

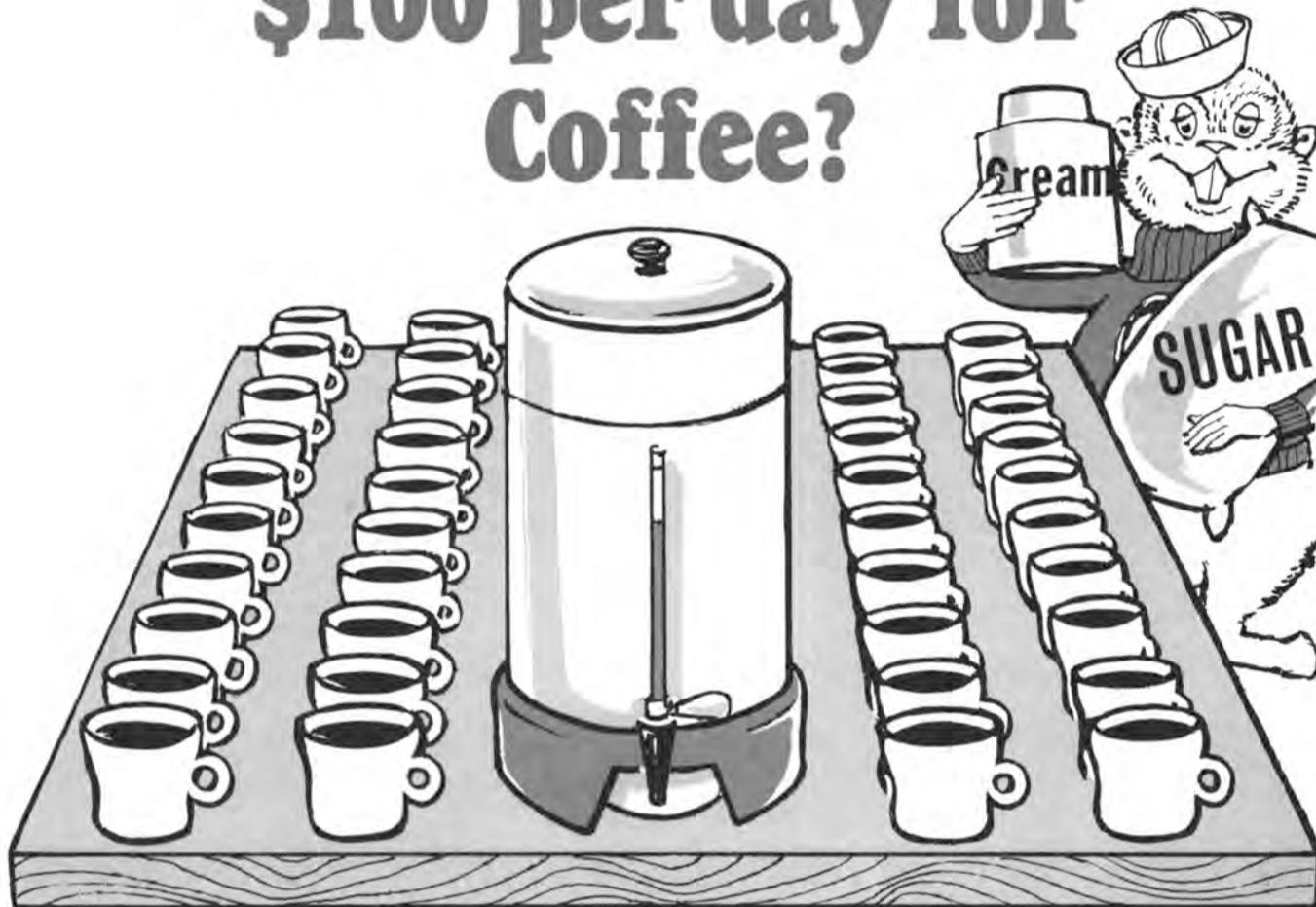
MARITIME REPORTER AND ENGINEERING NEWS



**Icebreaking Tanker Manhattan
Challenges The Northwest Passage**
(SEE PAGE 7)

SEPTEMBER 1, 1969

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Newport News Awarded \$88-Million Contract For Two Nuclear Subs

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., has been awarded a fixed-price-incentive-fee contract (subject to labor and material escalation) for the construction of two nuclear-powered attack submarines, SSN686 and 687. The contract, N00024-69-C-0307, was awarded by the Naval Ship Systems Command.

The two submarines were authorized by Congress in the Fiscal Year 1969 Shipbuilding and Conversion Program. The contract price was given as \$88-million.

Bumble Bee Requests Bids For Large Seiner

Bids for the construction of a 160-foot steel seine and bait fishing vessel for Bumble Bee Seafoods are to be received by the Maritime Administration on September 17. Requests for IFB should be sent to Bumble Bee Seafoods, c/o B. F. Jensen, naval architect and marine engineer, 71 Columbia Street, Seattle, Wash. 98104. The vessel is to be delivered at owner's pier, Astoria, Ore.

Halter Marine To Build Twin-Screw Tugboat For Jackson Marine

Halter Marine Services, Inc., New Orleans, La., has been given an order by Jackson Marine Service to construct a twin-screw tugboat. It is to have the following dimensions: 109 feet by 32 feet by 16 feet and be equipped with 2,300-total-bhp diesels. It has been designated Hull No. 237.

NSSC Awards Uniflite \$1-Million Contract

Uniflite Corporation of Bellingham, Wash., has been awarded a contract to build twenty-three 31-foot river patrol boats (PBR) by the Naval Ship Systems Command. The negotiated fixed-price contract, N00024-70-C-0211, is in the amount of \$1,089,489.

Stewart & Stevenson Orders Utility Boat From Mangone Ship

Stewart & Stevenson Services, Inc., Houston, Texas has ordered an offshore, oil-well utility vessel from Mangone Shipbuilding Co., Houston. The dimensions of the vessel will be 156 feet 6 inches by 36 feet by 15 feet. It will be powered by 2,400-total-bhp diesels and is designated Hull No. 95.

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MARITIME REPORTER AND ENGINEERING NEWS

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The distinctively new features of the Manhattan are easily discernible in this view taken during river trials.

Will The Northwest Passage Become A Trade Route?

The Manhattan Tackles A Big Job

Extensively Modified By Humble Oil & Refining Company, The Manhattan Is The First Commercial Vessel To Ever Attempt The "Top Of The World" Route

The icebreaking tanker SS Manhattan is on an historic voyage to test the feasibility of using the Arctic Northwest Passage as a year-round trade route. Humble Oil & Refining Company, the sponsor of the project, hopes to prove that the Passage can be used by special ships to deliver Arctic oil to U.S. East Coast ports. Such a tanker route would make possible the delivery of Alaskan crude oil to the Atlantic seaboard at a substantial cost advantage over alternate methods of transportation.

Humble, together with Atlantic Richfield Company and BP Oil Company who are participating to a small degree in the project, are extremely hopeful of the chances for success. The planning and preparations that went into the project were enormous. Hundreds of scientists and other individuals were involved. Various agencies of the governments of the United States and Canada cooperated extensively. M. A. Wright, chairman of Humble's board, said: "We view this as an excellent example of how government and industry can work together in a free and democratic society to accomplish common objectives." He also said that "hopefully" the project will be a success—"its a gamble we have to take. Humble's ante is close to \$30-million. One turn of the card will tell us whether we win or lose. We have decided to draw the card."

The converted Manhattan is well equipped for its demanding task.

Even before the recent modifications, the Manhattan was stronger and more powerful than any ship of its type in the world. Built in 1962 in Bethlehem Steel's shipyard in Quincy, Mass., the Manhattan is the largest merchant ship ever to fly the American flag and the largest commercial ship ever constructed in the U.S. Its 43,000-shp powerplant is nearly

1½ times more powerful than those on ships twice her size. In addition to size, the Manhattan is highly maneuverable, due to twin five-bladed propellers and twin rudders.

The vessel meets the highest requirements of the regulatory bodies for U.S.-flag operation. It was built under special survey of the American Bureau of Shipping and satisfies or exceeds the requirements of the Coast Guard. In short, the Manhattan is a one-vessel breed of super-tanker, more powerful, and more maneuverable than any similar ship on the seas.

To speed the conversion, the ship was dry-docked at Sun Shipbuilding and Dry Dock Company and cut into four pieces. The 65-foot forward bow was stored at Sun, to be replaced by a new 125-foot icebreaking bow which was built in two sections—the forward piece by Bath Iron Works and the after section by Sun.

The forward section, including the No. 1 cargo tank, was towed to Newport News Shipbuilding and Dry Dock Company where it was fitted with a heavy ice belt. The midship section, which included the bridge, was towed to Alabama Dry Dock and Shipbuilding Company

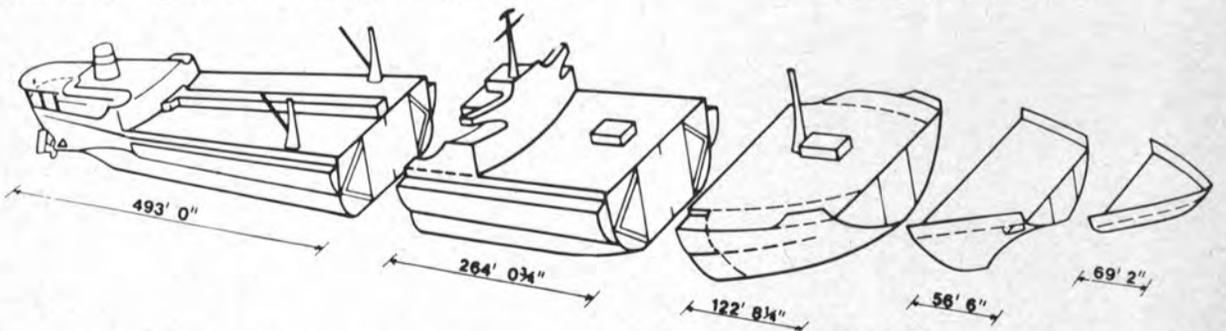
where an ice belt also was fitted. The stern section remained at Sun to be strengthened internally.

While the hull work was being carried on, Sun Ship workers were installing additional quarters, laboratories and electronic gear. When the hull sections were returned, Sun re-joined them, sealed off most of the cargo tanks (which will be used for ballast) and then put the ship through river trials.

As completed, the Manhattan has been lengthened from 940 feet to 1,005 feet, widened by 16 feet to 148 feet, and its weight increased by 9,000 tons.

The ship also has been altered in other less obvious ways, including the addition of new high-strength propellers and propeller shafts, external protection for the rudders, and the instrumentation equipment to measure the motions of the ship, ice pressures on the hull, and powerplant performance. Closed-circuit television will monitor the ice-flow and ice-breakage patterns around the ship. In special laboratories, analysts will process infrared film and

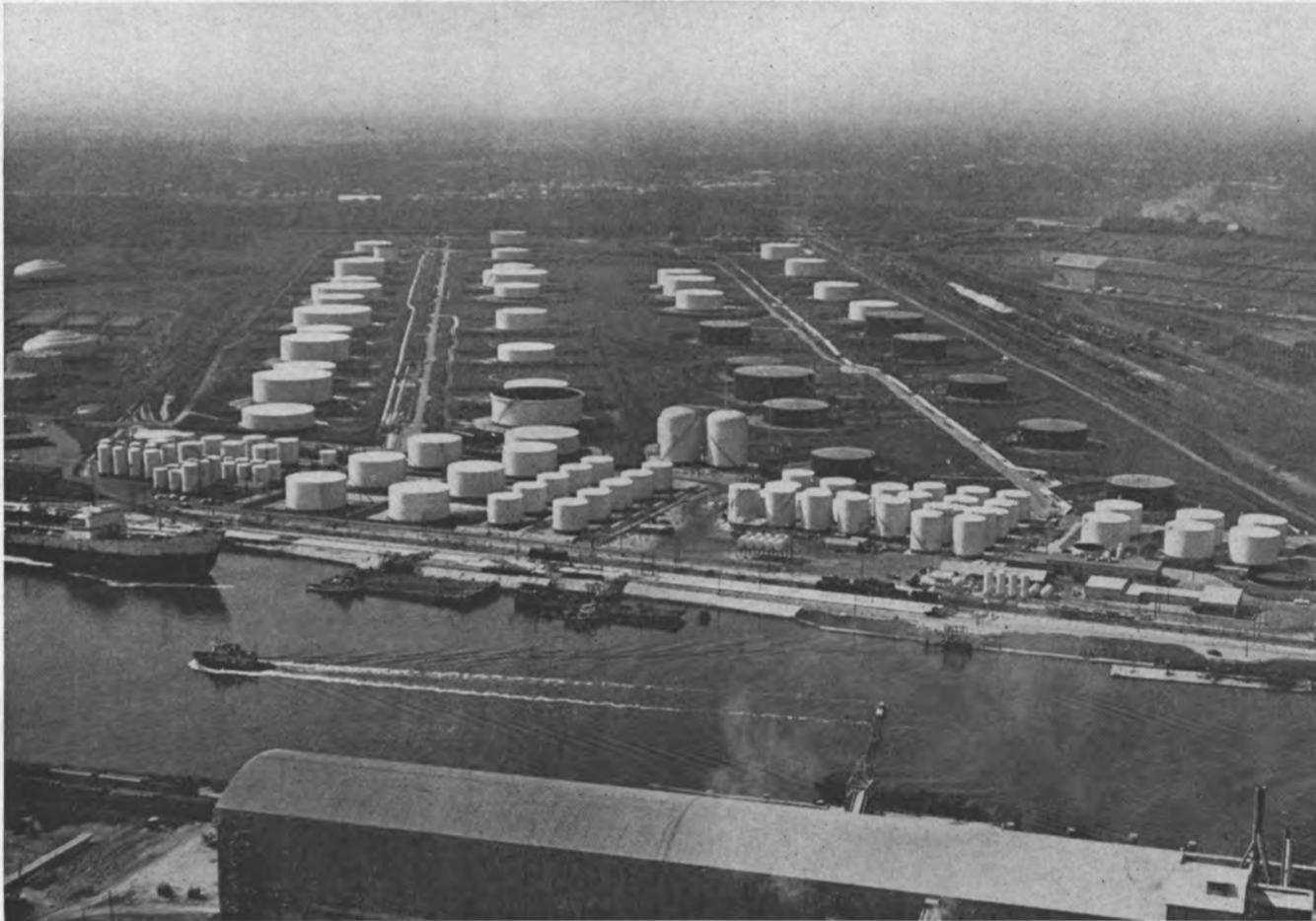
(Continued on page 9)



The segmentation of the Manhattan speeded the conversion. The 69-foot 2-inch bow was built by Bath Iron Works. The 56-foot 6-inch bow section was built at Sun Ship. The 122-foot 8¼-inch forward section was converted by Newport News Ship and the 264-foot midsection was altered by Alabama Dry Dock. The stern remained at Sun Ship.

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SS Manhattan

(Continued from page 7)

interpret laser-beam data from flyovers showing characteristics of the ice along the route. Accommodations for the crew, scientists, and observers were increased significantly.

Humble appointed **Stanley B. Haas** to be project manager of the Arctic Marine Task Force. When he first received the assignment, the firm considered the Arctic as pretty much a mystery area. However, as his group started to investigate the project they found that extensive research had been done by the U.S. Navy, Coast Guard and the Canadian government. This factual information made possible model testing of ships in ice in the Navy's underwater warfare center tank in San Diego in cooperation with the Coast Guard. These tests were followed by using a one-to-twenty scale model on a lake in the foothills of the French Alps.

Mr. Haas said: "After examining all this data we felt it feasible to think in terms of a large ship with high power operating in the Arctic on a year-round basis. The only difficulty was the lack of actual operating data collected in a scientific manner to confirm the validity of the math and model test study results." This led to the selection of a ship, conversion requirements and now the actual voyage in the Northwest Passage.

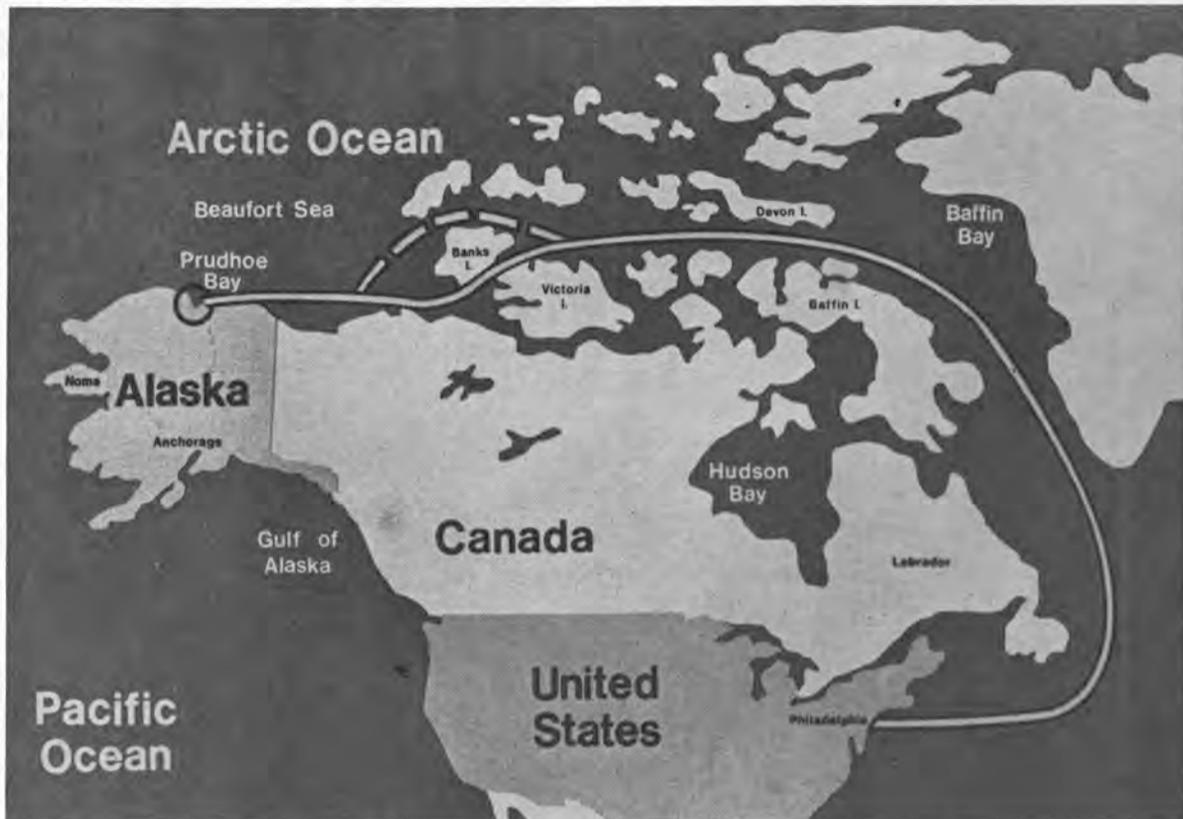
The tests showed that the new bow is capable of increasing the icebreaking capability of a given ship as much as 40 to 60 percent over the more conventional icebreaking design. The bow works on the downbreaking principle. It moves the vessel onto the ice at an 18-degree angle and then increases to the more conventional 30 degrees before the extended bow breaks the ice.

The bow also extends sideways eight feet wider than the hull on each side. It is believed this will leave more free water along the sides of the hull, thus greatly reducing ice friction. The ice will also be kept away from the sides by an external sloping ice belt built of 1¼-inch steel.

There has been installed two 1,000-hp Bird-Johnson bow thrusters—but not for bow maneuvering. The thrusters are to be used as pumps to move seawater between port and starboard tanks to rock the ship for icebreak-



McAllister Brothers tugs return the forward cargo section and the mid-section, which were rejoined at Newport News, through the Chesapeake and Delaware Canal to Sun Ship.



The 4,500-mile voyage of the Manhattan from Philadelphia to Prudhoe Bay is expected to take one month.

ing purposes. The controllable-pitch thrusters are powered by deck-mounted diesel engines through 25-foot-long right-angle drives.

On this voyage, the Manhattan will carry the most sophisticated state-of-the-art electronic gear ever assembled on a non-government ship. At least three major systems utilize technical advances which have been made in the past two years.

The problem of providing reliable communications was complex. Humble chose Collins Radio Company as the prime contractor for intra-task force and ship-to-Houston communications. In addition to the normal equipment, the Manhattan is equipped with radio telephone (voice), radio teletype (data), and radio telegraph (Morse code), transmitters and antenna systems capable of radiating effective power up to 500 times that of equipment normally found on commercial ships.

Accurate knowledge of the location and motion of the ship is a basic requirement. The forward speed, bearing, side-slip, and acceleration will be correlated with other parameters such as ice thickness, bow strain, and horsepower. To obtain this knowledge of location and motion, Humble contracted Litton Systems, Inc. to design a custom integrated electronic navigation system.

Known as the integrated position/navigation and impact/side-slip measurement system, it pulls together a number of inputs which are analyzed by a Litton program in a computer built by Digital Equipment Corporation. One such input is provided by a satellite receiver built by ITT/Aerospace. Another input involves the use of pulsed doppler sonar and special purpose computer equipment provided by the Marquardt Corporation.

Custom-designed and remote-controlled closed circuit TV cameras mounted on both ends of the vessel enable scientific observers to study the mechanics of cracking and ice flow dynamics. Prime contractor for this system was the Taft Broadcasting Company.

Dr. **Charles F. Jones**, president of Humble, pointed out that while Humble's motives in opening the Passage are economic and are oriented toward the company's well-being the ultimate effects may be almost unlimited.

Benefits of an open Polar sea route include increased U.S. self-sufficiency in oil, a U.S.-tanker fleet becoming by 1980 two-and-a-half

times its present size, opening other mineral resources of far northern Alaska and Canada, and other unknown advantages of a new sea route which brings major world trade centers closer in time.

Dr. **Jones** stated that, "If the experiment is successful, Humble will need six giant icebreaker tankers of the 250,000-dwt class by 1975. Each of the tankers may cost as much as \$50-million, or a total anticipated investment of some \$300-million."

If other companies on the North Slope follow this lead, Dr. **Jones** estimates that 25 or 30 supertankers of this class will be operating across the top of the continent.

Accompanying the Manhattan on this voyage will be the U.S. Coast Guard icebreaker Westwind and the Canadian icebreaker John A. McDonald. The Westwind will be relieved by the icebreaker Northwind, which will travel eastward from the Bering Sea, when they meet in the Passage. The Westwind will turn around and sail back over the route to the Atlantic Ocean.

After the Manhattan reaches Prudhoe Bay, following tests in Parry Channel (the actual Northwest Passage) and the Beaufort Sea, it will continue on west and go south through the Bering Strait and into the Bering Sea. However, the voyage itinerary may be changed and the ship headed north to see how it performs in ice conditions comparable to the hard winter-type ice the Passage would offer on a year-round basis. The Manhattan will return through the Passage continuing its data collection mission. The entire voyage is expected to take 100 days.

Humble acquired the Manhattan on a charter basis from Seatrain Lines, Inc. When the voyage is over, the ship is to be reconverted to its original condition and returned to Seatrain Lines.

The crew on the Manhattan was carefully selected. All the deck officers have undergone extensive training aboard the USCG icebreaker Staten Island in the Bering Sea in order to become acquainted with the operation of an ice-breaking vessel. They have had similar exposure aboard the Canadian icebreaker John A. McDonald. The officers also were sent through the ice-routing offices operated by the Canadian Department of Transport and through the U.S. Navy's Ice Observation School.

Ingalls Launches Fourth Combination Ship For Moore-McCormack Lines—SS Mormacsun



Mrs. Laurence J. Buser swings the champagne bottle to the bow of the 600-foot SS Mormacsun during the vessel's christening and launching at the Ingalls Shipbuilding division of Litton Industries in Pascagoula, Miss. Participating in the launching were, from left to right: Mrs. Laurence J. Buser, the ship's sponsor; Mrs. Robert E. O'Brien, matron of honor; Roy Bowman, representative of the Maritime Administration; William T. Moore, president of Moore-McCormack Lines; Congressman Frank T. Bow of Ohio, who delivered the principal launching address; Adm. Lawson P. Ramage, commander of Military Sea Transportation Service.

The SS Mormacsun, the fourth and last of Moore-McCormack Lines new, fast combination roll-on/roll-off containerships was launched on July 29 at Ingalls Shipbuilding division of Litton Industries at Pascagoula, Miss.

Mrs. Laurence J. Buser of Allendale, N.J., wife of the executive vice-president and director of Mooremack, was the sponsor of the ship assisted by Mrs. Robert E. O'Brien of Smoke Rise, N.J., wife of the senior vice-president and director of Mooremack. The Hon. Frank T. Bow, congressman from Ohio, delivered the principal address preceding the launching.

Many dignitaries from the Maritime Administration, the Military Sea Transportation Service and the Commerce Department were among the honored guests attending the ceremonies.

The Mormacsun and her three sisterships will have a cruising speed of 25 knots. The four ships have been designated as the "Sea-Bridge Class." The first two ships of this class, the Mormacsea and Mormacsky, are operating on a weekly service in Mooremack's European route which service has been expanded to include German ports. These ships are the first commercial combination roll-on/roll-off containerships ever designed and built in the United States.

In order to meet the needs of the shippers, the railroads and the motor carriers in this country and abroad, the combination ships were tailored to meet the vertical cargo movement of the lift-on/lift-off type of vessel and not conflict with the horizontal movement of the roll-on/roll-off cargo through the stern ramp. In the North Atlantic trade about 70 percent of the cargo will be containerized and the remaining 30 percent is better suited to other handling methods. The earning potential of dry and bulk cargo not containerized could not

be overlooked, and the combination ships offered the best possibility for capturing this important segment.

The design of the "Sea-Bridge Class" ships proceeded concurrently with the design of terminals and other facilities, thus providing for optimum results.

The unique feature of the roll-on/roll-off deck will efficiently serve as the sea-bridge in door-to-door transportation of large tractors, diesel engines, household moving vans, specialized refrigerated trailers, extra length steel beams and even small locomotives.

This is the fourth phase of Moore-McCormack Lines' extensive replacement program which started in 1958 with two passenger liners, the SS Argentina and the SS Brasil, followed by eight cargo liners of the Mormacpride Class, generally known as the 1624s. Six fast Constellation Class freight liners were added in 1965.

American Ship Elects Lepkowski Treasurer

The directors of The American Ship Building Company of Lorain, Ohio, have elected Stanley J. Lepkowski as treasurer of the firm.

Mr. Lepkowski has been with American Ship since January, 1965, when he joined the company as assistant comptroller. He was named comptroller a year later. Previously, Mr. Lepkowski spent 15 years with the old Thew Shovel Company of Lorain, rising from cost clerk to manager of the auditing and cost accounting departments.

A 1936 graduate of Lorain High School, Mr. Lepkowski first worked for American Ship as a rivet passer and fitter helper before entering the U.S. Army Signal Corps where he served as a master sergeant in the Pacific. After military service he attended Fenn College and earned his BBA degree in 1949.

MarAd Reorganization Creates Three Offices—Consolidates Others

A reorganization of the Maritime Administration to increase efficiency without increasing the staff has been announced by Secretary of Commerce Maurice H. Stans. The plan was designed by Andrew E. Gibson, the Maritime Administrator. The agency is a unit of the Commerce Department.

Under the plan, some departments will be consolidated and three additional offices of assistant administrator have been established. The existing office of assistant administrator for administration is continued. The new offices and the men who will fill them are:

Assistant administrator for research and development, responsible for all research and development, including nuclear programs and the joint surface effect ship. Varvin Pitkin was named acting assistant administrator.

Assistant administrator for operations, responsible for the technical programs, including ship construction, ship operations and ports and intermodal systems. Ludwig Hoffmann was named acting assistant administrator.

Assistant administrator for maritime aids, responsible for the aid programs, including subsidies, mortgage insurance, manpower and trade promotion. Edward Adptaker was named acting assistant administrator.

Other changes involve the transfer of the Division of Trade Studies

to the Office of Subsidiary Administration.

Cargo, commodity and ship data functions will be removed from the Division of Trade Studies and established as a division of Statistics in Subsidiary Administration.

The Division of Subsidiary Operations Examining and the Division of Operating Aids will be combined into a Division of Subsidiary Rates.

Kocks Container Crane Ordered For Savannah

Kocks Pittsburgh Corporation, Pittsburgh, Pa., has received a contract from Georgia Ports Authority covering a giant container crane for installation at Garden City Terminal in Savannah. Considered the world's largest and fastest container crane, the unit will stand taller than a 16-story building.

The Kocks crane will be a wide-gauge, double-boom model, with boom lengths of 113 feet 6 inches on both water and land sides. The landside extension is significant in that the crane can be used in pre-stacking containers for ship loading and in disposing of inbound containers on the land backup area. This flexibility can eliminate need for additional container-handling equipment.

The multi-purpose Kocks crane in Savannah will handle 20-foot and 40-foot containers and is also adaptable for general cargo use, bucket handling and scrap handling by magnet.

The Savannah crane will be in operation by spring of 1970.

3,000-Ton Heater-Equipped Petroleum Barge Placed In Caribbean Service By McAllister



McAllister Brothers' barge under tow in Caribbean is chartered to the Placco Company.

A 3,000-ton ocean barge with a complete self-contained heating system is now hauling asphalt and heavy petroleum products in the Gulf and Caribbean areas. The heating system greatly speeds the unloading of such high-viscosity products at the smaller and remote ports lacking heating equipment of their own.

Owned by McAllister Brothers, Inc., New York towing and transportation company, the barge is at present under charter to Placco Company of Puerto Rico, a Shell affiliate. Home port will be San

Juan, and McAllister people say that they "expect the demand for the unit to be brisk, as heated equipment like this has never been so accessible."

The new vessel was built for McAllister by Gretna Machine & Iron Works, Inc., Harvey, La. It is 245 feet long, has a 50-foot beam, and is 16-feet deep. Its delivery climaxed a \$6-million program of construction that brings the McAllister fleet to more than 200 vessels, including ocean and harbor tugs; oil, chemical, and dry-cargo barges; scows, lighters, and derricks.

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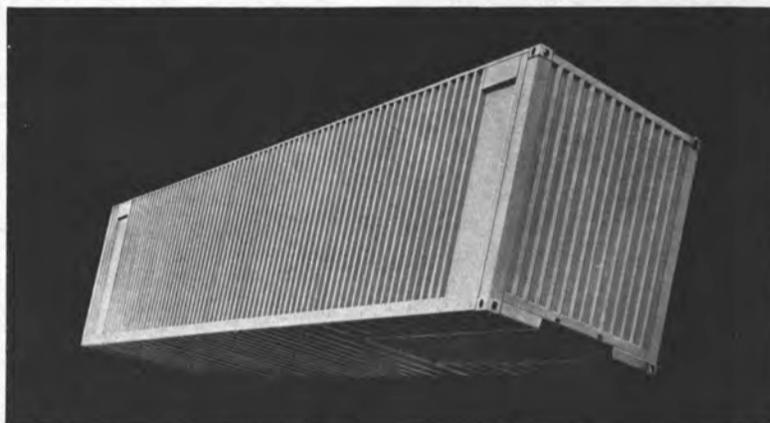


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Fluor Announces Second Step In Major Expansion Program To Cost About \$20-Million

Fluor Ocean Services, Inc., international offshore engineering and construction division of Fluor Corporation, Houston, Texas, has announced the second in a series of steps to be taken in a major equipment expansion program. Expenditures will be approximately \$20-million.

John G. Mackin, vice-president and general manager of Fluor Ocean Services, said this step will include development of new and more efficient construction equipment for specific use in the Gulf of Mexico. The new equipment will include two heavy derrick barges, a conventional pipelaying barge, two cargo barges, and two launch barges. Fluor previously an-

nounced construction of an 80-foot-by-275-foot reel-type pipelaying barge.

This new equipment supplements Fluor's existing Gulf fleet which already includes a spud barge, a dredge, a 150-ton derrick barge, and two crane barges and a reel-type pipelaying barge.

The two new derrick barges—one 400 ton and one 250 ton—are scheduled to be operational by spring of 1970. The third derrick barge, which has a 150-ton lift capability, was recently towed from Santa Barbara, Calif., where it was used by Ryan Contracting Company, a division of Fluor Ocean Services.

Fluor is augmenting its offshore pipelaying operations by converting an existing barge to a large-diameter (up to 36 inches) stovepipelaying barge. It is scheduled to be operational in April, 1970. A contract was previously awarded

for construction of a reel-type barge capable of laying subsea pipelines up to 12-inch diameters in water depths in excess of 500 feet. Construction of this barge is on schedule and it will be operational in January, 1970.

Swedish Yards Cautious In Accepting New Orders On Top Of Large Backlog

Major Swedish shipyards have so many orders on hand that some of them are showing restraint in accepting new orders until they can better survey the development of costs of the near future, according to a report published in a Stockholm paper.

Since the Suez Canal was closed two years ago, orders have remained remarkably stable and the boom is expected to continue when present tonnage on order has been delivered, leading shipbuilders say. They point out that a considerable amount of world shipping now is being replaced. Development partly is moving towards larger units and partly towards specialized units, such as container ships.

Eriksbergs Mekaniska Verkstad currently has 25 ships of 1.85-million dwt on order. They include seven 150,000-ton OBO (oil-bulk-ore) carriers and ten special tankers of 25,000 tons. The orders guarantee production until 1972.

The Gotaverken shipyards, meanwhile, have the longest order book in their history with employment guaranteed until 1973. Orders total 4-million dwt, of which about half are 11 tankers of between 220,000 and 230,000 tons.

Kokums, of Malmo, has orders totaling 2.3-million dwt, including four 250,000-tonners and six 210,000-tonners, while the state-owned Uddevalla shipyard is building tankers of 230,000 tons each for Norwegian shipping companies.

Pollution Federation Names A. F. Tripp Managing Director

Arthur F. Tripp Jr., a retired executive of Esso Standard Eastern, Inc., an affiliate of Standard Oil Company (New Jersey), has been appointed managing director of International Tanker Owners Pollution Federation, Ltd., it was announced in London.

The organization is the corporate entity for the implementation of the Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP).

Mr. Tripp, who retired from Esso Eastern last year after nearly 25 years with the Jersey Standard organization, succeeds J. V. C. Malcolmson, who is retiring.

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American Commercial Lines Acquires Coyle Lines Inc.

Texas Gas Transmission Corporation, Owensboro, Ky., has announced that its wholly owned subsidiary, American Commercial Lines, Inc., has acquired control of Coyle Lines, Inc., through an exchange of common stock valued at approximately \$750,000.

Coyle Lines, with extensive operating rights for barge transportation on the Gulf Intra-coastal Waterway and adjacent waterways, will become part of the Inland Waterways Services division of Texas Gas. The principal operating company of this division is American Commercial Barge Line Company of Jeffersonville, Ind.

The acquisition of Coyle enables the division to expand the scope of its operation and significantly increases the number of cities and ports it now provides with direct line service. Principal cities now served by Coyle include Brownsville, Corpus Christi, Houston, and Port Arthur, Texas; Lake Charles and Morgan City, La.; Birmingham and Mobile, Ala., and Tampa, Fla.

The Inland Waterways Services division of Texas Gas provides extensive barge service to business and industry along more than 8,000-miles of inland waterways.

Pate Is Consultant For New Orleans Port

Fred E. Pate has been appointed management consultant for the Port of New Orleans Public Bulk Terminal, according to the port's board of commissioners.

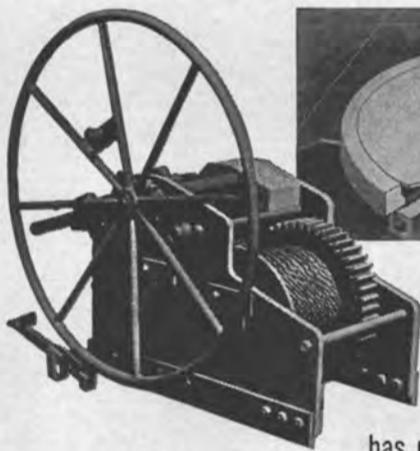
Mr. Pate has been a vice-president of Navios Corporation, Nassau, Bahamas, a subsidiary of United States Steel Corp.



ALABAMA PORT DIRECTOR HONORED—Walter M. Boyce, president of the Alabama World Trade Club, (right) awards Houston H. Feaster, director of the Alabama State Docks (center), a certificate of merit from the World Trade Club. The certificate pointed out the "significant contributions to the development of international trade" made by Mr. Feaster. James W. Oliphant Jr., chairman of the Mobile Area Chamber of Commerce World Trade Committee, looks on.

The Alabama World Trade Club is made up of business executives from Metropolitan Birmingham and throughout Alabama. This group of industrial leaders has banded together to work for improvement in international trade in the state.

Mr. Boyce stated that it was a great personal honor for him to present the plaque to Mr. Feaster for his foresight in improving the cargo-handling facilities, the expansion of the public grain elevator, construction of a highly successful International Trade Center, and in the establishment of the Theodore Industrial Complex and the modernization of the ore-handling capability of the Alabama State Docks. All of this activity and expansion has benefitted all Alabamians involved in foreign commerce.



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Mrs. Helen Delich Bentley Appointed FMC Chairman

President R. M. Nixon has nominated Mrs. Helen Delich Bentley, maritime editor of the Baltimore Sun, as a member and chairman of the Federal Maritime Commission. Mrs. Bentley will succeed Adm. John Harlee in the \$40,000 a year maritime post. Admiral Harlee recently submitted his resignation and left the Commission on September 1.

Mrs. Bentley is well known in maritime circles and has a wide and deep understanding of the U.S. shipping industry. This knowledge has been gained in more than 20-years of studying and reporting on shipping and shipbuilding affairs. Her reportorial activities, while based in Baltimore and Washington, D.C., have taken her all over the United States and to many foreign countries.

The Federal Maritime Commission is one of two major federal agencies involved in ocean shipping. The Commission, composed of five members serving five-year terms, regulates rates, sailing practices and other activities of international and domestic offshore shipping involved in the nation's waterborne trade. Unlike the Maritime Administration, which is part of the Department of Commerce, the Commission is an independent agency.

Mrs. Bentley is scheduled to take up her duties with the Commission on October 1. She will be given a leave of absence from the Baltimore Sun.

Bethlehem Steel Only Bidder For Matson Containerships

Bethlehem Steel Company, Sparrows Point, Md., was the only shipyard to submit bids to build two containerships for Matson Navigation Company.

The bids were \$30.1-million to build one and \$28.2-million for each of two with delivery of the first promised in 1,080 days and the second in 1,170 days.

Matson has applied for construction subsidy for the two ships but the Maritime Administration has not yet acted on the request.

International Utilities Expands Tourism Stake With \$25-Million Move Into Cruise Ship Field

International Utilities Corp., Toronto, Ont., expanding its already large leisure time and tourism commitment, will enter the cruise ship business in a \$25-million, two-step diversification move for its Gotaas-Larsen shipping subsidiary of New York City.

IU's president, John M. Seabrook, and H. Irgens Larsen, head of the shipping company, announced that Gotaas-Larsen will acquire all property, equipment and facilities of Eastern Steamship Lines, a Miami-based cruise ship line, operating to the Caribbean Islands from that port. In the transaction, Gotaas-Larsen gets two all-first-class luxury cruise ships—the Ariadne, with a passenger capacity of 325, and the New Bahama Star, with passenger capacity of 700. Both ships offer first-class luxury accommodations and are newly refitted and re-decorated.

In the second part of the diversification move, Gotaas-Larsen, working through Royal Caribbean Cruise Line, a new company in which it has a one-third interest, is building in Finland three ultra-modern first-class 15,000-ton luxury cruise ships, each with a passenger capacity of 850. These ships, slated for delivery in 1970 and 1971, also will operate out of Miami in Caribbean waters.

Mr. Seabrook said that the two separate moves will amount to a total cost of approximately \$25-million for International Utilities.

Eastern Steamship Lines will continue to

operate under present management and under its present name.

Mr. Larsen noted that the other two companies involved in the Norwegian partnership are I. M. Skaugen & Co., and Anders Wilhelmsen & Co., both of Oslo.

Gotaas-Larsen has been a freight-only operation until this time, except for a period of three years following World War II. The firm now operates tankers, bulk carriers, refrigerator ships, and self-loading/unloading lightening vessels. At the close of 1968, the company's shipping fleet numbered 33 vessels. Four tankers and one refrigerator ship still under construction will bring the total deadweight tonnage of the fleet to 2,180,000, not counting the new cruise ships acquired and under construction.

Mr. Seabrook noted that this latest develop-

ment ties in with the recent emphasis on the tourist business of C. Brewer and Company, Limited, another International Utilities subsidiary. With operations primarily in Hawaii, C. Brewer recently announced extensive plans for hotel acquisition and building in that state, he said, and the company also holds acreage in Puerto Rico, which likewise is being considered for hotel and general tourist development.

International Utilities, with assets of over \$1-billion, is one of the largest companies in Canada and the U.S. It began 44 years ago as a holding company for gas and electricity utility properties in Western Canada. Since then, it has diversified into mineral and petroleum exploration and mining, water utilities, trucking, oceanography, tourism, agriculture, real estate, and various manufacturing operations and financial services.

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Tidewater Marine To Spend \$21-Million On Marine Equipment

Tidewater Marine Service, Inc., will spend \$21-million in the next 17 months on new vessels and related marine equipment.

John P. Laborde, president, told shareholders at the corporation's annual meeting in New Orleans that the expansion program will be

accomplished in four phases, the first of which has begun. Construction already started or vessel contracts due to be let in the immediate future are valued at \$13,645,000.

Tidewater Marine is primarily engaged in providing marine transportation to the offshore oil and gas industries on a worldwide basis. During the fiscal year ended March 31, 1969, the company realized net

earnings of \$3,167,000 on gross revenues of \$47,513,000.

In addition to the immediate vessel building program, the company is presently spending \$1.8-million on up-dating and converting existing equipment and facilities, including expanded maintenance facilities at Tidewater's operational headquarters in Morgan City, La.

Additional expenditures totaling

\$5.7-million will be made for constructing new utility vessels, barges, tugs, and extremely high horsepower cargo-towing vessels to be used in domestic and foreign operations.

Of the above amounts, approximately \$7.2-million of construction will be done in foreign countries where Tidewater Marine is presently operating.

Mr. Laborde said the expansion program will be financed through internal cash generation and bank borrowing, with the bulk of investment concentrated in larger cargo vessels and tugs.

The company's present policy of diversification will be continued, said Mr. Laborde, with particular attention given to areas outside the field of marine transportation.

Re-elected to membership on the board of directors for one year terms were Mr. Laborde, Damon R. Bankston, Emile Z. Berman, John F. Bricker, David B. Graf, Peter V. Guarisco, Kenneth E. Hill, C. E. Laborde Jr., Carl S. Petty, John E. Pottharst Jr., Warren M. Shapleigh, and Burch Williams.

Immediately following the shareholders meeting, the board met and re-elected John P. Laborde as chairman and president. Also re-elected were Mr. Bankston as executive vice-president; Sam S. Allgood, vice-president for sales; William E. Bright, vice-president, manager U.S. Gulf Coast; Frederick H. Culver, vice-president, assistant manager U.S. Gulf Coast; F. J. Deutschmann, vice-president, administrative; A. Howard Hogue, vice-president, U.S. West Coast; Richard A. Philippi, vice-president and treasurer; Mawddy Williams, vice-president, South America, and C. E. Laborde Jr., secretary and general counsel.

Tidewater Marine Service, Inc. was organized in 1954 and paid its first cash dividend in 1962. It presently operates almost 375 vessels in the U.S. and abroad and has approximately 4,500 shareholders.

Newport News Awards Subcontract On DLGN's To Nuclear Service Co.

A subcontract valued at over \$7-million has been awarded to the Marine and Industrial Design Division of Nuclear Service and Construction Company by the Newport News Shipbuilding and Dry Dock Company of Newport News, Va., a subsidiary of Tenneco, Inc.

The subcontract involves certain non-nuclear engineering and design work for two nuclear-powered Navy frigates, DLGN-36 and DLGN-37, which are being constructed by the Virginia shipbuilder.

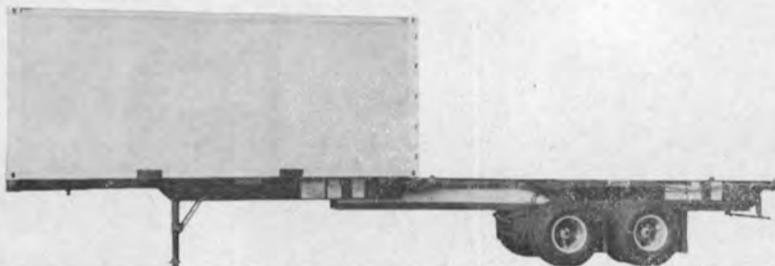
William O. Whitaker, general manager of the Marine and Industrial Design Division at Camden, N.J., stated that the subcontract will add two years to the Division's present backlog of work involving naval ships and commercial plant expansions.

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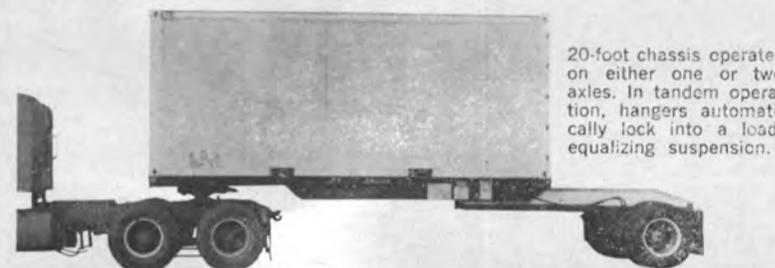
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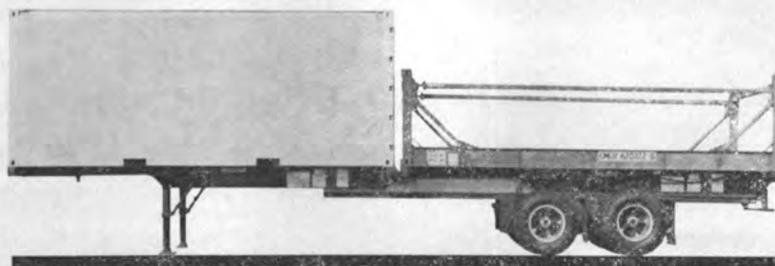


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Bailey Meter To Automate Lykes Sea-Barge Carriers

Bailey Meter Company, Wickliffe, Ohio will develop and manufacture centralized engine room and bridge control systems for three of the most powerful cargo ships ever built.

Under a contract award from General Dynamics, Bailey will provide 721 Solid State Electronic Analog Control System for main turbine control and MINI-LINE 500 Pneumatic Control Systems for combustion, feedwater and steam temperature control in all three vessels. The three ships, each with 36,000 shp, are being built at the Quincy, Mass., shipyard of General Dynamics Corporation for Lykes Bros. Steamship Co., Inc. of New Orleans.

The centralized engine room and bridge con-

trol systems will result in reliable operation of the machinery plant and ship by providing remote information display and control.

Each of the vessels includes two Babcock & Wilcox boilers equipped with three oil-fired, steam atomizing burners, capable of unattended operation over the normal operating range. Each boiler is capable of generating steam at a rate in excess of 100,000 pounds per hour.

A subsidiary of The Babcock & Wilcox Company, Bailey Meter Company is a leading manufacturer of control computers, instrumentation, and systems for the power and process industries.

The main turbine-control system will control speed and direction of rotation of the ship's propellers. There will be two speed-demand transmitters/receivers, one mounted on the bridge console and one on the engine room con-

sole. Each of the two units will function as either an engine order telegraph system when control of the turbines is in the engine room, or as a speed indexing device when speed control is from the bridge.

The pneumatic combustion-control system will maintain furnace input in accordance with boiler demand. At steady-state steaming or maneuvering, with two boilers operating in parallel at rates between 10 percent and 100 percent of full power, the control system will be capable of dividing the load without excess air readjustment so that each boiler generates an amount of steam within plus or minus 2 percent of the amount generated by the other boiler.

The two-element feedwater control system will maintain feedwater input in accordance with boiler demand. It will maintain water level within plus or minus one inch during steady-state conditions, and within plus or minus four inches of level set point during rapid load transients.

Final steam temperature will be controlled by a single element control system which will maintain a maximum steam temperature by bypassing some portion of the superheater surface.

Westinghouse Builds Two Research Subs

Two submarines are being built by Westinghouse Ocean Research and Engineering Center, Annapolis, Md., and Westinghouse Electric Corp., Pittsburgh, Pa., respectively, each for its own use.

The first, an exploration and research type submarine will be able to dive to 20,000 feet. Dimensions are 36 feet by 10 feet 3 inches by 14 feet with power to be supplied by electric motors and storage batteries.

The other, a research vessel to measure 19 feet 6 inches by 7 feet 8 inches by 8 feet 4 inches, will also be propelled by electric motors and storage batteries. Cost involved was not disclosed.



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CAPITOL-FLOWN FLAG FOR NUCLEAR SUB — An American flag which flew over the nation's capitol was presented by Mississippi Congressman **G. V. Montgomery** to the commanding officer of the nuclear submarine USS Puffer. The presentation was made during the Puffer's commissioning at the Ingalls Shipbuilding division of Litton Industries in Pascagoula, Miss. Congressman **Montgomery** delivered the principal address at the commissioning which marked the entry into the Navy Fleet of the eighth nuclear sub built by Ingalls. Participating in the commissioning were, left to right: **Ellis B. Gardner**, senior vice-president of Litton and president of Ingalls; Comdr. **John Will**, commanding officer of Puffer; Congressman **Montgomery**, and Capt. **R. R. Fargo**, Navy supervisor of shipbuilding at Pascagoula.



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Total Transportation Planning

Phillip J. Maddex and Ole Skaarup*

Several years ago, U.S. Borax was contemplating a change in its export shipping program. For years, borax was shipped in 50-pound bags. In 1960, it was still shipped in 50-pound bags. Three main products were shipped: two were anhydrous, and all three were sensitive to impurities. The products were bagged at the plant in the Mohave desert, and shipped by rail to the port in Los Angeles. From Los Angeles, shipment was made by conference steamship lines at conference rates. Anyone who has shipped bagged material to Europe by steamer knows that the cost is anywhere from \$20 to \$30 a ton or more.

The solution was conversion from shipment in bags to shipment in bulk. Studies and research solved the technical problems and demonstrated that high-quality material could be shipped in bulk to overseas destinations without contamination or deterioration.

The change of the shipping program required the construction of a bulk terminal in Los Angeles, Calif., Figure 1. Now, bulk borax is transported from the Mohave desert to Los Angeles in 100-ton hopper cars where it is stored in silos awaiting the ship. Another bulk terminal was built in Rotterdam, Holland, Figure 2, with facilities for unloading, bagging, storing and trans-shipping the borax to the European customers via ship, barge, rail or truck, in bulk or bags.

This took care of shipping borax to Europe but a return cargo was needed. A shipping contract was worked out with Volkswagen. They were bringing cars to California from Hamburg and were interested in a bulk cargo that would return their ships to Europe. Figure 3 shows schematic cross sections of the ship developed to handle both commodities.

The economical result of the new program was a reduction of the total transportation cost of much more than 50 percent.

The borax program was successful because it involved much more than a rate negotiation with the shipping conference or the railroad. It included: 1. a change of sales policy from delivery FOB California to delivery CIF in Europe, 2. revision of the production schedule, 3. planning for loading and handling at the plant, 4. shipment to the port, 5. storage at the port and loading of the ships, 6. selection of the proper type of ship, 7. combining it with a compatible backhaul cargo, 8. selecting a site and designing a trans-shipping terminal in Europe, 9. planning for storage, packaging and forwarding the material to customers, and 10. solving the special quality problem faced in handling a high-purity and high-cost material in bulk.

The key was to plan the entire flow from the production plant to the final point of consuming. This was made possible by maintaining control of the movement from start to finish. We call this "total transportation."

The borax program taught us the pattern that we have used successfully in several later "total transportation" projects.

*Mr. Maddex, engineering/management consultant, 21 West Street, New York, N.Y. 10006, presented the paper condensed here before a recent meeting of the International Cargo Handling Coordinating Association in New York. Mr. Skaarup, chairman of Skaarup Shipping Corporation, assisted Mr. Maddex in the preparation of the paper.



Figure 1—Special terminal for borax in Los Angeles.



Figure 2—Special borax terminal in Rotterdam, Holland.

To understand and discuss world shipping, it is helpful to consider for a moment the shipment of fuel. To cope with the growing demand for oil and to improve the cost picture, oil companies and shipowners started to increase the size of tankers. Two of the factors that have favored the tremendous change in tanker size are: the ease of handling liquid petroleum products, and the oil companies' coordinated management and control of production, distribution and marketing. This has made it possible to take advantage of our "total transportation" concept.

We do not maintain that increasing the size of ships is the panacea for saving the transportation dollar. On the contrary—it is just one factor that must be weighed thoroughly, along with all the other links of the transportation chain. A 200,000 tonner is of no economic benefit if it is loaded at an installation designed to handle 30,000 tonners, nor is it any good if it has to go to several unloading ports to discharge its cargo, Figure 4.

During the same period of rapid development of bigger and better ships, we have seen good progress in material-handling equipment. It used to be economically out of the question to trans-ship a full cargo of bulk material. Today we can give you many examples of trades

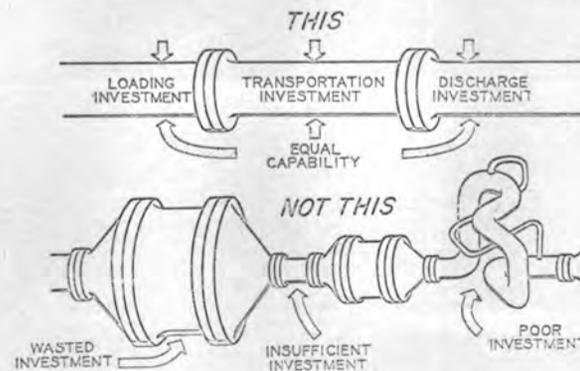
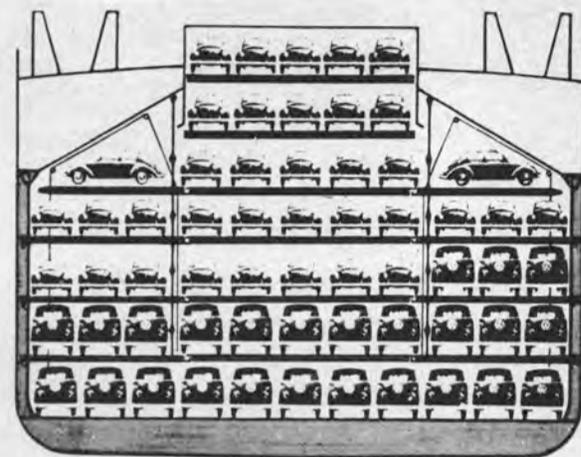
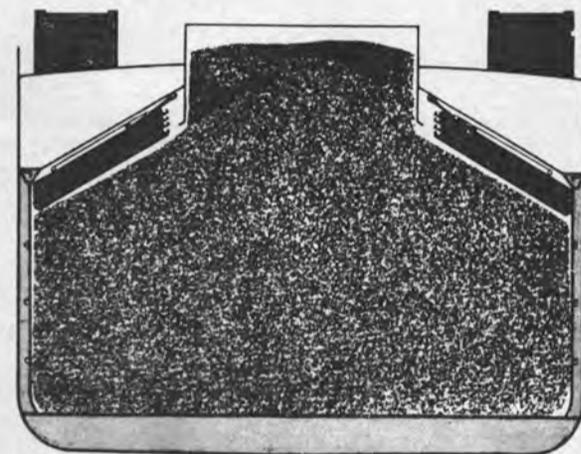


Figure 4—An oil company executive's view of transportation system balance.



CAR-DECKS IN PLACE



DRY BULK ON BOARD

Figure 3—Schematic cross sections of ship used to carry borax to Europe and Volkswagens to U.S.

that have been made possible solely by the use of a trans-shipping terminal.

The export of coal from the United States has varied from about 25-million to 60-million tons per year over the past 15 years. For most industries such variations in production would be intolerable. The coal industry has found a partial solution by constructing new effective coal-loading installations. Several of their customers in Europe and Japan have built port installations to match. Tied in with long-term contracts, or direct ownership of large vessels, a large segment of the coal export industry has solved its problem.

The same possibilities are available in other industries, but it will require a definitive approach and the control and coordination we are constantly advocating.

How do you maintain or acquire control of the entire line of transportation? The first area to look at is company policy for buying and selling. During the days of American isolationism, all our attention was focused on domestic raw materials and domestic customers. When we finally went abroad we took the easy way—sold FOB at our doorstep and bought CIF delivered to our plant. This is not the way to beat the competition in world markets. We lose control of the transportation. We must learn to sell CIF and buy FOB. We could take a lesson from some of the foreign steel industries who import all their raw materials, but through control of their shipping and the application of the "total transportation" concept, compete with us in our home markets.

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Continental Oil Building First UK Offshore Mooring Facility

Construction has begun on the first offshore mooring facility in the United Kingdom. The system already in use in various parts of the world permits supertankers to discharge crude oil at ports where the giant ships cannot navigate or where berthing conditions are not favorable.

Called the Single Point Mooring System, the facility is being built by Crude Oil Terminals (Humber) Ltd. on behalf of Continental Oil (UK) Limited, and will be located at the mouth of the Humber estuary, about five miles from Tetney Haven on the mainland. When completed late next year, the floating buoy connecting pipelines and storage facilities will provide an oil link from the Humber estuary through Tetney Haven and terminating at

Conoco's Humber refinery at nearby South Killingholme.

The project calls for a 36-inch, five-mile sea line from the offshore installation to Tetney Haven where a storage tank farm is being constructed. The storage consists of four tanks with a total capacity of one-million barrels. From Tetney Haven a 14-mile, 22-inch pipeline will deliver the crude oil to Conoco's Humber refinery. Total cost of the project is estimated at \$17-million. Coordination of the design, engineering and construction is under control of Conoco's engineering division.

The mooring system will be capable of handling tankers up to 200,000 dwt full laden. Initially, however, it will be restricted to vessels of about 110,000 dwt, due to the depth of water in the approaches to the buoy.

Anchored in position in four directions, the single point mooring is connected to a sea pipe-

line leading to shore. Flexible submarine hoses connect from the underside of the buoy to the sea pipeline. Floating hoses that can rotate in a full circle connect from the top of the buoy to the tankers' cargo discharge lines.

The buoy will be equipped with navigational lights, fog horns and automatic safety equipment. It remains operational in almost all weather and ships can remain safely moored to the buoy even during storms of great intensity.

Similar-type single-point mooring systems are in successful operation in various parts of the world, including Italy, Korea, Japan and off the coast of Africa. Although it is possible to equip the buoy to load as well as unload tankers, the system being constructed by COT (H) will discharge tankers only.

ACT (U.S.A.) Announces Appointments Of Northen And Chakas As V-P's



Michael Northen

Donald Chakas

The appointments of Michael Northen as executive vice-president and Donald Chakas as vice-president-operations have been announced by Associated Container Transportation (U.S.A.), 90 West Street, New York, N.Y. Both men have been with ACT (U.S.A.) since its inception in February.

Mr. Northen has the responsibility for developing and coordinating the new service which will operate between North America and Australia/New Zealand, starting early in 1971.

Before joining ACT, Mr. Northen held various positions of responsibility with the U.K.-based Blue Star Line in the course of which he gained in-depth knowledge of the Australia/New Zealand/North American trade. He had served in the Royal Navy before his association with Blue Star beginning in 1949. In 1956 he was assigned to the line's Wellington, New Zealand office. There he initiated a claims procedure and specialized in cargo stowage. He was transferred to New York in 1964 to establish and manage Blue Star's East Coast North American services.

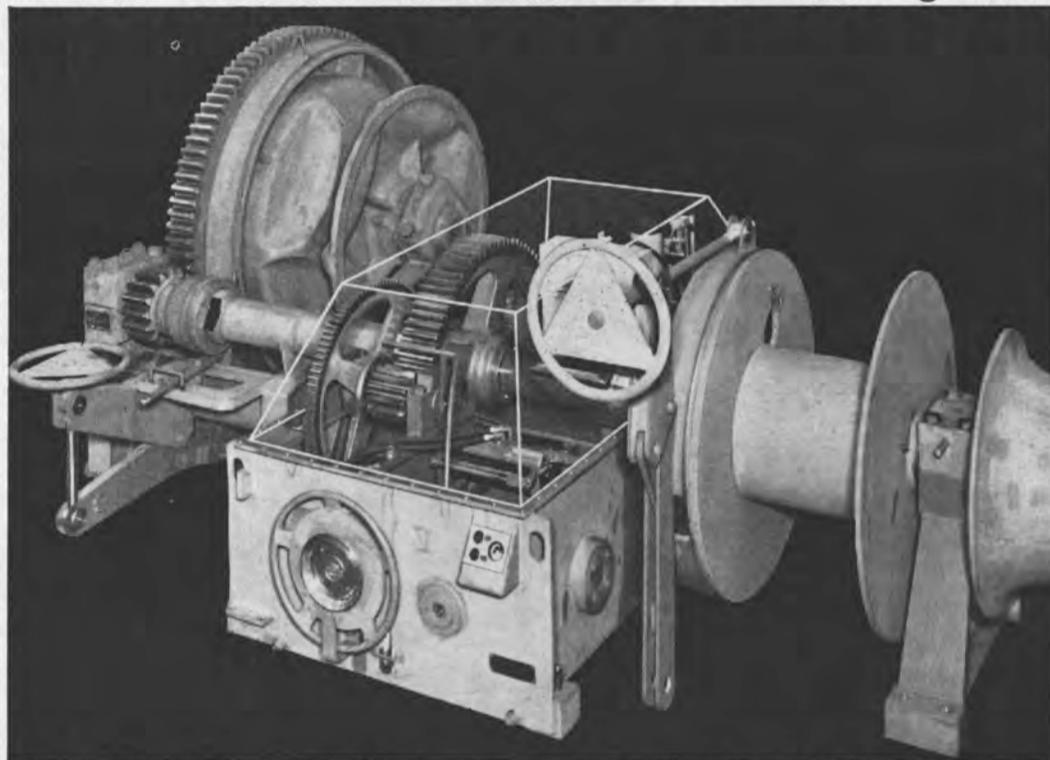
Mr. Chakas shares responsibility for developing and managing ACT. He had been with Caterpillar Tractor Company prior to this association, as supervisor of domestic traffic, then as supervisor of export traffic. During his 16 years with that company he earned an outstanding reputation as an expert in both the export field and in the development of containerization and intermodal transportation.

Mr. Chakas is a graduate of the University of Illinois and attended the college of Advance Traffic and John Marshall Law School. He is a member of the Association of Interstate Commerce Practitioners, the American Society of Traffic and Transportation and Delta Nu Alpha (transportation fraternity).

Marine Construction To Build Ocea-going Fishing Boat

Marine Construction & Design Co., Seattle, Wash., will build an ocea-going fishing boat for Thor Olsen of Seattle. The boat will measure 94 feet by 25 feet by 12 feet and be equipped with a single-screw 565-bhp diesel.

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Singapore Expanding Shipping Activities

The Republic of Singapore is initiating plans to become the leading shipping center in the Far East. It is already the fourth largest port in the world.

In 1964 the island republic began setting up shipyards to attract ships that formerly called at Mediterranean ports for repairs. There are few ports in the Far East with facilities to repair large oceangoing ships.

New construction is also included in the expansion plans. By the 1970's, the largest shipyard will be able to build vessels of up to 70,000 tons. The three shipyards are currently attempting to attract orders for small naval craft and oceangoing freighters.

Besides shipbuilding and ship repair, the republic has formed its own national shipping line. Called the Neptune Orient Line, it will carry European cargo from and to the Far East.

Princess Cruises Names S.W. McCausland Manager

Scott W. McCausland has been appointed general manager of Princess Cruises, Los Angeles, Calif., a division of Boise Cascade Corporation, it was announced by William Agee, vice-president in charge of Boise's shelter and recreation group.

Mr. McCausland succeeds Bruce A. Beatty, who resigned to pursue other business interests.

Prior to his appointment, Mr. McCausland was assistant to Mr. Agee, dividing his time between Boise Cascade's headquarters in Boise, Idaho, and the marine interests in Los Angeles. Before joining Boise in January, 1969, Mr. McCausland spent two years as a staff analyst and special assistant to the assistant secretary of defense in Washington, D.C.

Mr. McCausland received his AB degree cum laude in 1964 and MBA degree in business administration in 1966, both degrees from Harvard University.

Selective Radio Calling Unit Can Ease Operator's Duties

A constant radio watch no longer is required on board ships. Of the hundreds of messages collected daily by coastal radio stations and emitted ordinarily at predetermined times, only a few are of interest to each ship. Nevertheless radio operators are compelled to stay on watch during these transmitting times to prevent information addressed to their ship from being lost. In the future, however, this burden may be eased. With the aid of the tone-sequential selective-calling system, developed by Siemens AG of Munchen, Germany, coastal stations can address directly individual ships. The mobile receiving set of this system automatically announces to the radio operator that a message is destined for the respective ship.

With this tone-sequential selective calling method, each ship would be assigned a five-place 'directory' number. These five digits as well as four additional digits representing an additional information item are transmitted by radio at a predetermined rate with a tone sequence consisting of five plus four steps. The digits are encoded by 1-out-of-10 frequencies being sent for each digit. The additional information item is used for identification of the calling coastal radio station and also for informing the called ship of the desired answering channel.

At the coastal radio station the various digits are fed into the selective-calling coder by means of a ten-button keyboard on a control box. The four digits of the additional information item may be pushbutton-selected either

singly in succession or jointly with the aid of an identification button.

All tone sequences emitted by the coastal radio station are constantly received by the marine mobile radio sets and detected by the associated selective-calling decoders. Whenever the received tone sequence agrees with the preprogrammed tone sequence assigned to the respective decoder and thus with the tone sequence of the ship to be called, the radio operator will receive a signal. He merely has to answer and voice communication is established. The selective-calling decoder also operates in conjunction with an identification-signal decoder which detects and indicates the four-digit additional information item.

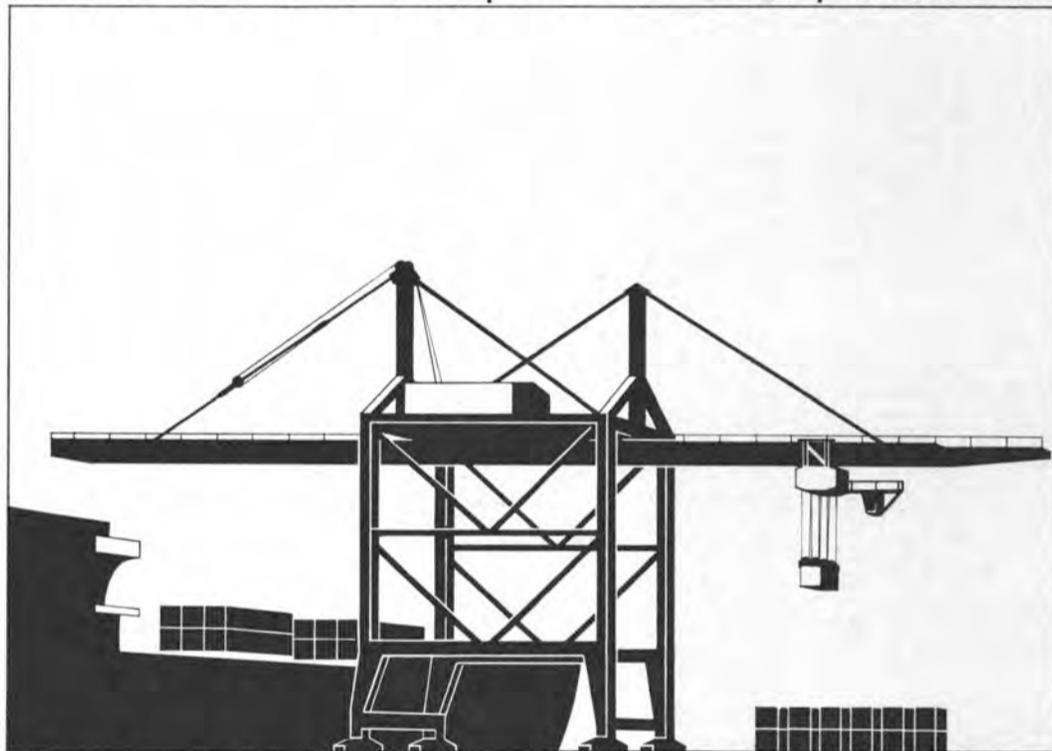
The International Radio Consultative Committee (CCIR) has recommended this tone sequential selective-calling method and the World Radio Administrative Conference of

1967 has decided on its adoption. The German Federal Post will be the first postal administration of the world to use it at their coastal radio stations.

Alaska Trainship To Order Second Ship For Alaska Run

Alaska Trainship Corp., subsidiary of the Alaska Steamship Co., has announced that it will order a new trainship to run opposite the Alaska, its trainship now operating between Canadian ports and Alaska. Like the Alaska, the new vessel will be registered in Liberia and be similar to it physically. The Alaska, built in Japan in 1959 to carry railroad freight cars between United States ports and Cuba, has a length between perpendiculars of 487 feet 6 inches, a beam of 70 feet, and a depth of 25 feet 7 inches.

KOCKS Container transporter at Philadelphia terminal



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landside rail	94' - 0"	Boom raising	5 min.
Rail centres	90' - 0"	Twelve KOCKS container transporters	
Height of lift above rail level		in operation or under construction	
to underside of container	64' - 0"	for the Ports of Antwerp, Bremen,	
Depth of lower below rail level	58' - 0"	Bremerhaven, Philadelphia	
Number of wheels per corner	8	and Savannah.	

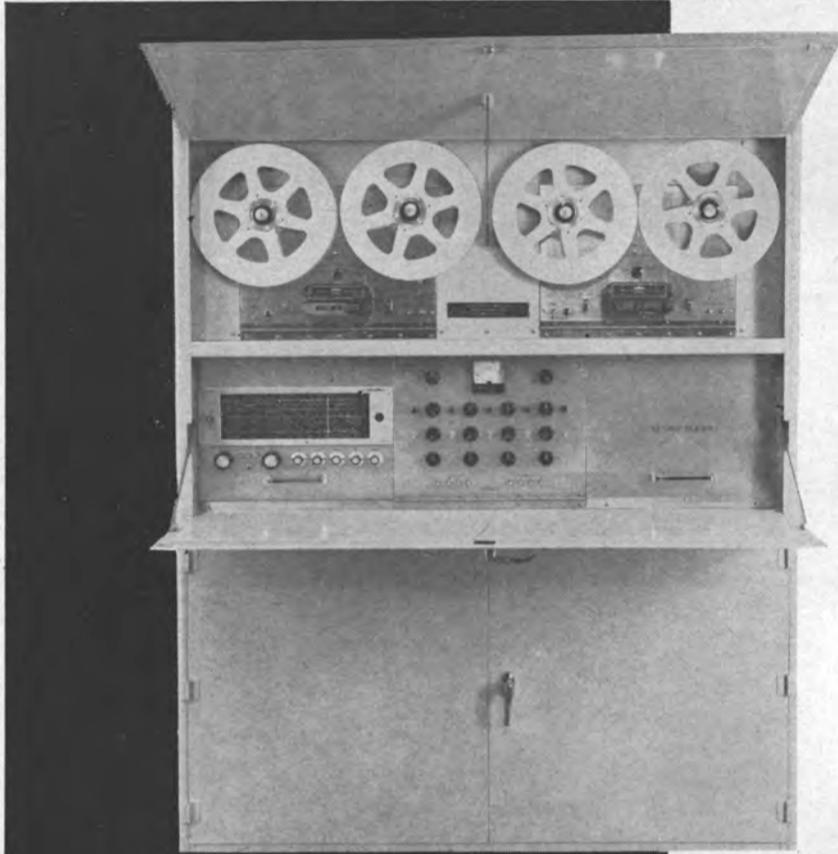
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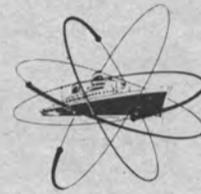
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Consultec To Build Model Tank For Testing Icebreaking Ships

Construction of a facility to test ship models in ice, the first of its kind in the free world, is being planned, according to **John E. Gray**, president of the NUS Corporation, Rockville, Md.

Consultec, Inc., a subsidiary of NUS, has been involved in the design, development, and model testing of icebreaking ships since 1966. The company recently completed the bow design and icebreaker model testing of the rebuilt tanker SS Manhattan.

Consultec President **Donald W. Walter** stated that this first-of-its-kind facility represents a significant and logical step toward the development of experimental methods for determining performance characteristics of tomorrow's icebreaking superships that will ply the Northwest Passage carrying oil, containers and bulk cargo.

Director of engineering at Consultec **Robert B. Dayton** said, "Our model basin will permit the simulation of actual ice conditions expected in the Arctic. The basin will be large enough to permit testing of large models of ships, tanker terminals, offshore oil platforms and other marine structures."

Experience of Consultec in ice model testing has shown that very large models are required in order to obtain meaningful results that reflect the sensitivity of changes in form to icebreaking efficiency.

In addition to the model basin, the facility will provide model design, fabrication, data recording, analysis and ice research laboratory facilities which will support the most extensive model testing programs.

Matson To Test Use Of 40-Foot Containers In Hawaiian Service

Matson Navigation Company, preparing for the addition of four new 34,000-ton containerships which will carry containers of all sizes, is launching a "pilot" program using 40-foot cargo containers for the first time in its Hawaii service.

Matson, which has used 24-foot containers since the company pioneered Pacific containerization 11 years ago, will continue to use 24-footers as the prime unit in its transportation system, according to **Edwin S.N. Wong**, vice-president, freight marketing and sales.

"Years of experience and study have demonstrated that the 24-foot size is the most efficient and economical in a total system," Mr. **Wong** said. "Now, however, the ability of our new ships to carry varying sizes provides an economical means of using the larger containers for lighter types of cargo."

Twelve 40-foot containers were carried on the Californian and the Hawaiian in August from San Francisco Bay for Honolulu. Eventually the vessels will carry 18 of the 40-footers and some will start moving out of the Port of Los Angeles in about two months, Mr. **Wong** said.

Matson's new Hawaiian Enterprise will be delivered by Bethlehem Steel Company's Sparrows Point, Md., shipyard in December. The Hawaiian Progress will be launched in October for delivery early next year. Each of the 23-knot, 719-foot vessels will carry more than 1,000 containers. Two similar ships are being built for Matson in West Germany for 1970 delivery.

Milton Nelson To Chair Rudder Club Dinner



Milton R. Nelson

Milton R. Nelson of McAllister Bros. Inc., New York, N.Y., has been appointed general chairman for The Rudder Club's "Annual Port Industries Night Dinner," it was announced by **Donald Quinn**, commodore of the Club.

According to Mr. **Nelson**, this affair will be held in the Grand Ballroom of the Commodore Hotel in New York on Wednesday evening, September 24. It is expected that a record turnout of representa-

tives in the marine and allied industries will attend the dinner.

Cost per guest is set at \$15.00 each (includes gratuity) and reservations can be made by contacting **Anthony D'Ambrosio** of Atlantic Coast Industries (212-UL 8-8910) or **John L. Magrino** of Marchessini Steamship Lines (212-WH 3-7550). Following the dinner, first class entertainment has been arranged by **Andrew W. D'Alessandro** of American Export Isbrandtsen Lines, the entertainment chairman.

Martine Becomes V-P, Norwegian-Caribbean

Reginald Martine Jr., who has served as vice-president-passenger division of Grace Line, Inc. and as second vice-president with Sheraton Corporation of America, has joined the Miami-based Norwegian-Caribbean Lines as a vice-president. Senior Vice-President **Robert P. Connors**, who announced the appointment, said that the new vice-president will be concerned initially with international market development.



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Norwegian Shipowners Form U.S. Company To Operate New York/Bermuda Cruise Service



Per A. Lorentzen



Hans Rasmus Astrup



Horace G. Craddock

Two prominent Norwegian shipowners have announced jointly the formation of Flagship Cruises, Inc., a new American company, to handle their 20,000-gt, 650-passenger Norwegian-flag luxury cruise ship in New York-Bermuda and other cruise services, starting early 1971. The 550-foot vessel, as yet unnamed, is under construction at Rheinstahl Nordseewerke G.m.b.H., Emden, West Germany.

The owners Fearnley & Eger and Oivind Lorentzen, Oslo, Norway (Norwegian Cruiseships A/S) were represented by Per A. Lorentzen, president of Oivind Lorentzen Activities, Inc., New York, and Hans Rasmus Astrup, president of Fearnley & Eger, Inc., New York, at the conference announcing the new company. Both shipping companies own and operate

substantial fleets of modern dry-cargo and tanker vessels engaged in many worldwide-trades. Their home offices are in Oslo, Norway.

Horace G. Craddock was presented as president of Flagship Cruises, Inc. He is a veteran passenger ship traffic official with a long association in New York and abroad in promoting international travel and the luxury liner and cruise trades, being credited with introducing many successful innovations in those fields. His recent activities include service as consultant to American-flag cruise shipowners and operators; vice-president of one of the nation's large travel agency chains, and president of another American company that handled sales planning for a Norwegian-flag luxury

cruise liner; operations all closely attached to his new duties.

Mr. Lorentzen said that he and his associates had recently concluded a contract with the Bermuda government Department of Tourism and Trade Development to operate annually 32 voyages between New York and Bermuda. As a result, the new cruise vessel will be assured of tying up at the No. 1 berth on Front Street in the heart of Hamilton on each of its Bermuda calls.

The owners believe that a bright future beckons operators of large luxury cruise ships that are especially designed, constructed, manned and operated to meet the requirements of the modern, expanding, new North American cruise market, the executive said. Continuing, he said: "There is a vast gap which separates the acceptability by the

traveling public of Transatlantic and other ships converted for cruise use and—what we are providing—cruise ships designed and built from the keel up to meet the specific modern living and service requirements of the new cruise market."

Mr. Lorentzen indicated that he and his associates were prepared to consider expanding their substantial investment in new cruise ships to meet the requirements of North American travelers as rapidly as the results of the present cruise ship can be assessed.

The new twin-screw ship will be powered by four single-acting high-speed Fiat diesel engines, developing 18,000 bhp, driving the variable-pitch propellers. It will be fitted with a bow thruster and a gyro-fin stabilizer. Service speed will be 20 knots.



Scale model of Flagship Cruises' 20,000-gt cruise liner being built in West Germany.

Lloyd's Register Appoints C. M. Glover Executive Director

Lloyd's Register of Shipping has appointed Colin Merriam Glover, T.D., M.A., to be executive director. He succeeds W. C. G. Knowles, who died last January while on a visit to the Far East.

Mr. Glover was educated at Oundle School and St. John's College, Cambridge. He joined The British Xylonite Co. Ltd. as a production trainee in 1933 and served with them until the outbreak of war. In November, 1945, he returned to British Xylonite, joining their subsidiary, B. X. Plastics Ltd., where he was appointed works manager in 1948, works director in 1950 and managing director in 1957. He was appointed managing director of The British Xylonite Co. Ltd. in 1961, when the company was acquired by the Distillers Co. Ltd. In 1963, when Bakelite Xylonite Ltd. was formed under the joint ownership of Distillers Co. Ltd. and Union Carbide Ltd., he became the company's managing director, which post he occupied until his resignation in March of this year.

During the 1939-45 war Mr. Glover, already in the Territorial Army, served with the Royal Artillery and took part in the campaign resulting in the evacuation from Dunkirk. After two years as a gunnery instructor, he returned to Europe on D-Day as a Battery Commander, R.A.

Todd-CEA Names Board Of Directors

Todd-CEA, Inc., New York, N.Y., a wholly owned subsidiary of Combustion Equipment Associates, Inc., has announced the appointment of a board of directors consisting of six members. The appointees are Robert M. Beningson, chairman William H. Bohn, Seymour Smith, Richard S. Sommer, James C. Anderson, and William Doninger.

Mr. Beningson is president and chief executive officer of Combustion Equipment Associates, the parent company. Mr. Bohn is president of Todd-CEA, Inc., Mr. Smith, Mr. Anderson and Mr. Doninger are officers and/or directors of the parent company. Mr. Sommer is assistant to the president.

Combustion Equipment Associates recently acquired the subsidiary company from Todd Shipyards Corporation. Todd-CEA is a major manufacturer of marine and oceanographic equipment, automatic energy systems and municipal health products.

Burton Will Build Two Oil Supply Boats

Zapata Marine Service, Houston, Texas, has ordered two offshore oil-well supply boats from Burton Shipyard, Inc., Houston. They will have the same dimensions: 180 feet by 40 feet by 16 feet, be of 700 dwt and be powered by 2,400-total-bhp diesels. They have been designated Hull Nos. 456 and 457.

Barbour Boat Works To Build Tanker Designed By Krogen



Artist's conception of 700-dwt tanker designed by James S. Krogen & Co. and to be built by Barbour Boat Works for an Esso affiliate.

Esso has contracted Miami-based naval architects James S. Krogen & Co., Miami, Fla., to design a 155-foot petroleum tanker for one of its affiliates, utilizing large stern drives in an unusual application for the propulsion system in an oceangoing vessel.

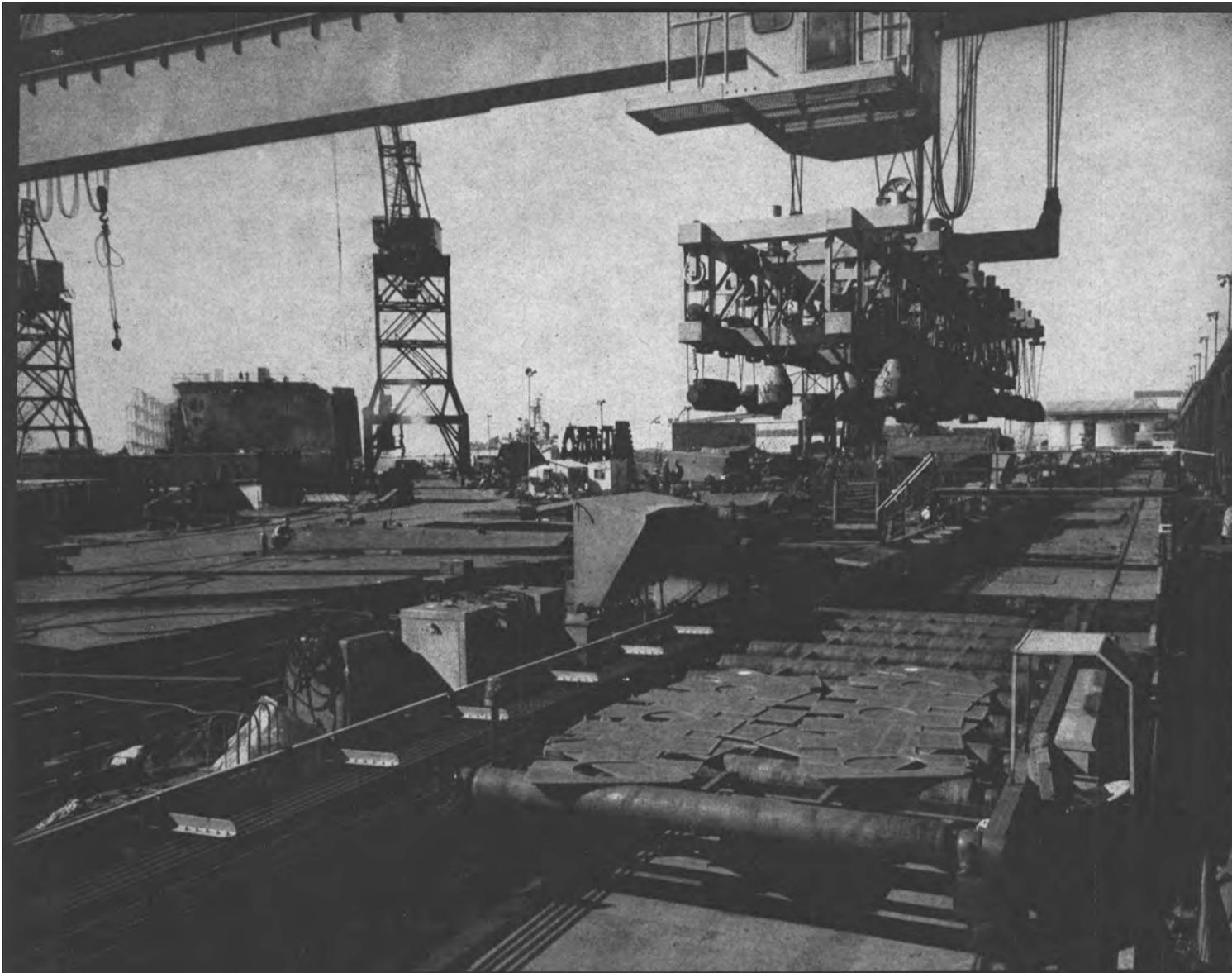
Scheduled to operate in the Bahamas and the Caribbean, the tanker will be constructed of welded steel and classed by American Bureau of Shipping. The construction contract has been awarded to the Barbour Boat Works of New Bern, N.C., and is scheduled for delivery in February. Total deadweight is 700 tons with a carrying capacity of 185,000 gallons of liquid petroleum products.

Cruising range is 2,000 miles at 10 knots, Mr. Krogen, president of James Krogen & Co., said. Power is provided by two 343 Caterpillar

diesel engines rated at 365 hp each with propulsion and steering coming from a pair of Dutch-made Schottel Navigator stern-drive units.

The stern-drive system offers several advantages over conventional systems, reports Mr. Krogen. The important ones are great maneuverability and ease of repair. The units swing up 86 degrees, lifting them completely free of the water. By using the stern drives, the Miami architects were also able to locate the engine room on the main deck level.

Other specifications include a shallow draft of 7 feet and a 30 foot six inch beam. Fuel capacity is 7,300 gallons and fresh water tanks hold 3,400 gallons. Space has also been provided for packaged petroleum products.



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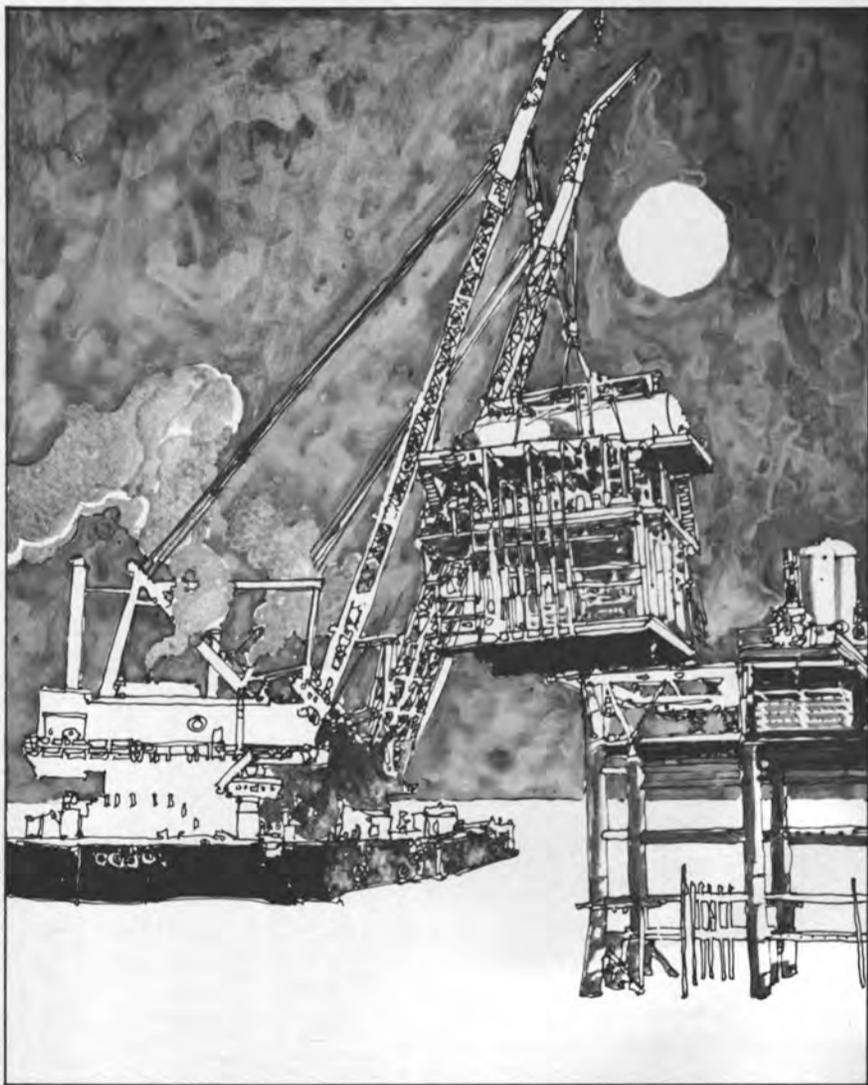
NASSCO

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FOUR IN ONE—The Ingalls Shipbuilding division of Litton Industries of Pascagoula, Miss., established a company record recently when it laid the keels for four vessels in one day. The keel layings mark the start of shipway construction on the nuclear-powered submarine Redfish; the Navy ammunition ship Flint, and two tankers, one for Marine Transport Lines, Inc. and the other for Falcon Carrier, Inc. The Redfish will be the tenth nuclear sub built by Ingalls for the Navy. Participating in the submarine keel laying (left photo) were, from left to right: Capt. R. R. Fargo, Navy supervisor of shipbuilding; George Bobelis, Ingalls vice-president-operations; Lt. Comdr. Vincent Bayer, supervisor of shipbuilding office, and Joe Sanchez, Ingalls' works manager.



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ACT (Ltd.) Introduces ACT (USA)— New Containership Service To Down Under



Directors of Associated Container Transportation, Ltd. with model of new ACT-class containership now serving the United Kingdom-Australia trade. Shown left to right are: **Alastair Lloyd**; **Sir Basil Smallpeice**, chairman; **James Payne** and **Derek Hollebone**. ACT (USA), an offshoot of ACT, Ltd., is slated to start a North America-Australia/New Zealand container shipping service in early 1971 with similar ships now building in Germany.

A "new concept in containerization," which is expected to change many of the present attitudes held by underwriters, importers, exporters and port authorities toward container shipping was presented recently by **R. A. Lloyd**, director of Associated Container Transportation Ltd. of England.

Mr. Lloyd spoke at the introduction of a new U. S. containership operation, Associated Container Transportation (USA), or ACT (USA), which will inaugurate service between North America and Australia/New Zealand in 1971.

The far-reaching concept behind the ACT operation, Mr. Lloyd explained, is a "highly disciplined" system of "total distribution."

The system, which requires "capital expenditure far beyond the normal commitment of any individual shipping line, puts the container operator in control of every stage of container and cargo movement. This control should even include terminals, and depots where possible," Mr. Lloyd said.

The ACT concept, he added, assumes "complete responsibility for total distribution."

Containerization "as we conceive it," Mr. Lloyd said, "should bring changes in the present thinking of underwriters.

"Despite the fact that our United Kingdom to Australia service is still very much in its infancy, it is already very evident that the risk of pilferage or other loss has been substantially reduced.

"ACT has successfully lifted some 50,000-tons of cargo between England and Australia in the first four months of its operation. Although it is still early to be positive on this point, I can tell you that the level of insurance claims so far received is significantly low in relation to both the value and volume of the cargo handled. I believe two of the major reasons for these achievements are the kind of ships and kind of facilities we are operating within the framework of our total distribution concept. If our experience holds, I would expect to see some major changes in the thinking of underwriters," Mr. Lloyd said.

Other changes he foresees as a result of a total distribution system would be in the thinking of importers and exporters. He pointed out that both importers and exporters will begin to estimate the costs of cargo carriage not only in terms of the freight rates but of the savings that can be made in using a system that attacks costs of handling, packing, insurance, and warehousing.

"To me, new methods of trading, on a basis of goods delivered door-to-door, seems inevitable," he said.

Mr. Lloyd also suggested that more port authorities will engage in long range planning and "cold bloodedly" tear down outmoded facilities and replace them with new installations. "It will be expensive," Mr. Lloyd admitted, "but it must come to handle the container revolution."

Mr. Lloyd summed up the ACT concept by emphasizing that "distribution, more and more, will require a systems approach."

The new container operation is a consortium of three famous British steamship companies—Ellerman Lines, Cunard-Port Lines, and Blue Star Line—with a combined shipping experience of more than 400 years. This consortium is a division of Associated Container Transportation (Australia) Ltd., incorporated in England.

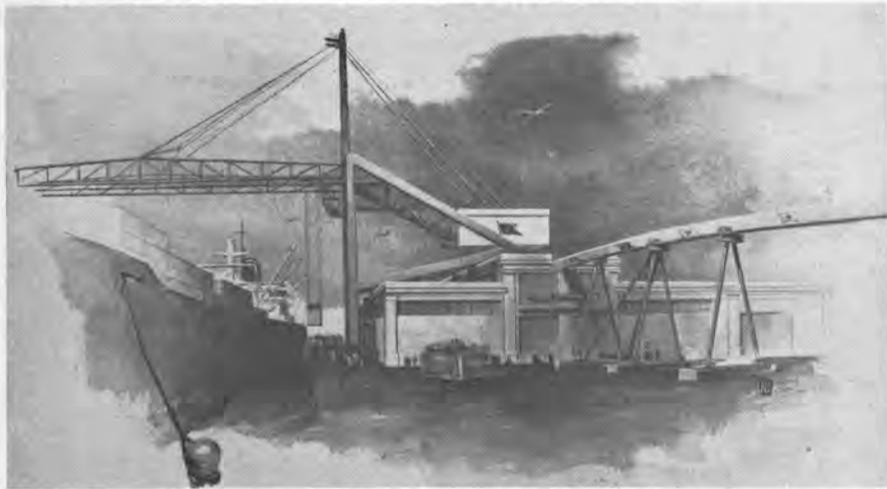
Four 24,000-ton ACT-class vessels are being built for U. S. service. They will cost some \$55,500,000. Each vessel will carry more than 1,200 containers. They are being built at the Bremer Vulkan shipyard in West Germany.

The 715-foot-long ships will be almost fully cellurized with some space for heavy machinery. They will carry 560 refrigerated containers and an additional 640 standard 20-by-8-by-8-foot containers, or 40-foot equivalents.

Jeffboat To Repower Twin-Screw Towboat

M/G Transport, Inc., Cincinnati, Ohio, has contracted Jeffboat, Inc., Jeffersonville, Ind., to repower the twin-screw towboat Mark Eastin with two 5,200-total-bhp General Motors diesels.

Los Angeles Equipping Narrow Wharf With Container-Handling/Bulk Crane



Unique 33-ton container crane to be installed at the Port of Los Angeles will ride with rear legs on top of existing warehouse building. In addition to containers, a grab bucket attachment will enable the crane to unload bulk products. Curve in tracks in artist's rendering allows gantry structure to negotiate a turn on the wharf.

Erection of one of the shipping world's most unique container cranes will soon be underway at the Port of Los Angeles. The new crane, which is the fourth container gantry crane in Los Angeles, is being built for Overseas Shipping Company and is a part of the firm's terminal modernization program at the West Coast Port.

According to **Bernard J. Caughlin**, the harbor's general manager, Overseas' program is the first to adapt a conventional cargo terminal to a container and conventional cargo-handling facility.

The port's chief harbor engineer, **Lawrence L. Whiteneck**, pointed out that more and more equipment is being called for to cope with this onslaught of containers. Already there are two complete container terminals at the Port of Los Angeles. A third total container facility is now under construction and two other facilities are being adapted for container handling.

The standard gantry cranes capable of handling all sizes of containers were developed for these purposes and have been erected in almost every major port in the world according to Mr. **Whiteneck**.

"As long as these terminals are built on new sites, no major difficulties arise, and the size and space requirements of these mechanized operations are provided for in the terminal layout," Mr. **Whiteneck** said.

He pointed out, however, that it is often overlooked that containers also have to be handled in fairly narrow port areas where special restrictions due to existing warehouses, narrow wharves and/or railway layouts make it impossible to erect any one of the standard container cranes.

Such restrictions existed at Overseas Shipping's Los Angeles facilities. Rather than completely remodel their existing terminal, they called in Houben Industries, Inc., to design a container-handling crane that would meet the shipping company's needs without necessitating major reconstruction of their existing facilities.

Wolf Niepelt, vice-president of engineering for Houben Industries, said his company designed the crane to cope with the restricted space.

"The crane will ride with the rear legs on top of an existing transit building, and to minimize the point loads on the wharf structure, the front-leg gantry trucks ride on existing railway tracks, resulting in a wider load distribution," Mr. **Niepelt** said.

"When our client told us that the crane must also handle bulk cargoes, we equipped it with a grab bucket attachment," he said.

Another unique feature of the crane is the boom width, which is only slightly more than one-half the width of the standard-model container cranes. By rotating a container 90 degrees, it enables container operation very close to superstructures or spars of ships, which is especially desirable for loading and unloading older ships not specifically designed for container traffic. Also, on the older ships, the containers are usually stacked in almost any position.

To be able to handle such cargo efficiently, the lift frame is equipped with a turning device which allows the operator to pick up the container regardless of its relative position. This avoids the necessity of "man-handling" the container into a precise position for pick-up.

For container operations, the crane has a lifting capacity of 33 tons and its hoisting speed is 60 feet per minute. For bucket operations, the hoisting speed is 120 fpm and the lifting capacity is 15 tons total.

According to **George Econn**, manager of Overseas Shipping Company's Los Angeles Harbor operations, construction and modernization work, including installation of the new unique crane, will be completed by the end of the summer.

"We will then be in full operation as the port's first combination container-bulk-conventional cargo-handling facility," Mr. **Econn** said.



ALL-ALUMINUM 100-FOOT CREWBOAT Shenandoah contrasts sharply with her surroundings before launching into Bayou Barataria waters. Camcraft, Inc., Crown Point, La., built its newest and largest crewboat for Offshore Logistics of Lafayette, La., who serves the offshore oil industry. The 100-foot-by-24-foot Shenandoah was constructed of Reynolds 5086-H32 aluminum supplied by Standard Brass and Manufacturing Company and Glazer Steel Corporation. She is powered by twin 12V149 Detroit Diesels and was clocked at 28.7 miles per hour in acceptance trials. The blue and white offshore vessel is Coast Guard approved to carry 123 passengers plus 15-long-tons of cargo on the afterdeck in ocean service. Equipment includes radar, marine radio, air conditioning, heating, full galley and sleeping accommodations for the crew of five.

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W. G. Sherwood Heads Two OSE Divisions

Sidney Kulek, vice-president and general manager of Ocean Science and Engineering, Inc. (OSE), has announced the appointment of **Wilbur G. Sherwood** to the position of manager of two of the company's divisions. The two divisions under his direction will be the Engineering-East Division and the newly formed Field Operations Division.

As manager of Engineering-East, Mr. Sherwood's duties will include management of OSE's engineering and ship design programs. He will additionally act as program manager for the design, construction and operation of the 2,000-ton Alcoa Seaprobe, the world's first deep-water search and recovery vessel. Also included will be the development of engineering on oil and water pollution control systems which OSE has developed and is current-

ly testing. The Field Operations responsibilities include management of Ocean Scallops, Inc. with their supporting vessels the Sheela L. and the Ruth M., and Ocean Science Ships, Inc. which include the RV Gulfrex, RV Oceanear and RV Wando River which are presently deployed around the world.

Mr. Sherwood will manage his divisions from the corporate headquarters at 4905 Del Ray Avenue, Washington, D.C. with a branch

office in West Palm Beach, Fla.

Mr. Sherwood comes to Ocean Science and Engineering, Inc., with a long background in management of ocean engineering, operations and research vessels. In 1961 he joined the newly formed General Motors Defense Research Laboratories in Santa Barbara, Calif. He was appointed head, sea test and later head, ocean engineering. In this capacity, he was responsible for all ocean engineering and sea-borne activities including the current Sea Spider and Amchitka installation programs in support of the Office of Naval Research and the Atomic Energy Commission respectively.

Mr. Sherwood is a graduate of the U.S. Naval Academy, and holds a post graduate master of science degree in industrial engineering from Purdue University.

Pacific Marine Names Kuwada Executive V-P



Richard Y. Kuwada

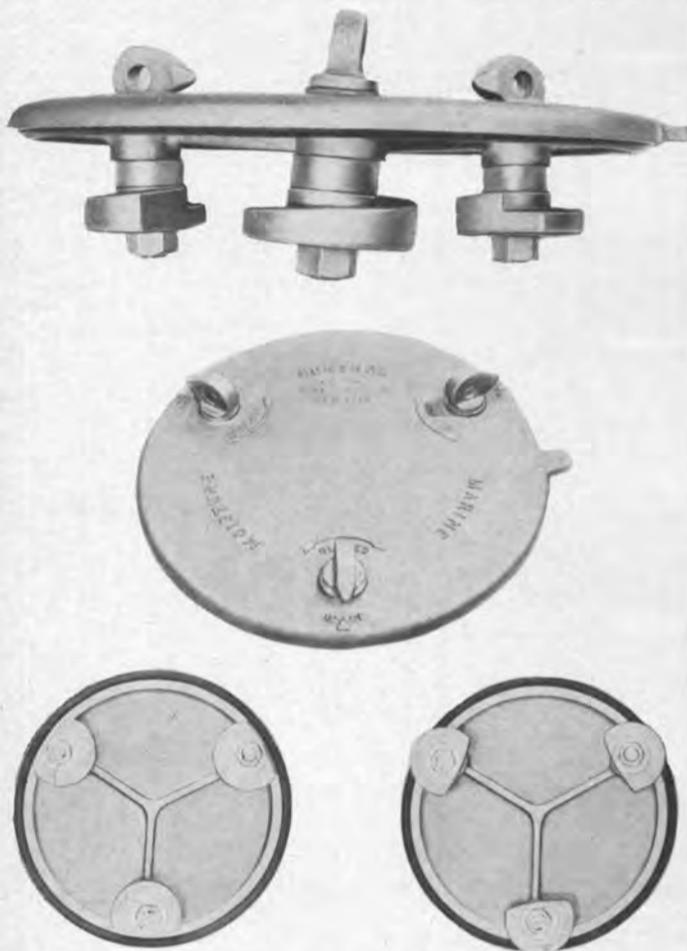
Richard Y. Kuwada, vice-president of Pacific Marine and Supply Co. Ltd., Honolulu, Hawaii, has been promoted to executive vice-president and elected to the board of directors. He will manage the company's operations and long-range growth as marine and industrial contractors, ship repairs and ship chandlers.

Before joining Pacific Marine 18 months ago, Mr. Kuwada was with the Dillingham Corporation. He is a member of the Propeller Club, National Defense Transportation Association, Honolulu Chamber of Commerce's Maritime Affairs Committee, Japanese Chamber of Commerce, and State and Labor Industrial Relations Advisory Board.

Rig-A-Lite Issues Bulletin Describing Fluorescent Fixtures

Bulletin 1007, issued by Rig-A-Lite Co., Inc., P.O. Box 9464, Houston, Texas 77011, describes in two pages a new line of fluorescent fixtures featuring "rugged durability of construction, dependability of service and ease of maintenance... plus a modernistic streamlined appearance with eye-appeal." The MAR-800 Series fixtures feature cast, high-tensile end caps for extraordinary durability and are described as being "superior in design efficiency, being composed of only 14 parts in total."

Copies of the bulletin may be obtained by writing Rig-A-Lite Co., Inc.



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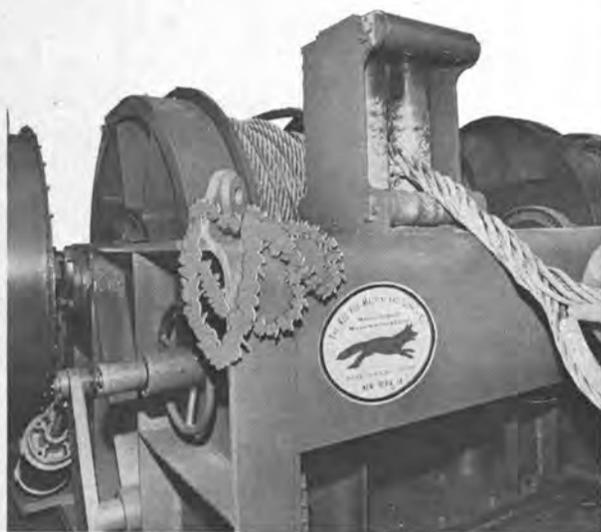
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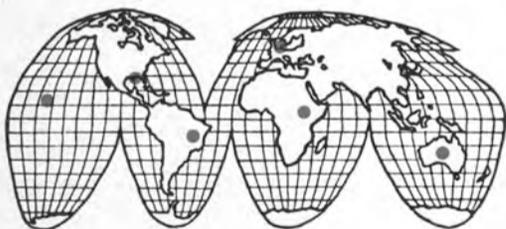
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**U.K.-Built Ship Has Special
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Adjustable side doors as ramps for fork-lift trucks.

The first U.K.-built vessel to be fitted with MacGregor/Lund, Mohr side doors has entered service for the London and Rochester Trading Co. Named Dangelde, the 932-dwt part-refrigerated/general-cargo vessel is expected to substantially reduce cargo handling times by using both side and over-the-top loading and discharging methods.

The ship's two side doors, both fitted on the port side as the ship will always berth this side to the quay, have been designed to suit various tide and quay levels at Whitstable on the River Thames Estuary and at Esbjerg in Denmark. An advantage of this type of side door is its dual-purpose characteristic which enables the door, when open, to be used as a shore-to-ship ramp. Both doors are combined with side hatches on the weather deck to provide sufficient height in the 'tweendeck when handling cargo at low tide, i.e. when quay level is relatively near the top of the side-door opening. The hatches are the same width as the side doors, 11 feet, and extend inboard for 10 feet 3 inches. Opening and positioning of the side doors and associated hatches can be completed in minutes. The hydraulic controls are located on the coaming of each hatch.

Each side-door panel is operated by wires in conjunction with two hydraulic jigger units which are situated close to the hull in the 'tweendeck. The doors are secured by manually operated heavy duty toggle-type cleats and the covers by quick-acting type cleats.

In addition to the extensive facilities for side loading, the 247-foot Dangelde has hatches in the weather and lower decks for the lift-on/lift-off handling of cargo. The aft hold and 'tweendeck are insulated. The hatches to these spaces are closed by insulated folding covers incorporating MacGregor "Cog-Mechanism" drive which comprises meshing articulated quadrants opposing each other on each cover. These are actuated by hydraulic cylinders fitted within the cover structure. This type of actuation system is especially suitable for insulated covers.

Both hatches to the refrigerated spaces are located off the centerline to the port side. The weather deck hatch, which measures 22 feet by 12 feet 11 inches, is flush to enable six 20-foot I.S.O. containers to be stowed on this deck. The second deck hatch measures 23 feet 2 inches by 12 feet 6 inches. Further access to the refrigerated spaces is provided by plug-type insulated doors in the transverse bulkhead adjacent to the forward hold and 'tweendeck.

The forward hold for general cargo is closed by a 22 foot 9 inch by 12 foot hydraulic flush folding hatch cover of the "Cog-Mechanism" type, while the 22 foot by 13 foot 6 inch hatch on the weather deck is situated on a coaming and is fitted with single-pull wire-operated covers.

The MacGregor U.K. also furnished and installed all of the hydraulic piping, a twin power pack, control valves, etc. for the side doors/hatches, aft weather-deck hatch and the two second-deck hatches.



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James Long Joins Pearlson Engineering



James M. Long

Pearlson Engineering Company, Inc., Miami, Fla., has appointed **James M. Long** as sales engineer, it was announced by **Raymond Pearlson**, president. Mr. Long is expected to do extensive travel abroad in his new position, where he will be visiting shipyards of varying sizes both civilian and military.

A native of Norwood, Mass., Mr. Long joins Pearlson Engineering after more than 15-years association with Crandall Drydock Engineers. He has supervised the construction of new drydock installations and several major reconstruction projects in shipyards from Newfoundland to the West Indies. For the past three years he also served as a director of the corporation.

Mr. Long served in the U.S. Navy for five years as a diver and instructor of diving and submarine escape apparatus. He attended Franklin Technical Institute and Northeastern University and currently resides in Miami, Fla.

To date, 52 of Pearlson Engineering's patented Syncrolift dry-docking and transfer systems have been installed in 17 countries.

New Book Describes Concrete Boatbuilding

"Concrete Boatbuilding—Its Technique and Its Future" by **Gainor W. Jackson** and **W. Morley Sutherland** is a new book published by John de Graff, Inc., 340 Oak Avenue, Tuckahoe, N.Y. 10707.

Ferro-cement processes for hull construction have been tested and advocated for more than 100 years. The book describes boats built this way with particular emphasis on the experimentation and production experience gained in New Zealand.

The information collected in this volume is specific enough to help the amateur builder. It is also technical enough to be useful to professional builders and designers.

The authors of this book are engineers with the Auckland Ferro-Cement Ltd. of New Zealand who are producing ferro-cement boats.

The book retails for \$7.95.

Sewart Seacraft Gets Order For Patrol Boats

Naval Ship Systems Command, Washington, D.C., has contracted the Sewart Seacraft Division of Teledyne, Inc., in Berwick, La. to build thirteen 50-foot fast patrol craft (PCF), at a cost of \$2,007,332.

World Shipbuilding Reaches All-Time High

Lloyd's Register of Shipping in its report on world shipbuilding at the end of June shows that new records have been set. There are under construction in the world 1,797 vessels of 16,775,599 gross tons, which is 836,120 tons more than the previous quarter. This is the highest figure for tonnage under construction ever recorded. These totals do not include ships

being built in Communist China and in Russia, for which no details are available.

There are 1,826 ships on order which have not been commenced totaling 37,978,754 gross tons. This is also a record.

When the new buildings are added to the orders not commenced, the total order book stands at 54,754,353 gross tons, an increase of 1,421,790 tons during the quarter. Japan leads with a total order book of more than 18-million tons.

Next comes Sweden with a little more than 5-million tons, followed by West Germany and Britain with 4.5-million tons each. In terms of the total order book, the United States ranks 13 with 1,458,535 gross tons.

Oil tankers being built total 8,420,905 gross tons, with a further 21,159,694 tons being on order but not commenced. The similar figures for bulk carriers are 3,705,485 tons under construction and 10,693,583 tons on order.

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Enjoy Chemical Co. Describes Rust-Ban 191 In Technical Booklet

Rust-Ban 191, a hard drying inorganic zinc coating for steels and other ferrous metals, is discussed in a new technical booklet available from Enjoy Chemical Company, 60 West 49th Street, New York, N.Y. 10020. Widely used by shipping companies for coating oceangoing vessels, Rust-Ban 191

coating systems have been used also to protect bridges, chemical plants, refineries, pulp and paper mills.

The water-based coating, spray applied like paint, affords corrosion protection which is similar in its effects to galvanizing. Corrosive elements preferentially oxidize the zinc leaving the coated metal intact.

The coating self-cures to an extremely hard, durable surface high-

ly resistant to abrasion and corrosive atmospheres and will withstand most petroleum products, animal and vegetable oils, petrochemicals and common organic solvents. The dried film is ready for service in eight hours after application under normal conditions.

The booklet details the physical properties of the self-curing coating as well as the properties of the dried film. Applications details covered include surface prepara-

tion, spraying procedures and recommended types of spray equipment, and approximate drying times under varying conditions of temperature and relative humidity.

Special topcoats for the coating are needed where decorative colors or special resistance to chemically active materials are desirable. A variety of special Rust-Ban topcoats are available including vinyls, epoxy, acrylics, chlorinated rubbers and polyvinyl emulsions.

G. R. Aitken Joins Elmont Chartering



George R. Aitken

S. J. Chiamonte, president of the Elmont Chartering Corporation, has announced that **George Robert Aitken** has become associated with Elmont Chartering as a tanker broker. Mr. **Aitken**, formerly assistant vice-president of Moore-McCormack Lines, Inc., has been 33 years in the shipping industry and was one of the pioneers in the coating and preservation of cargo tanks.

He is a member and former governor of the Downtown Athletic Club and is a member of the New York and Manhasset Bay Yacht Clubs as well as of many trade organizations.

The Elmont Chartering Corporation is located at 17 Battery Place, New York, N.Y.

Tokyo Shipping Offers Brochure

Tokyo Shipping Co., Ltd., is offering a new permanent file type combination descriptive service brochure and fleet table. It is titled "Under Many Skies On Many Seas."

According to Gannet Freighting Inc., general agents for the company in the U.S., the brochure highlights for the first time Tokyo Shipping's diversified services which include heavy-lift freighters, combination cargo and tow boats, ocean tugs and an ultra-heavy amphibious cargo carrier.

A unique feature of this permanent file brochure is the "fleet table" listing all vital statistics for the shipper, which can be updated at any time within the same binding to include new vessel listings resulting from Tokyo Shipping's continuing shipbuilding program.

The 16-page full-color brochure is available through Gannet Freighting Inc., 29 Broadway, New York, N.Y. 10006. It was produced by **Henry C. Bainbridge**, New York advertising and sales promotion consultant.

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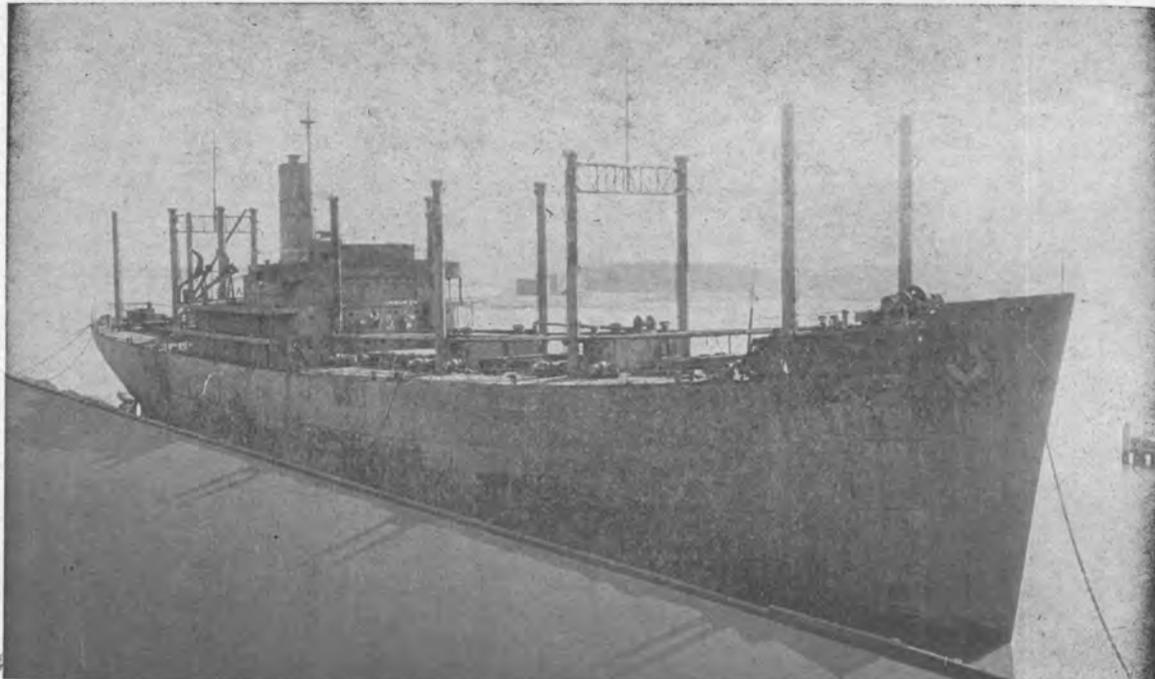
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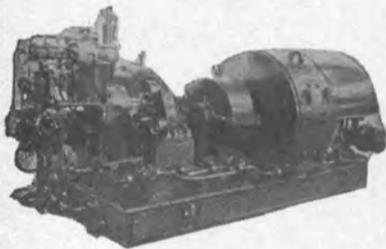
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TURBINE: Worthington-Moore—serial 7547 & 7548—440 lbs.—740°TT—28½" vacuum—type S4—5-stage—6097 RPM. GEAR: Type 14x7—6097/1200 RPM. GENERATOR: Crocker-Wheeler 102-HD—120/240 VDC—125 amps—40° rise—serial No. 973643 & 999795—compound wound. Armature flange 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—¾" bolt holes—8.247" diam.—7" B.C.—flange & shaft 5".

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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

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TURN TO 3RD PAGE FOLLOWING FOR 300 KW SPARE ARMATURES

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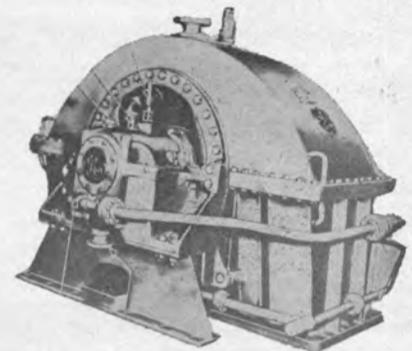
PUMP: 20 VCM—13,000 GPM—24.5 ft.—635 RPM.
MOTOR: Reliance—100 HP—230 volts—360 amps—475/635 RPM — Lt. Compound — Frame 1050T — Vertical.

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

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NEW H.P. AND L.P. T

For General Electric and Allis-Chalmers

ABS RECONDITIONED 660

L.P. & H.P. MAIN PRO

FROM EX-MEDINA VICTORY—MARAD

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

FROM EX-SHEEPSHEAD BAY VIC

H.P. Turbine—complete—Serial 4A-2264—L



AP2 VI
WESTING
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GEA

Immediate
6000 SHP—RP
ion 5410—L.P.
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VICTORY AP3 EVAPORATOR-DISTILLER

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



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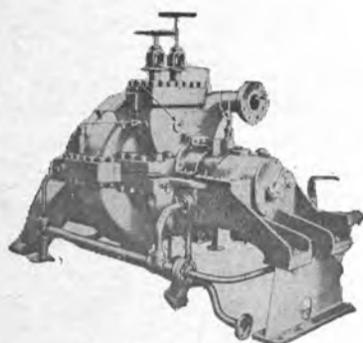
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ALLIS-CHALMERS

Low Pressure Turbine \$17,500
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TURBINE BEARINGS

-labyrinth packing—diaphragms.

H. P. WESTINGHOUSE

PULSION TURBINES

HULL 586—BUILDERS HULL 586

P. Turbine—complete—serial 4A-1619.

TORY—OFFICIAL NO. 81752

P. Turbine—complete—serial 4A-2265.

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

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

Delivery

A: H.P. pin-
pinion 3907
157 — from
ry serial 4A-

VICTORY AP3 FORCED DRAFT FANS

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

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MISCELLANEOUS PUMPS & PUMP MOTORS



DE LAVAL VERTICAL ROTARY MAIN LUBE OIL PUMP

10/15 HP—230 VDC—
250 GPM @ 43 lbs.—
980/1750 RPM. MO-
TORS: 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"—dis-
charge bolt circle 22 3/4". Suction (20) 1/4"
holes—discharge (16) 1/4" 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

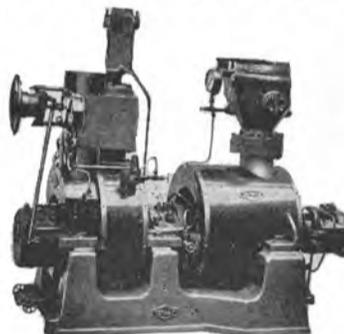


MARINE FEED PUMPS



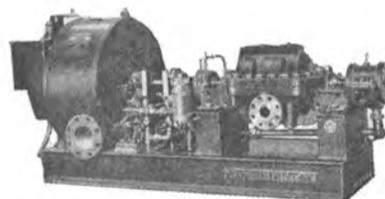
COFFIN MODEL F

Victory or T2, C3 etc.—control valve
1 1/4"—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. Con-
sumption 4280 lbs/hr—2 units avail-
able.



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—1 1/2" 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' 9 3/8"—OAW about 2'.

SPECIAL FROM RIDGEFIELD VICTORY

G.E. HP & LP TURBINES & REDUCTION GEAR—8500 HP—9350 HP Oregon Ship- building 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

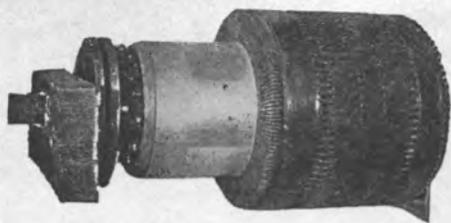
INGERSOLL-RAND

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 4 1/2 x 4 1/2—60 C.F.M.—15 H.P.—
230 volts.

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THAT
YOU
NEED**



A 300 KW VICTORY SHIP & C-2 GENERATOR ARMATURES

CROCKER-WHEELER

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

ALLIS-CHALMERS

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

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.

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.

C-2 ARMATURES

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

T2-SEA-1 TANKER MAIN STEAM & AUXILIARY EQUIPMENT



B MAIN TURBINE ROTORS
Large Turbine Rotors—Lynn
Large Turbine Rotors—Schenectady
Elliott Turbine Rotors—Fit G.E. small Schenectady turbine



C G.E. MAIN PROPULSION GENERATOR
REVOLVING FIELD
G.E. reconditioned—June 1967



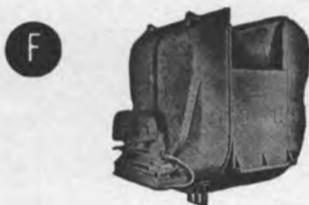
D G.E. MAIN GENERATOR STATORS



E REWOUND WESTINGHOUSE MAIN PROPULSION GENERATOR
REVOLVING FIELD

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

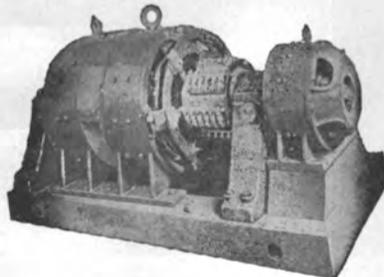
WRITE FOR COMPLETE INFORMATION



F WESTINGHOUSE MAIN GENERATOR STATOR WITH OR WITHOUT COOLER

G WESTINGHOUSE MAIN MOTOR FIELD COILS
COMPLETE SET
Westinghouse — universal type — newest design—80 pieces—one set.

H T2 RUDDER
Reconditioned—ready to go.
T2 TAILSHAFTS
Reconditioned
PROPELLERS
T2 propellers

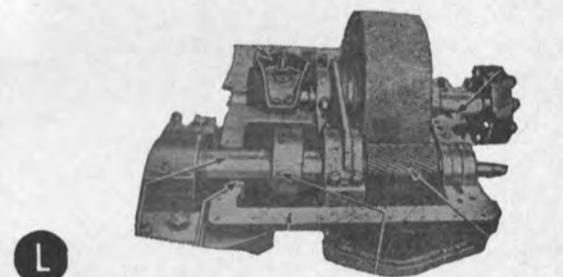


I WESTINGHOUSE EXCITER SETS
110 KW—28 KW—5 KW available
110 KW—32.5 KW—5 KW available

J LORIMER
Emergency Generator
Engine and Generator Parts



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



L G.E. AUX. TURBO-GEN. REDUCTION GEARS
Bull gear & pinion. With ABS.

M WESTINGHOUSE AUXILIARY GENERATOR REDUCTION GEARS AND BEARINGS
COOLERS



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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



THE BOSTON METALS CO.

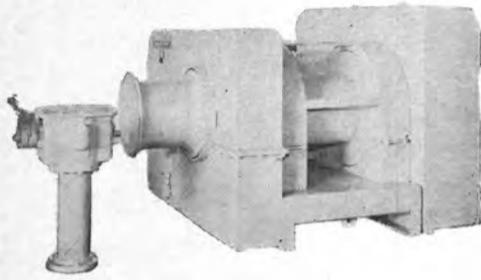
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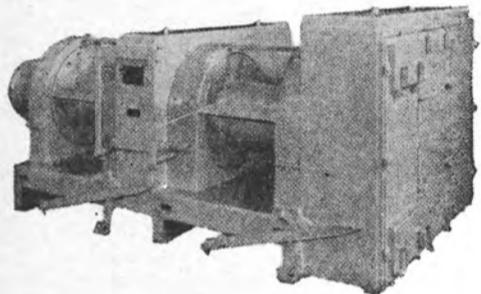
CARGO WINCHES, WINDLASSES & GENERATOR SETS

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.



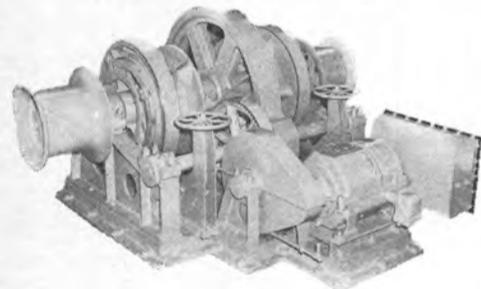
**DOUBLE DRUM
U-6 UNIT WINCHES**

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 2 1/4"
McKIERNAN-TERRY**

(2)—For 16,000 lb anchors—47 1/2" 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.

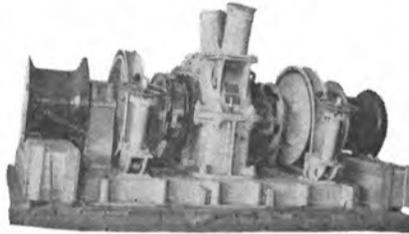
T-3 ANCHOR WINDLASS FOR 2 3/8" CHAIN

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

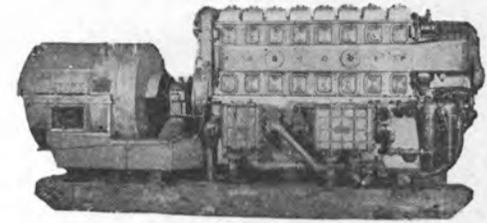
T-2 WINDLASS FOR 2-5/16" CHAIN

American Engineering type MALI-60-14—12 x 14—4' 8 1/2" between wildcat centers.

UNUSED 1 5/8" HEAVY DUTY LINK BELT WINDLASS



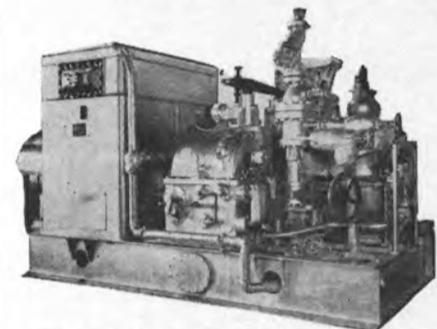
Below deck motor drive. Double Wildcat—driven by 50 HP—230 volt DC motor with vertical shaft and worm drive. Single speed—handles 7000 lb anchors and 60 fathoms of 1 5/8" chain at 7 fathoms per minute. Wildcat centers 56". Complete with all controls and warping features. Total weight 27,500 lbs. With spares.



**290 KW DIESEL
GENERATOR SET**

Westinghouse 290 KW generator—120/240 volts—1250 amps. ENGINE: GM 8-268A—6 1/2 x 7—8 cylinder—1200 RPM.

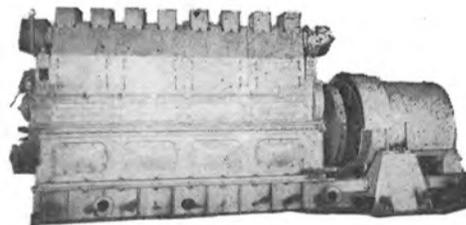
G.E. 600 KW 440/3/60 TURBO GENERATORS



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

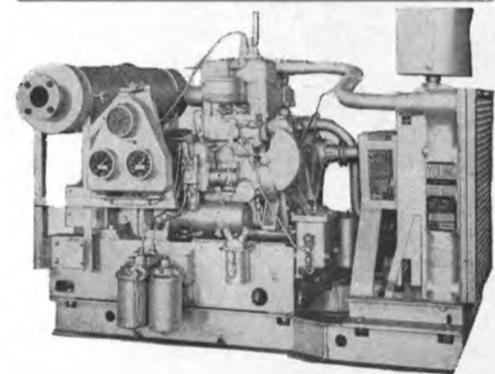
TURBINE: GE FN3-FN20—condensing 6-stage—525/565 lbs gauge. Super-heat 355/371—10033 RPM. GEAR: S-178—ratio 8.36:1—10033/1200. GENERATOR: 600 KW A.C.—type ATI—600 KW—750 KVA—450/3/60—1200 RPM—80% PF—totally enclosed—water cooled. EXCITER: 7 1/2 KW—120 volts—62.5 amps—1200 RPM.

GENERATOR SETS



**350 KW INGERSOLL-RAND
DIESEL GENERATOR SETS**

4 Available—engine type S—Ingersoll-Rand—1 1/2 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.



**UNUSED 10 KW
SUPERIOR DIESEL
GENERATOR SETS**

Radiator cooled units—120 volts DC—83.3 amps. ENGINE: Superior diesel model GAB-1—4 1/2" bore—5 3/4" stroke—16 HP—equipped with Young radiator. Overall dimensions—57" high—57" wide—75" long.



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Two Dravo-Built 5,000-HP River Towboats Christened By The Ohio River Company



MV J.N. Philips, above, and a sister vessel, the MV A.P. Boxley are the latest additions to the river fleet of The Ohio River Company. Both towboats were christened in dual ceremonies held recently in Cincinnati. The new vessels are the most powerful in the company's river fleet. The 5,000-hp towboats were placed in service push towing bulk cargoes. They will be operated by Orgulf Transport Company.

The most powerful towboats in The Ohio River Company's river fleet entered service recently following christening ceremonies in Cincinnati.

The new 5,000-hp vessels are named in honor of J. N. Philips, executive vice-president and trustee of Eastern Gas and Fuel Associates, Boston, parent organization of The Ohio River Company, and A. P. Boxley, president, Eastern Associated Coal Corp., Pittsburgh, the coal operating subsidiary of Eastern Gas and Fuel Associates, of which he is a senior vice-president and trustee. Their wives served as sponsors and broke the traditional bottle of champagne across the capstans of the vessels.



The MV A.P. Boxley was named in honor of A. P. Boxley, president of Eastern Associated Coal Corp. Christening party included, left to right: Mr. Boxley, Mrs. A. P. Boxley, sponsor, and his sons Robert, and wife Brenda, Benjamin W., and wife Carole, and A. P. Boxley III.

The twin-screw vessels were built at the Neville Island Shipyard of Dravo Corporation near Pittsburgh. The towboats have an overall length of 166 feet, a beam of 42 feet, and an 11½-foot operating draft. They are powered by two, General Motors, 16-cylinder, turbo-charged, aftercooled diesel engines with reverse-reduction gears and clutches.

They have Dravo kort nozzles, propellers, hull form and steering and flanking rudders all specially shaped and arranged in accordance with extensive model tank studies to assure high efficiency propulsion and maneuverability.

The new vessels are operated by The Ohio River Company's Orgulf Transport Co. affiliate for push towing of coal, bauxite and grain on the lower Mississippi River. The Cincinnati-based Ohio River Company and its affiliated companies operate 25 towboats and 1,000 barges moving tonnage on the inland and coastal waterways of the U.S., particularly on the Ohio River, more than any other water carrier. The entire fleet will move approximately 30-million tons of cargo in 1969.



The MV J.N. Philips was named in honor of John N. Philips, executive vice-president of Eastern Gas and Fuel Associates. Shown above are, Mr. Philips with his wife, Mrs. John N. Philips, sponsor (center), and his daughter, Miss Janice Philips.

Speaking at the ceremonies, L. R. Fiore, president, The Ohio River Company, said: "These new towboats represent another phase of our continuing building program to meet the future needs of barging on the inland and coastal waters. With the continuing development of more efficient and modern equipment, such as our new towboats, barging has established itself as the prime low-cost method for the movement of bulk materials in many areas, and we are proud of the many contributions The Ohio River Company has made to the progress of the barging industry."

Also speaking at the ceremony was L. P. Struble, executive vice-president, Dravo Corporation, who presented the sponsors with silver trays commemorating the event.

ICHCA Booklet Tells How To Stow Goods In Containers

A Swedish publication entitled "Stowing of Goods in Containers and on Flats" has now been made available in the United States through the U.S. National Committee of the International Cargo Handling Coordination Association.

The publication of the brochure is the result of a joint effort of the Swedish Transport Research Commission and the Swedish National Committee of ICHCA.

The advice and instruction on how to stow goods in containers and in flats are a summary of the experience and practical application acquired in various branches of land and sea transportation.

Containers in ocean transportation are a relatively new mode of cargo handling with the result that many unnecessary damage and insurance-claim problems are being encountered. While new knowledge and experience in the loading of these units are still being accumulated, the Swedish ICHCA brochure is the best information and guide that is available to date.

The brochure provides helpful guidelines in dealing with container-cargo stowage, pointing out that a container is a ship in miniature and that the goods stowed in it are subject to the accumulated stresses of three forms of transportation—trucking, railway, and oceangoing vessels.

The U.S. National Committee of ICHCA is sponsoring a seminar, in conjunction with a container exhibition at the Coliseum September 15-17 that will deal specifically with the need for greater attention to the contents of containers in ocean transportation.

The 72-page illustrated brochure can be obtained from the U.S. National Committee of ICHCA, P.O. Box 155, Bowling Green Station, New York, N.Y. 10004. The price is \$5 a copy.

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LORAN: Sperry Mark II
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SONAR: AN/FQS-1A, AN/UQS-1B,
QHBa, QCU

Spores in stock incl. above, Raytheon Pathfinder & SO series. Magnetrons and klystrons 2K25, 4J52, etc.

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Zapata Marine Names Smith Sales Manager Marine Transport Div.



Don E. Smith

Don E. Smith has joined Zapata Marine Service as sales manager, Marine Transport Division, Houston, Texas. In this capacity he will be in charge of sales for the services of Zapata's fleet of deep-sea tugs and inland marine towboats and barges.

Before joining Zapata, he was marketing manager for North American Rockwell-Oceans Systems Operations. Mr. Smith attended college in Fullerton, Calif. He served in the U.S. Navy.

Zapata Marine Service operates tugs, towboats and offshore rig/tug supply vessels around the world.

Japanese Ship Owners Recommend Build-Up In Containerization

Shipping and shipbuilding executives recently recommended to the Japanese government that Japan must take positive action to keep up with the rapid expansion in container traffic. The recommendation was made to Transportation Minister Ken Harada.

After studying the report, Mr. Harada stated that future Japanese shipping policy will be based on it. Initially, priority will be given to the routes between Japan and Europe and Japan and New York.

The recommendation stated that Japanese export cargoes to Europe suitable for containerization totaled 1.65-million tons in 1968. The same type of cargo to the United States totaled 2.03-million tons in 1968. These tonnages are expected to double by 1975.

In order to move properly into containerized cargo, the report stated that it would cost about \$440-million for containerships, containers and terminals. This cost is beyond the financial means of the steamship lines so it will be necessary for the government to provide financial aid, the report noted.

The report also discussed the Japan to U.S. West Coast route but advised caution on planned expenditures. It stated that of the six Japanese lines that operate container-ships on the route, four are planning to containerize the Japan-Seattle-Vancouver route in 1970. The cautious note was taken with regard to California-Japan runs since Sea-Land Service plans to enter this route with 30-knot container-ships.

McDermott To Build Two 7,000-BHP Tugs For Puget Sound Barge

McDermott Shipyard, Morgan City, La., has received an order from Puget Sound Barge Line, Seattle, Wash., to construct two twin-screw tugboats. Designated Hull Nos. 163 and 164, each tug will be 136 feet by 36 feet 8 inches by 19 feet 2 inches and be powered by 7,000-total-bhp diesels.

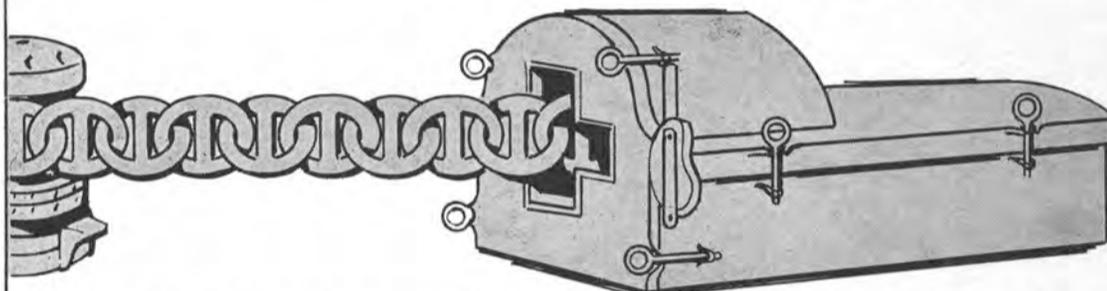
Western Gear Units Ordered For T-AGOR-16

Western Gear Corporation's Seamaster straight reduction gears have been ordered for the auxiliary oceanographic research vessel (T-AGOR-16) being built by Todd Shipyard's Seattle yard. This catamaran-type ship will be propelled by two diesel engines, one in each hull, with each developing 2,700 hp at 750 rpm. The ahead gear reduction ratio is 5.4:1.

The reduction gears were designed specifically for the T-AGOR and are of the double-pinion type to accommodate a Stewart and Stevenson 165-hp auxiliary diesel engine. The auxiliary engine will be used to propel the ship at slow speed.

Fawick 28VC1000 disconnect clutches are fitted on both gear units. A controllable-pitch propeller from Lips Propeller of Holland provides for the vessel's reversing capabilities.

Lockstad Patented Chain Pipe Covers Cut Labor Costs —

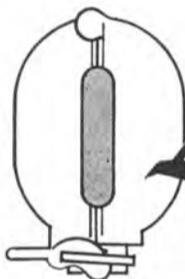


Now in use by all leading vessel operating companies

Prevent flooded chain lockers, eliminate hazardous and expensive methods of pouring concrete.

Lockstad has developed a new cover which secures in place in matter of minutes and can be removed in seconds. Cover makes a complete thorough seal around the ring of the chain pipe. Used for vertical or caspen type windlasses.

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WINDOW WIPERS



DAY AND NIGHT NAVIGATION under widely varied conditions of weather and temperature, demands the utmost in piloting visibility. Unsurpassed Kearfott Window Wipers—rugged, simple and powerful—efficiently meet these requirements. These are the ONLY wipers you should have on your boat!

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AWO Region 3 Meeting Highlights Ways To Improve Navigation Safety



Attending AWO luncheon meeting on July 25, left to right: **William C. McNeal**, a vice-president of Region 3 and of Oil Transport Company, Inc.; Rear Adm. **Russell R. Waesche**, commander Second Coast Guard District; **Braxton B. Carr**, president of The American Waterways Operators, Inc.; Major Gen. **R. G. MacDonnell**, president of the Mississippi River Commission and division engineer of Lower Mississippi Valley Corps of Engineers, and **Jesse Brent**, former chairman of AWO and president of Brent Towing Co.

Methods of improving navigation safety as well as improving efficiency of operations held the attention of barge and towing executives from throughout the United States at the summer quarterly meeting of The American Waterways Operators, Inc. members in Region 3 and related sessions held in Greenville, Miss. on July 24-27.

More than 450 top industry officials and over 50 officers of the Army Corps of Engineers and U.S. Coast Guard worked together in the sessions on a general theme—improvement of navigation safety—which is part of AWO's continuing efforts and interest.

The business sessions were opened July 25 with a navigation conference under the joint sponsorship of the Army Corps of Engineers, U.S. Coast Guard and AWO at which navigation matters pertaining to the Lower Mississippi River and the Gulf Coast areas were discussed in detail.

Topics discussed in the interest of safety included proposed licensing of the operators of uninspected towing vessels, bridge-to-bridge radio communications, better observance of Rules of the Road, and the movement of dangerous cargoes. (The American Waterways Operators, Inc., endorses the licensing proposal for operators of towing vessels as embodied in H.R. 4154 and urges its enactment. The Association also supports and urges enactment of bills H.R. 6971 and H.R. 5189, "to require a radio telephone on certain vessels while navigating upon specified waters of the United States." The Association, further in the interest of safe navigation, support and urges enactment of H.R. 214, a bill "to unify and consolidate the rules for navigation on the waters of the United States.")

The AWO Region 3 membership meeting followed the navigation conferences. **William C. McNeal**, AWO Region 3 vice-president, presided at the navigation conference and business meeting of AWO. **George H. Blohm**, chair-

man of the board of AWO, was in attendance and participated in both sessions.

Mr. **McNeal** is vice-president of Oil Transport Company, Inc. of New Orleans, La., and Mr. **Blohm** is vice-president and general manager of Cities Service Tankers Corporation of New York, N. Y.

Heading the delegation of officers and representatives of the Corps of Engineers at the navigation conference was Major Gen. **R. G. MacDonnell**, Lower Mississippi Valley division engineer, who was accompanied by Col. **Paul R. Sheffield**, deputy division engineer, and three members of his staff. Other Corps of Engineers officials who took part in the discussion were Col. **John W. Brennan**, Vicksburg district engineer and five members of his staff; Col. **Herbert R. Haar Jr.**, New Orleans district engineer and two members of his staff; Col. **R. E. Snetzer**, Mobile district engineer and two members of his staff; Col. **Charles T. Williams**, Memphis district engineer and two members of his staff; Col. **Edwin R. Decker**, St. Louis district engineer and two members of his staff; Col. **I. M. Rice**, Southwestern Division engineer, Dallas, and three members of his staff; Col. **Franklin B. Moon**, Galveston district engineer and a member of his staff; Col. **Charles L. Steel**, Little Rock district engineer and two members of his staff; Col. **John F. McElhenny**, Jacksonville district engineer and two members of his staff, and **Billie J. Bishop**, representing the Tulsa district engineer.

The Coast Guard delegation was headed by Rear Adm. **Russell R. Waesche**, commander, Second Coast Guard District, St. Louis, Mo., and nine members of his staff. The Eighth Coast Guard District in New Orleans was represented by Capt. **Donald D. Davidson** and Capt. **Merle L. Harbourn**.

AWO members were hosts at a reception and luncheon following the navigation conference at which **Braxton B. Carr**, president of The American Waterways Operators,

Inc., presented General **MacDonnell** an engraved certificate on behalf of the Association in appreciation of his "understanding of and assistance in solving inland waterway navigation problems during his term as president of the Mississippi River Commission and division engineer, Lower Mississippi Valley Division, December 1, 1966 to July 31, 1969." General **MacDonnell** also was presented a certificate naming him an honorary citizen of Greenville by the city's mayor, **Pat Dunne**.

At the afternoon business session of the Region 3 members there was a full discussion of the Association's program and activities. The president of the Association outlined in detail legislation of interest to AWO members pending before the Congress. Representative **Bill Alexander** of Arkansas made a presentation of the AWO Region 3 members on the proposed maritime academy at Helena, Ark.

The activities on July 25 continued with a catfish fry at the Greenville armory which was given by **Jesse E. Brent**. Among those in attendance was Sen. **James O. Eastland** of Mississippi. Mr. **Brent** is president of Brent Towing Company, Inc. of Greenville, Miss.

The fall meeting of AWO Region 3 members will be held October 15 at the Royal Coach Inn, Beaumont, Texas. The Region 3 annual meeting will be held January 14, 1970 at the Royal Sonesta Hotel in New Orleans.

Oakland, Calif. Names Crandall To Two Posts

The Oakland, Calif., Port Commission has named **Robert W. Crandall** as manager of its marine terminals department and also as port traffic manager. Mr. **Crandall** joined the Port of Oakland staff in 1966, as traffic representative and analyst. He previously had been export traffic manager for Kaiser Steel Corporation.



A NEW HYDROTRAIN RAIL BARGE is now in service following the recent launching at Bethlehem Steel Corporation's San Francisco shipyard. The 48-car-capacity barge is 400 feet long, 76 feet wide and 20 feet deep, and is one of the largest to be built in the Bay Area. It is shown on drydock at the shipyard during final outfitting. Named **McKinley**, the new barge is the last of five of this type built by the yard and operates between Seattle and Alaska. It was constructed for the Harbor Tug & Barge Company, San Francisco, and will be operated by Puget Sound-Alaska Van Lines. The keel for the first of four more barges, scheduled to be built at the yard, has been laid. These are of the same size as the rail barges but without rails. They will also operate in Alaskan waters.

Moore-McCormack Names Col. Marquette Director-Container Div.



William J. Marquette

Moore-McCormack Lines has announced the promotion of Col. **William J. Marquette**, USA (ret.) to director, Container Division. Colonel **Marquette** joined Moore-McCormack in December, 1966 as a full-time consultant. In his new position he will be in charge of all container-related services.

Colonel **Marquette** was formerly vice-president of Waterman Steamship Line and he had a long career in both the civilian and military sectors of containerization. He served as an assistant to the vice-president, International Service of R.E.A. Express after his retirement from active duty as commander of the Brooklyn Army Terminal.

Colonel **Marquette** was graduated from Rutgers University. He is a member of the National Defense Transportation Association, Traffic Club of New York and the Downtown Athletic Club.

Fishing Boat Ordered From Marine Constr.

An offshore fishing vessel is to be built by Marine Construction & Design Co., Seattle, for Gudjonsen, Sorensen & Petersen. To be named **Sea Spray**, the boat will be 94 feet by 25 feet by 12 feet and powered by a single-screw 565-bhp diesel.

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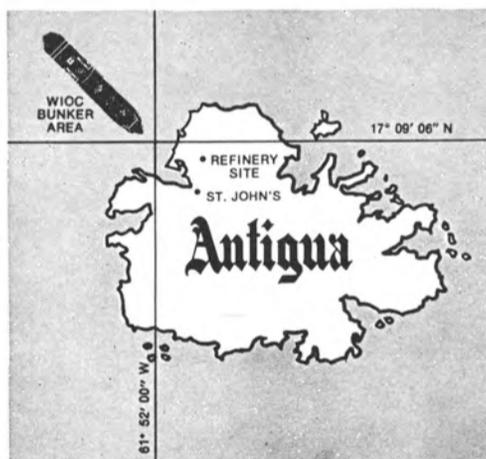
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Atlantic Lines Names Camardella Manager

The appointment of R. Ross Camardella as general manager of Atlantic Lines, Ltd., has been announced by A. P. Chester, president of Chester, Blackburn & Roder, Inc., New York, N. Y. the managing agents.

Mr. Camardella, a graduate of the New York State Maritime College, served as an officer both in the American merchant marine and the U.S. Navy.

After release from active duty in 1965, Mr. Camardella entered a training program with Chester, Blackburn & Roder. After serving first as a port captain in the Operations Department he was transferred to the Traffic Department in 1967, rising to the position of line manager.

In his new capacity as general manager of Atlantic Lines, Ltd., Mr. Camardella will direct and coordinate the overall activities of the line which operates 12 ships serving over 40 ports with agencies throughout the Caribbean area.

Marcona Appoints Fraser And Measter To Chartering Posts

The appointment of Thomas G. Fraser as assistant manager, commercial shipping-chartering, Marcona Corporation, San Francisco, Calif., was announced by F. J. Ewers, general manager-commercial shipping. Mr. Ewers also announced the appointment of Charles L. Measter as manager, chartering, New York for Marcona Inc.

Mr. Fraser previously had served as manager, traffic, for Chevron Shipping in San Francisco.

After graduation from the University of Oregon with a degree in business administration, Mr. Fraser served as a bomber pilot during the Korean war.

Mr. Measter previously served as chartering broker for Wm. H. Muller & Co. Inc. in New York City.

He is a graduate of St. Francis College, Brooklyn, holding a BA degree in history and is a member of the Society of Maritime Arbitrators in New York.

Covin Named Manager Of GE's West Coast Service Shop's Sales



Bill E. Covin

Bill E. Covin has been named manager of marine and utility service sales for the General Electric Service Shop's Department with an office at 1650 34th Street, Oakland, Calif.

The appointment was announced by James H. Sargent, manager of product and service planning for utility and marine industries for the GE Service Shops Department.

Mr. Covin's responsibilities include the service sales for marine customers of the Service Shops Department along the entire West Coast. He also services utility customers in the West Coast and

Rocky Mountain areas.

The GE department, which has 69 service and repair facilities located in key U.S. industrial areas, specializes in the repair, modification and maintenance of a wide range of electrical, electronic and mechanical equipment produced by all manufacturers.

Mr. Covin graduated from the University of Oklahoma in 1956, earning a bachelor of science degree in electrical engineering. From 1948-51 he played center on Sooner football teams.

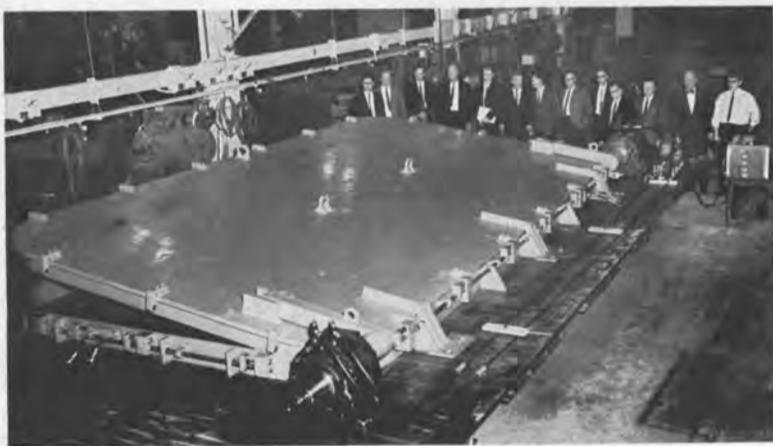
Mr. Covin's education was interrupted by Army duty which included a 1952-53 tour in Korea, where he served with the U.S. Army Corps of Engineers. In 1946-47, he served in the Navy.

He is a member of the Institute of Electrical and Electronics Engineers and the Society of Port Engineers.

Twin-Screw Towboat Ordered From Houma

Houma Shipbuilding Co., Inc., Houma, La., will build a twin-screw towboat for Spanier Marine Corp., Harvey, La. The towboat is to be 60 feet by 22 feet by 9 feet and of about 100 gt. It will be equipped with 800-total-bhp diesels.

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Seventeen of these 11'-7" x 22'-1" hinged hatches are being supplied to Erie Marine, Division of Litton Industries, for a new 1,000' Bethlehem Steel ore carrier. Specially designed for rapid loading, and projecting only 20" above the deck, these push button operated hatches may be opened 180 degrees against the deck and closed in less than two minutes.

In addition, W&K is furnishing four 10' watertight conveyor gate doors to seal around the conveyor belts which will unload the vessel at a 20,000 ton per hour rate. And, two 14'-9" x 23' watertight conveyor sideports at the stern to unload ore to shore side facilities.

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Todd's Alameda Yard Tests New Dry Dock



Sea-Land's containership Oakland is the first vessel to test Todd-Alameda yard's new heavy-lift floating dry dock. The new dock has a capacity of 25,000 tons.

The heaviest containership ever lifted in a San Francisco Bay Area floating dry dock, recently was raised out of the water at Todd Shipyards Corporation's Alameda yard.

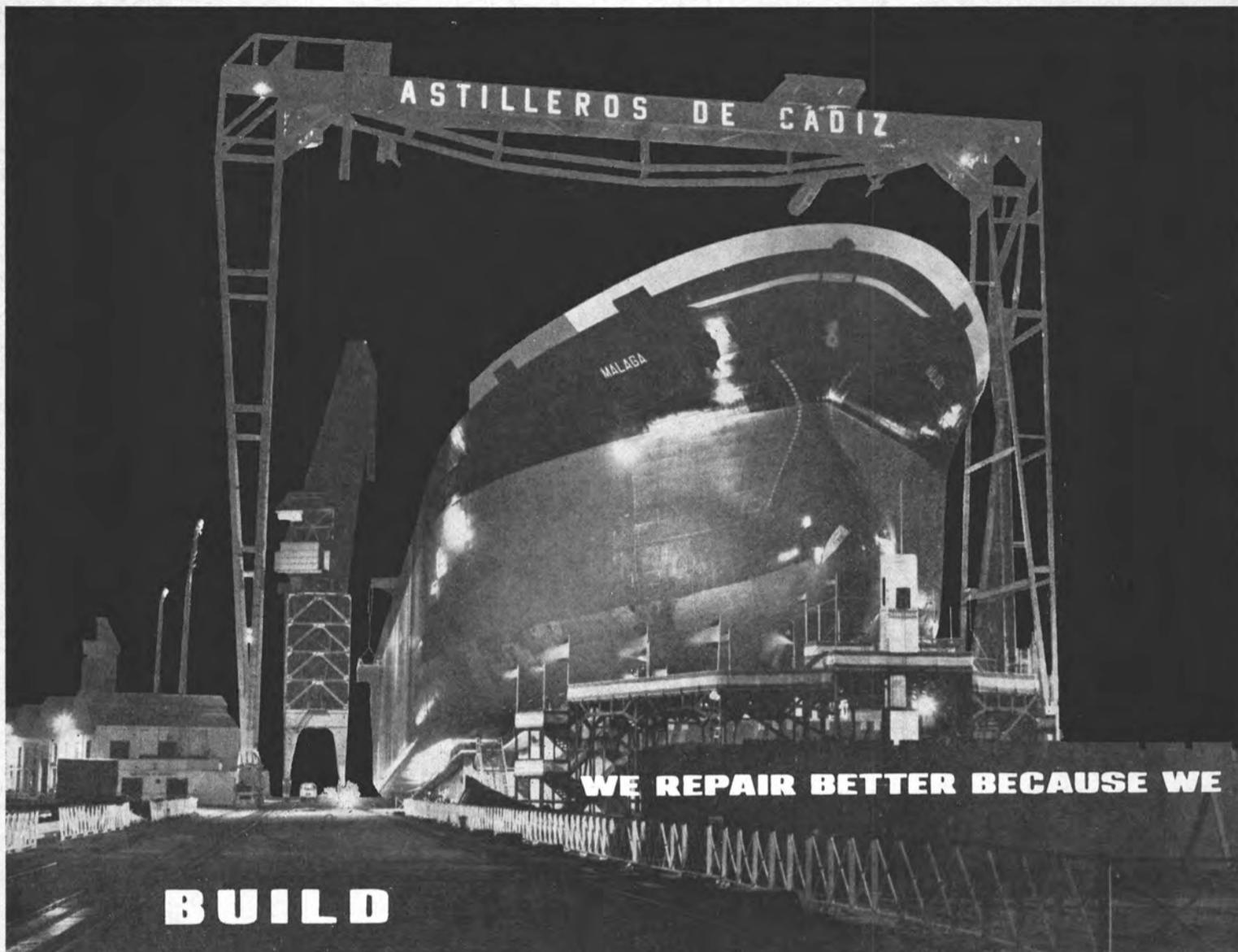
The vessel, Sea-Land's 684-foot Oakland, entered the Todd yard for "routine repairs," and was the first ship to test the capacity of the company's new 25,000-ton combination dry dock.

According to a spokesman for Todd, the new dry dock is certified to lift weights up to 50-million pounds—comparable to the weight of the 22-story International Build-

ing at Kearny and California Streets in San Francisco.

The maiden lift at Todd's yard was witnessed by Mayor John Reading of Oakland, State Sen. Nicholas Petris, and Port Director Ben Nutter.

The huge installation is part of a multi-million-dollar expansion and modernization program now being carried out at the company's Alameda yard designed to provide facilities for the supertankers expected to be employed on the Pacific Coast for handling the vast output of newly found oil reserves in Alaska.



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National Steel Holds Employee Open House Combined With Launching And Keel Laying



Attending the NASSCO launching and keel laying were, left to right: Capt. **Henry A. Gerdes**, USN, supervisor of shipbuilding, conversion and repair, San Diego; Capt. **John M. Danielsen**, force chaplain, Amphibious Force, Pacific Fleet; Rear Adm. **Gayle T. Martin**, USNR, representing commander, Naval Ship Systems Command; **John V. Banks**, executive vice-president, NASSCO; **Miss Lisa Heinz**, maid of honor; **Mrs. Luther C. Heinz**, sponsor; Rear Adm. **Luther C. Heinz**, USN, commander, Amphibious Force Atlantic Fleet; Congressman **Lionel Van Deerlin**, and Vice Adm. **John Victor Smith**, USN, commander, Amphibious Force, Pacific Fleet.

It was a fun-filled day for 10,807 employees and their families at the San Diego yard of National Steel and Shipbuilding Company when an open house was held in conjunction with launching and keel laying ceremonies.

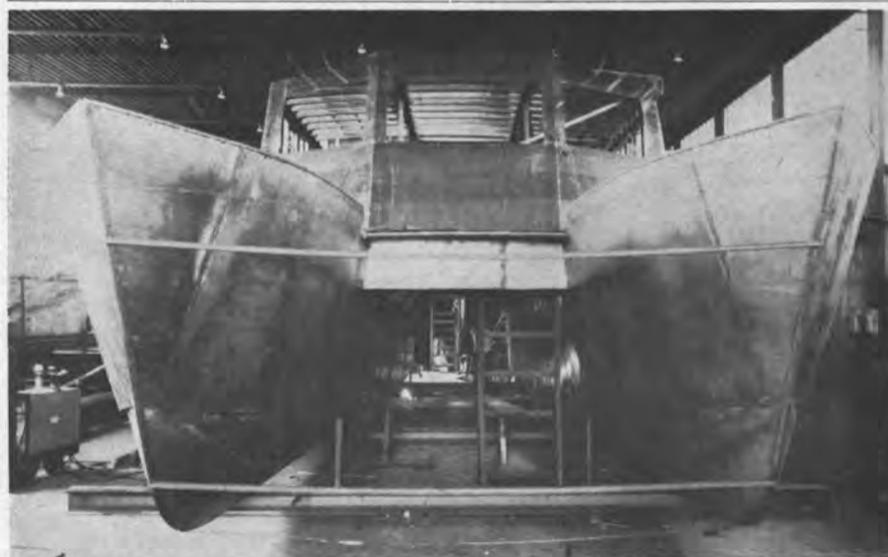
Setting the stage for the festivities was the launching of the USS Cayuga (LST-1186) and the keel laying of the USS San Bernardino (LST-1189).

Dignitaries present at the two ceremonies included: **Mrs. Luther C. Heinz**, sponsor of Cayuga; **Miss Lisa Heinz**, the ship's maid of honor; Hon. **Lionel Van Deerlin**, U.S. Congressman and speaker; Hon. **Paul Lattimore**, Mayor of Auburn, N.Y.; Rear Adm. **Gayle T. Martin**, USNR, representing the Naval Ship Systems Command; Rear Adm. **David M. Rubel**, USN, commander, Amphibious Training Command, Pacific Fleet; **John V. Banks**, executive vice-president, National Steel and Shipbuilding Company, and **John M. Murphy**, vice-president-sales, National Steel and Shipbuilding Company.

Immediately following the launching and keel laying ceremonies the entire facility was opened to employees and their families for touring and inspection. Food stands stationed throughout the tour route, manned by company executives, served 27,000 cokes, 10,000 containers of popcorn, 28,000 ice cream bars, 23,000 hot dogs, 4,500 portions of cotton candy, and 10,000 packages of bubble gum. Entertainment included a Dixieland band, a mariachi group, an employee band, a choral group, several clowns, movies and a calliope.

Pieces of equipment throughout the yard bore descriptive signs as well as the names of employees who operate them. Highlighting the tour was the inspection of the USS Fresno (LST-1182), the yard's latest product.

The day's program was planned and executed by the company's Management Club under the leadership of **Barney LeBlanc**, plant manager, and **Dan Pugh**, Management Club president.



CATAMARAN SURVEY VESSEL under construction at Fercraft Marine Inc., La Prairie, Quebec, Canada for the Canadian Department of Transport. The 50-foot vessel was designed by **Robert B. Harris**, naval architect, Great Neck, N.Y., for survey work in the Gulf of St. Lawrence. With 600-hp diesel propulsion, the boat will have a cruising speed of 17.4 knots and a maximum speed of 21.5 knots.

Southern Ship Delivers First of Four Navy Tugs With Automated Engine Rooms



The U.S. Navy tug Natchitoches, first of four Navy tugs with automated engine rooms being constructed under a \$3-million contract with Southern Shipbuilding Corporation.

A Navy tugboat named for the city of Natchitoches, La., has been completed by a Louisiana shipyard and commissioned for service at the naval base in Newport, R.I.

The 109-foot-long Natchitoches (YT-799) is the first of four Navy tugs to be completed under a \$3-million contract awarded to Southern Shipbuilding Corporation of Slidell, La.

The Natchitoches and her three sister tugs will be the first of their class to contain fully automated engine rooms, Southern Shipbuilding President **Alain R. Seligman** said. Each is powered by 2,000-hp diesel engine and will maintain complete seagoing capabilities, he said.

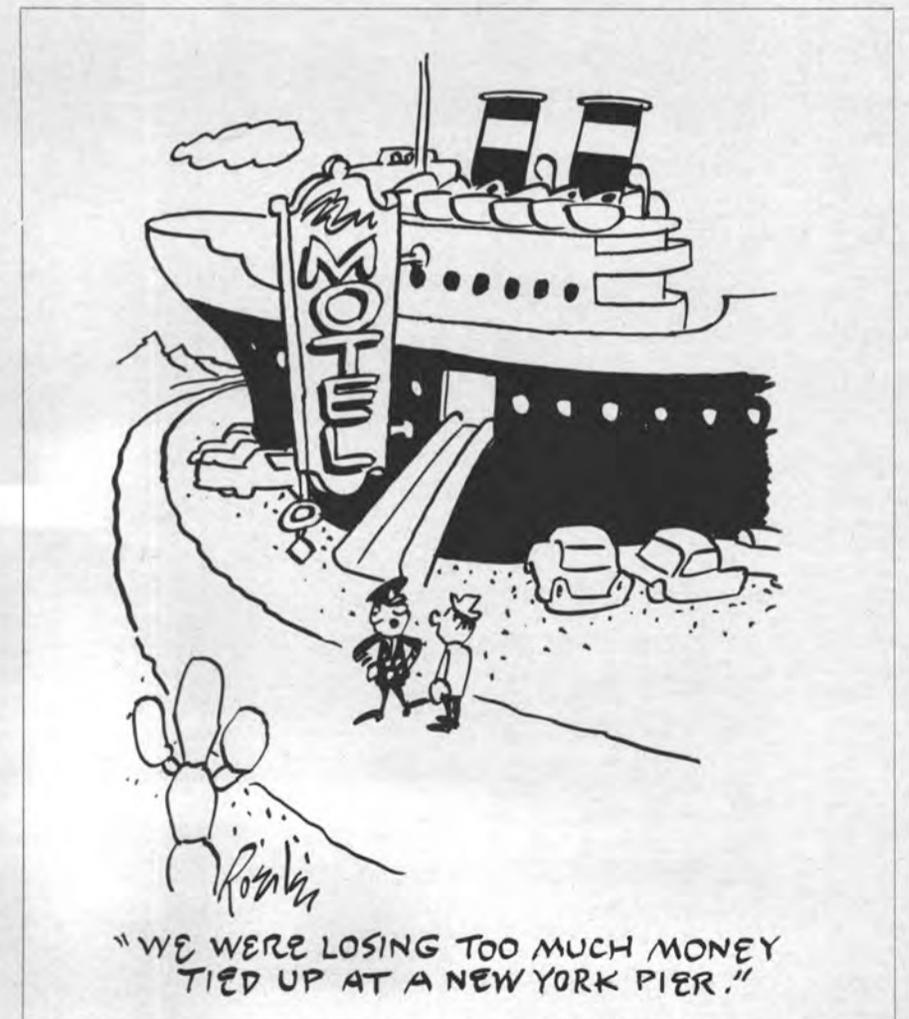
The YTB-760 Class of Navy tugs of which the Natchitoches is one, was designed and developed by Southern Shipbuilding. With the

completion of its current four-tug contract, the Slidell shipyard will have built 15 of the YTB-760's.

The Natchitoches is equipped for harbor work and carries sophisticated electronic gear, firefighting apparatus and towing machinery behind its heavily insulated, deep-throated bow. It is outfitted for a crew of 12.

Natchitoches is one of several cities with Indian class names to have a tug of the YTB class named for it, Mr. Seligman said. He said the YTB's are traditionally named by the Navy for cities with Indian names that have a population between 500 and 100,000.

The other three YTB's under construction at Southern Shipbuilding have been named for Eufaula, Ala., Palatka, Fla., and Cheraw, S.C. All will be delivered this year.



Mitsui-Built Morgenster Joins South African Marine's Fleet



The S.A. Morgenster will be operated by South African Marine between New York and Capetown.

Mitsui Shipbuilding & Engineering Co., Ltd., recently delivered at its Fujinagata Works the 12,000-dwt high-speed cargoliner S.A. Morgenster, the second of three sisterships, to her owners, South African Marine Corporation.

The first, S.A. Constantia, was delivered at the same yard in July, 1968, and the last, S.A. Vergelegen, will be completed also at the same yard this month. These liners are designed to engage in the New York/Capetown route, with calls at Japan scheduled for the future.

Besides general cargo and refrigerated or frozen cargo, the ship can carry various kinds of oils as well as a total of 214 containers of the 20-foot type. Cargo-handling gear consists of 18 sets of 5-ton booms and two sets of 30-ton heavy-lift booms. MacGregor hatch covers are provided for all holds, with the underdeck covers flush to provide for the use of fork-lift trucks.

The 551-foot vessel is powered by a Uraga-Sulzer 6RD90 diesel engine with a normal rating of 12,750 bhp at 116 rpm. A trial speed of 23 knots was reported by the yard.

These ships are classified by the American Bureau of Shipping.

APL Promotes G. O. Perry To Executive Director-Asia

American President Lines of San Francisco has promoted **George O. Perry** to the post of executive director-Asia, it was announced by **Peter T. Albert**, APL vice-president-marketing.

Headquartered in Tokyo, Mr. Perry will be responsible for all APL operations in all of Asia and will supervise the company's seven branch offices and agency representatives there.

Mr. Perry, who joined APL in 1954, has been managing director for Japan. He has served in the company's offices in Singapore, Indonesia and Tokyo, and has been an owner's representative for Ceylon, India and Pakistan. Most of Mr. Perry's business career prior to joining APL has been overseas in the Asia area with India Caltex, American Independent Oil Company and other oil producers operating in the Persian Gulf.

Grace Line Announces New Management Assignments For Pacific Coast Division

Arthur C. Novacek, president of Grace Line, has announced new senior management assignments for the Line's Pacific Coast Division, necessitated by the recent death of **Ernest R. Senn**, executive vice-president and director of Grace Line and general manager of the Pacific Division.

Albert B. Wenzell, vice-president of Grace Line, will now be responsible for all aspects of its services between United States and Canadian Pacific Coast ports and Latin America.

William A. St. Amant, vice-president of Grace Line, and longtime general manager of the Division's Johnson Line Agency, will now have autonomy in regard to conduct and operations of the agency. Its staff is being measurably increased, particularly in the sales area, in order to handle the increased activities of the Johnson Line which recently introduced the first all-container service between United States and Canadian Pacific Coast ports and Europe/Scandinavia. Grace Line has been agent for this pioneering Swedish steamship company for 55 years.

Mr. Wenzell's 30-years with Grace Line have encompassed a wide variety of assignments, from the purser's staff of a Santa vessel to managerial duties in the course of 17-years in Latin America, including manager, Steamer Department, Grace y Cia., Chile. He was elected a vice-president in 1957 and was in charge of the Line's West Coast of South America Service from New York. Mr. Wenzell also held the position of director of trade development and Latin American affairs, before being transferred to San Francisco in 1967.

Mr. St. Amant is also a veteran of long Grace Line service, having joined the Line in 1927. After early service at sea, and in San Francisco and Los Angeles during the 1930's, he came to New York as assistant freight traffic manager in 1949 and was made traffic manager in 1950. In 1957, he was elected a vice-president and named general manager of the Johnson Line Agency, a relationship that on an expanded basis he is now continuing.

Bethlehem-San Francisco To Build Carfloats For United

United Towing Co., San Francisco, has ordered two railroad carfloats to be built at the San Francisco yard of Bethlehem Steel Corporation at a price reported to be \$1-million each. They have been designated Hull Nos. 4107 and 4108 and are to be of the following dimensions: 384 feet by 76 feet by 20 feet and be of 5,100 gt.



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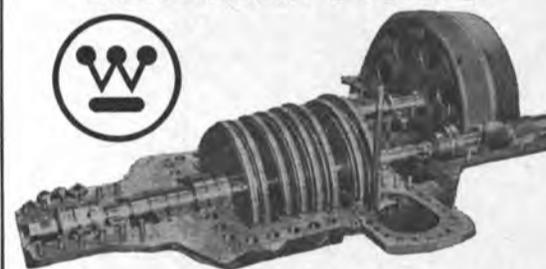
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Midland Insurance Co. Appoints W.F. Immen

William F. Immen has been appointed to the newly created post of port specialist by the Midland Insurance Company of 29 Broadway, New York, N.Y.

In his new assignment, Mr. Immen will act as a coordinator of Midland's claim, engineering and underwriting services and port accounts involved with shipping and stevedoring activities.

Mr. Immen, a graduate of the U.S. Merchant Marine Academy at Kings Point, holds a master's license and served as a first officer for several years. Before joining Midland he was associated with two firms active in the marine insurance field.

Conrad Industries' Method Of Launching Work Barge



The above photo sequence indicates the unique tilt-table launching system used by Conrad Industries of Morgan City, La. The ARC-23, a 120-foot by 30-foot by 7-foot-3-inch barge built for A. R. Crane Jr., was constructed inside the fabrication building. Upper left photo shows part of the yard force which built the barge with Parker Conrad (far right), president of Conrad Industries, and Frank Elliot (center foreground), barge building superintendent, prior to launching. Upper right

view shows barge being pulled over rollers of the launching system. Lower left photo shows the barge being tilted into the Atchafalaya Bay. The lower right view shows the barge retrieval after launching.

The heavily constructed barge will be used along the inland waterways of south Louisiana and in shallow water. It is equipped with spuds, operated by an American 90B three-drum hoist. The barge was designed by Mr. Conrad.

Pratt & Whitney Makes Four Key Promotions

Four key promotions at Pratt & Whitney Aircraft's Turbo-Power and Marine Department have been announced by William J. Closs, TP&M general manager.

Francis W. Powers has been promoted to manager, market planning, a new position involved with planning the overall activities of the Turbo-Power and Marine Department in the expanding industrial and marine market for aviation-type gas turbines.

Austin B. Crouchley has been promoted to marketing manager and replaces Mr. Powers in this position.

Kenneth H. Truesdell has been promoted to manager, systems support, a new position established to expand after-sales support activities for the large number of worldwide customers.

William L. McGaw has been promoted to the new position of manager, engineering operations.

Mr. Powers received degrees in mechanical engineering and business administration from the University of Minnesota. He joined Pratt & Whitney Aircraft as an experimental test engineer in 1942 and has been marketing manager of the Turbo-Power and Marine Department for the past two years.

Mr. Crouchley obtained a bachelor of science and mechanical engineering degrees from Tufts University. He joined Pratt & Whitney Aircraft as a senior sales engineer in 1962 and was a regional marketing manager in the Turbo-Power and Marine Department before his promotion to marketing manager.

Mr. Truesdell obtained a bachelor of science degree in electrical engineering from the Worcester Polytechnic Institute. He joined Pratt & Whitney Aircraft as a sales engineer in the Turbo-Power and Marine Department in August, 1965. Prior to his new assignment, Mr. Truesdell was regional marketing manager.

Mr. McGaw obtained his bachelor of science degree in mechanical engineering from Car-

negie Institute of Technology. He also has done post graduate work at Hillyer College and the University of Connecticut and was graduated from the Management Development Program at the Rensselaer Polytechnic Institute-Hartford Graduate Center. Mr. McGaw joined Pratt & Whitney Aircraft as an experimental test engineer in 1940 and was assigned to the Turbo-Power and Marine Department in 1960 as senior project engineer.

New York City Requests Ferryboat Design Proposals From Six Naval Architects

Six New York naval architectural firms have been requested to submit design proposals for three new Staten Island ferryboats. The invitation to compete for the design contract was issued by New York City's Marine and Aviation Department.

Charles G. Leedham, commissioner of the Marine and Aviation Department, said that the naval architects were given a free hand in submitting designs. The only restrictions imposed were the bow radius, to fit existing facilities, and the capability of carrying 6,000 passengers.

The three new ferryboats will replace three of the Miss New York class boats. The replacement was made possible by a grant from the U.S. Department of Transportation of \$13.4-million.

The naval architectural firms requested to submit proposals were: Gibbs & Cox, Inc.; John J. McMullen Associates, Inc.; J. J. Henry Co., Inc.; M. Rosenblatt & Son, Inc.; George G. Sharp, Inc., and Kindlund and Drake.

Twin City To Build Twin-Screw Towboat

Twin City Shipyard, Inc., St. Paul, Minn., has received an order from Twin City Barge & Towing Co. also in St. Paul, for a twin-screw towboat. The vessel is to measure 85 feet by 24 feet by 9 feet and be equipped with 1,200-total-bhp diesels. It will be named Windy City.

Shipping Leaders To Attend Special Luncheon To Be Held During Shipping Exposition

Leaders of the shipping and transportation industries will join **Charles D. Baker**, deputy under-secretary of transportation, Department of Transportation, on the dais of the All Industry Shipping Luncheon, which will be held on Tuesday, September 16 in the Grand Ballroom of the New York Hilton, New York, N.Y. Mr. Baker is the guest of honor and principal speaker at the luncheon which is being held in conjunction with the 2nd International Shipping, Containerization and Marine Engineering Exposition, which will be at the New York Coliseum on September 15-18.

The industry leaders are **Armour S. Armstrong**, office of the secretary of transportation; **Ralph E. Casey**, executive vice-president

of American Institute of Merchant Shipping; **John T. Cassidy**, senior vice-president, Dart Containerline; **Alexander P. Chopin**, chairman, New York Shipping Association; **Peter E. Edwards**, Foreign Commerce Club of New York; **Roger H. Gilman**, director of planning and development, Port of New York Authority; **Harold F. Hammond**, president, Transportation Association of America; **R. P. Holubowicz**, executive vice-president, United States National Committee, ICHCA; **Edwin M. Hood**, president, Shipbuilders Council of America; **Jacques Leblanc**, president, Dart Containerline; **Randolph Long**, publisher Marine Engineering/Log; Rear Adm. **Gordon McLintock**, superintendent, U.S. Merchant Marine Academy; **John J. McMullen**, president, United States Lines; **Arthur Novacek**, president, Grace Line; **Clifford B. O'Hara**, director of port commerce, Port of New York Authority;

Eugene Pollock, publisher, Container News; **Ted Przedpelski**, president, New York Foreign Freight Forwarders and Brokers Association; **Arthur C. Rutzen**, director, U.S. Department of Commerce; **Michael Stramiello Jr.**, regional commissioner of U.S. Customs; Commissioner **William Tobin**, New York City Department of Ports and Terminals, and Adm. **John M. Will**, chairman of the board, American Export Isbrandtsen Lines.

Standard Oil Of California Orders 261,000-DWT Tankers And Charters 227,000-Ton Ship

Standard Oil Company of California has announced plans for the addition of three more supertankers to its international fleet, raising the total tonnage of new ships the company has contracted for to about 3,250,000 tons.

O. N. Miller, California Standard chairman, said the company has ordered two new vessels of 261,000 tons each and will acquire a new 227,000-ton tanker on long-term charter.

The two 261,000-tonners will be constructed at Nagasaki, Japan, and delivered to the company in the spring of 1972. The charter ship, now under construction, will join the company's service in mid-1970.

In June, Standard accepted delivery of the first of six 210,000-ton supertankers, which have been under construction at shipyards in Sweden and Japan. The company said four other vessels in the 250,000-ton to 260,000-ton class are on order in the Netherlands and Japan, and another time-chartered 210,000-tonner is being built. All supertankers on order to Standard will be in service by 1972.

Eastern Canadian Section Of SNAME Announces 1969-70 Meeting Schedule

The Eastern Canadian Section of The Society of Naval Architects and Marine Engineers has announced its meeting schedule for the 1969-70 season. Meetings will be held on October 7, November 4, and December 2, 1969 and January 13 and 20, February 3 and 24, March 10 and April 14, 1970. A meeting date for May will be announced later.

The officers and committee chairman for the coming season are: **D. M. Craig**, chairman; **Capt. K. P. Farrel**, RCN, vice-chairman; **R. G. Hall**, secretary-treasurer; **G. E. Kristinsson**, **D. R. Moreira** and **L. G. Austin**, executive committee members; **R. Sinclair**, papers chairman; **A. H. Stevenson**, meetings chairman; **C. H. Owston**, publicity chairman; **J. G. German**, membership chairman; **T. D. Anderson**, Sections relation chairman; **R. Lowery**, subcommittee organization, and **J. H. Rensink**, past chairman. All the above members form the Section's executive committee.

R.D. Keiser To Serve With APL In New Post

Raymond D. Keiser recently joined American President Lines, San Francisco, in the newly-created post of general manager-Atlantic Division, it was announced by **Peter T. Albert**, APL vice-president-marketing.

Mr. Keiser, who will be headquartered in APL's New York office, is a veteran of 25 years' experience in freight transportation. Most recently he was with Flying Tiger Line as general terminal manager in New York and as assistant director of marketing in Los Angeles.

Mr. Keiser attended Rutgers University and is a graduate of the Academy of Advanced Traffic in New York. He is a member of the American Marketing Association, the National Council of Physical Distribution and Delta Nu Alpha (transportation fraternity).



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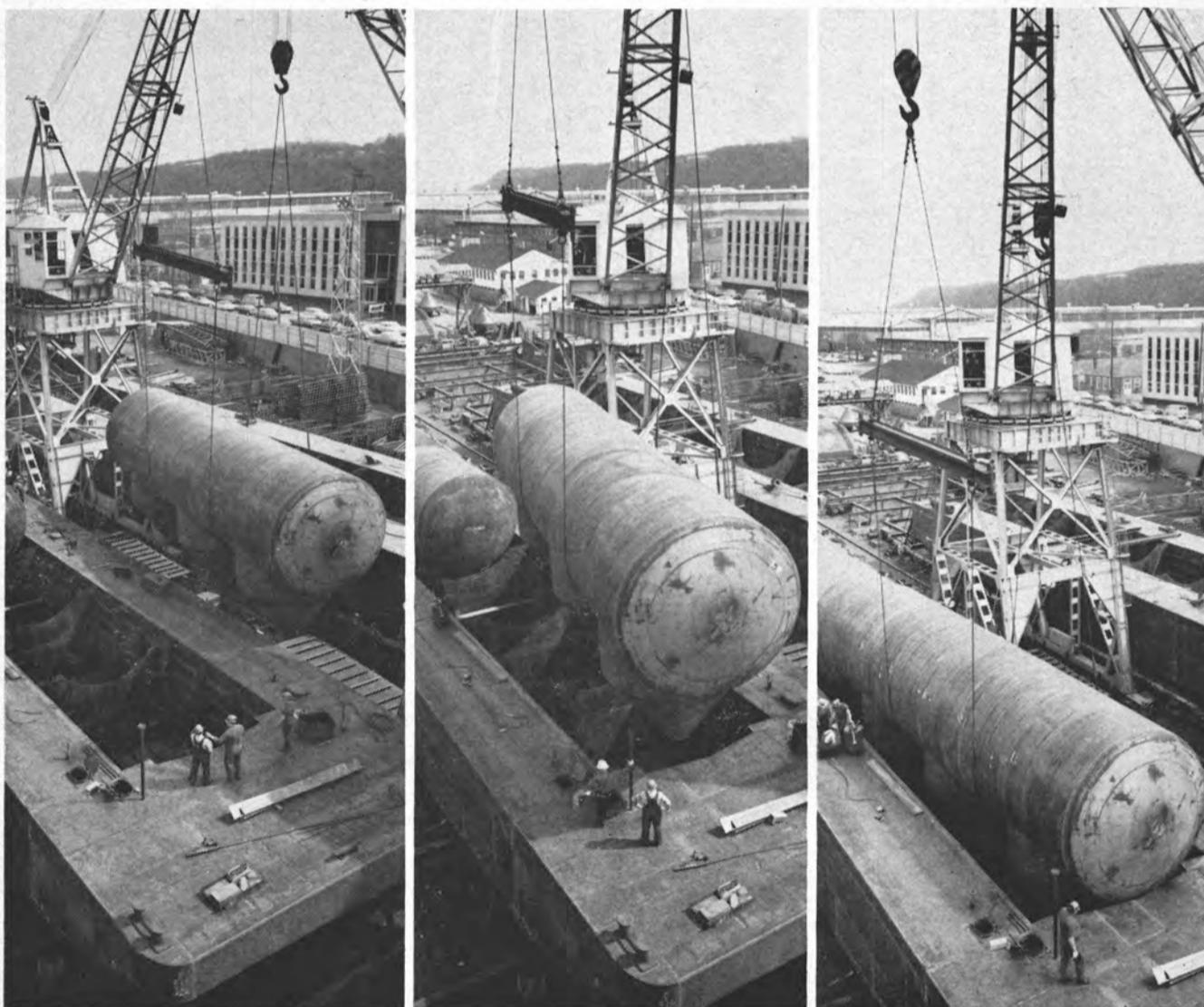
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Freeport International Appoints P. V. Kline Transportation Manager

Paul V. Kline has been named manager of transportation for Freeport International, Inc., a wholly owned subsidiary of Freeport Sulphur Company. Freeport International was formed to develop ventures overseas, and now is investi-

gating a copper deposit in Indonesia and two nickel finds in Australia.

Mr. Kline joined Freeport in 1953 and held several traffic positions before becoming director of transportation for Sulphur Export Corporation, a Freeport affiliate, in 1958. Before joining Freeport he had been with United States Gypsum Company and Standard Milling Company.

Main Iron To Build Twin-Screw Tugboat

Main Iron Works, Inc., Houma, La., has been awarded a contract by Gulf Mississippi Transportation Co., New Orleans, La., to build a twin-screw tugboat. The tug is to have an overall length of 111 feet, a beam of 30 feet, a depth of 12 feet 5 inches and will be equipped with 3,000-total-bhp diesels.

Transicold Expands General Sales Staff

Jack Sell, vice-president-marketing, Transicold Corporation, Montebello, Calif., has announced the appointments of Ted Harris to general sales manager and Bob Reider to assistant general sales manager of the transport refrigeration firm.

Mr. Harris joined Transicold in 1966 as chief instructor of the National Service School in Chicago. Before joining Transicold, Mr. Harris worked for Honeywell, Inc. for 11 years in field sales-Commercial Division. He has valuable management and manufacturing experience gained from operating his own air conditioning firm. He is a graduate of Washington University-St. Louis, holding a BSEE degree.

Mr. Harris will supervise the company's national and international network of distributors, sales and service outlets and regional sales managers throughout the country.

Mr. Reider joined Transicold in 1965 directly from Los Angeles State College where he received a BS in business administration. In October, 1965 he was promoted to Montebello-sales representative and in January, 1966 was appointed Los Angeles Branch-sales representative. After two years of outstanding sales and customer relations work at the branch, he was promoted to a regional sales manager post in the midwestern area.

Mr. Reider's experience in administration procedures, sales, and customer relations will be invaluable to Transicold customers, according to Mr. Sell.

Camlock Automates CL Coupling Line

Camlock Flange Sales Corp. has automated its CL Coupling by incorporating a remote controlled hydraulic operating system.

The new coupling, which can be quickly hooked up through rapid remote controlled action of its helical cams, can now be opened and closed in seconds. Ideal for use on lines of 12 inches and larger, the couplings have been designed for 150-pound ASA service and hydrostatically tested to 450 psi as leak-proof. A 300-psi size is also available.

For more information, write Camlock Flange Sales, Inc., 449 Sheridan Boulevard, Inwood, N.Y. 11696.

J. M. Bringslid Joins Columbus Line As Manager-Operations

Columbus Line in New York has named John Martin Bringslid its general manager of operations. Mr. Bringslid formerly was division operating manager for Central Gulf Steamship Corporation and before that was for four years a deck officer with the then American Export Lines. He is a graduate of the New York State Maritime College.

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Limongelli And Elia Named Vice-Presidents By East West Shipping

Eugene B. Limongelli has been named vice-president of sales for East West Shipping Agencies, Inc., 17 Battery Place, New York, N.Y., according to an announcement by Edward M. Halloran, president.

Mr. Limongelli has been actively engaged in foreign trade since 1957 both in operations and solicitation. Prior to joining East West he was manager of the Virginia State Ports Authority office in New York.

During his years in the steamship business, he has gained vast experience in all phases of foreign trade and transport.

Allen F. Elia also has been named vice-president of operations. Mr. Elia was formerly vice-president in charge of terminal operations for United States Navigation Company for both break-bulk service and container service.

Westours Acquiring 250-Passenger Ship

Westours, Inc., a Seattle-based cruise ship organization, has announced plans to acquire the 250-passenger liner Izarra for operations in the Alaskan trade in 1970.

With the new ship, to be renamed the West Star, Westour's fleet will number four vessels. Already in operation are the Polar Star, Glacier Queen and Yukon Star.

Littleton To Prepare Vibration Studies For Avondale On LASH

Littleton Research and Engineering Corp. was recently awarded a contract by Avondale Shipyards Inc. for the continuation of hull vibration studies on the LASH ships. Under a previous contract with Avondale, Littleton Research studied the vertical vibration of the LASH ships in order to predict where vibration problems might occur. On the basis of these studies a number of recommendations resulted in design changes. Avondale Shipyards then decided to have the vibration prediction on the LASH ships completed by studying the coupled torsional-lateral modes.

The torsional-lateral modes of vibration are considerably more complex than the vertical modes. Thus, although they are often the more severe form of vibration, they are considerably harder to predict than the vertical modes.

The prediction procedure developed by Littleton Research requires a detailed evaluation of the mass and elastic properties of the ship, and a careful estimate of both the hull pressure forces and the harmonic forces generated on the propeller. The calculations take into account the effects of local resonances, the influence of added mass due to water inertia and the effect of the gyroscopic forces occurring at the propeller. The result is a prediction of overall vibra-

tion amplitudes at key points throughout the ship.

Filippo Cali, chief naval architect for Avondale Shipyards, is coordinating the program. F. E. Reed, president of Littleton Research, and Ronald G. Orner, a senior analyst, are making the vibration predictions.

Barge Construction

Jeffboat, Inc., Jeffersonville, Ind., was contracted by Bauer Dredging

Co., Inc., Port LaVaca, Texas, to construct a 1,200-dwt oil barge. Designated Hull No. 2251, it will measure 150 feet by 50 feet by 9 feet 6 inches.

Jeffboat will also build a 1,000-dwt deck barge for Luhr Midwest Corp., Nebraska City, Neb. This barge will have dimensions of 175 feet by 36 feet by 10 feet.

Maxon Construction Co., Tell City, Ind., is to build two 1,400-dwt deck cargo barges for Taylor Sand

& Gravel Co., Caruthersville, Mo. Designated Hull Nos. 945 and 946, they will have the following dimensions: 195 feet by 35 feet by 9 feet 6 inches.

Oilfield Barges, Inc., Harvey, La., is to build two 900-dwt deck cargo barges for Barnett Towing, Inc., also in Harvey. Designated Hull Nos. 20 and 21, each barge will have the following dimensions: length—140 feet, beam—39 feet 6 inches, depth—9 feet.

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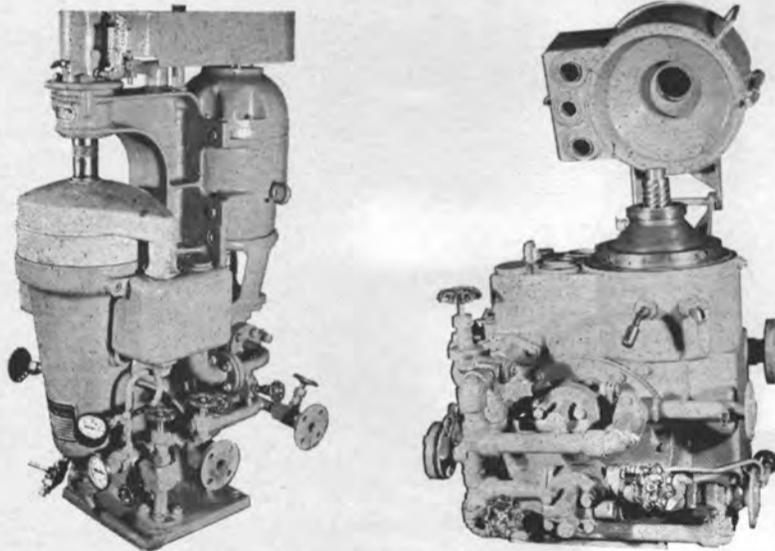


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Essomarine Adds Lube Barges In Rotterdam, Tokyo And Kobe



Esso Nederland 50 has entered service in Rotterdam.

Rotterdam, Tokyo and Kobe are the home ports for three bulk-delivery barges newly put into service by the Esso companies.

The Esso Nederland 50 began making direct deliveries into ships' lube tanks in Rotterdam harbor in July. The barge has ten tanks, six of them heated, and a total bulk capacity of 26,400 U.S. gallons. Each of her two pumps can deliver product at the rate of 7,900 gallons an hour. The 9-knot vessel also has storage space for 80 drums (4,400 U.S. gallons) of lubricants.

The Esso Tokyo Maru has a bulk capacity of 14,300 U.S. gallons. The barge serves ports throughout Tokyo Bay, including Kawasaki, Uraga, Yokohama, Yokosuka, and Tokyo itself. The new Esso Kobe Maru can carry 18,500 U.S. gallons in bulk. Amagasaki, Hirohata, Kobe, Kure, Mizushima, Osaka and Wakayama are among the Osaka Bay and Seto Inland Sea ports served by the Esso Kobe Maru. Each of the Japanese barges has five tanks, a pumping rate ranging from 3,100 to 6,600 gallons an hour, and hold space for 25 drums (1,375 U.S. gallons).

Announcement also has been made of the acquisition of tank trucks to deliver Essomarine lubricants in bulk at Lisbon, Portugal and at Los Angeles (Long Beach and San Pedro) and San Diego on the U.S. West Coast.

The Esso companies deliver product from barges or tank trucks at well over 100 ports. Nearly half of all Essomarine lubes are now delivered in this way.



Esso Tokyo Maru serves ports in Tokyo Bay area.

E.J. Flynn Heads Pacific Maritime Assoc.

Edmund J. Flynn, former director of industrial relations with the Metal Mining Division of Kennecott Copper Corporation in New York, has been named president of the San Francisco-based Pacific Maritime Association. According to the announcement by PMC, he succeeds to the post held previously by Undersecretary of Commerce Rocco C. Siciliano.

Mr. Flynn, who served in the past with the National Labor Relations Board and as secretary and director of industrial relations for the Printing Industry of America in Washington, will head the operations of PMA in future negotiations with longshore and American seagoing labor on the West Coast. PMA represents 113 steamship lines, stevedoring and pier terminal companies in collective bargaining and contract administration from San Diego to the Canadian border.

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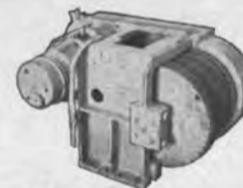
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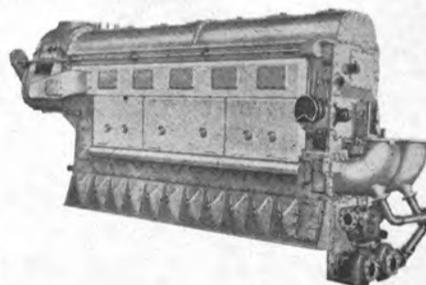
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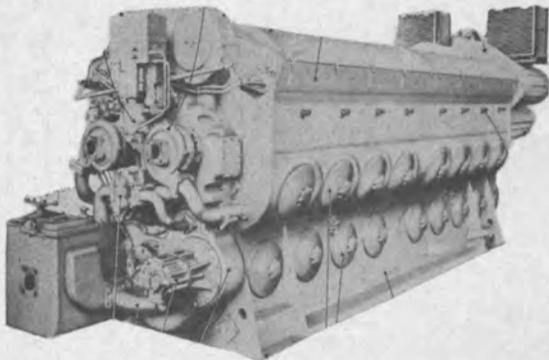
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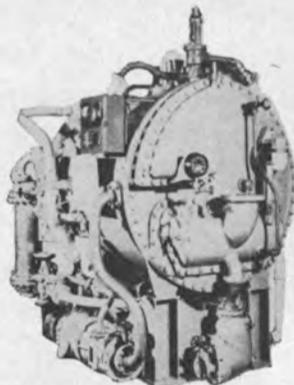
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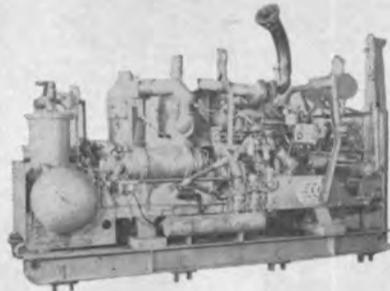
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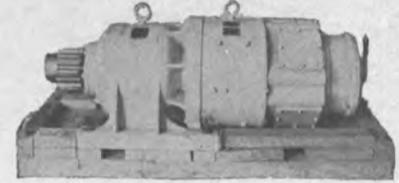
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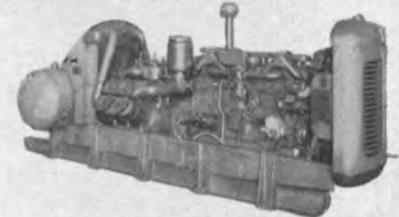
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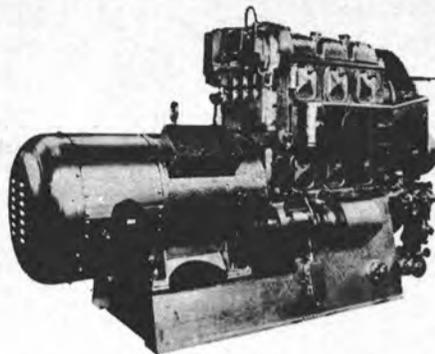
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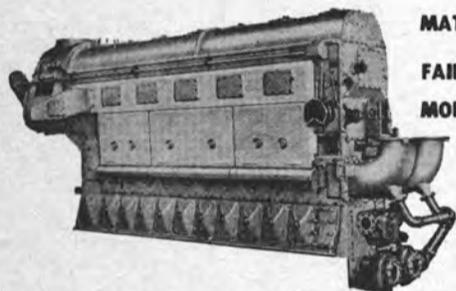
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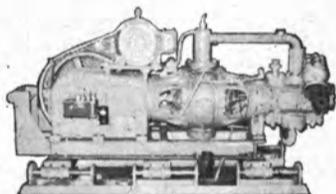
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TURBINE GENERATORS

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

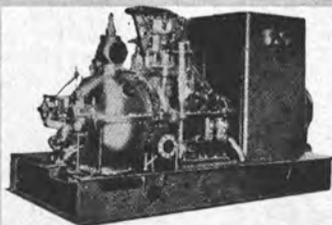
WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, driving on same common shaft a 250 KW Generator, 440/3/60, and a 90 KW Generator, 125 Volts DC.

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.



WATERTIGHT DOORS

As removed from reserve "moth-balled" 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.

USED, GOOD STEEL
"QUICK-ACTING WHEEL TYPE"
and DOG TYPE

Other sizes and prices quoted on request.

BEST BUYS!

AC & DC

Marine PUMPS

ZIDELL

EXPLORATIONS, INC.

3121 S.W. Meedy
Portland, Oregon 97201
Phone: (503) 228-8691
Telex: 036-701

Contact

Ralph E. Ingram
(503) 228-8691

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

AC PUMPS—Horizontal Centrifugal

- 2—Goulds, 2000 GPM, 470' head, Size 8x10, with Westinghouse Motors, 350 HP, 2300/3/60.
- 1—Ingersoll-Rand, 3000 GPM, 250' head, Size 8ALV, with Westinghouse Motor, 250 HP, 2200/3/60, 1775 RPM.
- 1—Worthington, 400 GPM, 150 PSI, 5½" suction, 3½" discharge, with G.E. Motor, 75 HP, 440/3/60, 3550 RPM.
- 2—Goulds, 300 GPM, 336' head, 3" suction, 2" discharge, with G.E. Motors, 50 HP, 440/3/60, 3550 RPM.
- 7—J.C. Carter, 365 GPM, 250' head, stainless steel, 3" suction, 3" discharge, with 220/440/3/60 Motors, 25 H.P.
- 8—Worthington, 200 GPM, 100 PSI, 3½" suction, 3" discharge, with wagner motors, 25 HP, 440/3/60.
- 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.
- 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.

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

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

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

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

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



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

STOCKLESS ANCHORS

USED, GOOD QUALITY . . . SAVE!

ANCHORS.. Unused, surplus 3000 # size Danforth

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



1" size
1 1/8" size
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 2 1/8" Chain, 65 HP, 230 DC, complete.

7—American Hoist and Derrick Company, horizontal, double wildcat—for 2 1/4" chain double gypsy, 70 HP, 230 Volts DC, with electric controls.

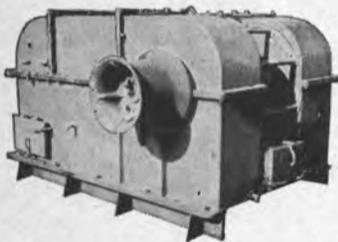
3—Hesse-Ersted, horizontal, double wildcat, 2 1/8" chain, 60 HP, 230 DC.

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

ANCHOR WINCHES

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

UNIWINCHES



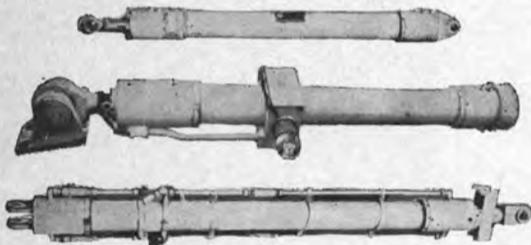
LAKESHORE UNWINCHES, with Allis-Chalmers Motors, 50 HP, 230 Volts DC, complete with Control Equipment.

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

STEERING STANDS



Brass Steering Stands. Complete with angle indicator on top, used, 11" base diameter by 35 1/2" 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 1 1/4" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

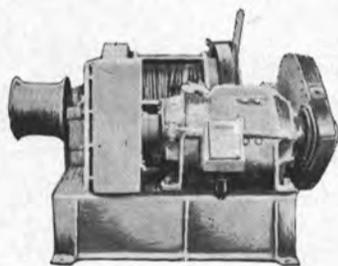


3—Hesse-Ersted Vertical, Single Wildcat—for 1 3/8" Anchor Chain, single gypsy, with HP General Electric Motor, 230 Volts DC, complete with Controller equipment.

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

McKiernan—Terry, Single Wildcat—for 3/4" chain, Single Gypsy, with underdeck drive with Star Motor, 7 1/2 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.

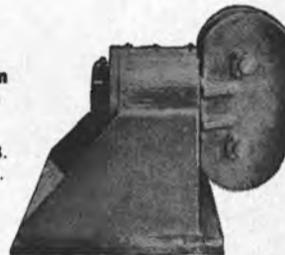


Standard Design
\$995 each

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 Liberty Ships and LST Vessels

PROPELLER SHAFTS

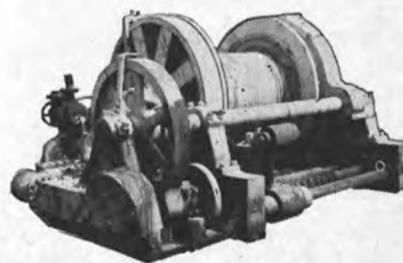
From C3-S1-A3 Vessel

From C2-S-B1 Vessel (Moore built)

From C2-SU Vessel

From Liberty Ships and LST Vessels

STEAM TOWING WINCH



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

Contact
RALPH E. INGRAM



**IMMEDIATE
DELIVERY**

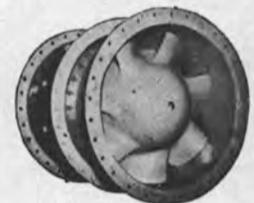
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AXIAL FLOW FANS

Rebuilt—Guaranteed



LaDel,
STURTE-
VANT
etc.

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

EXAMPLE LISTING:

Size A 1/4	@ \$160 each
Size A 1/2	@ \$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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ZIDELL

EXPLORATIONS, Inc.

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PORTLAND, OREGON 97201
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TELEX: 036-701



CARGO HOISTER BLOCKS

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

\$34.50 each

\$39.50 each with pull test cer-
tificates.

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 5 1/2" 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, 7 1/2 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 2 1/2 x 2, 17 GPM, 127' head, 5 HP, 230 DC.

MAIN CONDENSATE PUMPS, 2—Allis-Chalmers, Type CF-2V, vertical volute, Size 6 x 3 1/2, 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 2 1/2 x 1 1/2, 30 GPM, 208' head, 7 1/2 HP, 230 DC.

DIESEL OIL PUMP, Viking, Type ZKK, gear type, Size 3 x 2 1/2, 40 GPM, 30 PSI, 2 HP, 230 DC.

DISTILLER FRESH WATER DISTRIBUTION PUMPS, 2—Allis-Chalmers, Type SS-DH, horizontal centrifugal, Size 2 1/2 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 3 1/2, 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 2 1/2, 20 GPM, 400 PSI, 2 1/2 x 1 1/2, 10 HP, 230 DC.

ICE WATER CIRCULATING PUMP, Allis-Chalmers, Type SS-RH, 10 GPM, 81' head, 1" x 3/4", vertical volute, 1 HP, 230 DC.

HOT WATER CIRCULATING PUMP, Allis-Chalmers, Type SS-HH, 35 GPM, 70' head, 1 1/4 x 1 1/4, vertical volute, 2 HP, 230 DC.

REFRIGERATION CONDENSER CIRCULATING PUMPS, 2—Allis-Chalmers, Type SJK, 180 GPM, 81' head, 2 1/2 x 2, horizontal volute, 7 1/2 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, 7 1/2 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, 5 1/2 SP, 75 HP, 230 DC.

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

FORGED STEEL LINE SHAFTING

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

All items flanged

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

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

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SIZE 36-17 SIZE 20-5
SIZE 36-14

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

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

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

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

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

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

PORT FEED PUMP, Worthington, steam, Size 9 1/2 x 6 x 24 (2)

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

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

MAIN CONDENSATE PUMP, Worthington, Size 2 1/2-UZ-1, 120 GPM, 208 TDH, 15 HP, 230 DC (6)

AUXILIARY CIRCULATING PUMP, Worthington, Size 1 1/2-UZS-3, 20 GPM, 208 TDH, 5 HP, 230 DC (6)

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

LUBE OIL SERVICE STANDBY PUMP, Worthington, steam, Size 5 1/2 x 2 3/4 x 6 (2)

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

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

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

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

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

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

SANITARY PUMP, Worthington, Size 2 1/2 x 2, 2HP, 230 DC (4)

DRINKING WATER PUMPS, Size 2 1/8 x 2, 3/4 HP, 230 DC (4)

VACUUM PRIMING PUMPS, size MD537, 1 1/2 HP, 230 DC (4)

FORCED DRAFT FAN, Size 3 1/2 AHS, 7880/5970 CFM, S.P.—6.2/14 with G.E. motors 5/25 HP, 230 DC, 1910/3120 RPM (7)

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

**1 Only
ORTON WHIRLEY CRANE**

Lifting Rate: 25 tons @ 50 Ft. Radius @ 50 to 60 FPM.—
Boom: 80' to headblock (with 10' whip)
Whip: 10 tons @ 125 FPM—2 part line
Track Centers: 20'—Engine: Cummins HBIS 601, 180 HP supercharged, elec. start—
Motors: Each leg (4 tot.) 7½ HP, 230 DC.—
Power: Diesel electric (DC)

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230 VOLT D.C. MOTORS

- 1—250 HP, G.E., Type CY, Form HJ, Model 24G, 1200 RPM Horizontal, 2 B.B., Shunt Wd.
- 2—220 HP, G.E., Type CDM-1348S, Form HA, Model 25G 339, 1800 RPM, Stab. Sh. Wd. Horizontal, 2 B.B.
- 6—100 HP, Westinghouse, Type SK, FR. 163, Style 1B4631, 1150 RPM, Shunt Wd. Horizontal, 2 B.B.
- 2—55 HP, Electro-Dynamic, FR 25-SL, 550 RPM, Compound Wound, Single Ball Bearing. Originally for high pressure Air Compressor.
- 6—50 HP, Westinghouse, 600 RPM, Compd. Wd., Type CK, FR 9, Horizontal 2 B.B.
- 1—40 HP, Allis-Chalmers, 1750 RPM, Compound Wound, Horizontal, 2 B.B.
- 1—40 HP, G.E., Type CDM, FR 95, Model 35A1663, 1800 RPM, Compound Wound, Horizontal, 2 B.B.
- 1—18/25 HP, Electro-Dynamic, 1225/1750 RPM, Compd. Wd., FR. 7½ S, Horizontal, 2 B.B.
- 6—15 HP, Allis-Chalmers, 1225/1750 RPM, Stab. Sh. Wd., Type EB90, Horizontal, 2 B.B.
- 2—10 HP, Allis-Chalmers, 1225/1750 RPM, Compd. Wd., Type EB80, Horizontal, 2 B.B.
- 4—9.3 HP, Westinghouse, 640/852 RPM, Type SK, FR. 93.

120 VOLT D.C. MOTORS

- 1—304 HP, Westinghouse, 900 R.P.M., Shunt Wound, Horizontal, Pedestal Bearing.
- 3—25 HP, G.E., Type CDM, 1200 R.P.M., Horizontal, 2 B.B., unused. Removed from M.G. Sets.
- 20—7½ HP, Westinghouse Type SR, FR 43, Stab. Sh. Wd., 1750 RPM.

STEERING GEAR MOTORS

- 2—General Electric, 30 HP, 230 V, DC, 600 RPM, Stab. Sh. Wd., Type CDM, Fields Continuous Duty, Armature 1 Hr.
- 1—Westinghouse, 35 HP, 230 V, DC, 850 RPM, Stab. Sh. Wd., Type SK, Fr. 123, Fields Continuous Duty, Armature 1 Hr.

SHIP'S LIGHTING M-G SETS

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

SPECIAL D.C. GENERATORS

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

MOTOR-GENERATOR SETS

Unused Surplus in Original Boxes



Janette M-G Sets. Input: 1.75 HP, 230 V, DC, 7.2 Amperes, 1800 RPM. Output: 1-KVA (.85 KW), 115/1/60, 4 ball bearing, with speed regulator, and with noise filters. Navy Type CJM-21151, continuous duty. Net weight 435 #, Dimensions 44" L, 19½" W, 18½" H. Instruction book and parts list included.

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

D.C. MARINE CONTROLLERS

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

ROTOTROLS

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

D.C. TRANSFER PANEL

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

SPARE ARMATURES

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

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

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

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

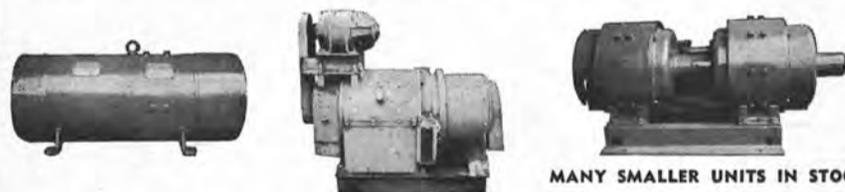
D.C. GENERATORS

- 2—500 KW, 120/240 V, Westinghouse FR. CB813.7, 750 RPM, 2 Pedestal Bearing, with Balance Coils. Removed from GM 8-278 Engines.
- 2—250 KW, 120/240 V, Westinghouse, 1200 RPM, Single Pedestal Bearings. Balance Coils not available, Type 12S18P107PH, removed from Turbines.
- 2—150 KW, 120 V, G.E., Type CDM-1348-S, Form HA, Model 25G 340, 1800 RPM, Compound Wound, Horizontal 2 B.B.
- 1—150, 120 V, GE, Type CDM, Form AA, Model 24G, 1200 RPM, Compound Wound, Horizontal, 2 B.B.
- 6—100 KW, 120/240 V, Westinghouse, Type SK, FR. 143.8, 1800 RPM, Single Ball Bearings. Balance Coils available.
- 3—100 KW, 120/240 V, Delco, 1200 RPM, Single Bushed Bearings, with Balance Coils. Removed from Superior GDB-8 Engines.
- 1—100 KW, 120/240 V, Allis-Chalmers, 1200 RPM, Single Sleeve Bearing, Shunt Wound, Type 4-14-45-13, removed from GM 3-268A Engine.
- 10—90/165 KW, Westinghouse, 125/400 Volt, Type SK, FR. 185, Shunt Wound, separately excited (120 V), 1200 RPM, Horizontal, 2 B.B.
- 4—75 KW, 120 V, G.E., Type CDM-1234, Mod. 24GA71, 1200 RPM, 2 Ball Bearing, Tapered Shaft. Removed from Motor-Generator Sets.
- 6—60 KW, 120 V, Westinghouse, Type SK, FR 143, Style 3B2855-PH, 1800 RPM, 1 B.B. Removed from Turbines.
- 6—60 KW, 120 V, Westinghouse, Type SK, FR. 153-L, Style 1B4632, 1200 RPM, Compound Wound, Horizontal, 2 B.B.

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

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

**Reconditioned
MOTOR GENERATOR SETS**



MANY SMALLER UNITS IN STOCK

230 VOLTS D.C. TO A.C.

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

115 VOLTS D.C. TO A.C.

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

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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 27 3/4" — Cast Steel.

IMMEDIATE DELIVERY FROM STOCK



BULWARK-MOUNTED CHOCKS

for curved or flat plate

7" RADIUS—14" x 10" opening

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7 x 10 CLYDE DOUBLE DRUM WINCHES



Drum 8500 lbs @ not less than 120 FPM; 13,000 lbs at no specified speed. Gypsy head 22,500 lbs. static pull. Foot brake to hold 17,000 lb. pull. Steam cylinders with standard 250 PSI.

DIMENSIONS:

9' 5 3/4" wide over winch heads
5' 10 1/2" wide on bedplate
4' 1" deep over bedplate
6' 5" overall—brake pedal, etc.
2" steam—2 1/2" exhaust.

Drums 16" diameter—20" wide—33 13/16" over flanges. Rebuilt by U.S.N. equal to new.

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14" R-2418 WATEROUS CARGO PUMP

With Reduction Gear & Diesel Drive



PUMP: All bronze body & rotors. Shaft and gears of Hi Tensile steel. Suction and discharge 14". Top discharge—side suction. CAPACITY: Bilge service 2500 GPM @ 20 PSI @ 71 HP. Oil service 2400 GPM @ 75 PSI @ 130 HP. Gear input at top (12 o'clock). Length of pump and gear: 75 3/8" long by 51" wide. ENGINE: Cummins diesel model JN-130-M—6 cyl.—4 1/8 x 5—130 HP @ 2500 RPM with power takeoff. Weight 2080 lbs.—reduction gear ratio 10.059:1—air starting but can be converted to electric starting. Typical serial No. 5289.

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NEW ALLIS-CHALMERS WINCH CONTROL PANELS



(7) 50 HP—230 volts DC—right hand—mfg by Allis-Chalmers. Resistors, control and brake. Dwg EK9231—U.S.M.C.—820-2—1404 ALT.

(6) As above, but left hand units.

\$1195 each

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



G.E. Type CG-21ACR in a single frame. MOTOR: 5 HP—115 V.D.C.—38 amps—3600 RPM. GENERATOR: 3.5 K.V.A.—2.97 KW—115 volts—1 phase—60 cycle—30.4 amps—model 5LY128A5. DIMENSIONS: 30 3/4" long x 14" wide x 12 3/4" high. Includes magnetic motor starter—Westinghouse 115 V.D.C.—size 3DC—class 6311-S31—push button station. Voltage regulator: type CG-23ACE—weight about 800 lbs. each. 2 Boxes of spare parts.

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

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DUPLEX STRAINERS

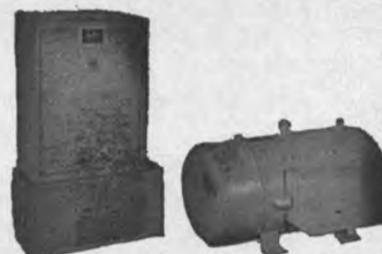
in good condition

4" \$349.00
22" x 3" between mounting holes
2" \$249.00
15" x 3" between mounting holes

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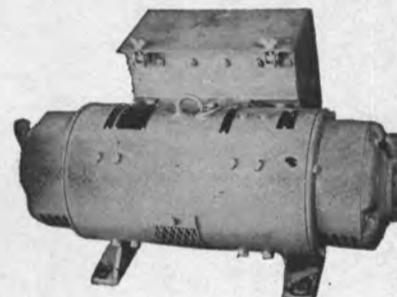
M.G. SETS



UNUSED SURPLUS 1 KVA SETS

INPUT: 1.75 HP—115 Volts DC—17 amps—1800 RPM. OUTPUT: 1 KVA—115 volts—8.7 amps—60 cycle single phase—0.9 PF. Unit is self-excited and will carry load immediately on starting. Regulation ±5%. Complete with magnetic starter & spare parts. Units designed and built to rigid Navy specs. SIZE: 19.5" long—26.5" wide—16" high. Weight 285 lbs. SPARES: 85 lbs. CONTROL: 20"X15"X10"—75 lbs.

\$18950



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.

\$12750



25 KW IDEAL M.G. SETS

INPUT: 40 HP—115 volts DC—290 amps—1800 RPM—frame 445. OUTPUT: Generator 31.5 KVA—25KW—440/3/60—1800 RPM. Control cabinet includes motor starter & generator control.

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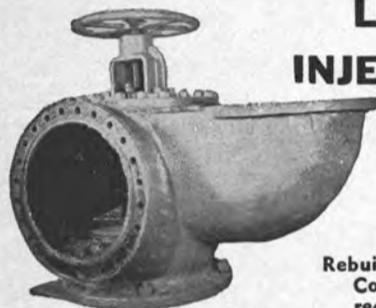
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**LOW
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WHILE THEY LAST

\$695 CLOSE
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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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LESLIE PUMP GOVERNOR VALVE

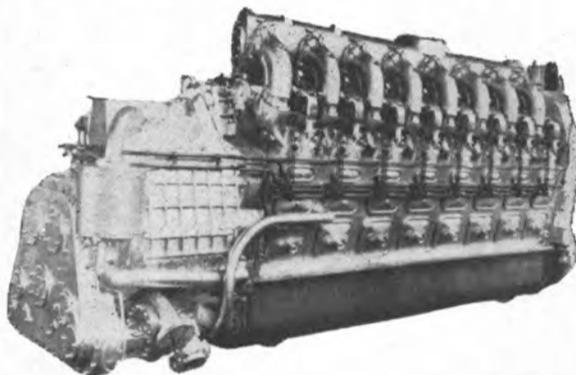
New—in original crates. For
U.S. Naval Vessels—type CT-
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8-268A 240KW Diesel Generator Sets
500 HP @ 1200 RPM—3/60/440—with all accessories

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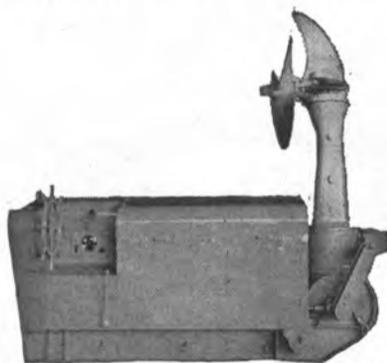
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Model 02-D—powered by 6-cylinder G.M. 6-71
diesel—driven through Oliver gear—8708—for-
ward ratio 1:1.27—reverse 1:1—3 blade propel-
ler—48" diameter—24" pitch—left hand—man-
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READY TO GO!

ALSO AVAILABLE

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NEW — UNUSED — 115 V.D.C.

20000 C.F.M. — 115	10000 C.F.M. — 115
16000 C.F.M. — 115	5000 C.F.M. — 115 (explosion-proof)
12000 C.F.M. — 115	4000 C.F.M. — 115

RECONDITIONED — 440 V.A.C.

A1A4W5 to A16A4W5—with starter—440/3/60
1000 C.F.M. 6000 C.F.M.
2000 C.F.M. 8000 C.F.M.
3000 C.F.M. 10000 C.F.M.
4000 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. 44 1/4"

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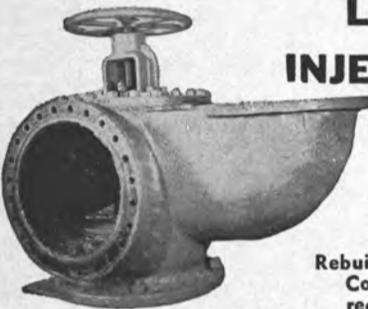


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24" OVERBOARD DISCHARGE VALVES

Reconditioned to ABS standards



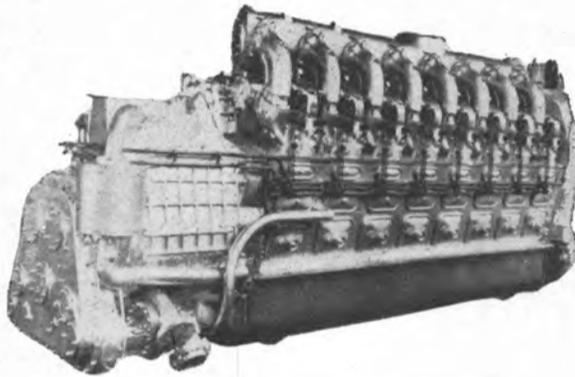
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120 volts DC—400 RPM—drip-proof marine type. 2-Wire direct connected set. Reciprocating 6 x 7 type E vertical self-oiling steam engine—plug & piston valve—220 lbs PSI—80 lbs. BP.

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LESLIE PUMP GOVERNOR VALVE

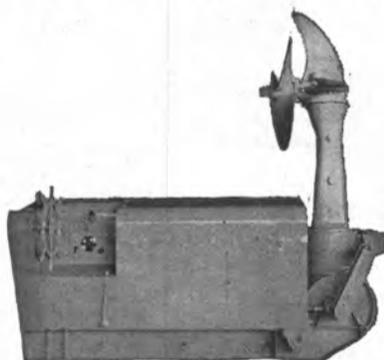
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NEW — UNUSED — 115 V.D.C.

20000 C.F.M. — 115	10000 C.F.M. — 115
16000 C.F.M. — 115	5000 C.F.M. — 115 (explosion-proof)
12000 C.F.M. — 115	4000 C.F.M. — 115

RECONDITIONED — 440 V.A.C.

A1A4W5 to A16A4W5—with starter—440/3/60
1000 C.F.M. — 6000 C.F.M.
2000 C.F.M. — 8000 C.F.M.
3000 C.F.M. — 10000 C.F.M.
4000 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. 44 1/4"

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The West Indies Oil Co., Ltd., St. John's Antigua, W. I.

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Eureka Chemical Co., 234 Lawrence Ave., South San Francisco, Calif. 94080
Farboil Company, 90 West St., N.Y., N.Y. 10006
Plasma Chemical Systems, Inc., 13909 Lee Jackson Hwy, Chantilly, Virginia 22021
USS Chemicals (Div. of U. S. Steel), P. O. Box 86, Pittsburgh, Pa.

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Lighter Aboard Ship, Inc., 225 Baronne St., New Orleans, La. 70112
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
RPC Corp., Marine Sales, 200 Park Ave., New York, N.Y. 10017
Star Iron & Steel Co., 336 Alexander Ave., Tacoma, Wash. 98421
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Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
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Hensen-Rotterdam, P.O. Box 5040, Rotterdam, Holland
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Red Fox Machine & Supply Co., P.O. Drawer 640, New Iberia, La. 70560
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Howard Turner Mfg. Co., 2545 Palm Drive, Signal Hill, Calif. 90806
Western Gear Corp., Heavy Machinery Div., Everett, Wash. 98201

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Metropolitan Floor Covering, Inc., Div. of Drehmann Paving & Flooring Co. 2101 Byberry Rd., Philadelphia, Pa. 19116

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Fiat, Turin, Italy, U.S.A. 375 Park Ave., New York, N.Y. 10022
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M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
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Stewart & Stevenson Services, Inc., 4516 Harrisburg Blvd., Houston, Texas 77011
Stork Dieselmotoren, Kromhout Motoren, P.O. Box 4196, Amsterdam, Holland.

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Valad Elec. Heating Co., 71 Cortlandt St., Tarrytown, New York

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Vickers, Marine & Ordnance Division, P.O. Box 302, Troy, Mich. 48084

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Metal Finishers, Inc., (Macrome Division), 3125 Brinkerhoff Road, Kansas City, Kansas 66115

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Western Gear Corp., Industrial Products Div., P.O. Box 126, Belmont, Calif. 94003

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Electronics Concepts Inc., (Div. of Automatic Sprinkler Corp. of America) P. O. Box 813, Charlottesville, Va. 22902
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Griffith Marine Electronics, Inc., 79 Fourth Street, New Rochelle, N. Y. 10801
Kaar Electronics Corp., 2250 Charleston Road, Mountain View, Calif. 94041
Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
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
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Brazos Engineering, a div. of Metallic Bldg. Co., 4625 Holmes Road, Box 14240, Houston, Texas 77021
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Gulf Coast Marine, Inc., P.O. Box 52987, Houston, Texas 77052
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Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
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Port Electric Turbine Div., 155-157 Perry St., New York 10014
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Motorola Communications & Electronics, Inc., 4935 W. LeMayne Ave., Chicago, Ill. 60651
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
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 Mobil Oil Co., Inc., 26 Broadway, New York, N.Y. 10004
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 Shell Oil Co., 50 W. 50 St., New York 10020
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 Devoe & Reynolds Co., Inc., Marine Division, Newark, N.J. 07105
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 Refineria Panama, S. A., 277 Park Ave., New York, N.Y. 10017
 Shell Oil Co., W. 50 St., New York 10020
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 Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231
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 Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of
 Sperry Rand Corp.

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 Syntrol, 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
 Albino 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 In-
 dustria, 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.
 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 Nakanoshima 2-chome Kitaku, Osaka-Japan
 Ishikawajima-Harima Heavy Industries Co., Ltd., 50 Broad Street
 New York, N.Y. 10004
 Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla.
 Jeffboat, Inc., Jeffersonville, Ind. 47130
 Kawasaki Dockyard Co., 8 Kaigan-dori, Ikuta-ku, Kobe, Japan
 LISNAVE, P.O. Box 2138, Lisbon, Portugal
 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-Muramachi, 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, Chiyoda-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

Pearson 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
 Rodermund Industries, Foot of Henderson St., Jersey City, N.J. 07302
 L. Rodriguez Shipyard, 24 Molo Norimbergo, 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
 Vore Corp., Equipment Systems Div., 516 Sylvan Ave., Englewood
 Cliffs, N.J. 07632
 Vickers Ltd., 222 London Rd., St. Albans, Herts, England
 Wyatt Industries Inc., Port Houston Shipyard Div., P.O. Box 3052,
 Houston, Texas 77001
 Ziegler 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

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.
 Intra-Coastal Towing & Trans. Co., P.O. Box 7533, Houston, Texas
 77007
 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.
 Turecama 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.
 Hydrosarch 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

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 & McCorken, 153 Franklin St., New York, N.Y. 10013

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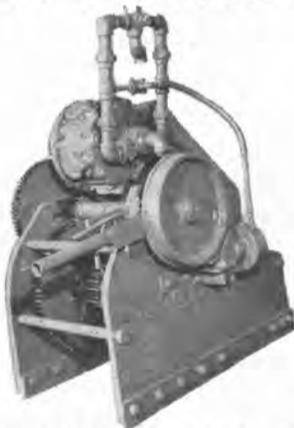
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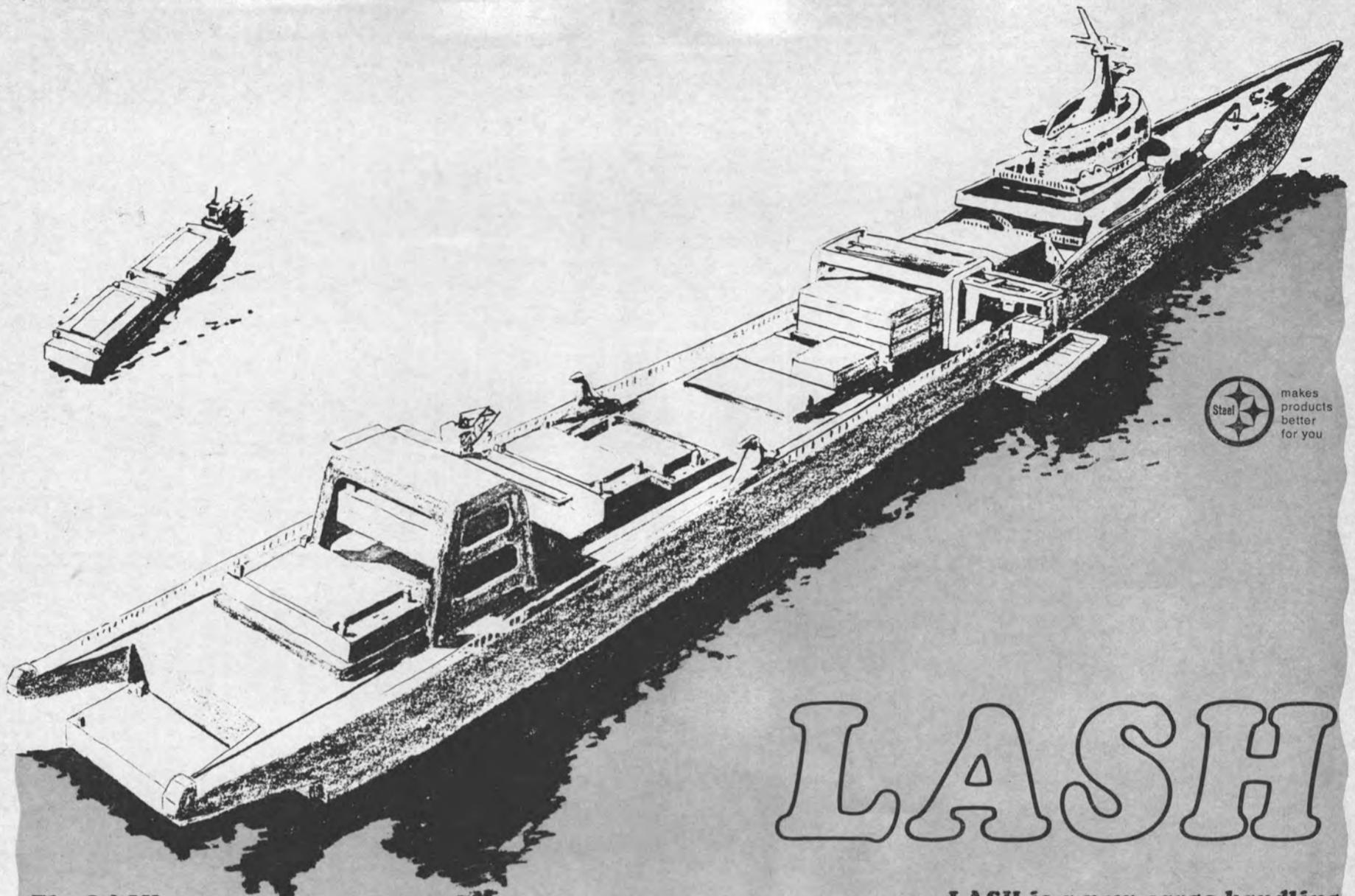
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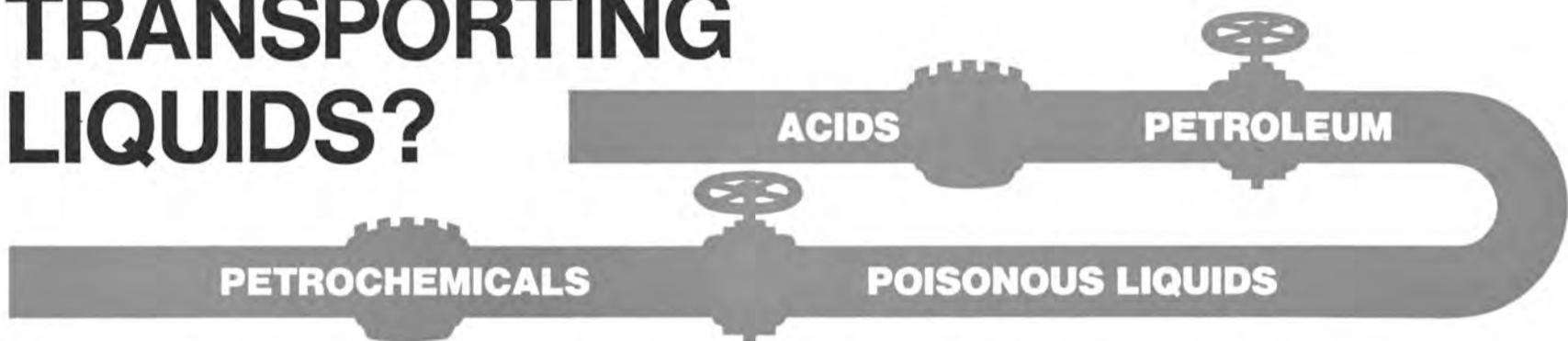
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