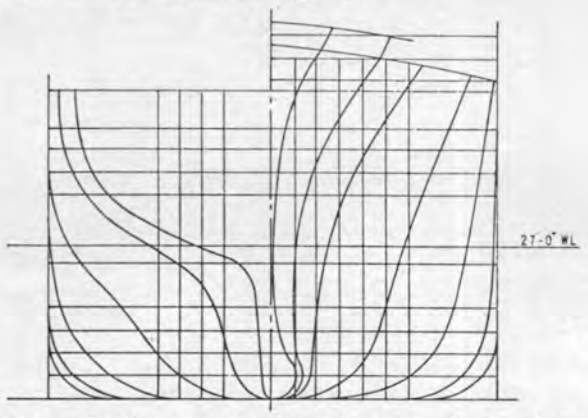


Figure 2—Body plan of 'parent' design developed for Pacer-Class vessels, with four-percent bulb.

Double Chine—The first phase of the simplified hull form study consisted in developing a double chine form having identical coefficients as the parent.

In order to determine the relative hydrodynamic merit of this form, resistance tests were conducted at the Davidson Laboratory of Stevens Institute of Technology at drafts corresponding to the available data on the parent form. Subsequently the model was fitted with a bulbous bow and the tests re-run at the same drafts.

The results of the tests show that the resistance of the double chine hull would average about 2½ percent higher than the parent hull over the normal operating range between 15 and 20 knots at the 31-foot 6-inch full-load draft. At the light draft however, the resistance averaged about 12½ percent higher than the parent form.

Blohm and Voss—The Blohm and Voss Shipyard, Hamburg, Germany, has carried out an extensive program of hydrodynamic research on a simplified hull form in conjunction with its standard ship designs for which patents are pending. The basic Blohm and Voss form includes a bulbous bow and bulbous stern sections.

With the cooperation of Blohm and Voss a model of the Container Pioneer and an equivalent smooth form of the parent design were built and tested at NSRDC. The shp curves showed surprisingly good performance for the flat-sided ship.

(Continued on page 35)

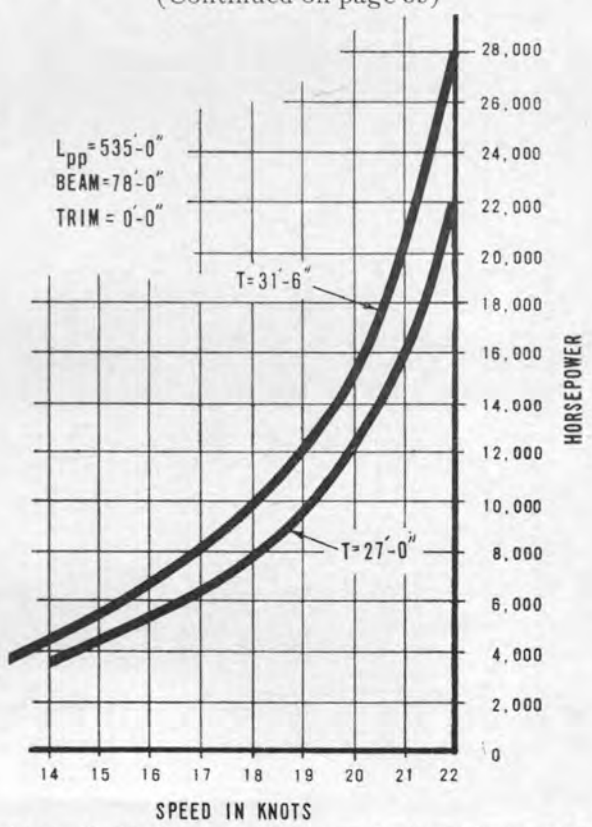


Figure 3—Shaft horsepower curves developed from model tests of 'parent' design tested at NSRDC.

*Mr. **Chwirut**, chief, Division of Small Ships, and Mr. **Cherrix**, chief of Final Design Branch, Division of Ship Design, Office of Ship Construction, Maritime Administration presented a detail report on the design of this new class of vessel, which is condensed here, before a recent meeting of the Chesapeake Section of The Society of Naval Architects and Marine Engineers.

Pacer-Class Design

(Continued from page 32)

Helical Ship—The helical ship is a patented form consisting of flat plates, plates with curvature in a single plane and rectangular sections with the exception of the bow and stern underwater portions which are helical in shape. Preliminary resistance tests on a hull of this type built to Mariner proportions indicated an increase of about 20 percent in ehp compared to the Mariner parent.

The question of the true magnitude of the possible life-cycle cost savings to be realized by the use of simplified forms is yet to be resolved. Meanwhile the preliminary design has been completed using the conventional rounded parent form.

Structural Hull

The hull structure is typical of modern cargoliners, with the top and bottom flanges longitudinally framed and the side shell and intermediate decks transversely framed. Mild steel is used throughout without a reduction in thickness for special coatings. The inner bottom plating is all of one thickness in order to minimize the number of plate sizes. To avoid the necessity of normalizing, the maximum thickness of plating specified is 1⅜ inches. With the exception of the gunwale connection to the sheer strake, the hull is all welded construction.

The twin hatches are framed with three longitudinal girder systems supported by columns at the hatch corners. The hatch end beams extend to the shell to form part of complete transverse webs.

Bilge brackets have been eliminated at the expense of heavier hold frames in the interest of conserving deck area for cargo stowage.

Superstructure—The superstructure was designed to basic needs only with a view to symmetry and simplification of construction and minimum maintenance. Such items as curved bulkheads, recesses, and offsets, have been virtually eliminated. The number of exterior doors and inclined ladders has been held to a minimum and deck overhangs eliminated to the greatest practicable extent. The quarters comply with current commercial standards of habitability. All living and public spaces are air conditioned and single occupancy rooms are provided for the entire crew.

Cargo Handling

Cargo handling function is so basic to the economic success of the ship, care had to be exercised that cost reduction would not seriously impair the operating efficiency.

The twin hatch arrangement provides multiple access to the cargo stowage spaces and at the same time leaves ample shelf space which is so important in multi-port trade routes.

The main hatches are arranged for stowage of 20-foot containers in the athwartship position. The loaded containers can be either handled by a marriage of two 10-ton booms or by the 70-ton and 30-ton Stulcken gears located between holds Nos. 2 & 3, and 4 & 5. Forty-foot containers can be stowed in a longitudinal position in the four hatches served by the heavy-lift gear.

One of the most expensive items in the outfit is power-operated hatch covers. A rather substantial saving has been realized by specifying mechanical covers of an advanced type successfully installed on a class of recent subsidized ships.

The prevalence of a-c cargo winches on foreign-flag ships led to a review of the long standing MarAd practice of specifying d-c winch drives with variable-voltage control. It was concluded that satisfactory control could be achieved with a-c drive. However, inquiries directed to manufacturers revealed that no domestic supplier could deliver a-c drive cargo winches without some development work. Opinions on cost varied widely. In view of the uncertainty of supply, d-c variable voltage drive is specified with a-c drive permitted as an alternate.

Table 2—Cost Reductions

	Group	Cost Reduction
1.	Steel	$ 300,000
2.	Accommodations and ventilation	300,000
3.	Hull piping	375,000
4.	Electrical and electronics	350,000
5.	Deck outfit	225,000
6.	Cargo handling and deck machinery	700,000
7.	Cargo refrigeration	550,000
8.	Machinery	575,000
9.	Indirect charges	75,000
	Total Reduction	$3,450,000

Steam Plant

The major features for the Pacer main machinery plant had their origins in two study contracts undertaken by Newport News Shipbuilding and Dry Dock Co. and the J. J. Henry Co., Inc. for MarAd's Office of Research and Development.

Additionally, the design reflects somewhat the experience gained at MarAd with respect to maintenance and repair costs and frequency of occurrence and some of the basic ideas put forth by the Humble Oil Co. in the construction of the Esso Houston class of tanker.

Out of the above sources, the design is believed to have achieved the basic goals of providing a reliable marine propulsion plant that meets the qualifications of: minimum capital cost, noncomplexity of machinery installation and operation, and adaptable to commercial requirements.

Steam conditions for the Pacer design have, basically, been selected in accordance with the findings of Newport News Report MA-2967. This study considered steam conditions from the standpoint of initial cost of pressure and temperature, dependent materials, plus present worth of fuel costs and maintenance over the lifetime of the ship, and concluded that steam conditions of 600 psig and 850°F. were economically attractive.

Superheated steam is supplied to a conventional cross-compound propulsion turbine and the one operating turbo-generator which exhausts to the main condenser. The deaerating feed heater uses bleed steam from the cross over. No other feedwater heating is utilized except in the boiler economizers. This cycle reduces capital costs and provides simplified installation and operation.

There is some sacrifice of fuel consumption to achieve the design goals. However, the fuel performance is still a respectable 0.541 lb. per shp-hr and compares favorably with many ships built under MarAd's ship-replacement program.

Single Boiler Concept—The obvious preliminary choice for one boiler was made after subjecting the proposal to an economic evaluation. It was also decided to incorporate some form of take-home capability mostly to pacify the persistent skeptics.

Take-home Power—A simple packaged boiler was selected on the basis of cost and the need for hotel service steam when in port when operating the standby ship's service diesel-generator set.

Electric-Plant—The design concept of the ships-service electric plant was to provide adequate but not excessive capacity. An allowance for the carriage of 20 refrigerated cargo containers was made.

A preliminary electric load analysis showed a maximum port load of 646 kw and a maximum sea load of 592 kw. The selected electric plant consists of a 750-kw turbo generator for both at sea and in-port use and a 600-kw diesel generator as a standby.

The standby unit rating of 600 kw was chosen on the basis that if needed, certain unessential loads could be dumped and others limited.

Manning and Mechanization—The scope of plant mechanization is limited to that which is necessary for safe and efficient operation with two watch-standing personnel. The boiler is fully mechanized in accordance with the applicable USCG regulations for a two-man watch. No other mechanization such as bridge control of main engine, automatic data logging and bell logging is provided. Some large valves will be provided with motor operators. A centralized control console incorporates boiler and turbine throttle controls at a convenient operating station. Other console display and control functions are limited to those necessary for maneuvering the vessel.

Additional Cost Reductions in Machinery—The specifications for the steam plant machinery contain several items which can also significantly contribute to overall cost reduction. Among these are the requirements for highly loaded main reduction gears, high boiler heat release rates, dripproof electric generators in lieu of enclosed air-cooled types for standby units and all cognizant MarAd value engineering letters.

Table 3—Multiple-Construction Cost

Each Of	Steam	Diesel
1	$17.1M	$16.5M
2	15.6	15.0
3	14.8	14.3
4	14.3	13.8
5	13.9	13.4
10	12.8	12.4
15	12.3	11.9
20	11.9	11.5
25	11.7	11.3

Diesel Plant

Selection of Engine—At the outset of the diesel-propelled design it was decided that the existing steam-plant machinery space would remain intact and the highest horsepower diesel propulsion unit that the engine room and machinery casings could accommodate would be installed. The limiting machinery dimensions ruled out the possible use of high horsepower slow-speed, direct-connected engines. Engine selection, therefore, was limited to compact medium speed engines. Of the available diesel engines, a 1,250 bhp/cylinder model offered the best horsepower per cubic foot needed to fulfill the design criteria. Final selection depended upon whether a single V-12 engine or twin, "in line 6", engines would be more desirable. The twin engine concept was chosen based upon the advantages of (1) increased reliability and (2) easier maneuverability; with minimum increase in capital cost.

The engines selected would not produce the same power and speed as the steam turbine version, however, the total output of 15,000 bhp would suffice to obtain 19.4 knots speed. The small sacrifice of 0.6 knots was considered acceptable to obtain a viable diesel design.

Costs

Having taken advantage of all the cost reduction possibilities, with the exception of the simplified form, and many other lesser ones too numerous to mention, it is believed that lower costs are possible as compared with the parent design, Table 2.

The results of this effort then would permit the construction of fleets of the Pacer design at the unit costs shown in Table 3.

These are budget type costs for the steamship version estimated at 1969 pricing levels and include allowances for changes under contract and owner's engineering and inspection. The diesel-propelled alternate would cost approximately 3 to 3½ percent less than the steamship version. The Pacer design thus appears to be capable of being a profitable investment for some trades as its capital costs are between 75 and 80 percent of those general cargo types having the ultimate in refinement and modernity.

Dravo Appoints Redding Mgr. And Miller Assistant Mgr. Of Engineering Works Div.

Joseph H. Redding

J. L. Miller

Dravo Corporation, Pittsburgh, has announced the appointments of **Joseph H. Redding** and **J. L. Miller** as manager and assistant manager of the newly formed planning department in its Engineering Works Division.

Mr. **Redding,** who previously served as vice-president of the Management System Division at H. B. Maynard and Company, Inc., holds BS and MS degrees from Carnegie-Mellon University.

Mr. **Miller** joined Dravo in 1942 and most recently served as assistant to the engineering manager in the Engineering Works Division.

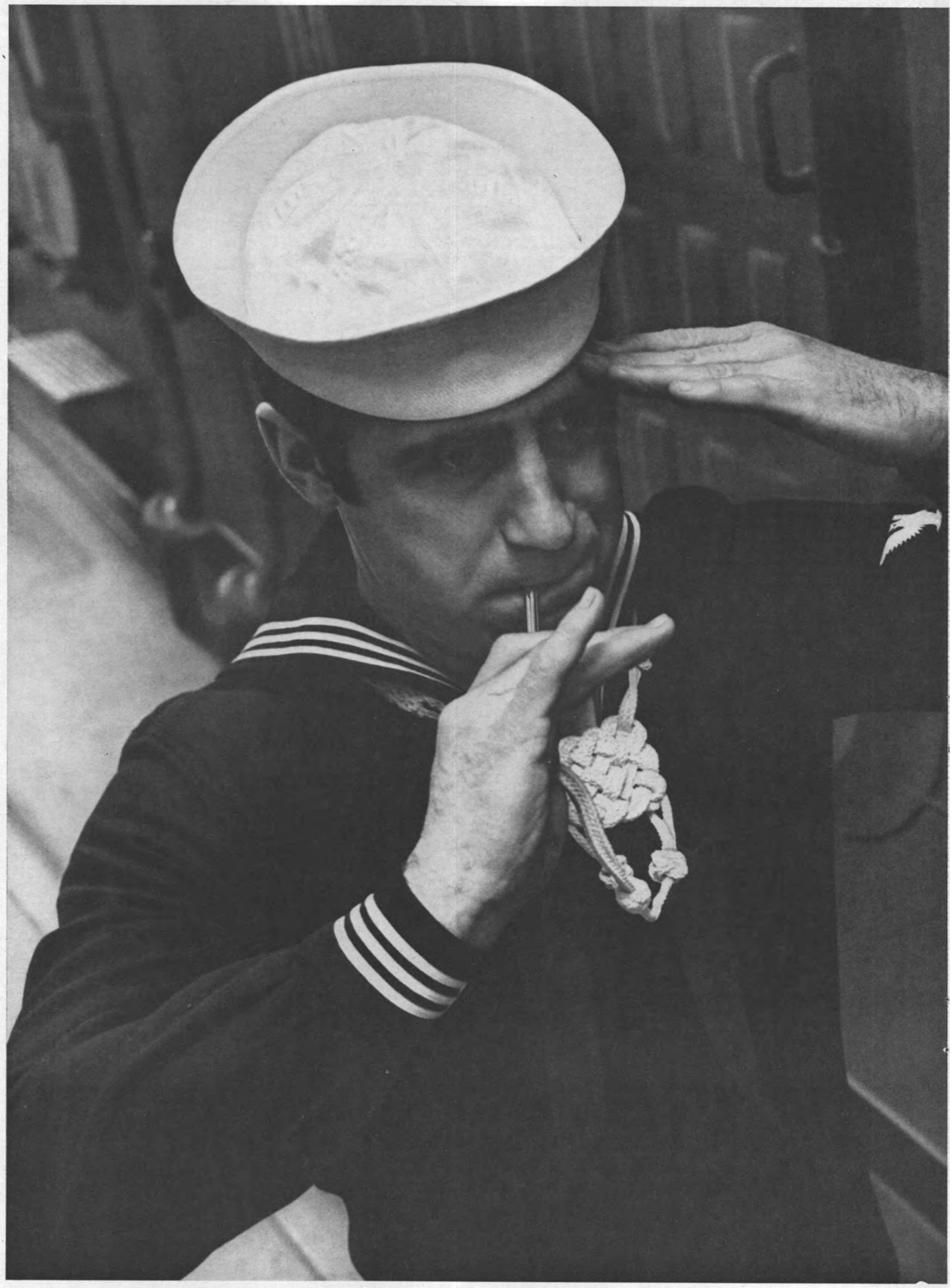
The division designs and markets a wide variety of materials handling, steelmaking, marine and other equipment. The new department will direct the division's long-range planning and development program, define goals and objectives and prepare studies to assess the division's functions and advise management.

De Laval Enters Gas Turbine Field

De Laval Turbine Inc., Trenton, N.J., and Stal-Laval Turbin AB, Finspong, Sweden have jointly announced the conclusion of arrangements under which De Laval Turbine Inc. will sell and manufacture, under license from Stal-Laval, in the United States, Canada and Mexico, gas turbines to be used for centrifugal compressor drives, power generation and marine propulsion.

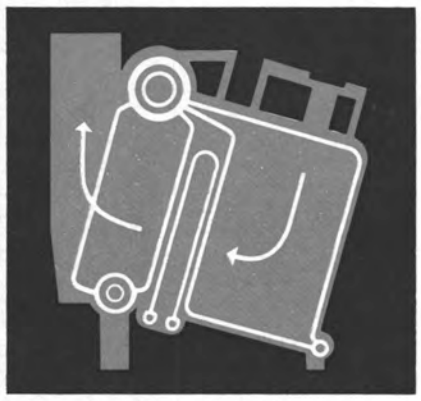
The gas turbine package plants can be used with jet engine-type gas generators or the Stal-Laval industrial-type GT-35 gas generator. Their availability will enable De Laval Turbine Inc. to undertake the furnishing of complete gas turbine-driven units to the industries which have traditionally been served with De Laval's diversified product lines.

PLEASURE BOAT TO WORKBOAT—A stock 27-foot Uniflite pleasure cruiser hull has proven to be an ideal choice for a crew/tow boat built for the Puget Sound Tug and Barge Company of Seattle, Wash. Uniflite engineers designed the interior and cockpit of the fiberglass boat to customer specification for barge work supplying Alaska north slope oil-drilling operations. Propulsion is provided by a 100-hp diesel engine driving a marine jet propulsion pump. The propulsion unit is well suited for shallow draft operation and beaching. The hull bottom was specially reinforced. Hull, stringers, deck and cabin are made entirely of fiberglass using Hetron fire-retardant polyester resin. Uniflite, Inc., Bellingham, Wash., points to this boat as a good example of how to adapt its stock cruiser hulls for commercial operations.



V2M-8 requests permission to come aboard.

Permission granted.



Schematic arrangement of a V2M-8 welded wall marine boiler. Boilers of this type are in fleet use aboard LKA class ships.

The V2M-8 boiler has important design features for high reliability:

A completely water cooled furnace for conservative heat absorption and long furnace life.

Welded wall construction means no furnace refractory and elimination of a major maintenance item.

Top firing into the symmetrical V2M-8 furnace provides optimum gas distribution and high combustion efficiency.

The vertical superheater means virtual elimination of slagging and fouling of gas passages.

Coupled with retractable soot blowers, wide range burners, and in-line tube banks, these features add up to high reliability and low maintenance, giving maximum availability.

Now in the fleet,V2M-8's represent the latest in marine boiler technology.

For more information, call or write Combustion Engineering, Inc., Marine Boiler Operations, Windsor, Conn. 06095.

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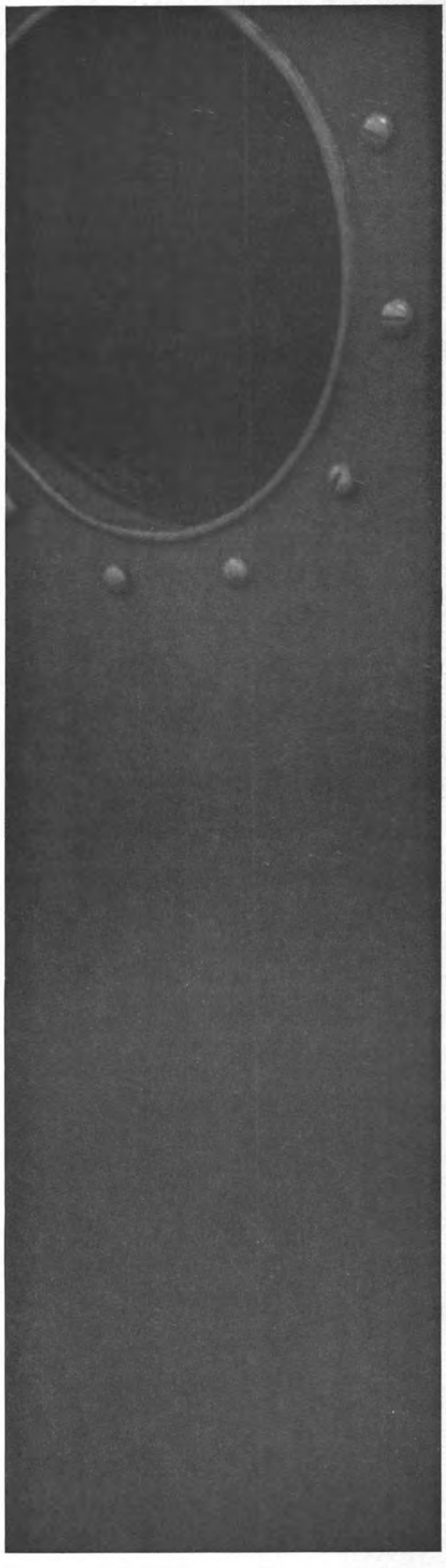

Moller Group Orders 272,000-DWT Tanker

A 272,000-dwt tanker has been ordered by the A. P. Moller Group of Copenhagen from Odense Staalskibsvaerft, A/S. The shipyard is a subsidiary of the Moller Group. According to the report, the yard now has 10 ships of over 200,000 tons on order, and is the only yard in Denmark now constructing tankers of such a size. The new vessel is due for delivery in 1971/1972.

Florida Ports Elect W. O. Savage President

The Florida Ports and Foreign Trades Council, an organization comprised of representatives from each of Florida's 20 seaports, has elected **William O. Savage,** of Tampa as president for the coming year.

Mr. **Savage** is president of A. R. Savage & Son, steamship agents in Tampa and Jacksonville.

Other officers elected include **J. E. Jaudon,** port manager of Palm Beach, vice-president; **E. P. Nickerson Jr.,** vice-president of John A. Merritt Co., Pensacola, secretary, and Adm. **I. J. Stephens,** port director of Miami, treasurer.

The Council's principal function is to develop foreign trade through Florida ports and to stimulate Florida industry to become active in foreign trade. The Council is the recipient of the Presidential "E" award for outstanding contributions to the export expansion program of the United States.

Frank L. LoRe Named Raytheon Marine Unit Manufacturing Manager

Frank L. LoRe

Frank L. LoRe has been named manufacturing manager for Raytheon Company's Marine Products Operation, South San Francisco, Calif. He will direct all manufacturing and related functions at the plant which produces radio telephones, depth sounders, radars, and other marine electronic aids as well as ultrasonic measuring systems.

Mr. **LoRe** joined Raytheon Company in 1967 as a manufacturing consultant on the corporate staff. Prior to that he was corporate manager of inventory control for Consolidated Packaging Corp. Earlier, he held production, material control, and manufacturing engineering posts with Motorola, Sperry Rand, and Federal Telephone and Radio Company. He was previously an instructor at St. John's University, College of Business Administration.

Mr. **LoRe** holds a bachelor's degree from St. John's University and a master's degree from New York University. He is a member of the American Production and Inventory Control Society, the American Ordnance Association, and the American Management Association.

Bethlehem To Convert T-2 Tanker Lynchburg Into Sulfur Carrier

Bethlehem Steel Company's Key Highway and Sparrows Point, Md. shipyards will convert the T-2 tanker Lynchburg into a liquefied sulfur carrier. The conversion, to cost $8,692,000, will be performed for Marine Navigation Company and Marine Sulphur Shipping Corporation.

The announcement of the conversion was made by the Maritime Administration when the chief of the office of Ship Operations approved the trade-out of the government-owned T-2 tanker in exchange for the bulk-carrier Mariner Collier. The Lynchburg was valued at $285,000 by the government and the Marine Collier at $56,000.

Bethlehem's Sparrows Point shipyard will build an entirely new forebody for the vessel. The Key Highway yard will cut off the existing T-2 forebody and install the new section.

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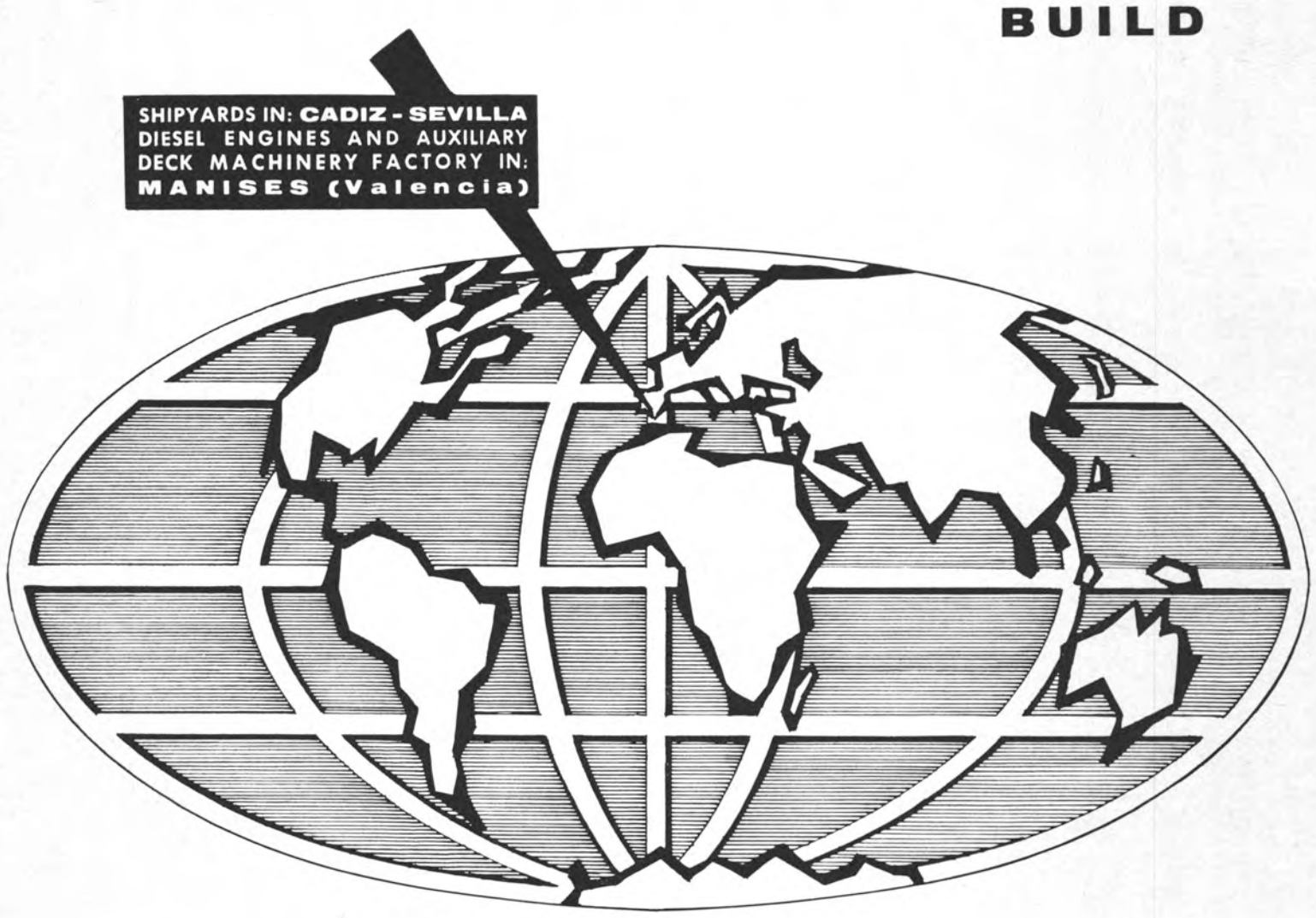

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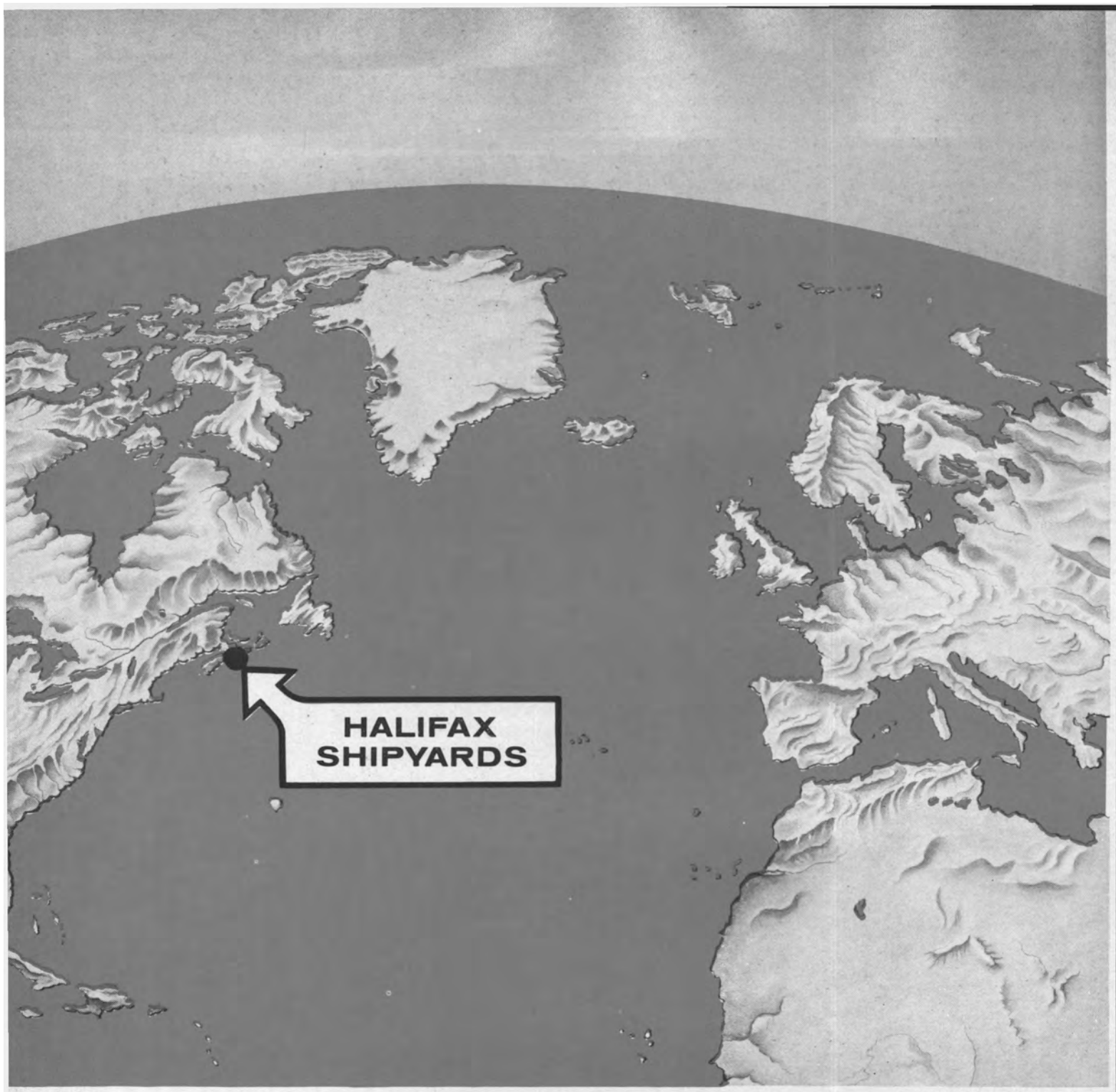

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Northern Metals Co.

Philadelphia Terminal Enters Commercial Container Field

Aerial view of Northern Metal's Phila. terminal showing the Callaghan (center) loading and 60-ton cranes (foreground).

The Northern Metal Co., which provides terminal service and stevedoring in Philadelphia, Pa., is entering into the field of containerization on a large scale. Recent changes in terminal policy have now actively entered the facility, on a limited basis, into the commercial cargo field under the direction of Col. **D. Rinque,** USA (ret.). This change in policy was announced by **Jack Rose,** president of the firm.

The Northern Metal Co. is a privately-owned marine terminal which was formed by the late **Max Rose.** For the past two decades it has performed terminal and stevedoring services in connection with the shipment of military cargo under Department of Defense contracts.

Since 1951 Northern has almost exclusively reserved its facilities for the military. During the Korean war the terminal processed and loaded on vessels thousands of military vehicles and over the years has handled all types of cargo, e.g., POV's (automobiles), general cargo, steel, Army tanks, etc. More recently the terminal was instrumental in helping to develop the full potential of the roll-on/roll-off vessel Adm. Wm. M. Callaghan. The vessel operated for six months, after being built, between Northern Metals and the Port of Bremerhaven, Germany. Northern developed procedures for the loading and discharging operations of this vessel which are still being utilized. The vessel is currently being operated from the military terminal in Bayonne, N.J.

The 160-acre facility is considered to be one of the largest and most completely equipped privately-owned marine terminals in the world. It has, over many years, performed a distinguished service for the department of defense and has a reputation which is difficult to surpass.

Not wishing to disturb the military operation, it has so far been rather selective in its commercial operations. However, because of its reputation many of the large shippers and shipping companies are showing interest in utilizing the facilities of this unusually complete marine terminal for commercial operations.

Adm. Wm. M. Callaghan loading cars over stern ramp from special facility developed by Northern Metal Co. which is still being utilized by MSTS.

Containers being handled by one of three 60-ton gantry cranes at Philadelphia terminal. Since 1968 containers have been stuffed at this facility.

Admiral Hushing Joins Bath As Executive Vice-President

James F. Goodrich, president of Bath Iron Works Corporation, has announced that Rear Adm. **William C. Hushing,** USN (ret.), joined BIW on July 1, as executive vice-president for administration and engineering. Admiral **Hushing** recently retired from active duty with the United States Navy, where he last served as commander of the Portsmouth Naval Shipyard.

After assuming his new position, Admiral **Hushing's** responsibilities will include supervision of the engineering, material management, personnel, financial and quality control departments of Bath Iron Works Corporation. He is expected to play a very vital role in the development of Bath's plans for an expanded shipbuilding effort in the coming months. **Lowry E. Gilbreath,** executive vice-president for operations, will continue to supervise Bath's production, industrial engineering, estimating, scheduling and planning activities.

Before assuming command of the Portsmouth Naval Shipyard in 1964, Admiral **Hushing** was the United States Navy's supervisor of shipbuilding at the Electric Boat Division of General Dynamics Corporation in Groton, Conn. Prior to that time, he was comptroller and industrial engineering officer at the Mare Island Naval Shipyard, Vallejo, Calif.

Admiral **Hushing** received his bachelor of science degree from the United States Naval Academy and later his master of science degree in naval construction and marine engineering from Massachusetts Institute of Technology. In 1962, he graduated from the advanced management program at the Harvard Business School of Harvard University. He was also the recipient of an honorary doctor of science degree from the University of New Hampshire in 1968.

Nabrico Dredge To Aid In Seabee Training

A new portable 14-inch hydraulic dredge, designed and built at a cost of about $400,000 by the Nashville Bridge Company, will be delivered in August to the United States Naval Construction Battalion Center in Davisville, R. I., it was announced by **Robert A. Downing,** executive vice-president.

He said that the dredge would be utilized at the Davisville Seabee Center to train Seabees in dredging techniques. The vessel is designed to permit dismantling and transportation by air, land or water to any required operational site. Mr. **Downing** said that it was necessary for Nabrico to modify the standard specifications for a 14-inch dredge, so the components of the Seabee unit could fit into the freight compartment of a C5A aircraft.

The dredge will be delivered unassembled to Davisville by rail. The Seabees will be trained to assemble, operate, maintain and dismantle the equipment, so it will be in constant readiness to support an assigned mission.

The new Nabrico dredge weighs 100 tons, and is 120 feet long with a 2-foot freeboard. It will carry an operational crew of six men, plus six additional men in support. The dredge is designed for a digging depth of 45 feet at 45 degrees with a discharge line of about one mile.

Marine Const. Building Offshore Fishing Boat

Marine Construction & Design Co., Seattle, Wash., was contracted by Resolff, Hendricks & Kaldestad to build an offshore fishing vessel. To be equipped with a single 565-bhp diesel, it will have dimensions of 94 feet by 25 feet by 12 feet. The vessel will be named Sea Star.

Barge Construction

Avondale Shipyards, Inc., New Orleans, La., has received an order for an oil barge from Interstate Oil Transport Co., Philadelphia, Pa. The vessel, designated Hull No. 1198, will measure 300 feet by 62 feet by 21 feet, and will be of 9,000 dwt.

Bethlehem-San Francisco Yard is scheduled to build two deck cargo barges. Each barge will be of 10,000 dwt and will have dimensions of 384 feet by 76 feet by 20 feet. One barge, designated Hull No. 4105, will be built for Tank Barge 31, Inc., and the other, designated Hull No. 4106, will be built for Tank Barge 32, Inc. Both companies are located in San Francisco.

Dravo Corp., Pittsburgh, Pa., is building a bulk cement barge for the Halliburton Co. of Duncan, Okla. The barge will have dimensions of 275 feet by 50 feet by 12 feet, and will be of 2,600 dwt.

General Steel Tank Co., Beaufort, N.C., has received a Navy contract for the construction of five lighters (YC-YFB-1249 through 1253). The price involved was not disclosed.

Jeffboat, Inc., Jeffersonville, Ind., has received an order from American Commercial Lines, Inc., Jeffersonville, Ind. to build four tank barges. Two of the barges will measure 195 feet by 52 feet 6 inches by 12 feet 6 inches, and two will measure 200 feet by 52 feet 6 inches by 12 feet 6 inches. Each barge will be of 2,250 dwt. Jeffboat is also building a crane barge for undisclosed interests. The barge will have dimensions of 180 feet by 75 feet by 12 feet, and will be approximately 2,500 dwt.

Ludlow Marine Corp., Yonkers, N.Y., is planning to build a deckhouse cargo barge for its own use. The barge will measure 45 feet by 24 feet by 5 feet, and has been designated Hull No. 1.

Nashville (Tenn.) Bridge Co. has been awarded a contract for the construction of an oil barge by Barge David, Inc. The vessel, designated Hull No. 2012, will have measurements of 264 feet by 54 feet by 12 feet, and will be of 3,600 dwt. The firm has also received orders from Barge Donna Rae, Inc. for two oil barges. The barges will each measure 264 feet by 54 feet by 12 feet and will be of 3,600 dwt. They have been designated Hull Nos. 2014 and 2031.

St. Louis Ship, a division of Pott Industries, Inc., St. Louis, Mo., will build three 2,500-dwt oil barges, each having dimensions of 290 feet by 52 feet 6 inches by 12 feet. One barge, designated Hull No. 2612, will be built for Lasson Barge Transportation Co.; another, Hull No. 2624, for Lasson Towing Service, and the third, Hull No. 2625, for B.R.C., Inc.

Tidewater Equipment Corp., Chesapeake, Va., will build two deck cargo barges for Tidewater Construction Corp. of Norfolk. Each barge will measure 120 feet by 40 feet by 8 feet, and will be of 800 dwt. They have been designated Hulls No. 50 and 51.

Zigler Shipyards, Inc., Jennings, La., has been contracted by Dow Chemical Co. to construct an independent, pressure-type tank barge. The barge will measure 195 feet by 35 feet by 11 feet and will be of 1,400 dwt. It has been designated Hull No. 203.

C-E Boilers To Power Spanish Navy Vessels

Combustion Engineering boilers have been ordered for five guided-missile destroyer escorts. The vessels are being built for the Spanish Navy by Bazan Shipyards at El Ferrol del Caudillo, Spain.

Each ship will be powered by two C-E boilers, type V2M with vertical superheaters, capable of generating 330,000 pounds of steam per hour, at 1,200 psig and 950° F.

Combustion Engineering will design the boilers, and furnish key components and auxiliaries to Astilleros de Cadiz, Spain, a C-E licensee. Astilleros will supply the balance of the components and assemble the boilers for delivery to the shipyard.

Gibbs & Cox of New York, N.Y. is the ship's systems design engineer.

MITSUI DELIVERS 106,000-DWT ORE CARRIER—The Owari Maru was delivered recently to the N.Y.K. Line by Mitsui Shipbuilding & Engineering Co., Ltd. The 850-foot vessel has a beam of 137 feet 7 inches, a depth of 64 feet 7½ inches and a loaded draft of 46 feet 7 inches. The ship is designed to the most economical dimensions to secure the planned deadweight. Hull steel weight was reduced by locating the bridge well aft, eliminating the poop deck, using corrugated bulkheads and the use of high-tensile steel. It is powered by a 23,200-maximum-bhp Mitsui B&W diesel engine, Type 9K84EF, which gave a trial speed of 16.7 knots.

A. L. MECHLING BARGE LINES, INC. BUYS ITS 3RD HYDRODYNE TOWBOAT FROM ST. LOUIS SHIP

During the past seven years, Mechling has studied the performance of its own HYDRODYNE Hull towboats, under ALL POSSIBLE WORKING CONDITIONS.

The efficiency, handling ability and thrust of Mechling's two Hydrodyne towboats, the M/V Daniel Webster, purchased in 1962, and the M/V Roy Mechling, purchased in 1965, were the deciding factors when Mechling ordered its third Hydrodyne.

The new M/V Sarah Elizabeth is a sister ship, except that its power has been increased to 5600 h.p.

If you are looking for a towboat that can supply more "push" per horsepower, you are looking for a Hydrodyne. Remember, the Hydrodyne hull is an exclusive design concept and hull configuration built only by St. Louis Ship. We are America's largest inland shipbuilding and repair firm. with 3 shipyards to serve you. Just call (314) 638-4000.

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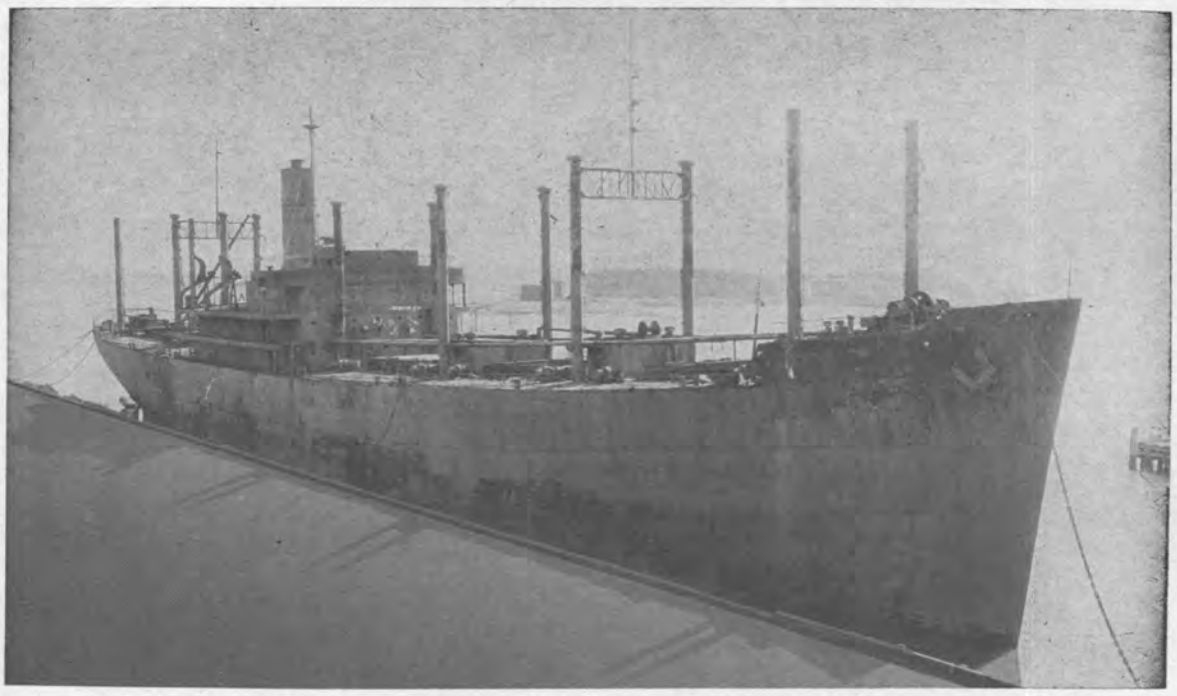
AP2/AP3 VICTORY C2/C3 NEW, US RECONDI



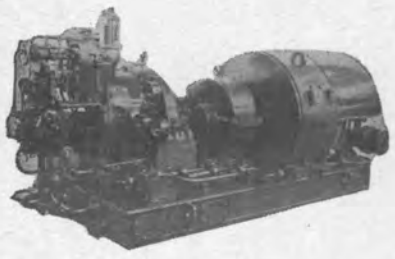
EQUIPMENT FROM MOORE DRYDOCK C-3 EX-MORMACSEA — HULL 197

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

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

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

TURBO-GENERATORS



300 KW — From AP2 Ex-Medina Victory

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

300 KW — From AP3 Ex-Ridgefield Victory

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

300 KW Murray

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

300 KW GENERAL ELECTRIC

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

TURN TO 3RD PAGE FOLLOWING FOR 300 KW SPARE ARMATURES

VICTORY AP3 TAILSHAFT

Isaacson Iron Works
Located Mobile

VICTORY AP3 RUDDER

Located Baltimore

VICTORY AP3 MAIN CIRCULATOR & MOTOR

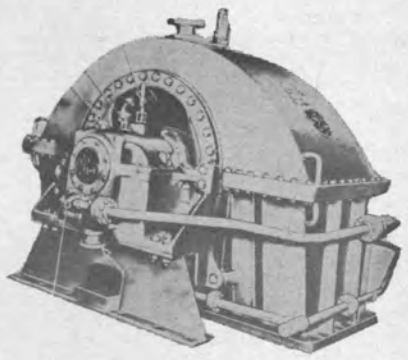
PUMP: 20 VCM—13,000 GPM—24.5 ft.—635 RPM. MOTOR: Reliance—100 HP—230 volts—360 amps—475/635 RPM — Lt. Compound — Frame 1050T — Vertical.

C3 PROPELLER BRONZE — 4-BLADE

21' 8" Diameter
21.669 Ft. Pitch
0.7 Radius

NEW AP2 VICTORY ENGI

6600 HP Main Propulsi



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COMPLETE TURBI

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

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

ABS RECONDITIONED 660

L. P. & H. P. MAIN PRO

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

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

AP2 VI
WESTING
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6000 SHP—R
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Ex-Medina Vict
1620.

VICTORY AP3 EVAPORATOR-DISTILLER

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

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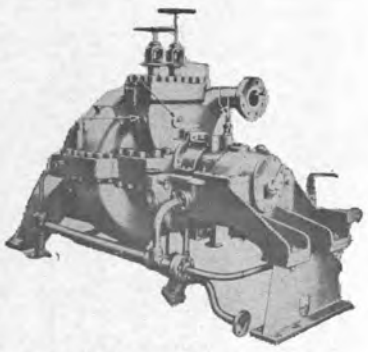
on HP & LP Turbines



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NE ASSEMBLIES

ALLIS-CHALMERS

Low Pressure Turbine $17,500
High Pressure Turbine $18,500

VES – $6750.00

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—labyrinth packing—diaphragms.

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HULL 586—BUILDERS HULL 586
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NEW H. P. & L. P. FLEXIBLE COUPLING
AP2—6000 H.P.

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

VICTORY AP3
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stinghouse—type 25—TD—18—19,000
.M. at 10.7 inches static pressure.

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MISCELLANEOUS PUMPS & PUMP MOTORS

DE LAVAL VERTICAL ROTARY MAIN LUBE OIL PUMP

10/15 HP—230 VDC—250 GPM @ 43 lbs.—980/1750 RPM. MOTORS: G.E. or Reliance.

MAIN CIRCULATOR & MOTOR FOR AP2 VICTORY

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

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

INGERSOLL-RAND CONDENSATE PUMPS - MOTORS - TURBINES

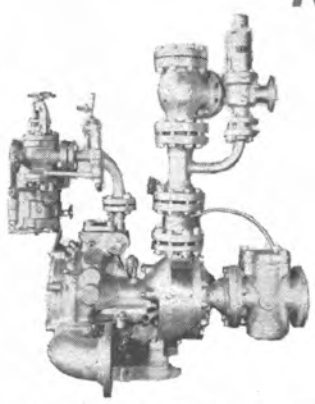
AP3—2VHM—150 GPM—1650 RPM
AP2—2VHM—120 GPM

CHOICE OF TURBINE OR MOTOR DRIVES

15 HP MOTORS: Reliance—G.E.—Crocker-Wheeler
TURBINES: Coppus type TF5 and Terry

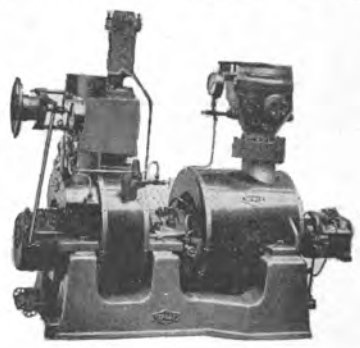
INQUIRE ABOUT ANY UNLISTED ITEMS THAT YOU NEED

MARINE FEED PUMPS



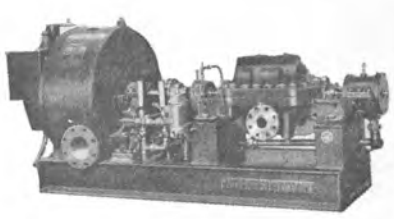
COFFIN MODEL F

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



WEIR TURBINE DRIVEN FEED PUMPS TMFP7

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



MAIN FEED PUMPS

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

PACIFIC FEED PUMPS – TYPE JB – AP3 VICTORY

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

SPECIAL FROM RIDGEFIELD VICTORY

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

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

AIR COMPRESSORS

INGERSOLL-RAND

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

SULLIVAN

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

300 KW VICTORY SHIP & C-2 GENERATOR ARMATURES

A

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-1—General Electric—120/240 volts DC—type MPC—stab. shunt.

T2-SEA-1 TANKER MAIN STEAM & AUXILIARY EQUIPMENT

B

MAIN TURBINE ROTORS

Large Turbine Rotors—Lynn

Large Turbine Rotors—Schenectady

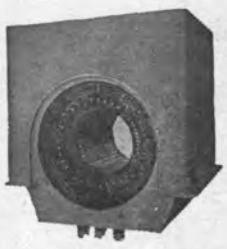
Elliott Turbine Rotors—Fit G.E. small Schenectady turbine

C

G.E. MAIN PROPULSION GENERATOR REVOLVING FIELD

G.E. reconditioned—June 1967

D



G.E. MAIN GENERATOR STATORS

E

REWOUND WESTINGHOUSE MAIN PROPULSION GENERATOR REVOLVING FIELD

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

WRITE FOR COMPLETE INFORMATION

F

WESTINGHOUSE MAIN GENERATOR STATOR WITH OR WITHOUT COOLER

G

WESTINGHOUSE MAIN MOTOR FIELD COILS

COMPLETE SET

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

H

T2 RUDDER

Reconditioned—ready to go.

T2 TAILSHAFTS

Reconditioned

PROPELLERS

T2 propellers

I

WESTINGHOUSE EXCITER SETS

110 KW—28 KW—5 KW available

110 KW—32.5 KW—5 KW available

J

LORIMER

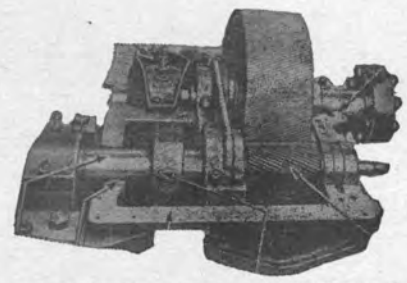
Emergency Generator Engine and Generator Parts

K

MAIN CIRCULATING PUMP MOTOR

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

L



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

Bull gear & pinion. With ABS.

M

WESTINGHOUSE AUXILIARY GENERATOR REDUCTION GEARS AND BEARINGS

COOLERS

N

MAIN MOTOR AIR COOLER

Westinghouse—ABS—ready to ship

O

MAIN GENERATOR AIR COOLER

Westinghouse — reconditioned with ABS—ready to ship

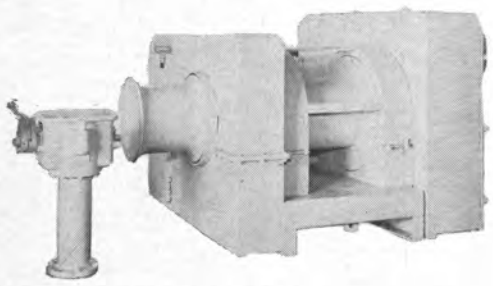
P

G.E. MAIN GENERATOR COOLER

type G4—bronze heads—AL brass tubes

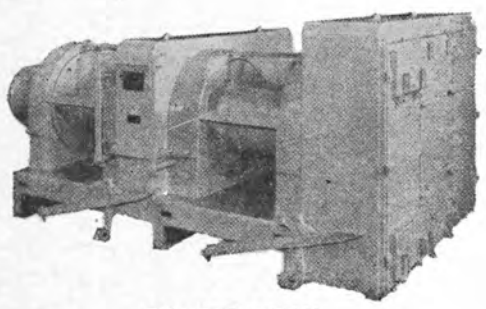
CARGO WINCHES, WINDLASSES & GENERATOR SETS

WINCHES



VICTORY TYPE UNIT WINCHES

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



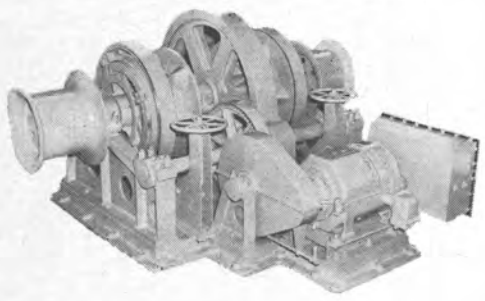
DOUBLE DRUM U-6 UNIT WINCHES

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

AMERICAN ENGINEERING UNIT WINCHES

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

WINDLASSES



NEW 2¼" McKIERNAN-TERRY

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

A.E.—2-7/16" WINDLASS

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

HYDE #12 WINDLASS FOR 2 11/16" CHAIN

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

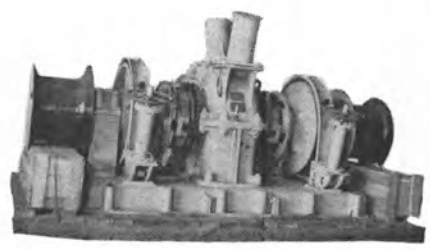
T-3 ANCHOR WINDLASS FOR 2⅜" CHAIN

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

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

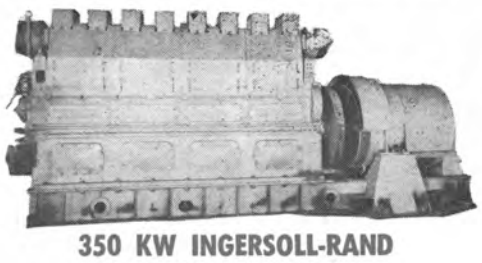
American Engineeirng type MALI-60-14—12 x 14—4' 8½" between wildcat centers.

UNUSED 1⅝" HEAVY DUTY LINK BELT WINDLASS



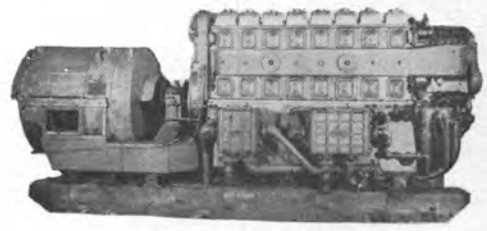
Below deck motor drive. Double Wildcat—driven by 50 HP—230 volt DC motor with vertical shaft and worm drive. Single speed—handles 7000 lb anchors and 60 fathoms of 1⅝" chain at 7 fathoms per minute. Wildcat centers 56". Complete with all controls and warping features. Total weight 27,500 lbs. With spares.

GENERATOR SETS



350 KW INGERSOLL-RAND DIESEL GENERATOR SETS

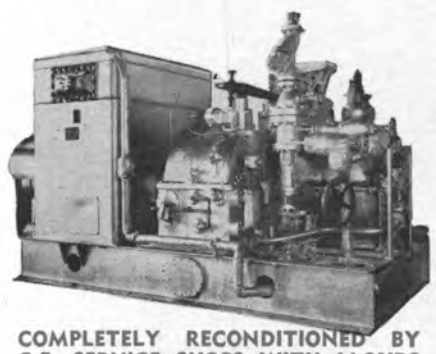
4 Available—engine type S—Ingersoll-Rand—1½ x 12—heat exchanger cooled—600 RPM. GENERATOR: General Electric—350 KW—120/240 volts DC—600 RPM. Complete with switchgear, coolers and air starting equipment.



290 KW DIESEL GENERATOR SET

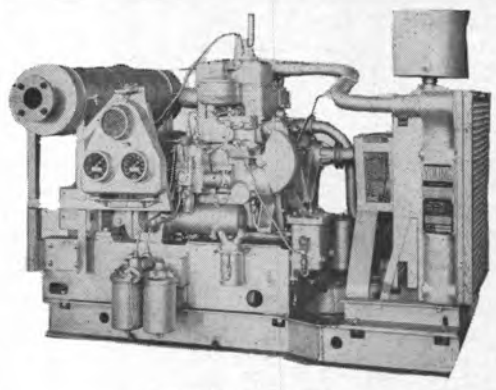
Westinghouse 290 KW generator—120/240 volts—1250 amps. ENGINE: GM 8-268A—6½ x 7—8 cylinder—1200 RPM.

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



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

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



UNUSED 10 KW SUPERIOR DIESEL GENERATOR SETS

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

Windjammer Acquires Short Hills Shipping

Windjammer International Corporation has announced that it has acquired all the stock of Short Hills Shipping Corp., privately owned by **S. A. (Huey) Long,** well-known shipping executive and sailing enthusiast. The transaction was for an undisclosed amount of notes.

Among the acquired company's assets are three 10,000-ton Victory ships, according to Capt. **Mike Burke,** Windjammer's president. He said Short Hills will be dissolved into a new wholly owned subsidiary, Windjammer Shipping, Inc. The three vessels will be renamed Suzy, Poly and Jeannine, for three of the Burkes' seven children. The ships are currently being refitted and conditioned at shipyards in Galveston, Texas and Jacksonville, Fla.

The Short Hills acquisition is the latest in a series of new developments for Windjammer International Corporation, a Maryland firm. Last month a new, wholly owned subsidiary, Windjammer Sea Sciences, was formed, as support and supply to the oceanographic research programs for government, industry and universities. Its first research vessel, the 180-foot Hydrographer, is being outfitted in the Miami shipyards of Hydrotech Corp., and is expected to be placed in service late in July.

Captain **Burke** said the new subsidiary will develop a fleet of floating laboratories and support craft during the next 12 to 18 months, with an investment in excess of $3.5-million.

A thriving cruise business in the Caribbean is operated through another wholly owned subsidiary, Windjammer Cruises, Ltd. In recent months Windjammer International Corporation has acquired Simpson Steamship Company of Nassau, The Bahamas, operators of the 2,000-ton freighter Linglea, and also acquired Bartosiak Shipping Company of Bermuda, operators of the 2,000-ton refrigerator ship Stella Nova.

Carrier Water-To-Air System Installed On Yacht To Supply Heat, Cooling And Ventilation

Figure Four is the latest of a breed of cruisers specially equipped with Carrier water-to-air heat pump systems for zoned year-round comfort and built by Stephens Marine.

Figure Four, a yacht owned by Texas businessman **Monte Frost,** is the latest in a breed of cruisers specially equipped with heat pump systems for zoned year-round comfort and built by Stephens Marine, Inc. of Stockton, Calif.

The air-conditioning systems are designed to operate in sea water temperatures ranging from 28 to 88 degrees, and in fresh water temperatures down to 35 degrees with the use of anti-freeze switches.

All of the specialized know-how of the J. H. Simpson Company and its design engineer **William Relf,** an engineering graduate of California State Polytechnic College, have gone into the heat pump system for Figure Four . . . the most sophisticated one of them all.

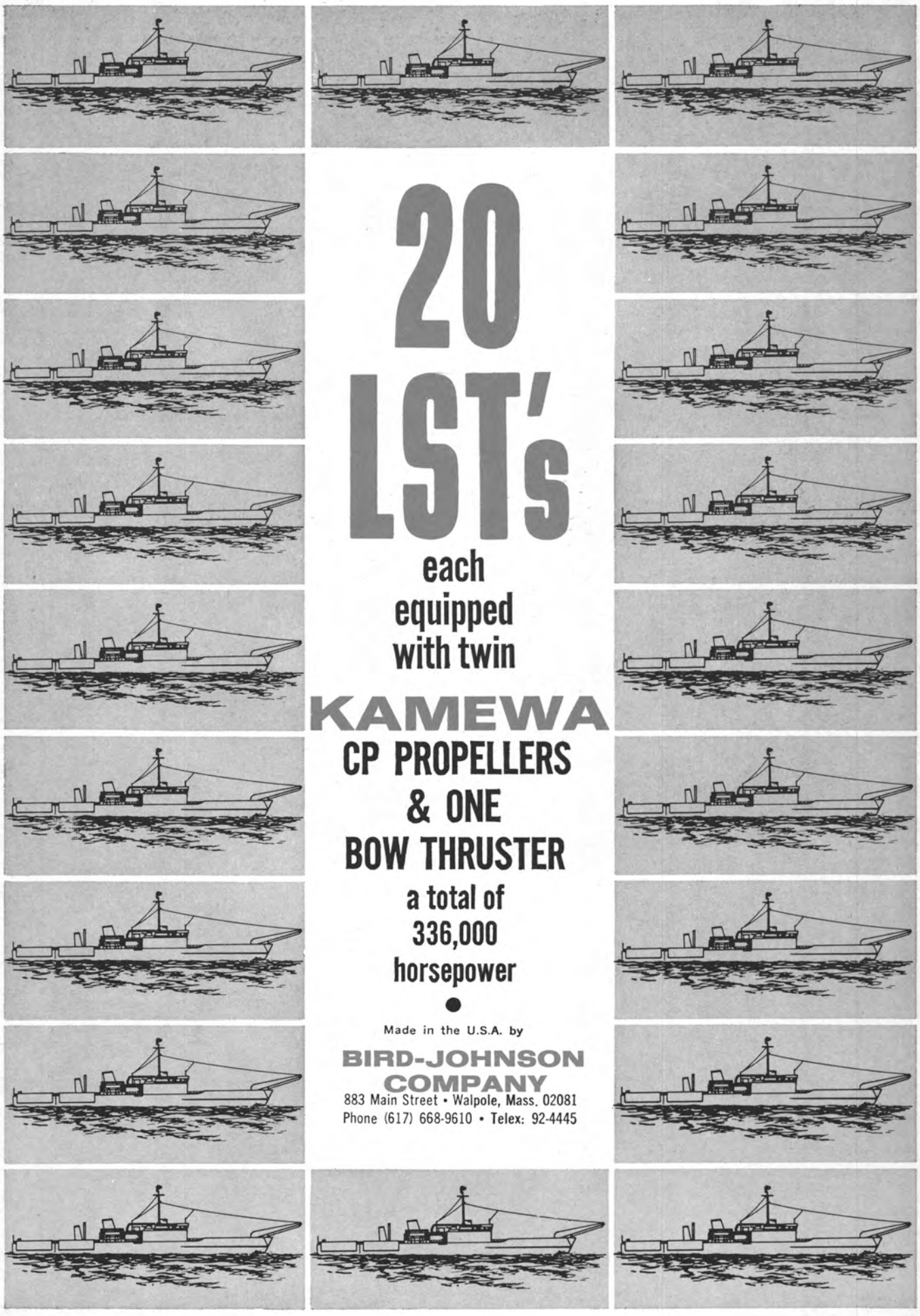
J. H. Simpson Company, a major mechanical contractor and franchised air conditioning dealer of Valair distributors, entered into marine installations as a side-line business some 20 years ago. At that time they did ventilation work on minesweepers and other government vessels under contract with Stephens Company. For the past eight years their marine installations have been confined to yacht air conditioning.

Powered by two Detroit Diesel V-8 engines that give it a maximum speed of 18 knots and a cruising range of about 500 miles, the 63-foot cruiser is built without conventional portholes, at the owner's request, and contains only fixed glass areas for light. Because of this, the yacht is entirely dependent on a Carrier water-to-air heat pump system for heating, cooling and ventilation air.

The dependency on air conditioning for comfort led Mr. **Frost** to insist on having two complete 5-ton systems in parallel and a variety of spare parts and tools including a spare compressor. The 100-percent back-up system assures air conditioning even if there are equipment failures.

In the heat-pump systems, bronze water pumps bring in sea or fresh water to cupronickel tube-in-tube condensers, each having 75,000 Btus of heat-rejection capacity. Refrigerant systems powered by Carrier serviceable hermetic motor-compressors either pick up heat from the water or reject heat to the water as it is pumped in and out of the condensers.

The refrigerant lines are connected to five fan-coil units each controlled by a separate thermostat. These fan-coil units are located throughout the cruiser, as close to the space they condition as possible, to minimize the amount of ductwork required.



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A Method To Improve Bridge Operations--

A Self-Plotting Radar

J. Watt and B. C. Piercy*

In these days of large, fast ships carrying a minimum crew, there is the need to eliminate as many manual functions as possible. One such function that has now been eliminated is the manual plotting of the courses of ships moving around your own vessels. Manual plotting has been necessary in the past to determine the motions of other ships relative to your own ship and to provide information concerning their true motions.

The Marconi International Marine Company has developed a radar which eliminates manual plotting. The radar has an electronic memory which automatically stores all target information during normal use and recalls the information when it is needed. Such a unit has been installed on the Methane Progress.

Called the Marconi Predictor, it is possible to obtain a clear and unambiguous radar plot, indicating the tracks (true motion or relative) which have been followed by all targets to arrive at their present positions on the display. This can be done with pushing only one button.

The operator does not have to wait for a plot to build up—the Predictor stores information continuously and automatically. An up-to-10-seconds-ago plot is always available, and is up-dated every 10 seconds. The period of elapsed time covered by a plot may be 1½, 3 or 6 minutes as selected by pushbuttons. When an automatic plot is being produced, every fourth sweep of the radar trace indicates the position 'now' of every target. The intervening three sweeps show, in succession, the 'memorized' positions at equal intervals of elapsed time during the chosen period of the plot: 1½, 1 and ½ minutes ago on a 1½-minute plot; 3, 2 and 1 minutes ago on a 3-minute plot, and 6, 4 and 2 minutes ago on a 6-minute plot. The 'now' positions are always easily distinguished from the memorized positions as the track steps forward.

The Predictor provides four modes of display, selected by pushbutton, namely: basic radar, true tracks, relative tracks and predicted relative tracks. The entire display on the 16-inch screen can be presented either with ship's head up or north up by pushbutton selection. Your own ship's position always remains at the center of the screen.

The four modes of operation are shown in Figures 1 through 4. Figure 4, predicted relative tracks, shows why the name Predictor was selected. In this mode, it is possible to determine what the overall situation will be if a change in course is executed.

In the operational use of Predictor, the user concentrates on those targets which are seen from their positions and relative tracks to deserve it. Other targets whose relative tracks make them obviously safe are taken in by one observation and from then on are spared only an occasional glance. The presence of the tracks of these 'safe' targets represents no distraction.

These unique plotting facilities have been provided, in addition to every conventional radar facility, in a single unit which has fewer controls than many of the conventional display units. The radar uses solid-state techniques to a high degree. The entire installation, including the 25-kw transceiver, uses only two thermionic devices—the magnetron and the cathode-ray tube.

*Mr. **Watt** and Mr. **Piercy,** The Marconi Company Limited, presented a paper, condensed here, before a recent meeting RTCM in Cleveland describing the Marconi Predictor. Inquiries concerning this paper can be made to **David Bowker,** North American representative, Marconi Marine, 232 Wescott Drive, Rahway, N.J. 07065.

The Marconi Predictor in use on the bridge of the Shell LPG tanker Methane Progress indicates its compactness.

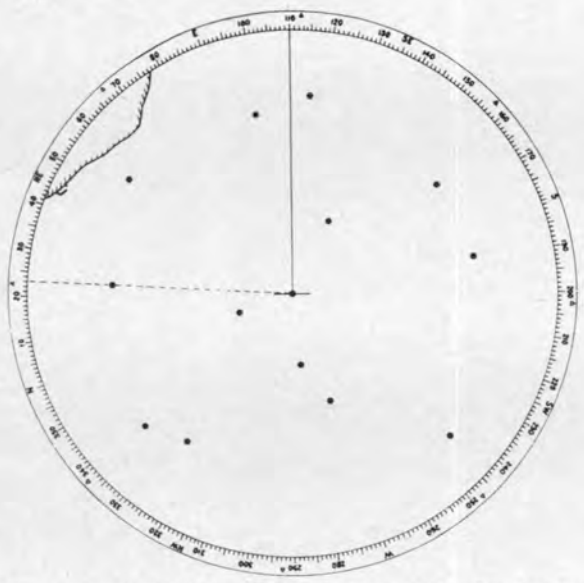


Figure 1—Basic Radar Mode. In this mode, the display is one of conventional relative motion. Both a mechanical bearing cursor and an electronic bearing marker are provided. Both indicate true bearings directly. To find out what all these targets are actually doing, a true-motion plot is needed. Figure 2 shows the same situation for a true-motion radar plot.

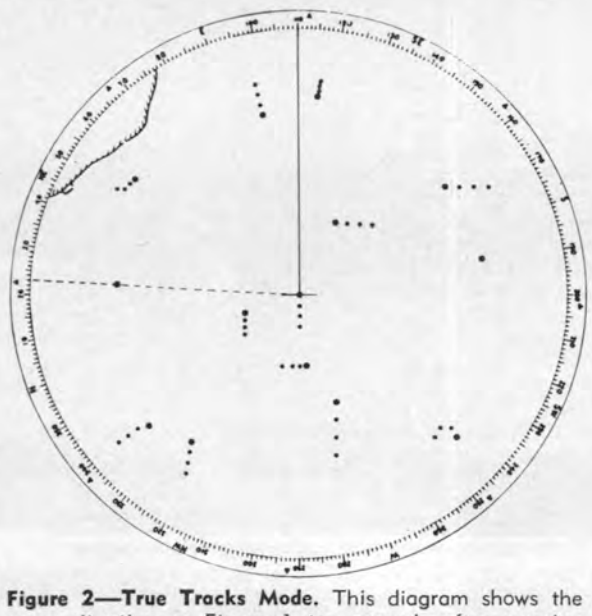


Figure 2—True Tracks Mode. This diagram shows the same situation as Figure 1 ten seconds after pressing the button for a true tracks radar plot. The track length selected is six minutes. The trace on the PPI has painted, in four consecutive sweeps, the true positions of every target at six, four and two minutes ago and 'now.' In practice, the direction of motion along the track is obvious by virtue of the presentation; but in these diagrams, it is necessary to indicate direction by slightly enlarging the 'now' paint. By use of the parallel lines on the mechanical bearing cursor, the course of each target can be measured and the speed accurately estimated.

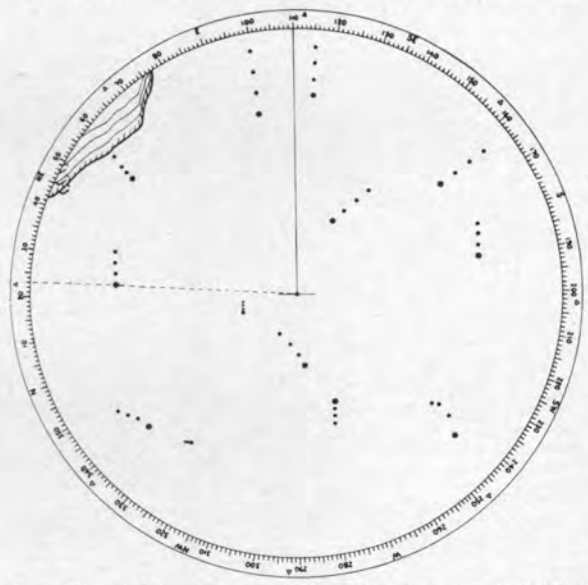


Figure 3—Relative Tracks Mode. This diagram shows the same situation 10 seconds after pressing the button for a relative tracks radar plot. This time, the successive sweeps of the trace have painted the relative positions of all targets, six, four and two minutes ago and 'now.' By using the mechanical bearing cursor, the closest point of approach of any target can now be estimated quickly.

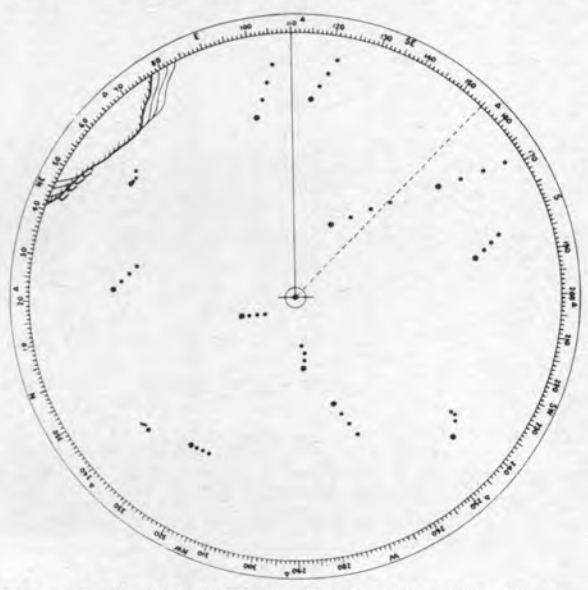
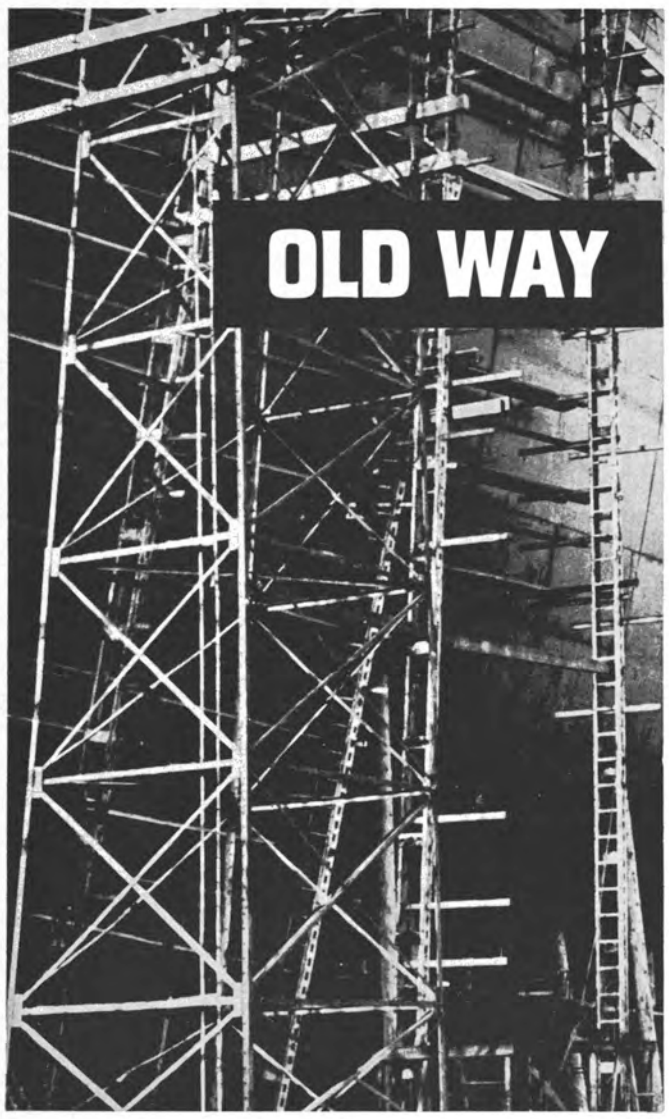
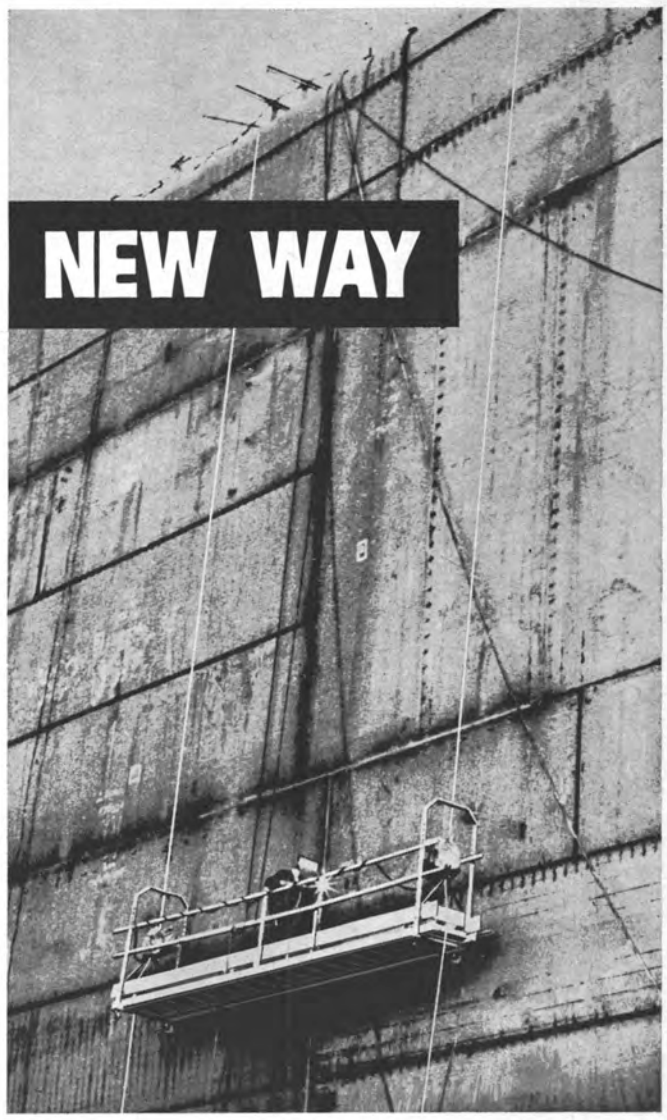


Figure 4—Predicted Relative Tracks Mode. This diagram shows the same situation 10 seconds after pressing the button for a radar plot of predicted relative tracks. The electronic bearing marker (dash line) now confirms the proposed new heading, but the actual heading marker stays unchanged. The ring around own ship's position indicates the amount of overshoot corresponding to the proposed angle of turn. The Predictor has worked out a new triangle of velocities for every target, and presents the relative tracks as they will appear if the course change is made. This predicted plot will be updated every 10 seconds before the helm order, and throughout the turn.





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SKY CLIMBER SYSTEM SPECIALISTS PROVIDE SIMPLE ANSWERS TO DIFFICULT PROBLEMS

SNAME Pacific Northwest Section Hears Paper Describing V.S.P. System On Lake Ferries

Principals at the Pacific Northwest Section, SNAME, meeting in Victoria, B.C. were, left to right: **M. Markey,** chairman; **T. Gilbertson,** author; **F. McLean,** holding model of one of the ferries, assistant deputy minister, B.C. District of Highways; **John Case,** author, and **Jacques Heyrman,** chairman of the British Columbia area of the section.

Two unique car-passenger ferries for operation on the Arrow Lakes of British Columbia, Canada, were described in detail at a recent meeting of the Pacific Northwest Section of The Society of Naval Architects and Marine Engineers.

The paper, entitled "Two V.S.P. (Voith Schneider Propulsion) Propelled Car Ferries," was presented by **John N. Case,** president, and **Tom Gilbertson,** construction supervisor, Case Existological Laboratories Limited, Victoria, B.C.

The decision to use the Voith Schneider Propeller system (vertical-axis propeller providing controllable pitch and thrust direction) was based on the excellent experience in Europe and the unique way in which these units solved so many operational problems, the authors explained.

Both the 165-foot, 41-car Galena and the 131-foot, 28-car Needles land on a concrete roadways with a 1:10 slope which are part of the highway. The level of the lake varies as much as 70 feet during the year. There are no guides for the ferries so they must be able to position themselves and hold their positions during loading and unloading. The ability of the V.S.P. system to produce thrust in any direction provides this capability. Further considerations were ease of repair and low headroom required.

The Galena's V.S.P. units, one at each end, are located 18 feet 7½ inches off the centerline, one being to port and one to starboard. Each unit is driven by a 350-hp electric motor driving through right-angle gears. Electric power is supplied by four diesel-driven 250-kw, 460-volt, 3-phase, 60-cycle generators, with any three operating in parallel at one time. Service speed was given as 10 knots.

The Needles' V.S.P. units are located on the boat's centerline, one forward and one aft. They are each driven by a 225-hp diesel engine connected to the V.S.P. by a 1.82:1 reduction gear, two flexible couplings and line shafting. Service speed was given as 7 knots.

American Ship Buying Nashville Terminal And Other Facilities

The American Ship Building Co. has announced the signing of a preliminary agreement to purchase the terminal business and certain other assets of Central-Cumberland Co. and Cumberland Storage & Warehouse Co., both of Nashville, Tenn.

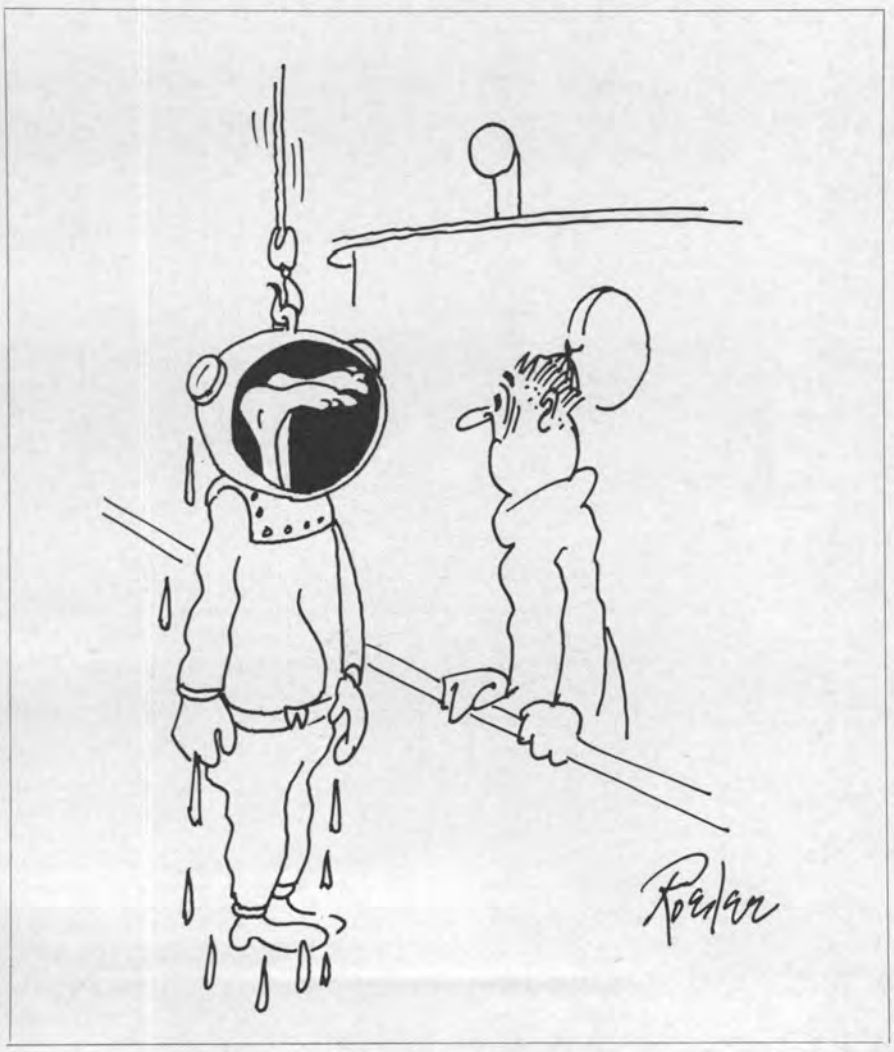
George M. Steinbrenner III, chairman and chief executive officer of American Ship, and Dr. **Jacob O. Kamm,** president, indicated the purchase was accomplished through an exchange of American Ship common stock. Purchase price was in the area of $1,000,000.

Assets included in the transaction are riverfront terminal facilities in Nashville for both railroad and barge shipments; a steel distribution operation including facilities, contracts, leases and crane and truck equipment, and 20½-acres of riverfront industrial land programmed for a planned industrial park.

All of the new operations will be placed in American Ship's Building Material Group and will be integrated with the Cincinnati Sheet Metal & Roofing Division.

American Ship already owns and operates terminal facilities on the Ohio River in Cincinnati.

"This is an ideal acquisition for us," explained Mr. **Kamm.** "It expands our terminal operations, gives us greater steel handling facilities and permits future expansion of building materials manufacturing in the Nashville area."



Shipbuilders Council Elects J. S. Smith Jr.

John S. Smith Jr., assistant to the president of Todd Shipyards Corporation, has been elected chairman of the Accident Prevention Committee of the Shipbuilders Council of America, it was announced by the Council in Washington, D.C. The new chairman succeeds **Harry Howard** of Bethlehem Steel Corporation, Shipbuilding Division.

J. A. Medernach Retires From Moore-McCormack After 39 Years Service

Joseph A. Medernach

After 39 active years with Moore-McCormack Lines, **Joseph A. Medernach,** vice-president and assistant to the president, retired as of June 30, under the company's mandatory retirement plan, according to an announcement by **William T. Moore,** chairman and president of the line.

Mr. **Medernach** first joined the company in 1930, after graduating from Georgetown University School of Foreign Service with a degree in bachelor of science in foreign service and two years of port survey work in South America. Moore-McCormack assigned him to Europe where he remained until the outbreak of World War II. During his European tour as the company's special representative, he spent considerable time in Poland, Germany, Czechoslovakia, Hungary and Scandinavia. After evacuating from Europe with his wife, Mr. **Medernach** was assigned the task of heading up the company's Trade Development Bureau, which took him to South America on an extended trip, where he assisted U.S. foreign traders in finding new sources of supply and outlets for their products.

This successful endeavor of the company was interrupted, following Pearl Harbor, when Mr. **Medernach** was called to Washington where he served for the duration as chief of the Air Transport Division of the Foreign Economic Administration.

On his return to Moore-McCormack late in 1945, he reorganized the Trade Development Bureau which continues to be an important part of the company.

He was appointed assistant to the president in 1954, elected assistant vice-president in 1957 when he was placed in charge of advertising and public relations. In 1961 he was elected a vice-president.

Mr. **Medernach** has been active in the foreign trade community of the United States, including Inter-American affairs, and served on numerous international trade committees. He was elected president of the Port of New York Propeller Club in 1965 and served in that capacity for three terms.

Craig And Lloyd Named Vice-Presidents By Booth American

Booth American Shipping Corp., 17 Battery Place, New York City, has named **P. D. Craig** and **H. F. Lloyd** as vice-presidents of the firm, according to an announcement by **P. Hancock,** president. Mr. **Lloyd** will be responsible for traffic and operations, and Mr. **Craig,** who is treasurer of the corporation, will administer accounts, insurance and claims.

Henry B. Schacht Elected President Cummins Engine Co.

Henry B. Schacht, group vice-president of Cummins Engine Company's international and subsidiary operations, and formerly vice-president-finance, has been elected president of the company and a member of the board of directors, **J. Irwin Miller,** chairman, recently announced.

Mr. **Miller** also announced that **E. Don Tull,** who started with Cummins in 1928 and who had been president since 1960, has been named chairman of the executive committee and that **Richard B. Stoner,** executive vice-president and corporate general manager, has been elected to a new position —vice-chairman of the company.

Vaughn L. Beals, vice-president and general manager of the domestic engine division, was elected to executive vice-president and a member of the board.

In making the executive announcements, Mr. **Miller** also said that Cummins' expansion plans call for the company to actively seek out new opportunities for growth in areas apart from the engine business.

Cummins, which is celebrating its 50th anniversary this year, is the largest independent producer of diesel engines in the world, and Mr. **Miller** said, is "committed to becoming truly a world company without regard to national boundaries." Cummins has manufacturing facilities and licensees in the United Kingdom, Japan, Australia, India and Mexico as well as the U.S., and sales and service locations in all free countries of the world.

World's Largest Multi-Stage Flash-Type Desalting Plant

Aqua-Chem Engineer Describes Combination Water/Power Plant To San Diego Section, SNAME

Armando B. Steinbruchel*

View of the desalting plant at the Rosarito, B.C., Mexico, installed by Aqua-Chem.

The Comision Federal de Electricidad (CFE) of the Mexican government which is responsible for the organization of all power generation facilities in Mexico, instituted a study several years ago which indicated that the best possible solution to the water needs of Tijuana would be a seawater distillation unit combined with the existing CFE powerplant at Rosarito, B.C. The desalting plant is now completed and is on stream.

With the world's largest multi-stage flash-type desalting plant installed, Mexico becomes a leader in the application of water desalting technology connected to power generation. This combination water/power plant produces fresh water from the sea at the lowest overall water cost, as compared with similar installations around the world.

With the 7.5-million-gallon per day (mgpd) Tijuana seawater desalting plant by Aqua-Chem, power engineers and desalting engineers have a classic opportunity to study a combination water/power plant.

The present generating facility consists of three 75-mw turbines, and the government is now adding a fourth unit, making the Rosarito installation of 300,000-kw capacity and the 7.5-mgpd seawater conversion unit the largest plant of its kind in the world.

Boilers fired with bunker-C oil produce throttle steam to the turbines at a pressure of 1,300 psig and 955°F. and the condensing takes place at 2 inches hg. abs. Extraction steam coupled to regenerative heaters are provided in boiler feedwater cycle, producing electricity at a heat rate of 10,955 btu/kwh at the design output.

Low-pressure heating steam to the desalting plant is supplied from the fifth extraction point operating at a pressure of 27.2 psia. The total heating steam demand for the 7.5-mgpd desalting plant can be extracted from any one of the three turbines.

*Mr. **Steinbruchel,** chief engineer, Aqua-Chem, Inc., Milwaukee, Wis., presented the paper condensed here before a recent meeting of the San Diego Section of The Society of Naval Architects and Marine Engineers and then conducted a guided tour of the facility.

The added economic advantage of combining power and water production is the fact steam generated in the boilers can produce power in the turbines prior to it being used as a heating source in the desalting plant. The cost of heating steam in the water utility production cost is, therefore, considerably reduced over single-purpose plants. The cost of extraction steam is calculated and charged to the water plant as it reflects the energy level of the steam withdrawn from the turbine cycle.

The loss of installed generating capacity at Rosarito, due to the desalting plant installation, is approximately 14 mw at the same throttle flow steam rate.

The Aqua-Chem seawater distillation plant consists of two 3.75-mgpd units, installed on a turnkey responsibility basis. These are the largest units now in operation or under contract.

The Aqua-Chem distillation units are of the long tube multi-stage flash design with brine recirculation. This design is based on a recirculating stream of brine, heated in a series of 40 stage heaters from 90°F. to approximately 223°F., followed by heating with exhaust steam to a temperature of 235°F. The hot brine is then introduced into a series of 44 flash stages, each operating at a slightly lower absolute pressure than the preceding stage. The flash vapor from stages 1 through 44 is condensed on the outside of the heater tubes in the vessels. The condensed vapor (distillate) is the product, and is also flash-cooled from stage to stage. Flash vapor from stages 41 through 44 condenses in the heat rejection section of the evaporator —the heat removed in these stages by the cooling seawater is equivalent to the heat input in the exchanger heated with exhaust steam (brine heater). The final product is pumped from stage 44, at a temperature of approximately 85°F. There is a continuous blowdown of concentrated brine to keep the solids concentration in the recirculating stream at 1.9 times that of the seawater feed. This concentration is selected to keep the calcium sulphate in the seawater in solution at the 235°F. temperature leaving the brine heater. Treated seawater makeup is added, equivalent to the distillate plus blowdown rates.

The long tube design, patented by Aqua-Chem, consists of each tube passing through multiple stages—in this particular case, five in each of the heat recovery vessels —thereby reducing the costs and power demand due to pressure drop which would result with separate waterboxes for each of the 44 stages.

Heating steam is extracted from the powerplant turbines at a pressure of 27 psia and at 97 percent quality. Provision is made for a pressure reducing station with desuperheater for part load operation at times when turbine exhaust steam is not available, reducing boiler steam at 1,300 psig at 27 psia. A small amount of high-pressure steam is used by the steam jet ejectors. Condensate from the brine heater is pumped back to the deaerators in the power plant.

Six pumps supply seawater to both the power plant and the desalting plant in two parallel supply ducts. A total of 30,000-gpm of water, 15,000 to each unit, is pumped to the condenser section of stages 41 through 44, the heat rejection section, where the water is heated from 70°F. to about 86°F.

About 5,400-gpm of the warm water leaving each stage 41 condenser section is used as preheated feedwater for the evaporator. Pretreatment is required to remove the bicarbonates from the seawater to prevent carbonate scaling of the heating surface. This treatment consists of neutralization with concentrated sulfuric acid, followed by atmospheric degasification to remove over 90 percent of the carbon dioxide resulting from the neutralization, followed by vacuum deaeration in a packed column deaerator built into stage 44—the incoming feed passes down through the bed of packing, with vapor from stage 44 rising upward countercurrent to the liquid flow. This deaerator removes not only the remaining carbon dioxide from the feed, but removes other dissolved gases as well. Removal of dioxide is of particular significance, since treated deaerated brine makes use of steel shells for the flash chambers practical from a corrosion standpoint.

The blowdown steam overflows at the flashing brine inlet to stage 44, and discharges through a barometric leg to a seal pit from which the concentrated brine overflows to the discharge pipe from the power plant condensers.

Non-condensables are vented from each stage and removed from the system with a three-stage steam jet ejector with direct contact condensers. A hogging ejector is provided to evacuate the system during startup.

In addition to sulfuric acid, facilities are provided for the addition, as required, of antifoam, sodium hydroxide into either the distillate or recirculating brine streams for pH adjustment and sodium sulfite to scavenge trace quantities of residual dissolved oxygen.

The plant has a high economy —10 pounds of distillate per pound of exhaust steam, and a low power requirement of only 7-kw per thousand gallons of distillate. The acid consumption is less than 2.5 pounds per thousand gallons of product. These low utilities requirements, coupled with the need for only a minimum number of operators, due to automatic operation, result in an approximate cost of only 65¢ per thousand gallons of products, based on the steam cost of 31¢ per million btu and a power cost of 1.2¢/kwh, Table 1.

Table 1—Water Production Costs

Item	Cost per 1,000 gal.
Fixed charges @ 8% per year	21.0¢
Steam	23.9¢
Electricity	8.3¢
Chemicals	6.0¢
Operating labor and supervisor (maintenance estimated)	5.8¢
Total Water Production Cost	65.0¢

Fresh water production by means of desalting seawater by the flash-distillation process has been proven to be, for many years, a reliable and economical way for many industrial and municipal agencies. However, the 7.5-mgpd seawater-distillation plant installed for Tijuana is the largest project of this type ever undertaken and drinking water production cost from this installation will be the lowest ever achieved for a saline water-conversion process. This combination water/power application will provide engineers an excellent opportunity to obtain firsthand experience and knowledge of the economical gains in combining water conversion with power production.

DESCO Ships Four Trawlers To Kuwait For Arabian Owner

Four DESCO trawlers are delivered under their own power to a cargo ship for trans-shipment to Kuwait.

Four DESCO trawlers recently were loaded on the Hansa Line's ship Falkenfels for shipment to Kuwait. The 73-foot trawlers were purchased by **Mishary Khalid Al-Zaid** of Kuwait, Arabia. This is his second order of trawlers from DESCO Marine, Inc. of St. Augustine, Fla. Two trawlers were shipped to the same owner in 1967 and were the beginning of his fleet.

All the trawlers are named after the owner—Khalid I, II, III and IV and Zaid I and II. When ordering, the 30-year-old owner makes a personal visit to the building yard to place the contract.

The trawlers are identical. They are powered by Caterpillar diesel engines driving a Columbian Bronze propeller through a Twin-Disc reduction gear. They are fully outfitted when they leave DESCO, even including Columbian Rope hawsers.

These four trawlers were hull nos. 1639 through 1642 in DESCO's continuous shrimp-trawler building program.

York Div. Announces Major Staff Changes

Gerard V. Patrick, chairman of the board and president of the York Division of Borg-Warner Corporation, York, Pa., has announced the appointment of **Edward P. Sheehan** to the position of executive vice-president of marketing.

Mr. **Sheehan** joined York in 1962 as staff assistant to the president. He became vice-president and director of marketing in 1967.

In this new capacity, Mr. **Sheehan** is responsible for all sales and merchandising of residential, commercial and large engineered machinery products for air conditioning and refrigeration applications in the United States as well as full responsibility for all functions of the York Division of Borg-Warner in Canada.

Prior to joining York, Mr. **Sheehan** was general sales manager of the Ophthalmic Division of American Optical Company.

Mr. **Sheehan** matriculated at Deerfield Academy and Williams College, Williamstown, Mass.

In related moves, Mr. **Sheehan** announced that **Charles H. Douts** has been promoted to the newly created position of administrative assistant to Mr. **Patrick** and that **George E. Buchanan III** has been named to succeed Mr. **Douts** as general service manager.

Mr. **Douts** attended Pennsylvania State University in a York-Pennsylvania State Co-operative Training Program. He was graduated in 1951 with a BS degree in mechanical engineering at which time he joined the former York Corporation service department where he has held numerous key positions before becoming general service manager in 1966.

Mr. **Buchanan** joined York in 1946 as a service mechanic apprentice. After completing his apprenticeship, he served in various capacities including packaged products field service supervisor. He was made assistant to the general service manager in 1967.

Dart Containerline Announces New York Staff Appointments —Trans-Atlantic Schedule

John T. Cassidy

John Vogele

George Fruehling

Jeffrey Driesen

Jacques Leblanc has been elected president of Dart Containerline Incorporated and a member of the board of directors. The announcement was made at the first annual meeting of Dart Containerline Incorporated, New York City. Mr. **Leblanc** will also act as chief executive officer and will coordinate all Dart Containerline activities in the United States. Dart Containerline is the new joint venture of Belgian Line, Clarke Traffic Services and Bristol City Line in a North Atlantic containership service between the United States and Canada East Coasts to United Kingdom and Continental ports.

Mr. **Leblanc** was formerly executive vice-president of Belgian Line Inc. Early in his career in the United States he concentrated on containerization and helped to develop the now successful two-port concept of the trans-Atlantic service of the Belgian Line.

Following his assumption of office as president, Mr. **Leblanc** announced the appointment of **John T. Cassidy** as senior vice-president, **John Vogele** as vice-president-finance, **George Fruehling** as vice-president of sales for traffic between the United States and Europe, and **Jeffrey Driesen** as vice-president of management services.

Mr. **Cassidy** was formerly vice-president of the Belgian Line Inc. in charge of sales and public relations. He is an executive reserve member of the Office of Emergency Transportation of the U.S. Department of Transportation, a director of the National Defense Transportation Association New York Chapter, a member of the Foreign Commerce Club of New York and the National Export Traffic League.

John Vogele was formerly treasurer of the Belgian Line Inc. and will be in charge of fiscal affairs for Dart Containerline Incorporated. Mr. **Vogele** is a member of the New York Credit and Financial Management Association.

Mr. **Fruehling** is a graduate of the University of Iowa and has a master's degree from Columbia University. He was formerly vice-president of the Belgian Line Inc. and in charge of both east and westbound solicitation for the company. Mr. **Fruehling** was instrumental in setting up the foundations for the container program of the Belgian Line Inc.

Mr. **Driesen** was formerly with the Belgian Line and Grace Line Inc. in charge of special projects and company planning. In his new capacity with Dart Containerline Mr. **Driesen** will also develop and coordinate the data processing system of the American Corporation along with its associates and parent organization, Dart Containerline Company Limited. Mr. **Driesen** will also serve as administrative and purchasing officer.

Dart Containerline is represented in the United States by Dart Containerline Incorporated, formerly headquartered at 67 Broad Street. The firm moved on July 14 to 30 Church Street, New York City, where it has the same staff as the former Belgian Line trans-Atlantic service.

The first eastbound sailing by Dart Containerline from New York was made on June 13. A two-port to two-port concept will be maintained, i.e., New York/Norfolk/Antwerp/Southampton, along with the same agencies and port representatives formerly utilized by the Belgian Line and their trans-Atlantic Painter vessels.

Dart Containerline will put into trans-Atlantic service three giant container vessels by mid-1970. These huge vessels will be able to carry up to 1,600 twenty-foot containers or the mixed equivalent in 20-foot and 40-foot-length containers. These container vessels will each have a displacement of 55,000 tons.

Philadelphia Resins Names Distributors

Philadelphia Resins Co. has made three distributor appointments, according to **David H. Kollock,** president.

Argo Marine Supply Co., Inc., 5837-B Mission Gorge Rd., San Diego, Calif., will distribute throughout southern California, New Mexico and Arizona and will handle epoxy chocking compounds and repair kits.

Glenaire Machinery Corp., 4037 Jefferson Highway, New Orleans, La., has been named as the New Orleans area distributor. In addition to the above mentioned products, Glenaire will handle vibration damping materials and industrial adhesives and coatings.

Preco Equipment Company, 6827 La Paeso, Houston, Texas, has been named as the Houston area distributor, servicing the numerous shipyards, operators and refineries in the area.

The appointments are to provide improved service to the company's constantly growing market in the California and Gulf Coast regions.

Philadelphia Resins is a leading producer of high strength adhesives and casting compounds for marine applications.

Bendix To Acquire Skagit Corporation

The Bendix Corporation and the Skagit Corporation of Sedro Wooley, Wash., have announced tentative plans for Bendix to acquire Skagit in a stock transaction estimated at $11.94-million.

The proposal would give Skagit about 169,000 shares of Bendix preferred and, if Skagit earnings warrant after the acquisition, up to 56,000 shares more.

Skagit is a privately held firm. It makes systems for the logging, marine and off-shore oil industries and materials-handling equipment.

American Marine Building Two Oil-Well Supply Boats

American Marine Corp., New Orleans, La., was awarded a contract by undisclosed interests, for the construction of two offshore, oil-well supply boats. Designated Hull Nos. 1032 and 1033, each vessel will have dimensions of 166 feet by 38 feet by 13 feet and will be equipped with twin-screw 1,700-total-bhp diesels.

Aerojet-General Names Waldo Assistant Mgr. Of SES Program

Robert D. Waldo has been named assistant manager of the Surface Effect Ships program at Aerojet-General Corporation, El Monte, Calif.

Mr. **Waldo's** appointment was announced by **William C. House,** Aerojet vice-president and manager of the Surface Effect Ships Division. The newly formed Aerojet division is conducting a 100-ton test craft development program for the Joint Surface Effect Ships Program Office (JSESPO), a U.S. Navy and Maritime Administration agency.

A surface effect ship (SES) rides on a bubble of air and travels much faster than conventional ships. The 100-ton craft under development will have a speed in excess of 80 knots.

Joining Aerojet in 1951 as a senior engineer, Mr. **Waldo** has held top engineering and management posts and had a major role in the firm's two-year intensive efforts in surface effect ship development leading to the current JSESPO program.

A graduate of the University of Colorado with a BS and MS in aeronautical engineering, Mr. **Waldo** also earned a master of business economics from Claremont Graduate School.

Aerojet is a subsidiary of The General Tire & Rubber Company.

Charles A. Narwicz Joins Stanwick Corp.

Charles A. Narwicz

Charles A. Narwicz has been named engineering assistant to **H. Noel Zelley,** president of The Stanwick Company. The announcement was made by **Tad Stanwick,** president of The Stanwick Corporation, a management systems company.

Mr. **Narwicz** has joined The Stanwick Corporation after serving over 12 years with the General Electric Company as a marine sales and application engineer and as manager of marine service for GE's installation and engineering department.

Mr. **Narwicz** will maintain his offices at the Stanwick headquarters, 1401 Wilson Boulevard in Arlington, Va. His responsibilities will entail the worldwide application of Stanwick's design work study, reliability and operating systems engineering to both the Navy and the marine industry, of which he is a prominent member.

A native of Brooklyn, N.Y., Mr. **Narwicz** graduated from the U.S. Merchant Marine Academy in 1949 with a degree in marine engineering. He served in the merchant marine and U.S. Navy as a lieutenant from 1949-1952. Subsequent to this duty during the Korean War, Mr. **Narwicz** has held various positions with the General Electric Company until his joining Stanwick in June of 1969.

Mr. **Narwicz,** a national vice-president of the U.S. Merchant Marine Academy Alumni Association, received the Association's meritorious alumni service award in 1964. He is a member of The Society of Naval Architects and Marine Engineers and was chairman of the N.Y. Section in 1964-65. He is the author of numerous technical papers on marine subjects which have been published in technical and trade journals. He is a member of the American Society of Naval Engineers, the Propeller Club, the Hague Post of the American Legion, the Whitehall Club and is in the U.S. Naval Reserve.

Mitsui To Build Four Cargo Ships For States Marine

States Marine Corp., New York, has contracted Mitsui Shipbuilding & Engineering Co., Ltd., to build four 15,000-dwt cargo ships. Each vessel will be equipped to carry containers and bulk cargoes and will have a sea speed of 17 knots.

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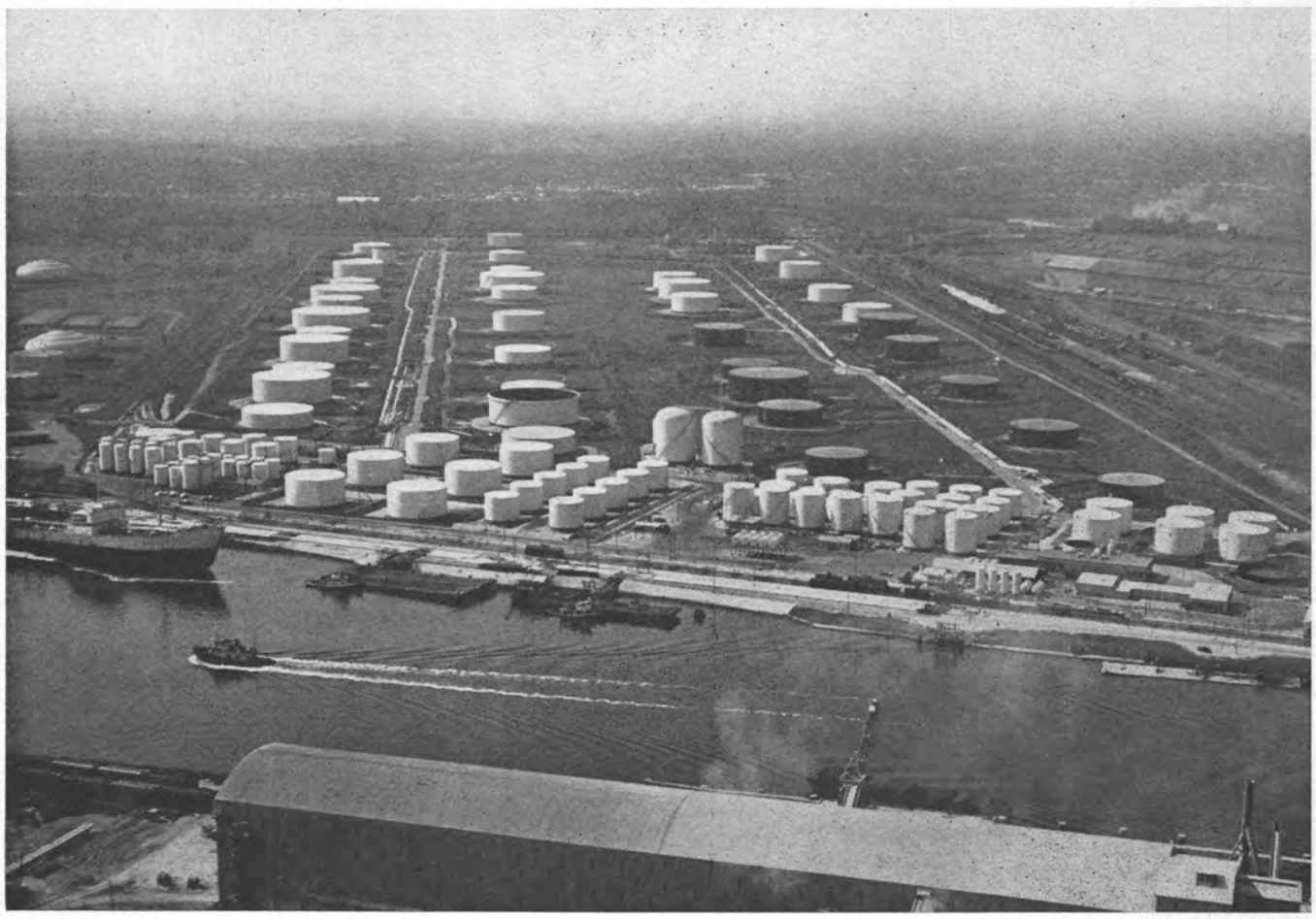

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Bethlehem Sparrows Point Launches Ninth 37,250-DWT Class Tanker

Mrs. E. Parry Thomas holds a bouquet of roses and a bottle of champagne just prior to christening the 37,250-dwt tanker, Eagle Charger, at Bethlehem's Sparrows Point yard. With **Mrs. Thomas** are, from left, **Daniel M. Mack-Forlist,** general manager of the yard; **J.P. Coakley,** president of United Tanker Group; Sen. **Howard Cannon** of Nevada, and **J. Carter Hammel,** chairman of the board of United Tanker Group.

The 37,250-dwt tanker SS Eagle Charger was launched recently at Bethlehem Steel Corporation's Sparrows Point, Maryland shipyard. The vessel, second of two of this class to be constructed by Bethlehem for the United Tanker Group of New York City, was sponsored by **Mrs. E. Parry Thomas,** wife of the chairman of the board of The Bank of Las Vegas.

The Eagle Charger is fitted with fueling-at-sea facilities in order to meet standards of the Military Sea Transportation Service. Delivery is scheduled for next fall.

The vessel's cargo tanks were coated with an epoxy system specifically designed for cold weather application. These coatings will enable the ship to operate with a minimum of maintenance.

The Eagle Charger and her sistership, the Eagle Leader, which was delivered in June, have an extended cruising range of about 12,000 miles. The vessel has a capacity of 334,800 barrels in its 15 tanks, and may be converted to the grain trade with a grain carrying capacity of approximately 1,500,000 bushels. Her cargo handling pumps will be capable of discharging a full liquid cargo in 14 hours.

The 660-foot 2-inch ship is equipped with Bethlehem centralized control which allows control of the engine from the bridge. The centralized control system is based upon the remote operation of the main propulsion plant for all ahead, astern, and maneuvering conditions, including standby. When the propulsion plant is operated from the bridge control station, the engine room central control station serves solely as a monitor of engine performance and bridge commands. The latter incorporates the engine controls and all other pertinent instrumentation and alarms to operate the vessel.

The ship is expected to operate at a normal sea speed of 16 knots. It has a 15,000 shaft horsepower turbine driving a single screw. The design includes a curved rake stem, a cruiser stern and a spade rudder. The vessel is built under the latest rules of the American Bureau of Shipping and will be classified by the Bureau.

A flume stabilization system, which involves the use of the cargo or ballast in three otherwise normal cargo tanks to reduce the roll of the vessel, is installed in the Eagle Charger. This system is fitted in the No. 2 tanks.

The Eagle Charger is the ninth vessel of the 37,250-ton class to be launched at Sparrows Point. The yard now has under construction, or under contract, 20 vessels: two Navy ammunition ships, two containerships, nine 37,000-ton tankers or chemical carriers, and seven large tankers ranging up to nearly 70,000 dwt.

United Tanker Group owns and/or operates 22 ships, most of them tankers. Included in the organization's operations is the South Atlantic and Caribbean Lines from Miami and Jacksonville, Fla., to Puerto Rico.

It was stated by **J. P. Coakley,** president of the United Tanker Group, that plans are being formulated for additional construction in the near future.

New Orleans To Start Construction Program On Container Terminal

The New Orleans Port Commission is about to begin construction of a nine-berth terminal for containerships of all types. To be known as the France Road Terminal, the facility will cost an estimated $64-million. It will occupy a 280-acre site at the intersection of the Inner Harbor Navigation Canal and the Mississippi River Gulf Outlet.

At the same time, the Commission will embark on a program for renovation of some of the port's older wharves to make them suitable for handling containers.

Bids for the first construction phase of the France Road Terminal will be opened by the Port Commission on July 15. These will cover construction of a reinforced concrete wharf 830 feet long, equipment for roll-on/roll-off operations and provision for future installation of container cranes.

Over the next two years, the port will spend $30.8-million to install the first three berths at France Road and improve some existing wharves.

Both **Robert R. Barkerding** and Col. **William H. Lewis,** acting director of the port, emphasized that the terminal equipment will be the most advanced available, and that "flexibility" will be a principal feature of the new terminal. Kaiser Engineers, Inc., produced the final plans.

Robert F. Lynch Named CP Bermuda President

Robert F. Lynch

Robert F. Lynch has been elected president and chief executive officer of Canadian Pacific (Bermuda) Limited with headquarters in Hamilton, Bermuda.

Mr. **Lynch** has had extensive experience in the shipping industry, most recently as manager, inland waterways operations for Mobil Oil Corp. in New York.

He will direct the operations of Canadian Pacific (Bermuda) Limited's growing fleet of liquid and dry bulk ocean vessels. CP Bermuda was formed in 1965 to build, own and operate under charter bulk ships for world trading.

The company's fleet includes two 71,000-ton tankers and three 27,000-ton dry bulk carriers. Ships under construction include two 250,000-ton tankers which will be among the largest ships in the world when they go into service in 1970 and 1971, two 57,000-ton bulk carriers and a 16,000-ton log and lumber carrier.

Mr. **Lynch** was educated at Miami University, Oxford, Ohio; the U.S. Merchant Marine Academy, Kings Point, N.Y., and the Boston University School of Law.

In private legal practice from 1951-62, he was engaged in all aspects of admiralty and maritime law for towing of deep sea vessels. He was appointed marine counsel for Mobil Oil in April, 1962, with responsibility for the legal work required for the re-organization of Mobil's several foreign marine affiliates, and supervising Mobil's marine claims and insurance section.

In November, 1965, Mr. **Lynch** was appointed manager, inland waterways operations.

He is a member of the panel of arbitrators, American Arbitration Association and the Maritime Law Association of the United States.

Detroit Diesel Names Kelly Advertising Mgr.

Jack A. Kelly

Raymond F. Prussing, general sales manager at Detroit Diesel Engine Division, General Motors Corporation, recently announced the promotion of **Jack A. Kelly** to advertising manager.

In his new position Mr. **Kelly** will be responsible for coordinating all activities with the division's advertising agency, MacManus, John & Adams, as well as development of shows and exhibits.

Mr. **Kelly,** a graduate of Eastern Michigan University, joined Detroit Diesel in June of 1955 as regional parts representative and held the position of supervisor, sales promotion, prior to his present appointment.

BIGGEST AND NEWEST SPANISH LPG CARRIER, the Butanueve, was recently delivered by the Astilleros de Cadiz, S.A., Sevilla shipyard to Butano, S.A. The vessel has a capacity of 487,330-cubic-feet. The ship has a triple hull and is equipped with several plants for the production and handling of nitrogen, freon and other fluids. In addition to liquid propane, the vessel can carry ammonia, butadienne and butane. The ship is powered by a 9,600-bhp Manises-Sulzer diesel engine built by Astilleros de Cadiz.

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Kocks' Container Transporters Ordered For Bremerhaven

The Friedrich Kocks Company of Bremen, Germany, has been awarded an order for the construction and erection of four container transporters for the sea-wharf of Bremerhaven, Germany. Their design is similar to the one of the transporters previously supplied to the "Nordhafen" in Bremerhaven, shown in the photograph, however, having a capacity of 54 metric tons including spreader.

With further orders gained recently from the port authorities of Philadelphia and Savannah, Kocks' total number of container transporters already supplied or on order now amounts to twelve. Furthermore, Kocks has constructed for various European Ports 20 level-luffing-slewing cranes of 25 metric tons capacity—partly as twin-control cranes—, of which the greatest proportion is already operating.

Le Tourneau To Build Marine Rig For Western

The oceanic division of the Texas-based Western Co. has ordered a marine service rig worth more than $2.5-million from Le Tourneau Offshore Inc., according to **Clay Chiles,** vice-president and general manager of the Houston-based division. The rig, which is to be built in Vicksburg, Miss., for delivery by December 1 of this year, will be partially self-propelled and capable of working in 80 feet of water and drilling to depths of 10,000 feet.

Humboldt To Build Dredge Hull, Towboat

Humboldt Boat Service, St. Louis, Mo., has received an order for a dredge hull from Riverside Sand & Dredging Co., also of St. Louis. The hull's dimensions will be 100 feet by 24 feet by 5 feet.

Humboldt Boat Service will also build a twin-screw towboat for stock purposes. The vessel, to have dimensions of 50 feet by 18 feet by 5 feet, will be equipped with 500-total-bhp Cummins diesels.

Worthington Organizes Machinery Systems Unit

Worthington Machinery Systems International, Bloomfield, N. J., a new division to facilitate installation of modern machinery systems anywhere in the world, has been organized by Worthington Corporation.

Patrick L. McManus, group vice-president of Studebaker-Worthington, Inc., said the new unit would develop business in both domestic and international markets. To fulfill its objectives of increasing Worthington's share of existing markets and to penetrate and develop new markets, the new division will market, coordinate, engineer and construct systems and sub-systems as well as turn-key projects which primarily utilize equipment as manufactured by Worthington domestic and international manufacturing operations.

Mr. **McManus** announced that **William F. McBrien** has been appointed president of Worthington Machinery Systems.

"With the formation of the new division," Mr. **McBrien** said, "we are in a position to aid customers through our ability to provide worldwide sourcing of the highly engineered components for today's complex machinery systems. Because of the time and manpower expense of designing machinery systems and then obtaining and assembling the individual components, the customer no longer wants to purchase a product—he wants a complete system using that product. Worthington Machinery Systems is in strong position to fill this need because of our accumulated experience in systems work in international markets and by our ability to source machinery system components from Worthington plants throughout the world."

Headquarters for Worthington Machinery Systems International is at 200 Bloomfield Avenue in Bloomfield, N. J. Systems design and specifying engineers will work directly with Worthington companies and suppliers wherever in the world the customer requirements can best be filled, Mr. **McBrien** said.

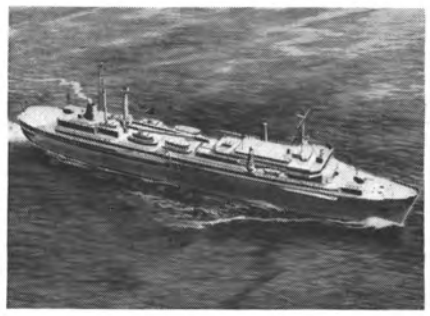
Curtis Offers Data Catalog On Universal Joints For Marine Applications

Data for purchasing, design, engineering and maintenance of the complete line of Curtis Universal Joints is contained in a currently available catalog issued by the manufacturer. Curtis joints are specified by the U.S. Navy and manufactured to meet rigid marine requirements utilizing a variety of non-corrosive materials. Copies of the catalog are available, free of charge, by writing to Curtis Universal Joint Company, Inc., 25 Bernie Avenue, Springfield, Mass. 01107.

Depend on AAI for a better way to—

move cargo from ship to ship

The requirement was to transfer cargo from ships to landing craft, at a fast rate, under the dynamic pitch and roll conditions of open sea. The problem solvers at AAI developed and produced the systems now on the Navy's LPD Ships: LaSalle, Austin, Ogden and Duluth. Each ship's system, consisting of six units of cabs and LO-HED® Hoists operating on three monorail tracks in a wet well, is capable of moving cargo continuously at the rate of 350 tons an hour. An example of a better way by AAI.



move weapons from deck to deck

Currently in production at AAI is a better weapons handling system for the handling of torpedoes, SUBROC, ASROC, and other weapons aboard the AS class vessel — submarine fleet support ships AS36 and 37. Mobility through and between deck levels is provided through a system of hoists, bridge cranes, and a rail network. The improved techniques are a result of AAI's extensive experience in creating materials handling systems.

Here's how AAI's "do it a better way" thinking is applied to the engineering of shipboard elevators. On 9000 lb. capacity weapons elevators we've accomplished a 60% weight savings over conventional design without sacrificing safety or efficiency. This results in substantially reduced construction and testing costs. These elevators, currently in production at AAI, are for installation on the aircraft carrier USS America, CVA66. Another elevator, now being built at AAI, is destined for the aircraft carrier USS Nimitz, CVA(N)68. Looking for a better way to solve your problem? See the creative engineers at AAI.

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Hatteras Starts Production On 74-Foot Fiberglass Trawler

To meet the rising demand for durable and economical shrimp trawlers for long range operation, the Hatteras Yacht Division of North American Rockwell, Inc. has developed a standard 74-foot molded fiberglass trawler. Production has started on this standard trawler in the firm's new New Bern, N.C. facility. The vessel was designed by J. B. Hargrave Naval Architects, Inc., West Palm Beach, Fla.

In the design, particular attention was given to trawling power, good seakeeping qualities, ease of maintenance, crew comfort, and convenience of operation. The vessel is 74 feet long overall, with a 22-foot beam and about a 9-foot draft loaded. Fuel capacity is 14,000 gallons in steel and integral fiberglass tanks. The fish hold is of molded fiberglass with an inside gel coat so that sanitary conditions are easily maintained. The hold has a capacity of about 50-tons of ice; however, it is felt that most of the vessels will be fitted with mechanical refrigeration. The standard engine is the Caterpillar D343 TA, with 6:1 reduction gear turning a four-blade 72-inch by 42-inch propeller. The standard boat is delivered with a Stroudsburg Model-520 winch and complete rig.

Accommodations are provided on the main deck for captain and four crew members, and includes a large galley and dining area and a shower. Space is provided for a second shower if desired.

The design is such that the vessel can be easily arranged for stern trawling or for use as a purse seiner.

Semi-Containership Launched By Uraga Heavy Industries —Shipyard Changes Name

Uraga Heavy Industries, Ltd. of Tokyo, Japan —since June 30 the Sumitomo Shipbuilding & Machinery Co., Ltd.—has launched the second 13,250-dwt semi-containership for the Malaysia Marine Corporation. This 492-foot vessel is the fifth ship built by Uraga which applies the "semi-submerged ship theory" for the hull form.

Named the Singapore Pride, the ship can carry containers together with general cargo. It is fitted with 22½-ton booms employing the Ebel rigging arrangement. Propulsion will be provided by a Uraga-Sulzer diesel engine, Type 9RD76, developing 14,400 bhp at 119 rpm and giving the ship a service speed of 19.5 knots.

The name of the firm was changed from Uraga Heavy Industries, Ltd. upon the merger on June 30 with the Sumitomo Machinery Co., Ltd.

A.P. Stanley Joins Ingram's Deep-Sea Division

Anthony P. Stanley has joined the Deep-Sea Division of Ingram Corporation at New Orleans, La., where he will assist in the introduction of a completely new concept in fast moving, oceangoing tug-barge transportation.

Formerly, as chartering and oil manager of National Bulk Carriers and associated **D. K. Ludwig** companies, Mr. **Stanley** lived in New York for 14 years after leaving his native London in 1955.

OSE Reorganizes Divisional Activities

Willard Bascom, president of Ocean Science and Engineering, Inc. (OSE), Washington, D.C., has announced a reorganization of divisional activities at OSE to more effectively respond to the company's principal markets and goals. Mr. **Bascom** indicated that the changes will enable the company to assimilate the expanding business in certain new ocean markets such as the Arctic regions.

Sidney Kulek has been appointed a vice-president and general manager of Ocean Science and Engineering, Inc. and will be based in Washington, D.C. The Florida operations, including engineering in West Palm Beach and scallop operations in Fort Pierce, will report to Washington. A new Washington, D.C.-based division has been formed under Dr. **T. K. Chamberlain** called the Science Division with activities which include environmental studies.

National Cargo Bureau Appoints S. F. Sammis Chief Surveyor

S. Fraser Sammis

Capt. **S. Fraser Sammis** has been appointed chief surveyor of the National Cargo Bureau, it was announced by Capt. **Hewlett R. Bishop,** executive vice-president. As chief surveyor Captain **Sammis** will be in charge of the bureau's surveyors located in all seaports of the United States. Captain **Bishop** previously served as executive vice-president and chief surveyor and this will allow him to devote full time to his duties as executive vice-president.

National Cargo Bureau is a nationwide non-profit membership organization dedicated to the safe stowage, securing and unloading of cargo on all vessels for the purpose of claims prevention. It formulates recommendations to the Government on safe stowage of dangerous goods and other cargoes, and offers low-cost cargo-loading inspection service (breakbulk and containers) and inspection of cargo-handling gear.

Captain **Sammis** has served with the National Cargo Bureau since 1957 when he joined the surveying staff in Baltimore, Md. He was transferred to the New York office in 1959 and was made head of the Technical Department in 1962, deputy chief surveyor, technical in 1966 and since the summer of 1968 has served as deputy chief surveyor. He is a graduate of the U.S. Merchant Marine Academy at Kings Point, Class of 1950, and served his sea time with the United States Lines. He is a master mariner and is a member of The Society of Naval Architects and Marine Engineers.

While serving with the National Cargo Bureau, Captain **Sammis** has contributed to the development of the various booklets on stowage of cargo published by NCB, among them the "General Information for Grain Loading" and the "Shippers' Guide for Proper Stowage of Intermodal Containers," which was published in April of this year. He served as adviser to the U.S. Delegation to IMCO Sub-Committee on Bulk Cargoes in 1966, 1967 and 1968.

Captain **Sammis** has published several articles which have appeared in the Kings Point Log and marine publications. He has given talks to marine industry organizations on the work of National Cargo Bureau in ports throughout the United States. He is a joint recipient with Captain **Bishop** of the Chairman's Award of the Marine Section of the National Safety Council for a paper presented in March, 1967 in New York.

Alexander Ind. Names Hornsby Sales Engineer

John W. Hornsby

William B. Alexander, president of Alexander Industries, Inc., New Orleans, has announced the appointment of **John W. Hornsby** as a marine sales engineer for the company. Mr. **Hornsby** is well known in the marine industry and was most recently a vice-president at Equitable Equipment Company, Inc. He previously served as president of Higgins Shipyards, Inc.; executive vice-president of New York Shipbuilding Corporation, and chief mechanical engineer for Tampa Shipbuilding Company. He will be located in the New Orleans office of Alexander Industries.

Woods Hole Receives Navy Contract For Oceanographic Studies

The Office of Naval Research has isued a $2,272,972 cost-plus-fixed-fee contract (N00014-66-C-0241 Mod G 07) for oceanographic studies to the Woods Hole Oceanographic Institution.

Pouch Terminal Officially Opens New Pier 21 On Staten Island, N.Y.

New, $1,000,000 Pier 21, shown in artist's rendering, replaces old structure, destroyed by fire, and represents initial phase of long-range pier and warehouse development program at Staten Island's Pouch Terminal.

The new Pier 21 on Staten Island, N.Y. was opened late last month by **A. T. Pouch Jr.**, president of Pouch Terminal, Inc.

Heading the list of prominent speakers were the Hon. **Robert T. Connor,** president of the Borough of Richmond, the Hon. **John M. Murphy,** congressman of the 16th Congressional District, and the Hon. **Patrick F. Crossman,** Commissioner of the Department of Ports and Terminals, who represented the Hon. **John V. Lindsay,** mayor of the City of New York. Other distinguished officials of the state, city and borough were also in attendance. The pier was officially opened by **Mrs. Alfred T. Pouch Sr.**

"This new facility," Mr. **Pouch** said, "has been rebuilt at a cost in excess of $1,000,000. It replaces the old Pier 21 which was destroyed by fire in 1967. The project represents the first phase of a long-range development program aimed at maximum efficiency in pier and warehouse operation." This well-known terminal is one of the few remaining privately-owned and operated waterfront complexes in the Port of New York. It employs over 500 people.

The pier structure is 830 feet long and 160 feet wide with a 131,750-foot area. It contains the most modern equipment, including 30-foot-wide string pieces for handling containers as well as palletized and general cargo. The shed itself features loading platforms, truck levelers, automatic door and sprinkler systems, powered ventilation and many more new features. Careful thought and planning have been given to the easy flow of traffic for the fast handling of cargo.

The pier also features a heliport, which is located at the sea end. It is the only steamship pier in the Port of New York with a heliport.

Pouch Terminal Piers 19, 20 and 21 are leased to the Pittston Stevedoring Corporation. Pier 21 will be used exclusively by vessels of the Barber Steamship Lines, Inc. Piers 19 and 20 are being used regularly by the Barber Lines as well as the Mexican Line and the P. N. Djakarta Lloyd Line. Complete terminal and stevedoring services for these lines are provided by Pittston Stevedoring Corp.

According to **A. T. Pouch Jr.,** president of the 55-year-old company, the piers at this terminal are the closest in the port to the sea, and are virtually on the deep-water channel. Cargo vessels are afforded the shortest possible turnaround time. With the Verrazano-Narrows Bridge and the Clove Lakes Expressway, the terminal is easily accessible to all major highways and expressways. Rail connections are with the Baltimore & Ohio Railroad.

The engineering firm of Mueser, Rutledge, Wentworth & Johnston designed the pier. Thor. Wetlesen, Inc. constructed the piling and the new deck area, and the Butler Manufacturing Company erected the modern shed building. General contractors were Carlson & Sweat of New York.

Japan Announces Plans For 2nd Nuclear Ship And Launches First

The Japanese government announced concurrently with the launching of its first nuclear ship that plans are underway to build a second nuclear-powered vessel.

The launching in June of the nuclear ship Mutsu at the Tokyo shipyard of Ishikawajima-Harima Heavy Industries Co., Ltd. was a festive affair attended by top Japanese officials. Their Highnesses **Crown Prince Akihito** and **Princess Michiko** were present. Also in attendance was Prime Minister **Eisaku Sato**; cabinet members; **Shuichi Sasaki,** president of the Japan Nuclear Ship Development Agency, and **Renzo Taguchi,** president of IHI.

After the ship had been christened by **Shuichi Sasaki,** the **Crown Princess** cut a rope, smashing a champagne bottle against the hull, after which it was launched.

The Japan Nuclear Ship Development Agency ordered the ship in November, 1967 from IHI and Mitsubishi Atomic Power Industries, Inc. (MAPI). Her hull and reactor containment vessel are being constructed by IHI, the nuclear reactor to be installed by MAPI.

Upon completion, the ship will be the world's fourth nuclear-powered vessel, following the icebreaker Lenin of the U.S.S.R., the cargo vessel Savannah of the United States and the ore carrier Otto Hahn of West Germany.

The $15,463,000 (including reactor) ship is an 8,350-gt nuclear-powered experimental vessel designed for the purpose of applying atomic power for marine use and obtaining a thorough knowledge of the construction and operation of nuclear ships in anticipation of the forthcoming "Nuclear Ship Age."

By adopting an indirect-cycle light-water reactor with a thermal output of 36,000 kw which uses uranium oxide of low enrichment as its fuel, she will be able to cruise for about 145,000 sea-miles (equivalent to 7 times the earth's circumference) at a service speed of 16.5 knots, with only 2.8-tons of fuel.

After completion, voyages for various experiments will be made for two years, and then the ship will be used for training crew members for future nuclear-powered vessels and for carrying special cargo.

"Mini" Cargo Ships To Open Mississippi For Ocean Shipping

A fleet of "mini-ships" will soon be delivering cargo to Greenville, Miss. The new 3,100-ton ships will thus circumvent what has been a barrier to oceangoing ships traversing the Mississippi River above Baton Rouge where a low bridge is installed.

Abington Steamship Corp. of New Orleans will change its base of operations to Greenville and will begin operation late this summer with the first of 10 specially designed shallow-draft, low-silhouette ships between Greenville and ports in the Caribbean. **G. P. Abington,** president of the company, stated that this move will cut down the congestion they have experienced in major ports and also reduce double cargo handling.

George P. Livanos, president of Seres Shipping, Inc., New York, who will own the ships, said the first of the mini-ships, the Mini Luck, will come nonstop from Korea and the Far East directly to Greenville.

E. D. Abbott Joins Marine Supply Co.

Edward V. Abbott

Marine Supply Co. has announced that **Edward V. Abbott** has joined their company as special representative and consultant to the offshore petroleum industry.

Mr. **Abbott** is a graduate of the University of Southern California and a former officer in the U.S. Navy. His most recent connection was with Belco Petroleum Corp. in Peru. He was associated with Brown and Root on the Mohole Project in Houston and with J. Ray McDermott Co., in Maracaibo, Venezuela.

Mr. **Abbott** has had many years experience in South America as equipment engineer and purchasing agent for offshore drilling and construction companies.

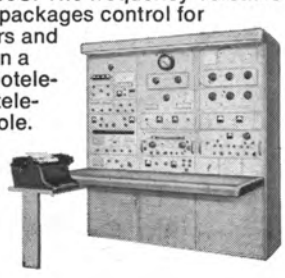
SIGNING A $25.5-MILLION CONTRACT for conversion by Todd Shipyards Corp. yards at Galveston, Texas, and Brooklyn, N.Y., of three Mariner-type cargoships to full containerships for United States Lines at offices of the Maritime Subsidy Board, U.S. Department of Commerce, in Washington, D.C. Principals involved were, left to right: (seated) **J. T. Gilbride,** president of Todd Shipyards; **A. E. Gibson,** chairman of the Maritime Subsidy Board, and **John J. McMullen,** president of United States Lines; (standing) Rep. **Jack Brooks** of Texas; **Roy Bowman** and **Robert J. Blackwell,** members of the Maritime Subsidy Board; **Paul M. Edwards,** European manager of freight traffic and sales, U.S. Lines, and Rep. **William Moorehead,** of Pennsylvania.

Type CRM-N2C-30. 10 cm. big-ship radar that scans a 40-mile area with extreme clarity. High definition 16-inch PPI display. Provides both true and relative display flexibility for all your plotting requirements. (Another model, type CRM-N1C-75, does the same quality job in the 3.2 cm. band.)

Type 7U/SSB. Single sideband radiotelegraph-radiotelephone console for "Flags of Convenience" ships. Provides 750-watt antenna power output. Contains 3 receivers and 2 transmitters.

Type CRM-N7A-40. The radar that's small enough for a tugboat, but powerful enough to reach 40 miles. Transistorized for compactness and low power consumption. 10-inch display. AFC. 40 KW minimum peak power output. Dual pulse operation and 6-foot slotted waveguide antenna sharpen the picture. 7 range scales with 13-yard range resolution.

Type CRM-C8C. The frequency-versatile system that packages control for 3 transmitters and 3 receivers in a modern radiotelegraph-radiotelephone console. Gives you 500-watt transmitting power.



Type ET-8063-A. The powerful one kilowatt single sideband transmitter that turns an ocean liner into a worldwide 50-frequency telephone and telegraph center. Its 5-band coverage ranges from 2 to 30 MHz. Versatile enough for suppressed carrier, reduced carrier, full carrier or CW carrier operations. Drawer-type construction makes all components easy to get at.

Type LR-85. Compact, highly sensitive loran receiver indicator. Complete loran A and C coverage with envelope or cycle matching on C, in a self-contained package only 10½" x 9½" x 12", weighing 17 pounds with power drain of 25 watts. Available for operation from 115 volts A.C., 12V D.C. or 24 volts to 45 volts D.C.

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The eyes and ears of the fleet.

Merchant fleet or fishing fleet, tugboat or passenger liner, Radiomarine outfits them all. The oldest name in marine electronics has all the newest advances . . . solid state reliability, greater communications reach, higher resolution radar, loran and RDF. When you specify Radiomarine, you benefit from our total shipboard systems approach that gives you a matched communications and navigation system that's unmatched in performance.

Remember there is a Radiomarine communications and navigation electronics sales engineer in major U.S. Ports to serve you, and RCA Service Company provides service support in all principal ocean and inland waterway ports.

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RADIOMARINE CORPORATION

EAC ***A Subsidiary of Electronic Assistance Corporation***
20 Bridge Avenue, Red Bank, New Jersey 07701

McDermott To Build Oil-Well Drilling Rig

The Offshore Co., Houston, Texas, has contracted McDermott Shipyard, Morgan City, La., to build a self-elevating offshore, oil-well drilling rig. Designated Hull No. 155, the rig will measure 132 feet by 107 feet 8 inches by 15 feet and will be equipped with 5,000-bhp diesel-electric machinery.

High Seas Opens New Houston Office

High Seas, Inc. has announced the opening of its new office at 921 Chamber of Commerce Building, Houston, Texas 77002. The Circle Drilling Division of High Seas, Inc. also announced the closing of its Lake Charles, La. office. Personnel from this office were transferred to the Houston office.

Charles S. Owen Jr. Elected President Southern Industries

Charles S. Owen Jr.

Directors of Southern Industries, Inc. have elected **Charles S. Owen Jr.** as president of the Richmond (Va.)-based metal fabricating firm.

Mr. **Owen** had been executive vice-president since May, 1967, after joining Southern Industries in 1965 as controller and assistant treasurer.

He continues as controller and a member of the board of directors for Solaronics, Inc., an affiliated firm which manufactures gas-fired infra-red heating equipment.

Major production of Southern Industries is now in marine furniture and fittings, though it still makes one type of oil-fired space heater—a link with its beginning 113 years ago as Southern Steel and Stove Works.

A native of Wakefield, Mr. **Owen** attended the University of Richmond and became a certified public accountant. He was a senior staff member at Andrews, Burket & Co. here before joining Southern Industries. He is a member of the Virginia Society of Certified Public Accountants, the American Institute of Certified Public Accountants, and The Society of Naval Architects and Marine Engineers.

De Laval Awarded Navy Contract For Fuel-Oil Pumps

De Laval Turbine, Inc., Trenton, N.J., has received a $2,550,000 negotiated letter contract for fuel-oil pumps with associated equipment and data for the Standard Distillate Fuel Program. The contract (N00024-69-C-5377) was issued by the Naval Ship Systems Command.

Hitachi Zosen Delivers 216,000-DWT Tanker Incorporating Special Design Features

The Olympic Armour, first of five 216,000-dwt sisterships, is designed so that it can pass through the Suez Canal in ballast condition.

The 216,508-dwt tanker Olympic Armour, built in Sakai Shipyards of Hitachi Zosen, was delivered recently to Grafton Shipping, Panama, S.A., of the Onassis group.

This 1,057-foot, 6-inch tanker is the largest 200,000-dwt-class ship that Hitachi Zosen has developed and designed which can pass in ballast condition through the Suez Canal. The American Bureau of Shipping classed tanker has a beam of 158 feet and a depth of 82 feet. It is the first of five sisterships to be built in the Sakai Shipyard for service between the Persian Gulf and Europe.

The cargo tanks and cargo piping, including those for stripping, are arranged to accommodate two different kinds of cargo oil at the ratio of 50:50 or 25:75. Because of this arrangement, a two-port loading/discharging can be made, which also enables a sailing to be made without ballast in the cargo tanks.

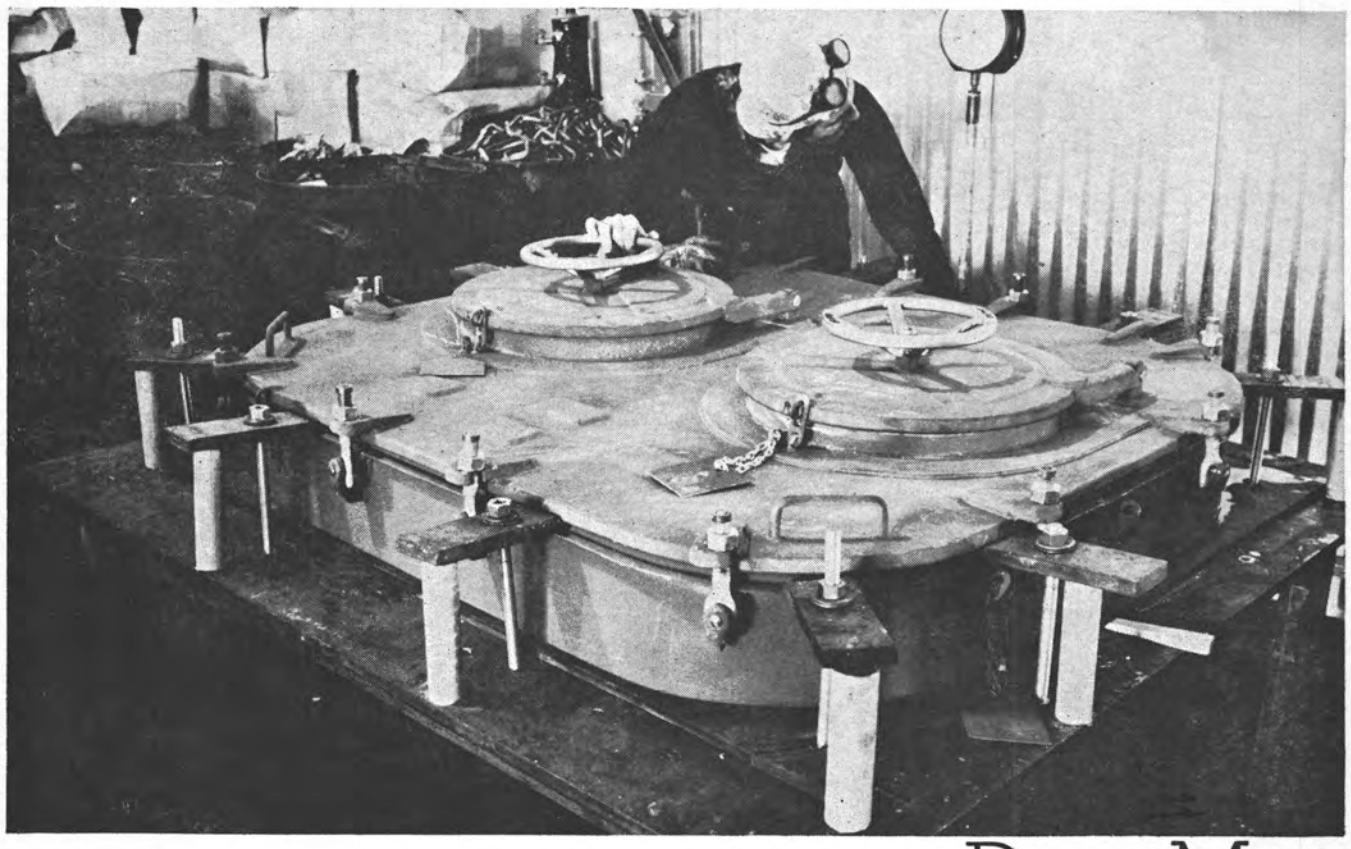
The big bulbous bow which Hitachi Zosen has developed and designed to improve propulsive efficiency is adopted to the underwater bow. A cutaway stern has been used to shorten the hull length and decrease the hull weight.

Cast-iron pipe, because of its high corrosion resistance, is used for some of the piping in the cargo tanks and pump room.

To increase the efficiency of tank cleaning, Gum Clean as well as Butterworth are fitted in the cargo tanks in which ballast is to be normally loaded.

The poop deck is provided with a helicopter landing area for the convenience of personnel embarking/disembarking.

The remote control of the main turbine and main boiler is provided from a control station in the engine room. Propulsion is provided by a 30,000-shp Mitsubishi steam turbine, which gave a trial speed of 16.5 knots.



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Closure Plant make them,
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to commercial or military specs.

Industrial Division
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Gladding-Hearn Delivers Dredge Tender For Seabees

Gladding-Hearn Shipbuilding Corporation of Somerset, Mass., recently delivered a steel-hulled dredge tender to the U.S. Naval Construction Battalion Center, Davisville, R.I.

The boat is designed as a shallow draft tender for a 120-foot suction dredge which is to be used in conjunction with a training program for Seabee's personnel, and is fitted with pushing knees for moving pipelines, barges, etc. An A-frame derrick with a Beebe winch fitted on deck is capable of lifting 2,000 pounds. The 35-foot vessel has a 10-foot beam and is designed with a tunnel stern so that her draft is only 32 inches. The bow is in the form of a curved rake with ¼-inch plate so that the boat may be driven right onto the beach which may be the only landing place in the dredges working area.

Construction is on the rugged side, necessary for the strenuous work expected of dredge tenders. A three-inch solid half round is fitted along the sheer. The vessel is longitudinally framed and was sandblasted prior to painting with Devoe and Raynolds Cathacote system.

Power is furnished by a GM-8V71 diesel engine, fitted with a 2¼ :1 Capitol HYC gear which turns a 32-inch by 28-inch Columbian Style H propeller through a 2¾-inch monel shaft fitted with monel sleeves. A Fernsturn keel cooler is employed to prevent clogging of engine water from silt or sand. A 32-volt electrical system is used.

Standard Oil Of Indiana Orders 226,000-DWT Tankers From Astilleros De Cadiz

Through its subsidiary, the International Oil Co., New York, Standard Oil of Indiana has ordered two 226,365-dwt oil tankers from Astilleros de Cadiz of Spain. Each tanker will have dimensions of 997 feet 4⅜ inches by 166 feet by 85 feet 10⅝ inches, and will be equipped with a 30,000-bhp diesel engine. The carriers, designated Hull Nos. 93 and 94, will be operated by the Interhemisphere Transport Co.

American Ship Names Gavin Sproul Engineering Mgr., Marine Operations

George M. Steinbrenner III, chairman and chief executive officer of The American Ship Building Co., Lorain, Ohio, has named **Gavin Sproul** manager of engineering for the company's marine operations.

Mr. **Sproul,** who joined American Ship as a design engineer in 1963, has recently been project engineer on the huge new 858-foot ore carrier being built for U.S. Steel Corporation. He will continue in that assignment in addition to the new, broader duties.

Mr. **Sproul** was born in Glasgow and studied naval architecture there at the Royal College of Science and Technology. He worked for the Fairfield Shipbuilding Co. in Glasgow before emigrating to Canada in 1961.

MarAd To Request Proposals For Standard Ship Designs

Maritime Administrator **Andrew E. Gibson** told the House Fisheries and Wildlife Subcommittee on June 19 that the Maritime Administration would soon ask for proposals from shipyards, naval architects and others for a series of plans for standard ship designs.

This request is part of an administration effort to bring down the cost of new tonnage through standardization of ship type and larger scale production.

Until now, Mr. **Gibson** stated, standardization has only been achieved when more than one subsidized operator could be brought to agree on the same or nearly the same type ship and a multiple vessel contract could be let. This contemplated change would give operators a choice of effective, pre-designed ships from which to choose.

Almont Shipping Names E.E. Ball President

Ernest E. Ball has been named president of Almont Shipping Co., operators of a bulk cargo terminal at Wilmington, N.C., it was announced by **W. S. R. Beane,** board chairman of the firm. Mr. **Ball,** who began his new duties early this month, was president of Elizabeth River Terminal, Inc. of Norfolk, Va., where he also served as chairman of the Norfolk Marine Terminal Association and as chairman of the Middle Atlantic Ports Dockage Association.

Mr. **Ball** graduated from Dartmouth College, with graduate studies at the Amos Tuck School of Business Administration and Columbia University. He served as a naval officer aboard destroyers during World War II and Korea.

Atlantic-Richfield Negotiating For 120,000-DWT U.S. Tankers

The Atlantic-Richfield Co. is negotiating with two U.S. shipyards for the construction of five 100,000- to 120,000-dwt tankers. Both shipyards are offering vessels of their own design.

According to the report of the negotiations, a contract for three of the tankers will be awarded by September 1. An option to order the other two will be taken at the time of the award.

Atlantic-Richfield will use the tankers to move Alaskan North Slope crude oil to domestic refineries. They would operate between Valdez, and Bellingham, Wash.

American Export Acquires National Equipment Rental

Stockholders of American Export Industries, parent company of American Export Isbrandtsen Lines, have approved a merger with National Equipment Rental Ltd., which leases computers, aircraft and other forms of equipment. The action was taken at separate special stockholder meetings of both firms in Dover, Del. AEI President **Jakob Isbrandtsen,** predicted that the merger will provide the combined enterprise with greater growth opportunity.

Under the program of merger, National Equipment Rental will become a wholly owned subsidiary of American Export Industries, which is itself developing an integrated, intermodal transportation system.

Union Barge Line Promotes McCormick And Dermotta

William A. McCormick

Rudolph J. Dermotta

Union Barge Line Corporation has announced the appointments of **William A. McCormick** as superintendent of maintenance and **Rudolph J. Dermotta** as Pittsburgh port engineer.

Mr. **McCormick** joined Dravo Corporation, parent firm of the barge line, in 1955 and most recently served as safety engineer for Union. In his new position, he will be responsible for repairs and maintenance of the Union Barge Line fleet, which includes ten diesel towboats and nearly 400 barges. Mr. **McCormick** holds a bachelor of science degree in mechanical engineering from the University of Wisconsin.

Mr. **Dermotta** joined Dravo in 1936 and most recently served as chief engineer on the towboat Peace. In his new position, he will be responsible for the barge line's port facilities at Neville Island, Pa., and for fleet repairs and maintenance on the Ohio River.

Bethlehem Submits Low Bid To Convert Four Texaco Tankers

Bethlehem Steel Company's Key Highway yard, Baltimore, Md., submitted the lower of two bids received by Texaco Inc. for the conversion of four 20,000-dwt North Dakota class tankers.

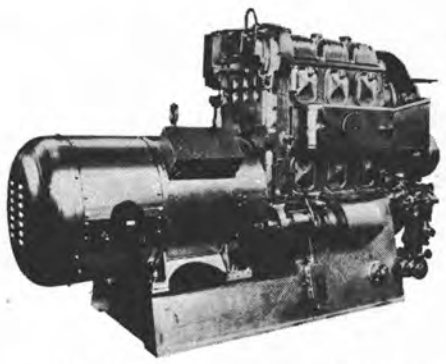
The specifications called for the jumboizing of the ships to 42,000 dwt and other conversion work. The cargo tank sections and bows would be renewed, with the sterns and midship houses retained. When converted, the ships would be assigned to the Gulf Coast-East Coast service.

Excello Gets Order For Commercial Submarine

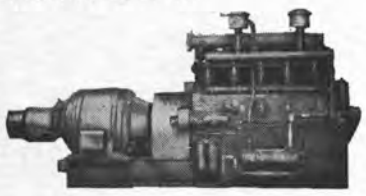
Excello, Inc., Silver Springs, N.Y., will build a commercial submarine for Ocean Systems, Inc., Reston, Va., a subsidiary of Union Carbide Corp. The vessel will have measurements of 22 feet by 7 feet by 8 feet, and will be able to dive to depths of 2,000 feet. It has been designated Hull No. 1 and will be named O.S.1.

MARINE DIESEL GENERATORS

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



LORIMER 100 KW
450/3/60 Volts DC.



BUDA 6DHG691, 60 KW, 120 Volts DC.

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

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

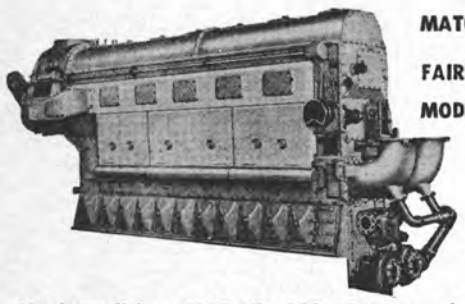
SUPERIOR, Model IDB-8, 100 KW, 450/3/60.

GENERAL MOTORS Model 3-268A, 152 BHP, 1200 RPM, with 100 KW Generators, 450 volts AC, 3 phase, 60 cycles.

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

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

MARINE DIESEL ENGINES



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MODEL 38D8-⅛

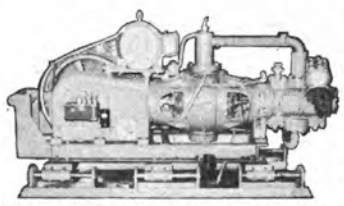
1 Port;
1 Starboard

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, 850 RPM.

AIR COMPRESSORS



JOY CLASS WG82

JOY Air Compressors Class WG82, 2-stage rated 100 CFM at 300 PSI, water cooled, size 7" x 3⅜" x 7" Typical Shop #75652, with Reliance motor, 30 HP, 220/440/AC/3/60.
WORTHINGTON, 60 CFM, 110 PSI, with 15 HP Motor, 440/3/60.
WORTHINGTON, 60 CFM, 15 HP, 230 DC.
INGERSOLL-RAND, 150 CFM, 600 PSI, Model 75, with Westinghouse Motors, 75 HP, 230 DC.
INGERSOLL-RAND, 194 CFM, 110 PSI, 40 HP, 230 DC.
INGERSOLL-RAND, 50 CFM, 600 PSI, Model 30, with Westinghouse Motors, 15 HP, 230 DC.
CHICAGO-PNEUMATIC, 161 CFM, 100 PSI, 40 HP, 230 DC.
WESTINGHOUSE Air Brake, 246 CFM, 140 PSI, with 50 HP Motors, 440/3/60.
WORTHINGTON, 175 CFM, 125 PSI, with 50 HP Motors, 440/3/60.

STEAM AIR COMPRESSORS
Westinghouse Air Brake Company, Size 9½ x 9 x 10 Vertical.

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.

ALLIS-CHALMERS, 440 PSI, 740 F, with Allis-Chalmers Generators, 300 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.

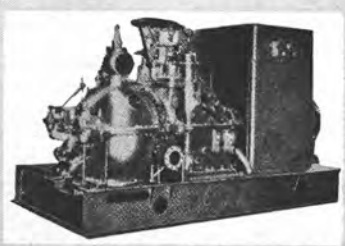
WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, driving on same comman shaft a 250 KW Generator, 440/3/60, and a 90 KW Generator, 125 Volts DC.

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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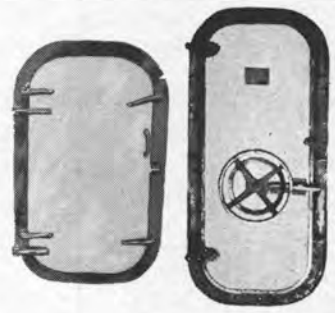
As removed from reserve "mothballed" vessels. Huge inventory of practically all sizes and types ready for immediate delivery . . . and more on the way. These doors have the frame trimmed and are suitable for re-use. Doors are available in 4, 6, 8 and 10 dog types; many are "Quick-acting-wheel controlled."

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 $100.00 ea.
26" x 66"—Quick Acting $175.00 ea.



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AC PUMPS—Horizontal Centrifugal

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

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

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

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

7—J.C. Carter, 365 GPM, 250' head, stainless steel, 3" suction, 3" discharge, with 220/440/3/60 Motors, 25 H.P.

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

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

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

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

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

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

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

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

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

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

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

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

AC PUMPS—Vertical Centrifugal

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

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

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

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

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

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

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

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

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

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

AC PUMPS—Horizontal Rotary

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

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

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

AC PUMPS—Vertical Rotary

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

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

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

DC PUMPS—Horizontal Centrifugal

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

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

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

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

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

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

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

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

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

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

DC PUMPS—Horizontal Centrifugal

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

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

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

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

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

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

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

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

DC PUMPS—Horizontal Centrifugal

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

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

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

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

DC PUMPS—Vertical Centrifugal

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

DC PUMPS—Horizontal Rotary

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

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

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

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

DC PUMPS—Vertical Rotary

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

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

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

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

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

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

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

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

BOILER FEED PUMPS — TURBINE & ELECTRIC

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

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

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

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

TURBINE DRIVEN PUMPS — Various

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

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

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

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

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

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

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

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

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

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

STOCKLESS ANCHORS

USED, GOOD QUALITY . . . SAVE!

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

ANCHORS... Unused, surplus 3000 # size Danforth

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

ANCHOR WINDLASS

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

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

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

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

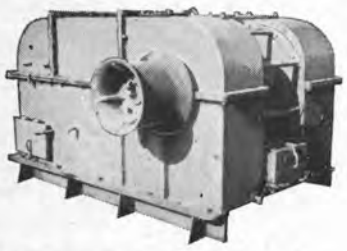
3—Hesse-Ersted, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

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

ANCHOR WINCHES

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

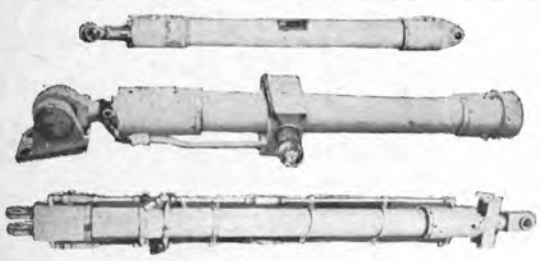
UNIWINCHES



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

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

HYDRAULIC CYLINDERS



3000 PSI

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

STEERING STANDS

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

$195.00 each

CAPSTAN WINDLASSES

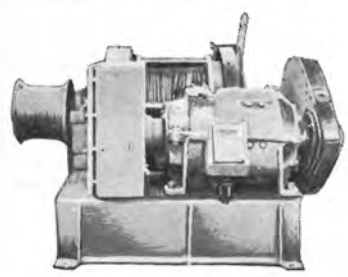
Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1¼" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

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

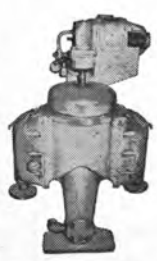
Hyde, Vertical, Single Wildcat, for 1⅛" Anchor Chain, single gypsy, with 20/5 HP Motor, 440/3/60.

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

CARGO WINCHES



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



CENTRIFUGES

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

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

FAIRLEADS

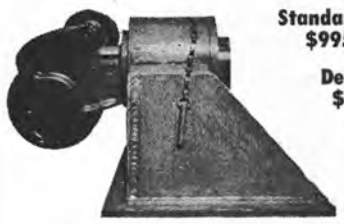
Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

To Give You These Features:

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

Self Aligning, Swivel Type Head.

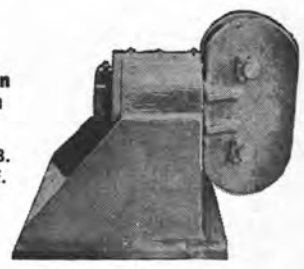
Dependable and Ruggedly built to perform consistently year after year with minimum maintenance.



Standard Design $995 each

Deluxe Design $1250 each

Model Design $1350 each



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

SPECIAL ITEMS

COUPLINGS

(Flexible Couplings between Turbines and Reducing Gear)

1—Set from C3-S1-A3 Vessel
1—Set from C2-S-B1 (Moore built)
1—Set from AP2 Victory Ship

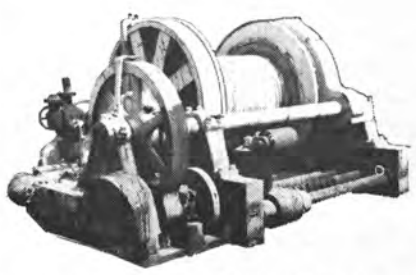
PROPELLERS

From C3-S1-A3 Vessel
From C2-S1-B1 Vessel
From AP2 Victory Ship
From Liberty Ships and LST Vessels

PROPELLER SHAFTS

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

STEAM TOWING WINCH



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

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on all your needs!

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AXIAL FLOW FANS

Rebuilt—Guaranteed

LaDel, STURTEVANT etc.

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

EXAMPLE LISTING:

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

PRICES ARE F.O.B. PORTLAND, OREGON

SPERRY GYRO COMPASSES

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

Machinery and EQUIPMENT

as removed from

S.S. "JAMES O'HARA"

(AP-179) C3-S1-A3

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

The

S.S. "FREDERICK FUNSTON"

for Immediate Sale!

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CARGO HOISTER BLOCKS

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

$34.50 each

$39.50 each with pull test certificates.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

FORGED STEEL LINE SHAFTING

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

All items flanged

6—Sections 19" diameter, 23'—11" long,
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MAIN CIRCULATING PUMP, Allis-Chalmers, Size 18 x 18, Type SEV, 8500 GPM, 20.2' head, with 60 HP motor, 230 DC (1)

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

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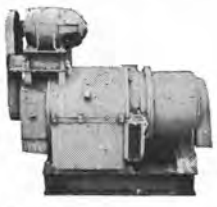

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Hertner. Input: 230 V, DC, 24A. Output: 3.5 KVA, 440 V, 60 cy., 3Ø.
Hertner. Input: 230 V, DC, 28A. Output: 5 KVA, PF .85, 115 V, 60 cy., Ø1.
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Century. Input: 10 HP, 230 V, DC. Output: 7.5 KVA, 3.75 KW, 120/1/60.
Bogue. Input: 230 V, DC, 57A, 15 HP. Output: 10 KVA, PF .8, 120 V, 60 cy., 1Ø.
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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.

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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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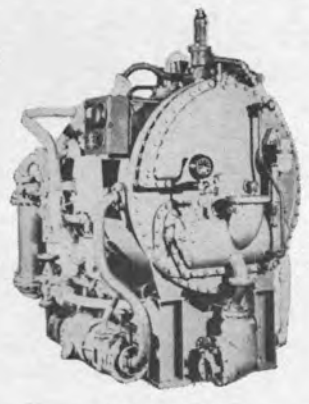

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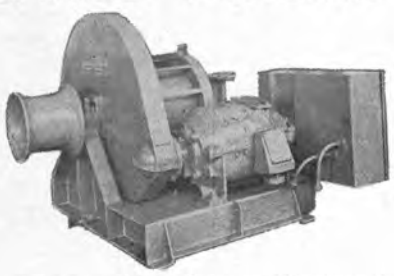

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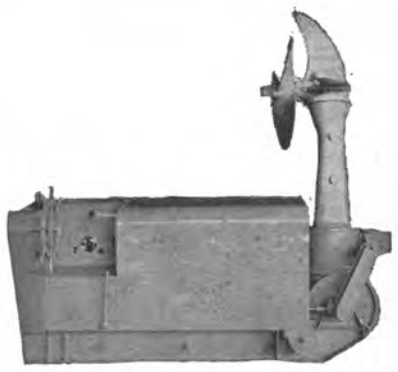

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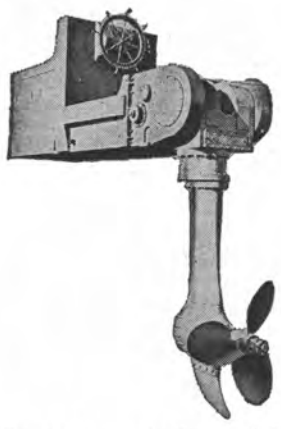

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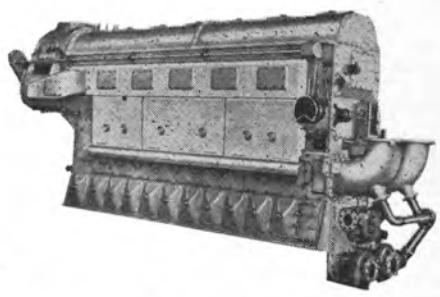

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BARGE MOUNTED REVOLVING CRANE 50-Ton capacity, Barge dimensions: 57' wide x 190' long.
CRANES-WHIRLEYS: One American 1956 model R20 HHE heavy duty 50 Ton. One practically new American model 254 capacity 90 Tons at 50', 25 Tons at 140'. One Clyde model 24E 50 Tons at 45'.
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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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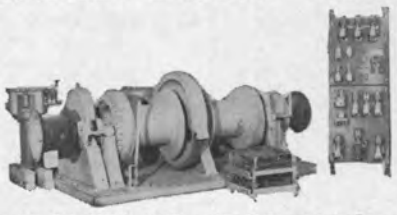
3 TON CLYDE DOUBLE DRUM WINCH



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

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

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

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NEW-UNUSED LIBERTY SHIP Troy-Enberg 20 KW Generators

WHILE THEY LAST

$695 CLOSE OUT PRICE

Factory Packages

120 volts DC—400 RPM—drip-proof marine type. 2-Wire direct connected set. Reciprocating 6 x 7 type E vertical self-oiling steam engine—plug & piston valve—220 lbs PSI—80 lbs. BP.

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VERTICAL BOILER

Suitable for

Pile Drivers Steam Cranes Hoists, etc.

$12500

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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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.

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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.

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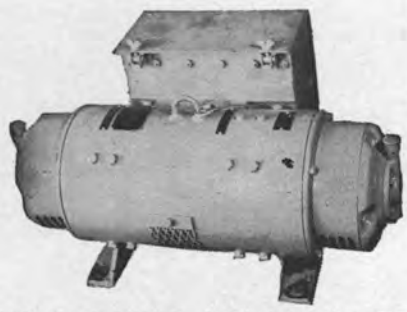

NEW 0.5 KVA HERTNER SETS

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.

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CONTINENTAL: 3.7 KW—Input: 7½ HP 230 volts DC/28 amps/1800 RPM. Type D-324X—continuous. Output: Generator type DS-324XB 3.7 KW/7.5 KVA/120/1/60—62.5 amps—0.5 PF compound wound.

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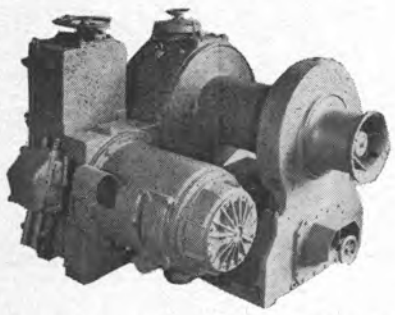
SPECIAL WINCH OFFER



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

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(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

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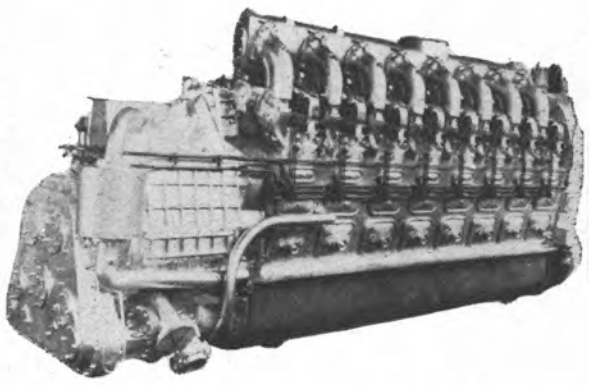


16-278A DIESELS

1700 HP @ 750 RPM

Large Quantity to Move

COMPLETE INSPECTION INVITED

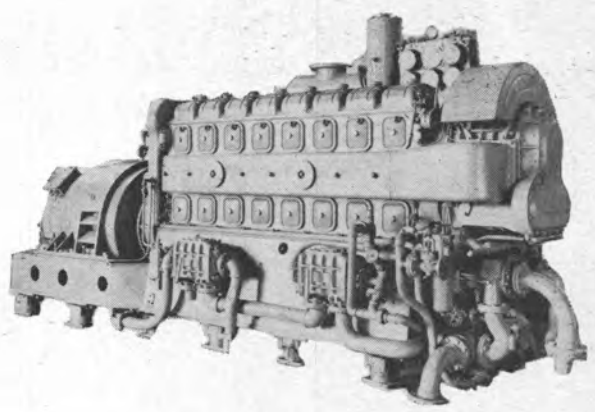
PRICE ~~$9750~~?

8-268A DIESELS

500 HP @ 1200 RPM

DRIVING
240 KW 3/60/440
GENERATORS

COMPLETE!
ALL ACCESSORIES



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

COME MAKE ANY INSPECTION YOU WISH
All Equipment is Priced to Move!

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NAVY YARDS PLEASE NOTE!

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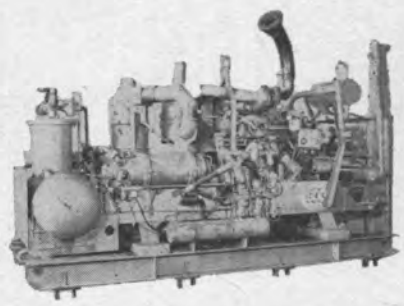
Practically New 600 CFM
GARDNER-DENVER ROTA-SCREW ROTARY AIR COMPRESSOR



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

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

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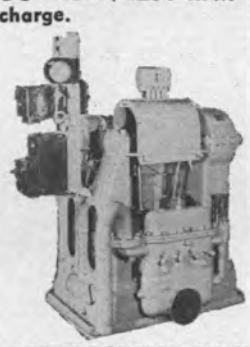
MARINE PUMPS
Fire – Bilge – General Service

AUXILIARY CONDENSATE

Worthington—1½ UZ-3—20 GPM @ 208'—5 HP—230 VDC—1577/2250 RPM—2½" suction—1½" discharge.



RECIPROCATING PUMP

80 GPM @ 60 lbs.—self-priming motor-driven, with air dome. 2-Cylinder—5" bore—8" stroke—4" suction—3" discharge Variable speed 6 HP motor—230 VDC—reduction gear ratio 22:1. German-built—long a favorite on foreign ships for reliability.

$1250.00

BRONZE FEED-WATER BOOSTER PUMPS

220/237 GPM @ 144' head—2-stage—1750 RPM with 30 HP 440/3/60 motor control & spares. Built for USN.

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NEW - UNUSED
1-5/16 ANCHOR WINDLASS

Made by Ideal Electric Co.—with spares. Double wildcat—1-5/16"—15 HP—115 volts DC—1750 RPM—all controls—two outboard gypsies. Wildcats 36" between centers—6000 lb line pull @ 50 FPM. DIMENSIONS: O.A. width over gypsies—84"; OA length 81". Will sell windlass without power if desired.

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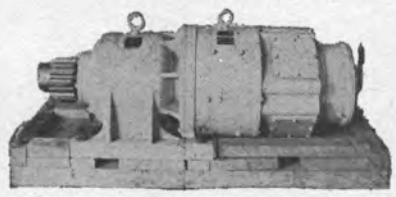
NOTICE!
DREDGES — CONTRACTORS

OLD FAITHFUL IS BACK!!!
NEW 20 HP 230 VOLT D.C.
GEARHEAD MOTORS
30 R.P.M. OUTPUT



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

$1450.00 EACH

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Please Note!
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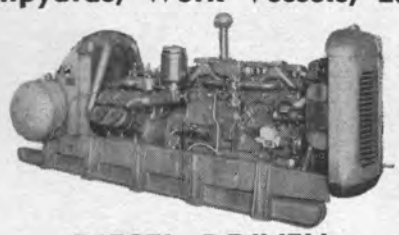

DIESEL DRIVEN
INGERSOLL-RAND AIR COMPRESSOR

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

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20 KW NORDBERG
"Power Chief"
DIESEL GENERATOR SET

2 Available. Kato 20 KW 120/240 single phase AC Gen. driven by 30 HP Nordberg 2-cylinder diesel engine—4½" bore—5½" stroke—4-cycle—1800 RPM—167 cu. inch displacement. Electric starting. Panel boards have Regohm voltage regulator. Panel is rigged for automatic standby control.

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in good condition

4" $349.00
22" x 3" between mounting holes

2" $249.00
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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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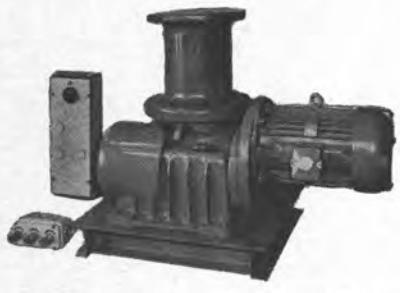
NEW – UNUSED 10 H. P. REVERSING CAPSTANS

Shipboard Use
Duty 10,000 lbs @ 60 FPM



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

6 IN STOCK FOR IMMEDIATE DELIVERY

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Self - Aligning

MARINE FAIRLEADS

$1175

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

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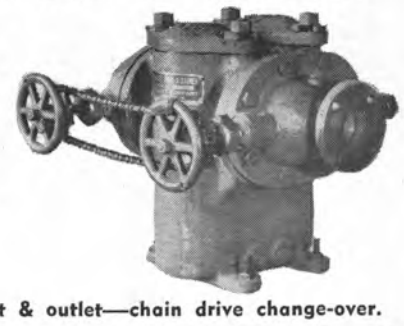
ELLIOT DUPLEX LUBE OIL STRAINERS

Formerly used with 12-567 Diesel



1½" inlet & outlet—chain drive change-over.

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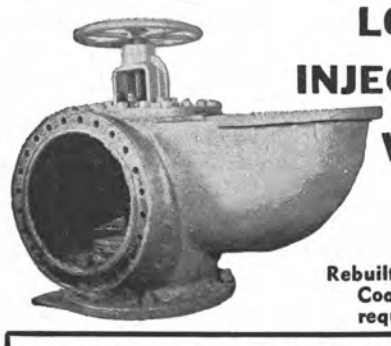
24" OVERBOARD DISCHARGE VALVES

Reconditioned to ABS standards



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Rebuilt to ABS and Coast Guard requirements

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AXIAL FLOW FANS

NEW UNUSED 230 V. D.C.

Navy size A10D2W6—LaDel Co., 10,000 CFM @ 3" S.P. MOTOR: Reliance Motor Co.—7.5/3.1 HP, 230 VDC—1310/1750 RPM. DIMENSIONS: 32⅛" OD—31¼" BC—29¼ ID—40¾" length.

$450.00

AF80—Sirocco—8000 CFM @ 2" S.P. MOTOR Welco 4/1.9 HP—230 VDC—1310/1750 RPM. DIMENSIONS: 30½" OD — 29¼ BC — 27¼ ID—37¾" length. U.S. Maritime type fan.

$329.50

AF100—Sirocco—10,000 CFM @ 2" S.P. MOTOR: Welco 5/2.2 HP—230 VDC—1310/1750 RPM. DIMENSIONS: 32½" OD—31⅛" BC—29¼ ID—40⅝" length. U.S. Maritime type fan.

$375.00

NEW — UNUSED — 115 V.D.C.

20000 C.F.M. — 115
16000 C.F.M. — 115
12000 C.F.M. — 115
10000 C.F.M. — 115
5000 C.F.M. — 115 (explosion-proof)
4000 C.F.M. — 115

RECONDITIONED — 440 V.A.C.

A1A4W5 to A16A4W5—with starter—440/3/60

1000 C.F.M.
2000 C.F.M.
3000 C.F.M.
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6000 C.F.M.
8000 C.F.M.
10000 C.F.M.
16000 C.F.M.

LARGE AXIAL FLOW FANS 30000 C.F.M.

A304W5—25 HP—440/3/60, 30000 C.F.M. @ 3" static; 40000 CFM @ 1" static. I.D. 44¼"

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Resister type—magnetic—semi-automatic—overload protection. Continuous duty—waterproof enclosure—16½" wide—23" high—10" deep. For starting, stopping, reversing topping winches and other uses requiring reversing starters.

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Wiley Mfg. Co., Box 97, Port Deposit, Md. 21904

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

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

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

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

DIESEL ENGINES
Alco-Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029
Bruce GM Diesel, Inc., U.S. Route 46 at Savoy St., Lodi, N.J. 07644
Burmeister & Wain, 2 Torvegade, Copenhagen K, Denmark
Colt Industries Inc., Fairbanks Morse Power Systems Div., Beloit, Wisc. 53511
Electro-Motive Division General Motors, La Grange, Illinois 60525
Fiat, Turin, Italy, U.S.A. 375 Park Ave., New York, N.Y. 10022
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
M.A.N. Maschinefabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany.
H. O. Penn Machinery Co., Inc., Caterpillar dir., 140th St. & East River, New York, N.Y. 10454
Stewart & Stevenson Services, Inc., 4516 Harrisburg Blvd., Houston, Texas 77011
Stork Dieselmotoren, Kromhout Motoren, P.O. Box 4196, Amsterdam, Holland.

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

DOORS—Watertight—Bulkhead
Blue Water Marine Supply, Inc., 2102 69 St., P.O. Box 9156, Houston, Texas 77006
Overbeke-Kain Co., 209 Aurora Rd., Bedford, Ohio 44014
Peck Iron & Metal Co., 3500 Elm Avenue, Portsmouth, Va. 23704
Walz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

ELECTRICAL EQUIPMENT
Arnessen Marine Systems, Inc., 335 Bond St., Brooklyn, N.Y.
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150
Oceanic Electrical Mfg. Co., Inc., 148 Perry Street, N.Y. 10004
Owesen & Co., Inc., 315 Notre Dame, New Orleans, La. 70130
Pauluhn Electric Mfg. Co., Inc., 422 Broome St., New York 10013
Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029

EVAPORATORS
Aqua-Chem, Inc., 225 N. Grand Ave., Waukesha, Wis. 53186
Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004
Mechanical Equipment Co., Inc., 861 Carondelet St., New Orleans, La. 70130

FITTINGS & HARDWARE
Kerotest Mfg., Corp., 2516 Liberty Ave., Pittsburgh, Pa. 15222
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202

FLOATING EQUIPMENT—Steel—Aluminum Pontoons
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.

FUEL RECOVERY
Tretolite Div., Petrolite Corp., 369 Marshall Ave., St. Louis, Mo. 63119

GALLEY RANGES
Elisha Webb & Son Co., 136 So. Front St., Philadelphia, Pa. 19106

HEAT EXCHANGES
Aqua-Chem. Inc., 225 N. Grand Ave., Waukesha, Wis. 53186

HEATERS—Ship
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231
Valod Elec. Heating Co., 71 Cortlandt St., Tarrytown, New York

HYDRAULICS
Bond Hydraulics Equipment Service Inc., 9264 Kennedy Blvd., North Bergen, N.J. 07047
Vickers, Marine & Ordnance Division, P.O. Box 302, Troy, Mich. 48084

INSULATION—Marine
Bailey Carpenter & Insulation Co.,Inc.,74SullivanSt.,Brklyn,N.Y.11231
Johns-Manville, Box 290-T, New York, N.Y. 10016
Reef Industries, Inc., P.O. Box 23221, New Orleans, La. 70123

MACHINE SHOP—TROUBLE SERVICE
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
Metal Finishers, Inc., (Mecrome Division), 3125 Brinkerhoff Road, Kansas City, Kansas 66115

MARINE DRIVES—GEARS
Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406
Western Gear Corp., Industrial Products Div., P.O. Box 126, Belmont, Calif. 94003

MARINE NAVIGATION EQUIPMENT & AIDS
American Hydromath Co., 2020 Jericho Tpke, New Hyde Park, N.Y. 11040
Decca Radar, Inc., 386 Park Ave. So., New York, N.Y. 10016
Electronics Concepts Inc., (Div. of Automatic Sprinkler Corp. of America) P. O. Box 813, Charlottesville, Va. 22902
Fisher Research Laboratory, 1890 Embaracadero Road, Palo Alto, California 94303
Griffith Marine Electronics, Inc., 79 Fourth Street, New Rochelle, N. Y. 10801
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101
Safety Guide Prod. Div. Borg Warner, P.O. Box 248, Scottsburg, Indiana 47170
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

MARINE EQUIPMENT
Beaver Tool & Machine Co., P.O. Box 94717, 525 S.E. 29th St., Oklahoma City, Okla. 73109
Brazos Engineering, a div. of Metallic Bldg. Co., 4625 Holmes Road, Box 14240, Houston, Texas 77021
Gadelius, K. K., P.O. Box 802, Kobe Port, 651-01 Japan
Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
H & H Engineering Co., 430 So. Navajo, Denver, Colo. 80223
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Kearfott Marine (Div. of The Singer Co.) 21 West St., New York, N.Y. 10006
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
Sky Climber Inc., 17311 So. Main Street, Gardena, Calif. 90247
Vokes Filter Div. (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221
Worthington Corp., 401 Worthington Ave., Harrison, N.J. 07029

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

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

MARINE PROPULSION
The Buehler Corp., 9000 Precision Drive, Indianapolis, Ind. 46236
Combustion Engineering, Inc., Windsor, Connecticut 06095
De Laval Turbine, Inc., 853 Nottingham Way, Trenton, N.J. 08602
Foster Wheeler Corp., 666 Fifth Ave., New York, N.Y. 10019
General Electric Co., Schenectady, N.Y. 12305
Mathers Controls, Inc., 902 N.W. Ballard Way, Seattle, Wash. 98107
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York 10014
Stal-Laval, Inc., 147 E. 50th St., New York, N.Y. 10022
Western Gear Corp., Precision Products Div., P.O. Box 190, Lynwood, Calif. 90262

MARINE RADIO COMMUNICATIONS EQUIPMENT
Collins Radio Co., M/S 416-118, Dallas, Texas 75207
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Motorola Communications & Electronics, Inc., 4935 W. LeMoyne Ave., Chicago, Ill. 60651
RF Communications, Inc., 1680 University Ave., Rochester, N.Y. 14610
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Marine Products Operation, 213 East Grand Avenue, South San Francisco, California 94080
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101

NAVAL ARCHITECTS AND MARINE ENGINEERS
BG Marine Services, Div. of Genge Industries, Inc., 4419 Van Nuys Blvd., Sherman Oaks, Calif. 91403
Coast Engineering Co., 711 West 21 St., Norfolk, Va. 23517
Commercial Radio Sound Corp., 652 First Avenue, N.Y., N.Y. 10016
Crandall Dry Dock Engineers, Inc., 238 Main St., Cambridge 42, Mass
Cushing & Nodstrom Inc., 50 Trinity Place, New York, N.Y. 10006
Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011
M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228
Christopher J. Foster, 17 Battery Place, New York, N.Y. 10004 14 Vanderventer Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
W. R. Henderson & Co., 3611 Revere, Houston, Texas 77006
Morris Guralnick, Associates, Inc., 74 New Montgomery St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
L. K. Homyer, Box 408, Corona Del Mar, California 92625
James S. Krogen, 1460 Brickell Ave., Miami, Fla. 33131
Littleton Research and Engineering Corp., 95 Russell Street, Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Applications Co., Inc., P.O. Box 167, Mineola, N.Y. 11502
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 1180 Ave. of Americas, N.Y., N.Y. 10036
Rudolph F. Matzer & Associates, Route 1 - Box 314 D, Jacksonville, Fla. 32211
John J. McMullen Associates, Inc., 17 Battery Pl., New York, N.Y.
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Gunnar Nelson, 2185 Lemoine Ave., Ft. Lee, N.J. 07024
Pearlson Engineering Co., Inc., 2825 Oak Ave., Miami, Florida 33133
Research & Design Corp., 17 Battery Place, Suite 1227 New York, N.Y. 10004
Philip L. Rhodes, 369 Lexington Ave., New York, N.Y. 10017
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 45 Second St., San Francisco, Calif.

Sanders & Thomas, Inc., 1st-Federal Bldg., Pottstown, Pa. 19464
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
George Slifer, 1422 Lakewood Rd., Jacksonville, Fla. 32207
Philip F. Spaulding & Associates, 65 Marion St., Seattle, Wash. 98104
R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
Transcaribbean Shipping & Trading Corp., Panam Docks, Isle Grande, P.O. Box 564, San Juan, P.R. 00902
H. Newton Whittelsey, Inc., 17 Battery Pl., New York, N.Y. 10004

OIL PURIFIERS—Repair
Norse Electric Mfg. Co., Inc., 57-59 Commerce St., Bklyn, N.Y. 11230
Peck Equipment Co., 3500 Elm Avenue, Portsmouth, Virginia 23704

OILS—Marine—Additives
Esso International Inc., Esso Bldg., 15 West 51 St., New York, N.Y.
Gulf Oil Trading Co., 1290 Ave. of the Americas, New York, N.Y.
Mobil Oil Co., Inc., 26 Broadway, New York, N.Y. 10004
Refineria Panama, S. A., 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., 50 W. 50 St., New York 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017

PAINT—Marine—Protective Coatings
Amercoat Corp., 201 N. Berry St., Brea, Calif. 92621
Devoe & Raynolds Co., Inc., Marine Division, Newark, N.J. 07105
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
International Paint Co., 21 West St., New York, N.Y. 10006
Mobil Chemical Company, Metuchen, N.J. 08840

PETROLEUM SUPPLIES
Independent Petroleum Supply Co., 277 Park Ave., New York 10017
Refineria Panama, S. A. 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., W. 50 St., New York 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017
The West Indies Oil Co., Ltd. St. John's, Antigua, W. I.

PLASTICS—Marine Applications
Atlas Minerals & Chemical Div., ESB, Inc., Mertztown, Pa. 19539
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231
Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936

POLLUTION CONTROL
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020

PROPELLERS—New and Reconditioned
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Baldwin-Lima-Hamilton Corp., Phila., Pa. 19142
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Bird-Johnson Co., 883 Main Street, Walpole, Mass. 02081
Escher Wyss, G.M.B.H., 798 Ravensburg, Germany

PUMPS
Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City, Kansas 66110
De Laval Turbine, Inc., 853 Nottingham Way, Trenton, N.J. 08602
Goulds Pumps, Seneca Falls, N.Y. 13148

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

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

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, P.O. Box #709, Orange, Calif. 92669
Wall Rope Works, Inc., Beverly, N. J. 08010

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

RUDDER ANGLE INDICATORS
Electric Tachometer Corp., 68th & Upland Street, Phila., Pa. 19142
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

SEALS
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
Syntron, a division of FMC Corp., 398 Lexington Ave., Homer City, Pa. 15748

SEARCHLIGHTS
Portable Light Co., Inc., 67 Passaic Ave., Kearny, N.J. 07032
Snelson Oilfield Lighting Co., 1201 E. Daggett St., Forth Worth, Texas 76104

SEWAGE DISPOSAL
Youngstown Welding & Engineering Co., 3708 Oakwood Ave., Youngstown, Ohio 44509

SHIPBREAKING—Salvage
The Boston Metals Co., 313 E. Baltimore, Md. 21202
National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731
Northern Metal Co., Minor & Bleigh Sts., Philadelphia, Pa. 19136
Peck Equipment Co., 3500 Elm Ave., Portsmouth, Va. 23704
Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

SHIP BROKERS
Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119

SHIPBUILDING—Repairs, Maintenance, Drydocking
Albina Engine & Machine Works, 2100 N. Albina Ave., Portland, Ore. 97227
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Astilleros de Cadiz, S.A., Zurhono 72, Madrid 10, Spain
Atlantic Gulf & Pacific Co. of Manila Inc., 45 Muelle De La Industria, Manila
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Barbour Boat Works, Inc., P.O. Box 1069, New Bern, N.C. 28560
Bender Ship Repair, Inc., 265 So. Water St., Mobile, Ala. 36602
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885
Brewer Dry Dock Co., Mariners Harbor, Staten Island, N.Y.
Ira S. Bushey & Sons, Inc., 764 Court St., Brooklyn, N.Y. 11231
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.
Equitable Equipment Co., Inc., 410 Camp St., New Orleans, La. 70130
Furness-Smiths Dock (Trinidad) Ltd., P.O. Box 893, Chaguaramas Dockyard, Port Chaguaramas, Trinidad, West Indies.
Gotaverken American Corp., 39 Broadway, New York 6, N.Y.
Groignard Shipyards, P.O. Box 829 Colbert, Marseilles, France.
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
Kawasoki Dockyard Co., 8 Kaigan-dori, Ikuta-ku, Kobe, Japan
LISNAVE, P.O. Box 2138, Lisbon, Portugual
Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
Lone Star Marine Salvage Co., 7200 S. Harbor Drive, Houston, Texas 77001
Maryland Shipbuilding & Drydock Co., P.O. Box 537, Baltimore, Maryland 21203
Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047
Mitsui Shipbuilding & Eng. Co., Ltd., Nihonbashi-Muromachi, Chuo-ku, Tokyo, Japan
Nashville Bridge Co., P.O. Box 239, Nashville 1, Tenn.
National Steel & Shipbuilding Corp., San Diego 12, Cal.
Newport News Shipbuilding and Dry Dock Co., Newport News, Va.
Nippon Kokan Kabushiki Kaisha, 2, 1-chome, Otemachi, Chivoda-ku, Tokyo, Japan
O.A.R.N. (officine Allestimento e Riparazioni Navi) Genoa, Italy
Pacific Coast Engineering Co., P.O. Drawer 6, Alameda, Calif. 94506
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J.
Puerto Rico Drydock and Marine Terminals, Inc., P.O. Box 2209, San Juan, Puerto Rico 00903
Rodermond Industries, Foot of Henderson St., Jersey City, N.J. 07302
L. Rodriquez Shipyard, 24 Molo Norimberga, Messina, Italy.
St. Louis Shipbuilding—Federal Barge, Inc. 611 East Marceau, St. Louis 11, Mo.
Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan
Southern Shipbuilding Corp., P.O. Box 1089, Slidell, La. 70458
Tampa Ship Repair & Dry Dock Co., Inc., P.O. Box 1277, Tampa, Florida 33601
Terrin Agency, Inc., 17 Battery Place, New York, N.Y. 10004
Todd Shipyards Corp., 1 Broadway, New York City
Vare Corp., Equipment Systems Div., 516 Sylvan Ave., Englewood Cliffs, N.J. 07632
Vickers Ltd., 222 London Rd., St. Albans, Herts, England
Wiley Mfg. Co., Port Deposit, Md.
Wyatt Industries Inc., Port Houston Shipyard Div., P.O. Box 3052, Houston, Texas 77001
Zigler Shipyards Inc., P.O. Box 492, Jennings, Louisiana 70546

SHIP MODELS
Boucher-Lewis Precision Models, Inc., 36 E. 12 St., N.Y., N.Y. 10003

SHIP STABILIZERS
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 7 Dey Street, New York, N.Y. 10007
John J. McMullen Associates, Inc., 17 Battery Pl., N.Y., N.Y. 10004
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

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

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

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

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

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

TOWING—Lighterage, Transportations, Barge Chartering
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Curtis Bay Towing Co., Mercantile Bldg., Baltimore 2, Md.
G & H Towing Company, 509 Texas Building, Galveston, Texas 77550
Henry Gillen's Sons Lighterage, 140 Cedar St., New York, N.Y. 10006
James Hughes, Inc., 17 Battery Pl., New York, N.Y.
Jackson Marine Corp., P.O. Box 1087, Aransas Pass, Texas 78336
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y.
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
P. F. Martin, Inc., Mall Bldg., 325 Chestnut St., Philadelphia, Pa.
Moran Towing & Transportation Co., Inc., 17 Battery Place, N.Y.
Nickerson Marine Towing Co., 1670 Southeast 17th Street, Ft. Lauderdale, Fla. 33316
Red Star Towing & Transportation Co., 500 Fifth Ave., N.Y. 10036
L. Smit & Co., 11 Broadway, New York 4, N.Y.
Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002
M. & J. Tracy, Inc., 1 Broadway, New York, N.Y.
Turecamo Coastal and Harbor Towing Corp., 1752 Shore Parkway, Brooklyn, N.Y.
Vancouver Tug Boat Co., Ltd., 10 Pemberton Ave., No. Vancouver, B.C., Canada

VALVES AND FITTINGS—Hydraulic—Safety Flanges
Hooper Valve & Engineering Corp., 24th St. & Virginia Ave., Newport News, Va.
Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn 31, N.Y.
Hydrosearch Co., Inc., Riva Rd., Annapolis, Md. 21401
Marine Moisture Control Co., 39 Redfern Ave., Inwood 96, L.I., N.Y.
Mechanical Marine Company, 45-15 37th St., Long Island City, N.Y.
Todd Products, Div. of Todd Shipyards Corp., Halleck St., Brooklyn, N.Y. 11231

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

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

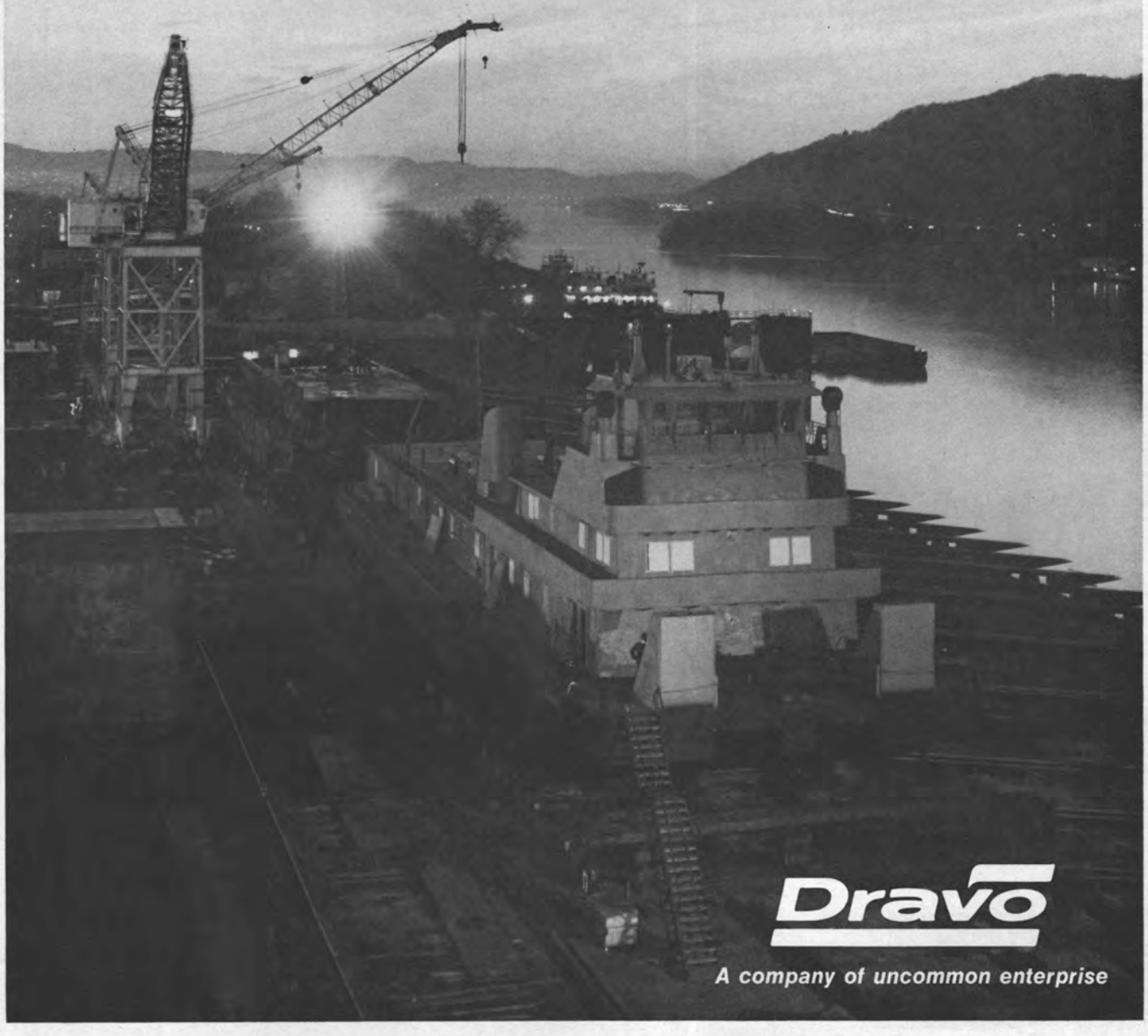
WIRE ROPE
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., Bethlehem, Pa. 18018
DiMattina Supply Co., 59-61 Seabring St., Brooklyn, N.Y. 11231
United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230

ZINC
Smith & McCrorken, 153 Franklin St., New York, N.Y. 10013

10,000 hp on the way

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

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



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"INTER-ZINC" requires no special curing solution for hardening. It is self curing. It can be applied at temperatures as low as 0°F or up to 95% relative humidity with no effect on the cure. It can be subjected to extreme changes in atmosphere 20 minutes after application. "INTER-ZINC" provides superior durability resistance to "rust creep" and has remarkable abrasion resistance when cured.

One coat of "INTER-ZINC" protects steel structures. In marine use, it is unparallelled as a primer for other coatings such as INTERGARD® Epoxies, on ships' hulls, superstructures or off-shore drilling platforms, barges and steel piers.

"INTER-ZINC" is specifically formulated for simple overcoating. Overcoat "INTER-ZINC" with any "INTERGARD" Two Package Epoxy. Overcoat "INTER-ZINC" with "INTERGARD" 4437 for interim contamination protection and/or for subsequent top coats of conventional International Alkyds, "INTERGARD" Epoxies, and any other type International heavy duty paints.

Today is an age of specialization. Consult specialists for complete corrosion protection in any type of environment. Remember International Paint products are the result of the most advanced technology in research, development and manufacture of coatings for heavy duty service. Their long, trouble-free life on the job makes them economical beyond compare. We invite you to consult us on your next job, without obligation.

"INTER-ZINC" Shop Primer is also available featuring all of the usual attractions of zinc rich Shop Primers such as weldability, durability, etc. Consult us for details on "INTER-ZINC" Shop Primer.

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