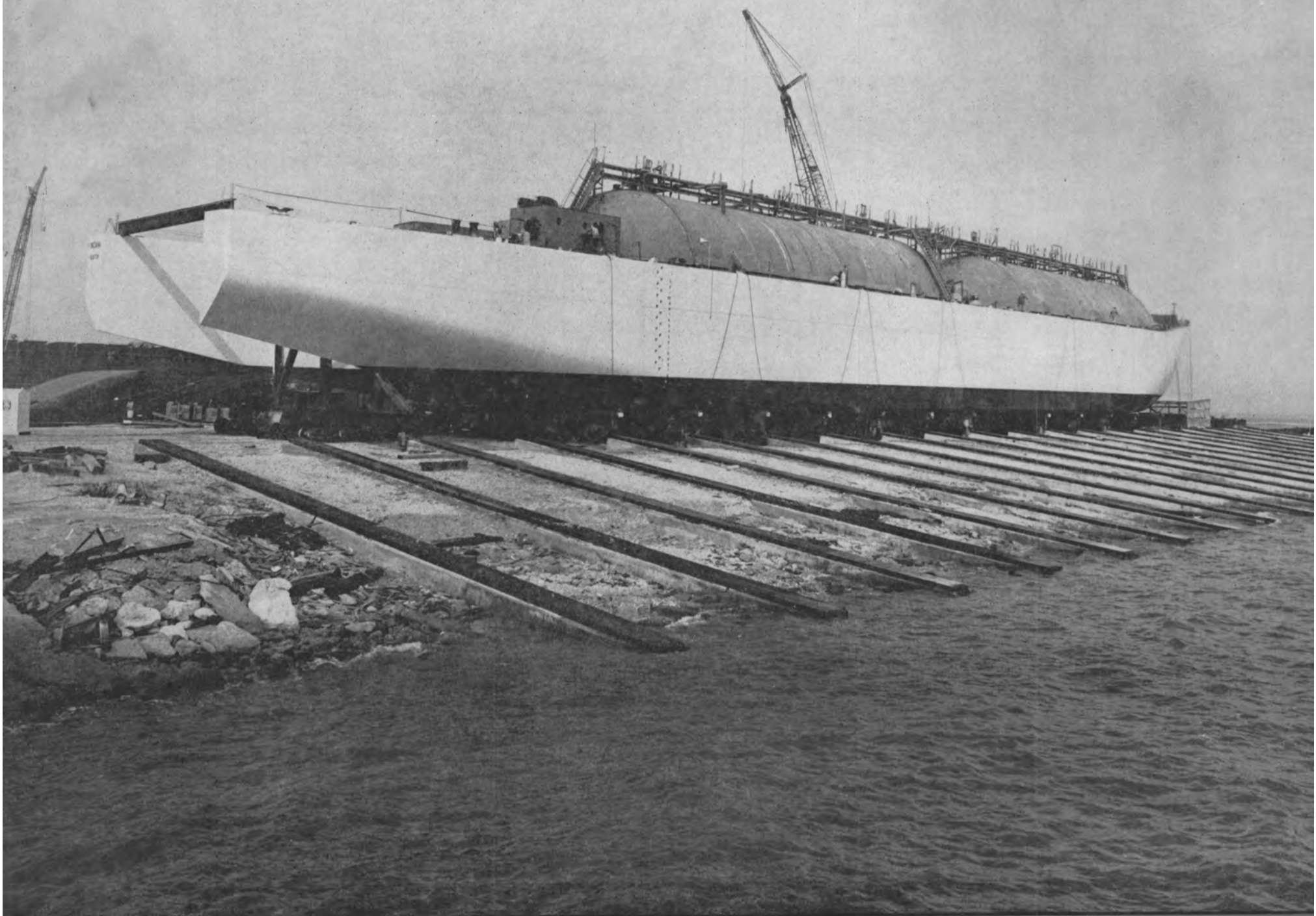


# MARITIME REPORTER AND ENGINEERING NEWS



**Kelso Marine Launches Butadiene Barge  
Featuring Very Large Cylindrical Tanks  
And Deep Stern Notch For Tug Linkage**

(SEE PAGE 6)

**OCEANS  
The New  
Frontier**

(SEE PAGE 10)

**NOVEMBER 15, 1971**

# NU-BLU Nylon Rope



## ...Up to 30% stronger than the best white nylon

NU-BLU Nylon is the first real advance in nylon rope since 1958 when American announced a dramatic 34% increase in nylon rope strength. NU-BLU Nylon, tinted blue for positive identification, is manufactured from Du Pont Super Type 707 nylon.

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NU-BLU Nylon is available in the following constructions and sizes for heavy marine use:

3 Strand — 4½" thru 15" Circumference  
 Square Braided — 6" " 10" "

### COMPARATIVE WEIGHTS AND STRENGTHS

Circ. Inches	NU-BLU NYLON ..... vs ..... WHITE NYLON				3-STRAND* Brk. Test in Lbs.
	3-STRAND		SQUARE BRAIDED		
	Lbs. per 100 Ft.	Brk. Test in Lbs.	Lbs. per 100 Ft.	Brk. Test in Lbs.	
4½	55	68,000	—	—	53,000
5	68	84,000	—	—	65,000
5½	83	102,000	—	—	78,000
6	95	118,000	100	134,000	92,000
6½	109	135,000	117	154,000	106,000
7	129	160,000	137	180,000	125,000
7½	149	183,000	157	208,000	140,000
8	168	208,000	179	235,000	162,000
9	210	255,000	228	290,000	200,000
10	263	320,000	280	365,000	250,000
11	316	370,000	—	—	300,000
12	379	450,000	—	—	360,000
13	450	530,000	—	—	425,000
14	520	610,000	—	—	490,000
15	600	700,000	—	—	560,000

\*Weights are the same as for 3-Strand NU-BLU Nylon

NOTES: Breaking test figures are average. Minimum will be 10% below average. Lbs. per 100' are average. Maximum weight 5% above these figures. Maximum Working Load 11% of Breaking Test.



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# MECO



## Willamette Iron & Steel Apparent Low Bidder

Bids for lengthening and upgrading two 352-foot ferries for Alaska's Department of Public Works, Division of Marine Transportation, were received last August. The apparent low bid of \$6,165,000 for lengthening one ferry and \$12,788,000 for work on two ferries, was made by Willamette Iron & Steel Co. of Portland, Ore.

## Metro-Goldwyn-Mayer Plans Liners Directed Toward 'Youth Market'

Three luxury cruise liners, specifically aimed at the "youth market," are planned by Metro-Goldwyn-Mayer Inc. The total cost of the 20,000-ton vessels will be approximately \$54 million, and each will have 400 double-occupancy cabins.

Discussions are under way with shipyards in Germany and Italy regarding construction possibilities. The first liner is scheduled for completion by the end of 1974 and the other two vessels should be in service by the end of 1975. MGM states that one ship is expected to serve the West Coast from Alaska to Mexico, the second the East Coast from Boston to the Caribbean, and the third will tour Europe and the Mediterranean. Options are planned by MGM for the building of two additional ships.

## Arthur Levy To Supply Eight Boats To Support S.A. Offshore Drilling

Arthur Levy Boat Service, Inc., a Petrolane Company, has been awarded a long-term contract by Petrobras to furnish eight boats to work in support of drilling activities off shore Brazil.

The package, consisting of five supply boats and three crew boats, represents the largest single transaction for drilling support vessels to date. The first three vessels will be delivered to Brazil in December 1971, and will work with the drillship Discoverer I, also under contract to Petrobras. All vessels are expected to be on location by mid-1972.

Arthur Levy Boat Service, Inc., Morgan City, La., one of the largest companies specializing in furnishing marine transportation to petroleum and related industries, owns and operates a fleet of 55 vessels and presently has eight new supply vessels under construction. In addition, plans and specifications are being finalized for the construction of several high horsepower combination supply/tug vessels.

## On August 23, 1971, underwater salvage history was made by the Cyclo Manufacturing Co. of Denver, Colo.



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# MARITIME REPORTER

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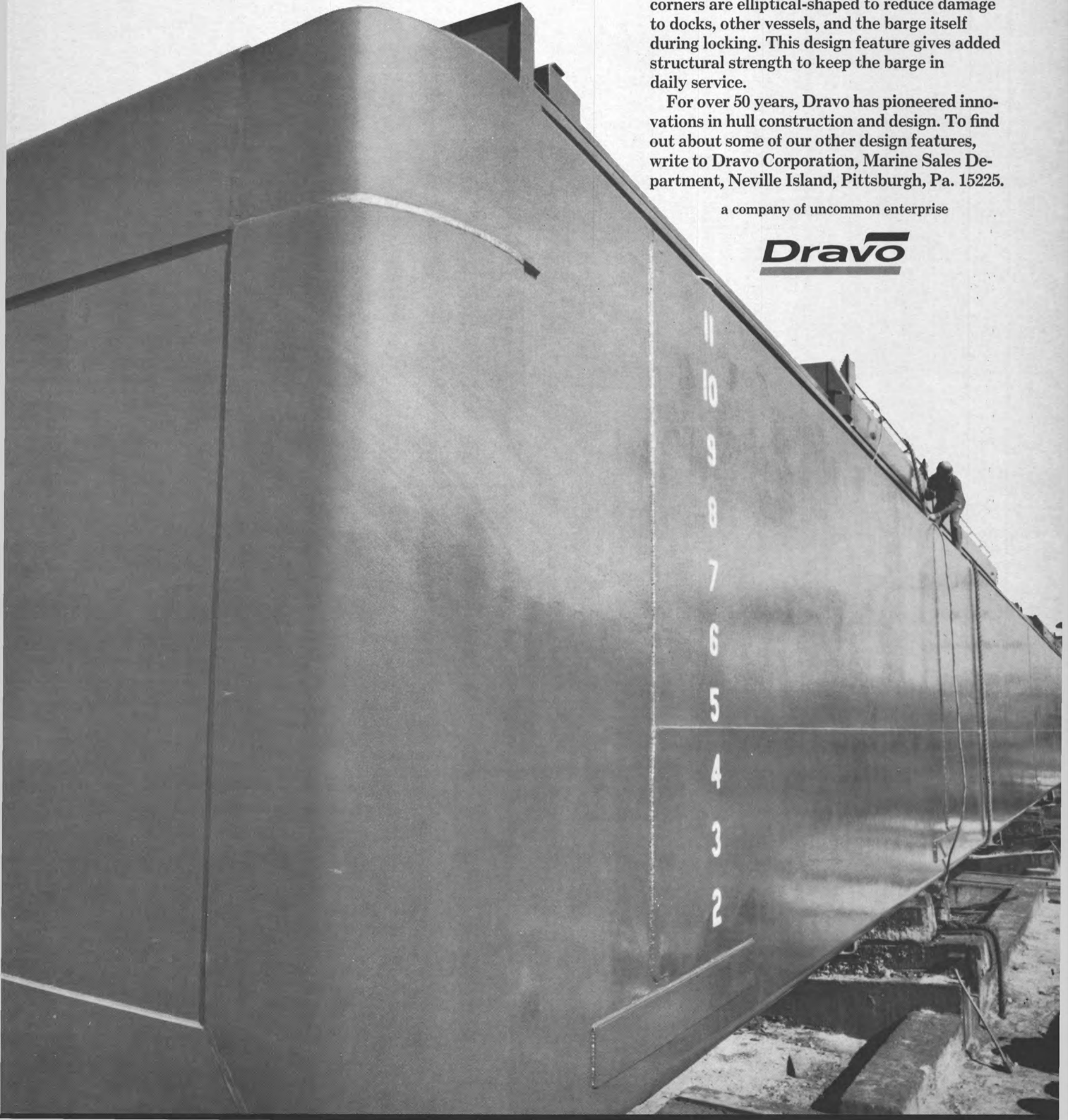
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## Kelso Launches Unusual Petrochemical Carrier



The Ponciana, built with a modified ship's bow and deep stern notch for push towing, carries what is believed to be the largest cylindrical tanks in barge transportation.

Kelso Marine, Inc. of Galveston, Texas, a subsidiary of C. Brewer and Company Ltd. of Hawaii, recently launched the barge Ponciana, a pressure tank barge that incorporates a tug-barge pushing system making the barge and its propelling vessel an integrated tow.

Built for operation by Central American Barge and Towing Company, the barge will work between Puerto Rico and the U.S. Gulf Coast. Designed by Robert Bludworth of Central American and the naval architectural firm of Schuller and Allan, Inc. of Houston, the barge will be used for the transportation of butadiene.

The barge is classed by the American Bureau of Shipping and the U.S. Coast Guard for unrestricted ocean service with a cargo capacity of approximately 5,500 short tons of butadiene. Measuring 385 feet by 56 feet by 26 feet, the vessel features two 40-foot diameter by 130-foot long cylindrical pressure tanks in tandem.

Harry Fiegel, vice president of Kelso Marine, indicates that these tanks, which are heavily insulated and built with 1-7/16-inch steel, are probably the largest cylindrical tanks ever built for use in barge transportation.

The tanks are engineered to withstand internal pressures of over 100 psi and contain baffle plates to minimize cargo movement during rough sea conditions. At this pressure, the barge will also be suitable for the transportation of other petrochemical products such as vinyl chloride.

Butadiene, which will be loaded as a refrigerated liquid, is a product of ethylene production. Its principal uses are in styrene butadiene rubber and as a starting material for nylon 66.

The vessel is designed with a modified ship's bow and deep stern notch for push towing. The tug is held into the notch with a patented linkage method which results in the two vessels operating as a unit while at sea in much the same manner as tugboat-barge push towing operations in inland waters.

The barge will have the ability

to discharge using two hydraulically driven deepwell pumps. A 400-hp hydraulically operated bow thruster unit is also being installed.

Central American expects the new system to provide operating speeds of 12 to 15 knots and give the barge far greater maneuverability and seaworthiness than is obtained in conventional open sea hawser towing. Speed and resistance tests were performed by the naval architects at the University of Michigan. The maritime industry is viewing these open sea barge-moving techniques with an eye to reducing manpower costs and increasing safety and efficiency. With such a system it is feasible for the tug to bring the barge to port, leave it for loading or unloading, and connect up with another barge which has previously been loaded for sea. It is expected that the operational costs for this type tug-barge will be far lower than conventional ships.

Already under way is a similar barge Kelso will construct for Union Carbide. Also designed for the transportation of butadiene, the Carbide vessel will employ a refrigeration system. There will be two independent automatically controlled refrigeration systems, each of which is capable of handling the full refrigeration requirement. Cargo loaded at 25 degrees Fahrenheit will be maintained at 20 degrees, plus or minus one degree.

There are two cylindrical cargo tanks in the Carbide barge which measure 26 feet in diameter by 276 feet long. These tanks will be placed side by side in the barge. Each cylindrical tank has a capacity of about 25,000 barrels, or 2,650 short tons of butadiene. Integral hull tanks located fore and aft of the cylindrical tanks will handle approximately 12,000 barrels of Grade B poison and 14,000 barrels of Grade C flammable products.

As one of the most modern Gulf Coast barge builders, Kelso Marine's yard relies on a number of automatic processes in construction. The cylindrical tanks used in both of the above barges were constructed by Kelso, employing

unique new welding procedures featured in the April issue of "Iron Age." A 33,000-square-foot multi-level fabrication building houses a series of Kelso-developed machinery of which their 6,000-ton plate press is unique in the barge building industry. Many patents have been obtained or are pending on this equipment.

The yard features a complete Syncrolift and lateral transfer system capable of lifting 750 tons, a 1,200-foot superbarge construction way and 600-foot side launching way.

During this year, Kelso has placed added emphasis on the construction of marine equipment for inland service. Hopper barges are being built at an increasing rate, while double-skin chemical barges and single-skin oil tows for river and canal service have been added to the production lines.

Of particular interest to inland operators of small towboats was the recent introduction of the Kel-Kat catamaran design line of towboats in the 600 to 1,000-hp class. The yard plans to produce four to six of these maneuverable and efficient boats annually.

Recent large barges constructed at the yard include the 430-foot vessel Hawaii for dry cargo transport between the mainland West Coast and Hawaii by Ultramar Chemical Company; and a 430-foot oil barge tanker built for Crowley Launch and Tugboat Company of San Francisco. Other projects in recent months have included two barges for the offshore oil industry built for Sedco, Inc. of Dallas.

The Kelso yard is located on the north side of Galveston Island fronting Galveston Bay and Intracoastal Canal at Mile 355.

## Tanker Owners Extend Liability Agreement For Pollution Damage

Owners of 96 percent of all oil tankers in the world are now backing a British-sponsored scheme to help meet the cost of accidental oil pollution damage.

The International Tanker Owners Pollution Federation started the scheme two years ago. It includes a voluntary agreement concerning liability for pollution damage.

A spokesman for the Federation said that during its first two years it had assisted the settlement of claims for compensation made by governments and by tanker owners who, under the scheme, had cleaned up accidental pollution for which they were responsible and had been able to claim reimbursement from the Federation's privately-run insurance scheme.

The scheme, as originally envisaged, was dependent on 80 percent of the world tanker tonnage joining. Now this target has been exceeded, the agreement is to continue for at least another three years.

The U.K. Chamber of Shipping has also given its full support to

two wide-ranging studies on marine pollution which the British Government has agreed to lead in preparation for an Inter-Government Maritime Consultative Organisation (IMCO) conference in 1973.

One will be examination of the present methods of retaining oil on board ship; the other a cost/benefit study on the environmental and financial consequences of eliminating all discharge of oil into the sea.

The Chamber's president, John Kirby, said: "British shipowners are convinced of the effectiveness for tankers of the load-on-top system, which will be examined in the first study, and will make available the results of research by both the Chamber of Shipping and individual shipping companies into oil/water separators, oil content meters and other technical aids controlling the proportion of oil in tank washing discharged into the sea. If, however, the studies reveal any improvements that can be made, we shall take what steps are possible to act upon them."

The International Tanker Owners Pollution Federation Ltd. is located at 41/43 Mincing Lane, London EC3.

## Gotaverken Appoints Bengt Tengroth Vice Managing Director



Bengt Tengroth

Bengt Tengroth has been appointed vice managing director of Gotaverken, Goteborg, Sweden. He will be primarily responsible for personnel and training aspects in the entire Gotaverken group.

Mr. Tengroth was a member of the official commission which investigated the company earlier this year and was nominated by the Swedish Government as a member of the board of Gotaverken when the company was taken over by the Salen Group.

Prior to his new appointment at Gotaverken, Mr. Tengroth was employed as a grinder at SKF in Goteborg. He is well-known as a union man, was a member of the General Council of the Swedish Trade Union Confederation (LO), a member of the executive board of the Swedish Metal Workers' Union, chairman of the local Metal Workers' Union, the LO regional organization in Goteborg, and of the works club at SKF. Mr. Tengroth is also vice chairman of the Port Authority board in Goteborg and has been a member of the City Council.

## One-Thousandth LASH Lighter Launched



LASH inventor and designer **Jerome L. Goldman** stands with the one-thousandth LASH lighter just before its launching at Avondale Shipyards in New Orleans. More than 2,500 of the standard-dimension lighters will ultimately be built to serve the 22 LASH ships now operating or ordered.

A significant milestone in the LASH (Lighter Aboard Ship) construction program was reached in October, when the one-thousandth LASH lighter was launched.

The 1,000 LASH lighters account for about 20,000,000 cubic feet of cargo space, according to LASH inventor and designer **Jerome L. Goldman**.

**Mr. Goldman**, who is president of Friede & Goldman, Inc. and LASH Systems, Inc., the firms responsible for the design and licensing of LASH ships and lighters, said some 600 additional lighters are to be built under present contracts. Contracts for still more lighters to serve seven LASH ships ordered in the summer of 1971 will be placed soon, he said.

All the LASH lighters have standard dimensions to permit easy interchange from ship to ship, trade route to trade route. They are 61 feet 6 inches long; 31 feet 2 inches wide; 13 feet high, with a maximum fresh water draft of 8 feet 8

inches. Cargo capacity is 372 long tons in about 20,000 cubic feet of space.

Equitable Equipment Company, of New Orleans, La., has built 410 lighters for Central Gulf Steamship Corporation to serve that company's two LASH vessels in the U.S. Gulf, United Kingdom, North Europe trade. These lighters have double-skin steel construction in the forward and after peaks and the double bottoms, while the sides are single-skin. The hatch opening is 44 feet by 26 feet, served by three panel-type self-centering hatch covers that are watertight.

The Equitable lighters are equipped with four winches secured to the lighter deck by padeyes that provide rotation as required during marshaling or towing. Four 24-inch kevels are used with the lighter deck gear. Quick-connection vent fittings are provided at each end of the lighter. The interiors of these and all LASH lighters contain lashing padeyes to secure cargo.

Avondale Shipyards, Inc. is well

along on contracts to build 425 lighters for Prudential-Grace Lines, Inc., and 396 lighters for Pacific Far East Line, Inc. The shipyard production line is turning out two lighters daily.

The Avondale-built lighters for Prudential-Grace are of double-skin construction throughout. Walkways on either side of the lighter have been eliminated to increase the width of the hatch opening to 29 feet 5 inches. The length of the hatch opening is 44 feet. Like the Equitable lighters, these lighters are fitted with three lift-on lift-off hatch covers. Forward and aft are five-ton hand winches fitted with 130 feet of wire having a four-foot eye on one end. A pair of 24-inch kevels is located outboard of the hand winches at either end of the lighter.

The lighters that Avondale is building for Pacific Far East line are of double-skin construction and have a hatch opening of 44 feet by 29 feet 5 inches. The hatch covers are built in four sections and operated by two hydro-mechanical

units. Each hydro-mechanical unit controls two hatch cover sections, which fold forward and aft in an upward motion. Guide rollers ride a forward and aft track on the outboard section of the hatch opening to facilitate easy opening and closing.

Pacific Far East Line has also ordered the first prototype fiberglass lighter and is scheduled to begin service tests of it soon. The fiberglass lighter, fitted out exactly like the company's steel lighters, was built by Arben Marine Corporation, of Costa Mesa, Calif., where it has completed shop tests.

A third lighter contractor, General Steel Tank Company, of Reidsville, N.C., is building 400 LASH lighters for the Holland-America-Hapag Lloyd group (Combi Line), which has plans to operate two LASH ships in the U.S. Gulf-North Europe trade. These lighters are being built at New Ross, Ireland, by a subsidiary of General Steel Tank Company, and by the parent firm in the United States.

## Another 'Star' built towboat enters service

Shown running her trials is the new twin-screw towboat "Mercer Straits", built for RivTow Straits Limited, Vancouver, Canada, by "Star", the shipyard where quality construction is a continuing tradition. Named after the Mercer family, former owners of the yard, she is the second vessel to be built since the change of ownership in November 1970. The tug is 92'6" long by 24'6" moulded breadth by 11' draft, and is powered by twin General Motors, Series 149, V-16 diesel engines with a combined output of 1800 b.h.p. at 1800 r.p.m. She entered service in mid-July.



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LASH lighter assembly lines at the Westwego plant of Avondale Shipyards are turning out two lighters daily. Fabricated lighter sections are assembled, sandblasted, and painted on their way to the launching ramp. Avondale is presently working under contracts to provide a total of 821 lighters for two steamship companies.

# C-E boilers can be delivered assembled.

Many shipbuilders now specify delivery of assembled boilers. They profit from these advantages:

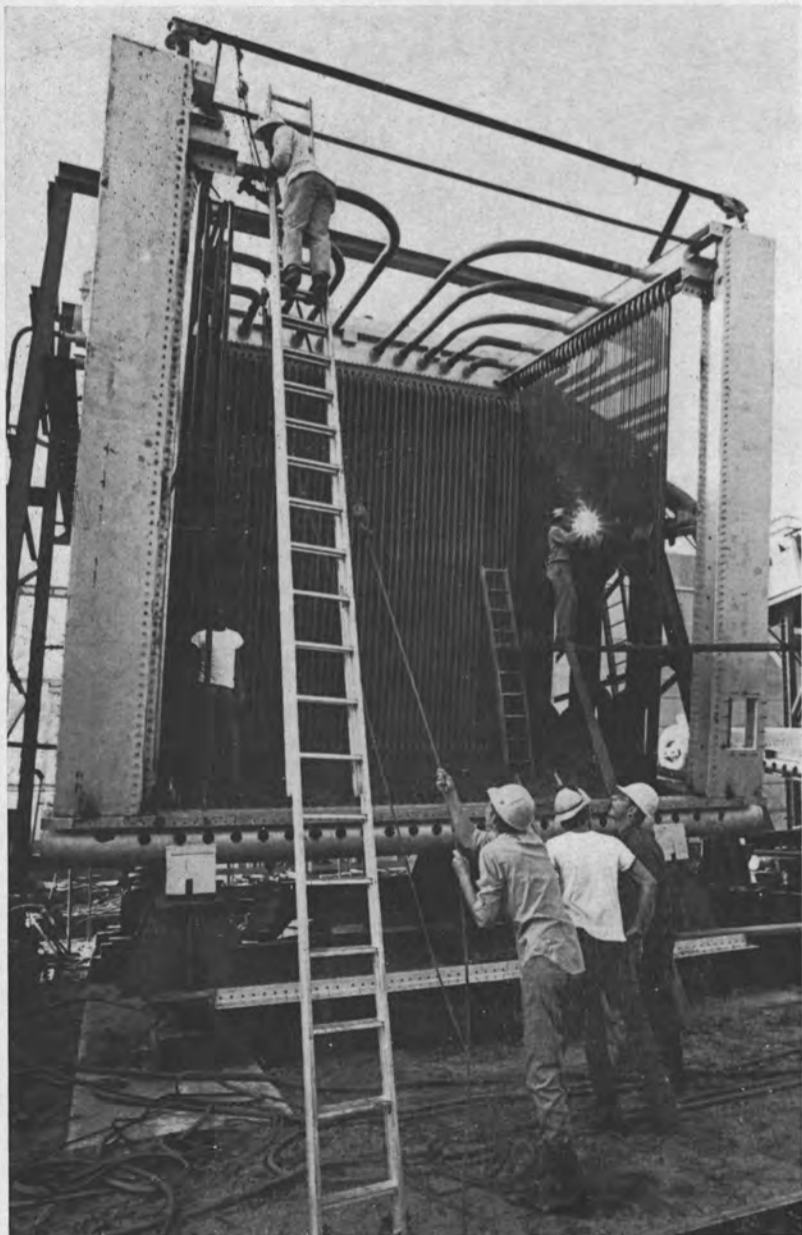
- Boilers ready for installation aboard ship.
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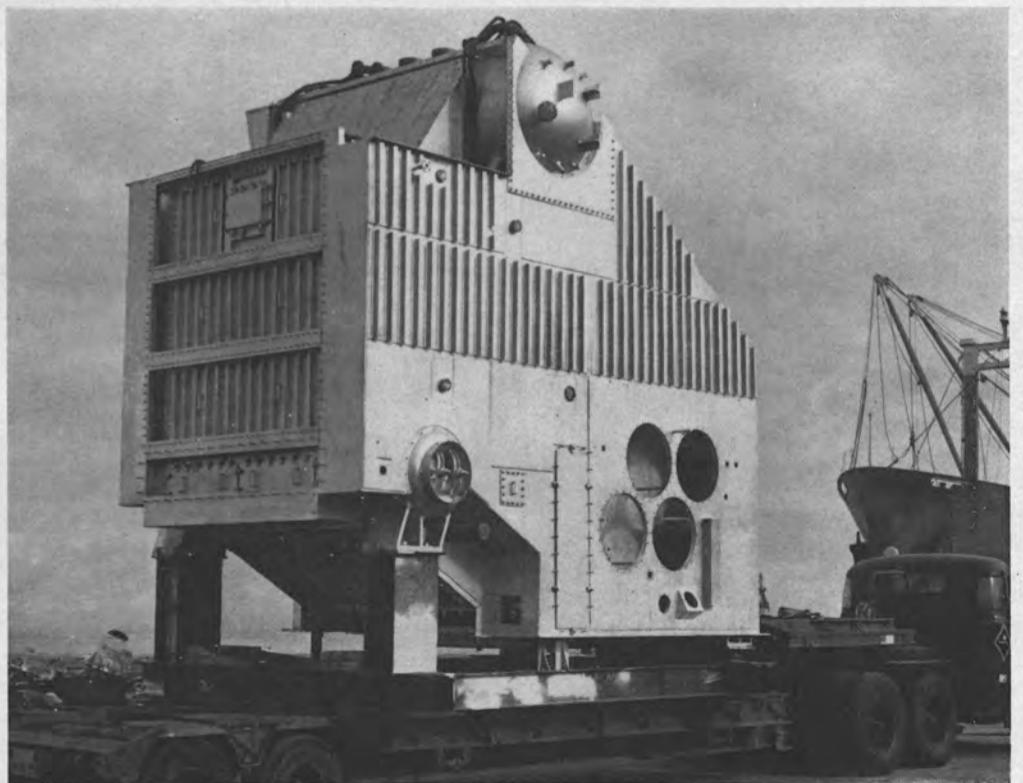
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*Left: V2M-8 boiler being assembled for delivery to the Seatrain Shipbuilding Corp., Brooklyn, New York for installation in one of its 230,000 dwt tankers—the largest ships built in the USA.*

*Below: One of ten V2M-VS assembled boilers enroute to a Spanish shipyard.*

*Right: V2M-9 boilers, like this one, are being delivered and installed in ships under construction in Scandinavia.*







# OCEANS —

## The New Frontier

This is the second and final part of "Oceans—The New Frontier." The first half was presented in our issue of November 1, 1971.

### Boundary Limits Of National Jurisdiction

As a step prior to solution of international problems, the United States should improve and refine existing legal systems for the exploration, exploitation and protection of natural resources within the national jurisdiction, including such matters as fixing boundary lines, accommodation of conflicting uses, and environmental quality.

On September 28, 1945, President Truman issued a Presidential Proclamation proclaiming that the "natural resources of the subsoil and seabed of the Continental Shelf beneath the High Seas, but contiguous to the coasts of the United States were to be regarded as subject to the jurisdiction and control of the United States." Supporting our nation's traditional policy of freedom of the seas, he expressly provided that his proclamation in no way affected the "character as High Seas of the waters above the Continental Shelf and the right to their free and unimpeded navigation."

President Truman then placed the natural resources of the Continental Shelf under the Department of the Interior by Executive Order, pending Congressional action.

Eight years later in May 1953, Congress enacted the Submerged Lands Act which granted the states ownership of the lands beneath navigable waters seaward to a line three miles distant from the coastline of each state.

Immediately following this, the Congress enacted the Outer Continental Shelf Lands Act which declared that the United States owns all submerged lands in the Continental Shelf seaward of the lands granted to the states. The law did not define the seaward limits of the Outer Continental Shelf.

In 1958, the Geneva Convention on the Continental Shelf, an international treaty which the United States has ratified, defined the legal Continental Shelf as the seabed and subsoil adjacent to the coast outside the territorial sea to a depth of 200 meters, or beyond that limit to where the depth of the superjacent waters admits of the exploitation of said areas. The coastal state exercises sovereign rights over this Continental Shelf for the purpose of exploitation and development of its natural resources.

This is an exclusive right. If the coastal state does not explore or develop the Continental Shelf, no one else may undertake these activities or lay claim to the shelf without the express consent of the coastal state. These rights do not depend upon occupation or proclamation.

This territorial right to the Continental Shelf was further reinforced by the International Court of Justice in the North Sea Continental Shelf Cases. The Court related its decision to the Truman Proclamation of 1945 as "the starting point of positive law on this subject and the chief doctrine it enunciated, namely that a Coastal State as having an original, natural and exclusive (in short, a vested) right to the Continental Shelf off its shores, came to prevail over all others, being now reflected in Article 2 of the 1958 Geneva Convention on the Continental Shelf." It is obvious that the United States now holds an exclusive right to the lands off its coastal shore, namely the Continental Shelf and Slope. In 1968, the American Bar Association stated "In our opinion, the United States should stand on its right under the (1958 Geneva) Convention as heretofore ratified.

"If legal uncertainties are believed to constitute an impediment to utilization of undersea mineral resources, such uncertainties can be eliminated by uniform declarations of the coastal nations which are parties to the Convention . . . identifying their claims of jurisdiction with the submerged portion of the continental land mass, and reciprocally restricting their claims accordingly."

The language of the Geneva treaty implies that, as its technical capability develops, a coastal country may extend its jurisdiction across that portion of the seabed and ocean floor adjacent to its coastline until it encounters the similarly extended jurisdiction of the coastal country opposite. Opponents of this interpretation argue that the Convention did not intend for the boundary limits of the Continental Shelf to be determined by the gradual extension of this boundary by developing technology. Many experts state that if the Convention had such a radical extension of national jurisdiction in mind, the Convention undoubtedly would have made this point clear.

The present state of affairs regarding the legal limits of the Continental Shelf is chaotic. Claims by various countries vary from 12 to 200 miles, and the world is faced with the insecurity of having

individual countries extend the boundary limits of their Continental Shelves on a continuing and almost daily basis.

On May 23, 1970, President Nixon proposed a treaty under which all nations would renounce their national claims over the natural resources of the seabed beyond the 200 meter (656 feet) isobath. He proposed that the resources beyond that limit would be regarded as the "common heritage of mankind." This proposal was presented as a draft treaty by the United States delegation to the United Nations Seabed Committee in August 1970.

In his message, the President called for an international regime for exploiting of seabed resources beyond this limit and this regime would collect mineral royalties to be used for economic assistance to developing countries. An international trusteeship zone would be created for the continental margins beyond the 200 meter depth and the coastal nations would act as trustee for the international community. Each state would receive a share of the revenues from the area under its trusteeship and would be able to impose additional taxes if it were deemed desirable. Furthermore, exploration and exploitation permits would be issued by the trustee states, pending agreement on the international machinery that would ultimately regulate the international zone. Such permits would be subject to approval when international machinery is finally agreed upon.

At the same time that the President released his message, the U.N. General Assembly adopted a resolution that the seabed and subsoil beyond the limits of national jurisdiction should be the common heritage of mankind, that they should not be subject to appropriation by states or persons, and that no state may exercise or acquire rights in this area except in accordance with an international regime to be established. The General Assembly also adopted a resolution calling for a third United Nations Conference on the Law of the Seabed to be held in 1973. This summer the U.N. Seabed Committee will meet in Geneva to draft a working treaty for an international regime and to prepare a comprehensive agenda for the 1973 conference. The conference will also deal with preservation of the marine environment, free passage through, and over international straits, and agreement establishing the width of the territorial sea at 12 miles.

At this early stage of negotiation it is unwise for the United States

to suggest unilaterally limiting its jurisdiction to the narrow boundary suggested by the President. If the President's suggestion were adopted, all Continental Shelf and Continental Slope resources beyond a depth of 200 meters would fall within an internationalized zone, and the recovery of these resources would be under the control of an international regime yet to be determined.

The U.S. Geological Survey has estimated the potential resources in place between the 200 and 2,500 meter isobaths as including more than 600-billion barrels of oil. By comparison, U.S. production of oil on land and on the Continental Shelf has amounted to less than 100-billion barrels during the past 100 years.

Obviously, these submerged lands are a major component of the U.S. mineral estate which will be vital to our welfare in future decades. It is alleged that in return for this renunciation the United States would obtain four benefits: freedom of scientific research; freedom to use the seabed for nonoffensive military purposes, such as automatic stations in the seabed for monitoring possible hostile ship movements; freedom of transit in straits of the world, and encouraging other nations to reduce their claims of a 200-mile territorial sea.

However, all of these objectives can be obtained by reaching limited protocol or agreements that do not require renunciation of potential minerals and resources that will be vital to our nation's welfare before the end of this century.

The United States should assert promptly and forthrightly its exclusive jurisdiction over the mineral resources of the entire submerged portion of the continent off its shores seaward of state-owned offshore areas down to its junction with the abyssal ocean floor, and should work with other nations toward the ultimate objective of precise demarcation of the boundaries of coastal nations' natural resources jurisdiction.

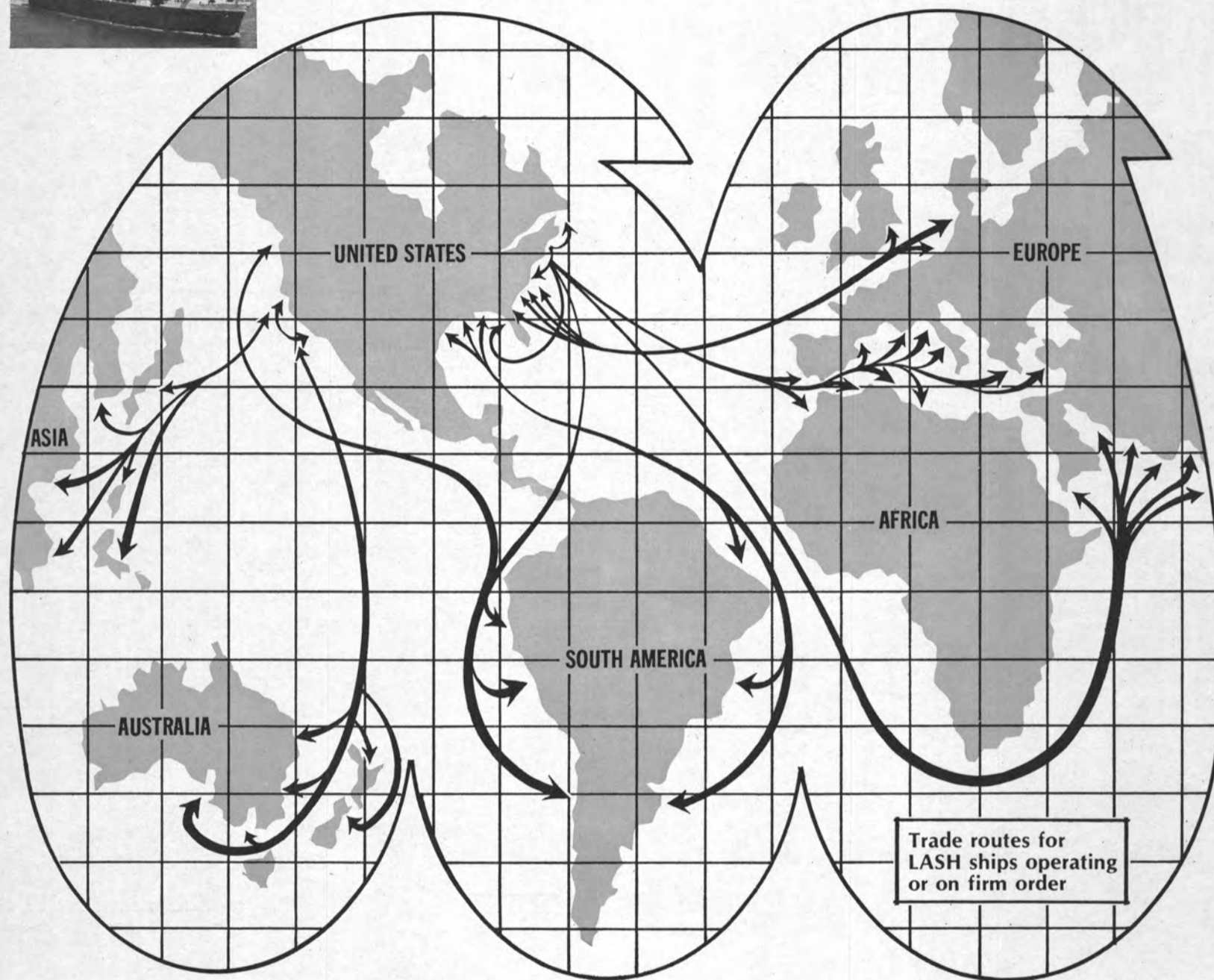
The adoption of this proposal on a worldwide basis would give each coastal country exclusive rights to the resources of its entire Continental Shelf and Continental Slope to an average depth of 10,000 and 18,000 feet, or to a point where the Continental Shelf joins what is commonly defined as the deep ocean floor. Such an extension of rights would not include jurisdiction over the suprajacent waters or related air space that extend beyond the limits of a country's territorial sea.

(Continued on page 12)



# LASH

*A world-wide trade route network takes shape*



A LASH trade route network, linking major world ports, has been established less than two years after the first ship began operations. The 22 LASH ships operated or ordered by seven ship operators will serve principal ports in North America, South America, Europe, Asia, Africa and Australia.

Establishment of world-wide LASH service offers greater benefits for shippers and LASH operators, because the standard dimensions of LASH lighters permit efficient interchange from ship to ship, trade route to trade route.

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**LASH SYSTEMS, INC.** SUITE 1414, 225 BARONNE ST., NEW ORLEANS, LOUISIANA, U.S.A.

## The New Frontier—

(Continued from page 10)

While there is general agreement that the limits of the Continental Shelf should be standardized on a worldwide basis, exact agreement on the extent of these limits has been difficult to coordinate. Any recommendation which fixes boundary limits for the Continental Shelf based upon an arbitrary depth or distance from shore will prove to be impractical as they relate to the physical geography of the earth's surface, whereas extending limits to the junction of the Continental Slope with the abyssal ocean floor coincides with a natural prolongation of the continents themselves. While it is not always possible to establish a legal boundary that reflects the geographical features of the area in question, it would be unwise to base such important limits on difficult-to-determine features such as bathymetric contours and distance-from-shore criteria.

It is interesting to note that many developing nations, which are supposed to benefit from the internationalization proposal, look upon their coastal zones as national assets vital to their future development and are strongly opposed to internationalizing their shelf areas.

Added to this workability problem, the President's proposal outlines no ratification requirements, indicating the United States' willingness to be among the first countries to ratify such an agreement.

According to international precedent, multilateral treaties of this nature commonly enter into force upon ratification by 25 percent of the participating countries. As an example, the Geneva Convention on the Continental Shelf was drafted in 1958, but did not enter into force until June 10, 1964 when 25 percent, or 22 of the 86 countries that participated in this Convention, submitted their instruments of ratification.

At present, only 45 of the 127 member states of the United Nations have ratified it, meaning that 82 countries are not bound by any of the terms and conditions of this treaty. As non-signatories to this agreement, these countries are free to explore and exploit the mineral resources of and portion of the seabed and ocean floor beyond the recognized limits of national jurisdiction, while the United States is bound to comply with the restrictions imposed by this treaty.

To prevent repetition of this inequity, it has been suggested that, regardless of where boundaries are set, the United States Government should not become a party to a treaty of this nature unless world participation by all developed countries and by 75 percent of the developing countries is an unalterable condition of enforcement.

A third and most serious consequence of the President's boundary proposal is its effect upon research and development in deepwater areas. Certain segments of U.S.

industry are presently operating in ocean areas which, if the President's proposal were adopted, would fall under the jurisdiction of an international regime yet to be defined. In recent years, these industries have invested large sums of money in investigating this area and in developing techniques needed to recover resources from this hostile environment.

The President's recent suggestion of a narrow boundary for the Continental Shelf has cast a cloud of insecurity upon the industrial future of the deep seabed and as a result, has adversely affected the research and development funding that industry is willing to risk in seabed development.

In light of these objections, the President's proposal for boundary limits of the Continental Shelf should be carefully re-examined, and an amended position should be resubmitted by the Federal Government which is more favorable to the security and well-being of the United States and its industrial future in resource development of deep ocean areas.

### Research

Freedom of scientific research and investigation, especially freedom of research within the ocean environment, is becoming increasingly important for the advancement and well-being of modern society. The newly developed concept of an integrated global technology coordinating research studies within the atmosphere, the oceans, and in outer space, requires scientific investigation to be conducted freely without the restrictions that political boundaries currently impose.

To the scientist, the world's oceans, like its atmosphere, are interconnected. The waters of the oceans, including the minerals and nutrients suspended within them, are carried over vast regions by strong currents. Many species of fish migrate from sea to sea irrespective of the boundaries designated by man, and many marine organisms spend a portion of their life cycles in coastal waters under the jurisdiction of one country, and spend the rest of their life cycles in the high seas under the jurisdiction of no country. With the assistance of tools such as magnetometers, echo sounders, and coring devices, scientists are studying a continuing pattern in the deepsea floor, learning about its geology, its formation, and even the very origin of this planet itself.

Since the end of the Second World War, there have been noticeable restrictions placed upon scientific investigations conducted in the territorial waters of a number of countries, and these restrictions have proven to be a serious handicap to the working scientist. Oceanographers and other scientists should be permitted to study this deepsea floor with a minimum of restrictions placed upon their activities. Whenever possible, the results of scientific studies should be published and the countries of the

world should share the burden of investigating this area of the world's oceans. In this regard, one outstanding concept is the International Decade of Ocean Exploration, in which the nations of the world are joining together in a common, long-term program of ocean exploration.

A comprehensive study of the world's oceans and their resources would be beyond the means of any single nation. By joining together to share the financial burden of such research, the nations of the world will eliminate duplication of effort. Each will benefit by an expanded program of ocean research normally beyond the financial means of a country conducting independent research. In addition, all research will be organized on a coordinated, global basis rather than a project basis.

Present knowledge about the oceans, their resources, and their effect upon our environment is limited. Great benefits derived over a short period of time could be gained if the nations of the world agreed to pool their ships, their personnel, and their capabilities. Developing countries would strengthen their research capabilities, and by participating in a worldwide program, they would gain the use of sophisticated and expensive equipment such as submersibles, research vessels, buoy networks, and oceanographic vessels. By participating in a common, long-term program, the developing countries will have a platform from which their marine engineers, oceanographers, biologists, and technicians would gain valuable field experience normally unavailable to scientists in the lesser developed countries.

As the world's needs and population rapidly expand, we realize that we have just begun to identify the great benefits that lie in and under the world's oceans. The sea is destined to provide the world with new sources of food and drugs, with vast supplies of mineral resources, and with new understanding of our weather and climate.

The technology needed to harvest these and many other benefits is rapidly developing. The challenge is formidable, but the rewards of probing this ocean frontier will benefit all of mankind. The task of solving the political, legal, technical, scientific, and economic problems of exploring the world's oceans is a formidable job, but with diligent effort and cooperation the oceans can be made to connect the nations of the world rather than divide them.

### Domestic Oceanography

Prior to World War II, interest in the world's oceans was limited to a loosely organized group of scientists who probed the ocean's currents, salinity, chemistry and resources. Few universities gave accredited ocean science courses and even fewer owned and operated oceanographic vessels.

During the 1950s, some attention was focused on the oceans by Gov-

ernment committees which were asked to study and evaluate the oceans and their potential. Their reports were discussed in Congress, which agreed that the nation lacked a unified effort in investigating and developing the marine sciences, and that a clear national ocean policy was long overdue.

Although the scientific revolution that emerged during the 1960s was geared to exploration of outer space, the question of inner space was soon to attract the interest and curiosity of this rapidly expanding group of technologists.

On an individual basis, without plan or coordinated effort, science, industry, and Government entered the oceanographic arena; each allocating funds and personnel to projects of individual interest. Oceanography grew, matured, and finally emerged in the mid-1960s as a colossal undertaking, without direction, plan or organization.

As an indication of the growth oceanography is expected to experience in the 1970s the President's Commission on Marine Science and Technology, in its report *OUR NATION AND THE SEA*, recommended an annual Federal oceanography budget for marine science and technology of \$2 billion by 1980. This does not include the separate funding normally allocated to national defense projects.

Despite the vast sums of money spent by the Federal Government, our national oceanography efforts have been confused, fragmented, overlapping, and lacking direction. Marine science projects within the Federal Government were distributed among 22 separate departments, bureaus, offices and agencies. In many areas interests overlapped, and this scattered responsibility resulted in duplication of effort, combined with an atmosphere of competition rather than cooperation among the many agencies involved.

The first step toward putting the Federal Government's house in order came in June 1970, when President Nixon announced his Reorganization Plan No. 4 which would consolidate the then fragmented programs and interests in the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce. NOAA, under the President's plan, included the Environmental Science Service Administration (ESSA), then in the Commerce Department, as its major component. ESSA consisted of the Coast and Geodetic Survey, the National Environmental Satellite Center, the Weather Bureau, the Environmental Data Service and the Research Laboratories. In addition, the Office of Sea Grant Programs was transferred from the National Science Foundation; the Bureau of Commercial Fisheries, and Marine Mining from the Department of the Interior; the National Oceanographic Data Center from the Navy; and the Lake Survey from the Army Corps of Engineers.

The creation of the National

(Continued on page 14)

# “When that storm hit, I thought I’d lost my tow for sure —any other rope would have parted.”

When the McAllister Towing Company first decided to use new blue-tinted Super 707 nylon rope, they didn't know what was in store for them. Captain Frank Bradley was to make a routine trip hauling two heavily laden mud dumpers. Out at sea, a sudden storm caught the captain and his tow. The load put on the Super 707 rope was so great that the heavy-

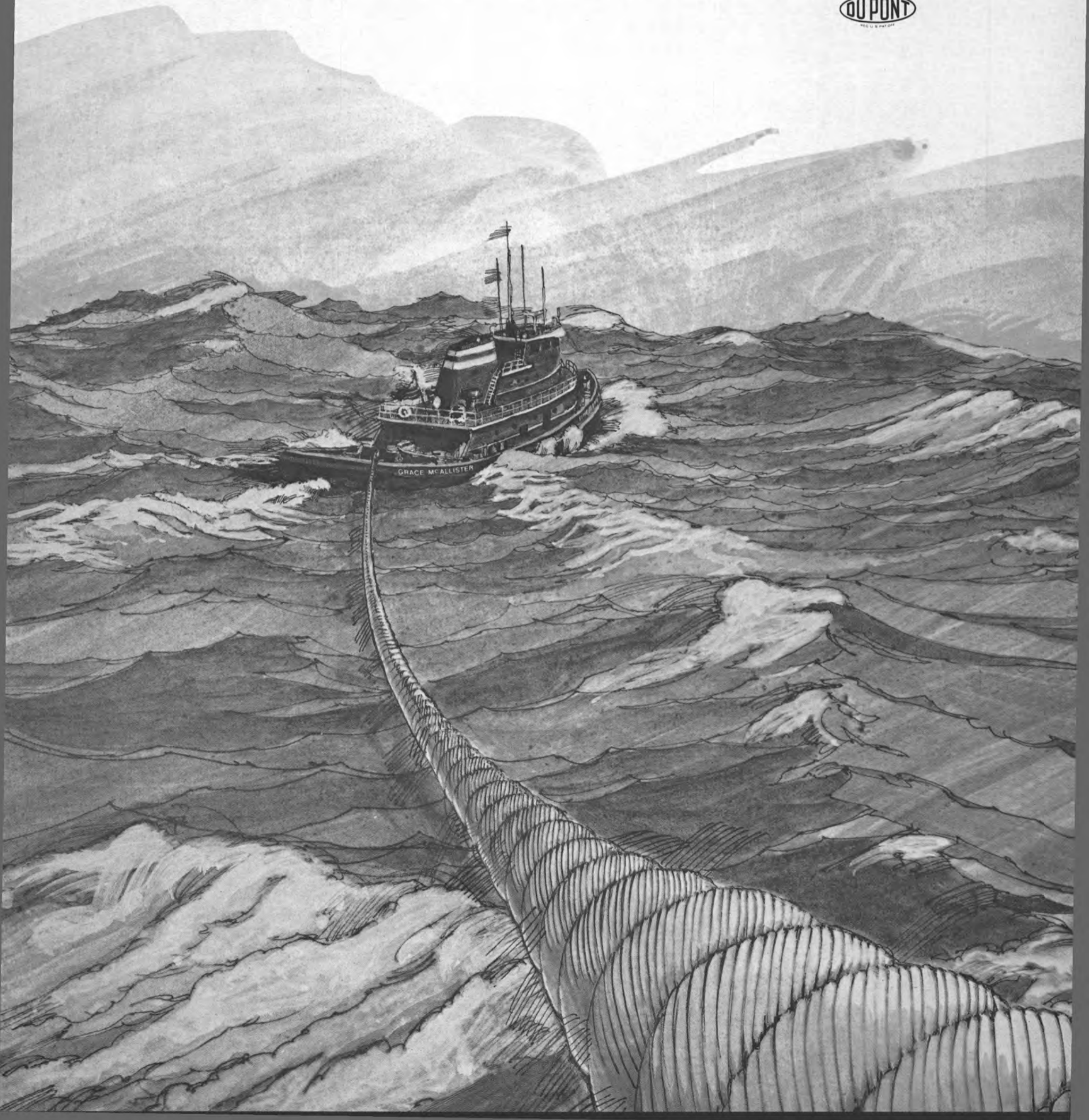
duty-steel thimble was bent. Yet the line held. And everybody and everything got back safely.

The large lines of Super 707 nylon now available are the strongest ever made per unit of weight. In a recent test, the breaking strength of a 3-inch-diameter rope of Super 707 exceeded the Military Spec (MIL-R-17343-D) for nylon by *twenty tons*—although it contained less nylon

than permitted by that spec.

And what that means to you is a tougher, more reliable rope. A longer-lasting rope—with greater resistance to abrasion.

So get Super 707 nylon rope. It's the tough one—tinted blue so you'll know it. For more information, write: Du Pont Company, Room 31H1, Wilmington, Delaware 19898.



## The New Frontier—

(Continued from page 12)

Oceanic and Atmospheric Administration was an important interim step in the formulation of a National Oceans Policy by the Federal Government. Ultimately, NOAA should become an independent agency, reporting directly to the President.

NOAA will allocate Federal priorities and responsibilities and, as a result of centralizing efforts in this area, it should effectively eliminate the duplication of effort and funding that previously existed in Federal programs. A coordinated effort in national oceanography programs would also provide new initiative and efficiency in decision-making capabilities of the Executive Branch of Government. NOAA will provide high-level spokesmen within the Federal Government for ocean affairs, and should serve as a focal point and forum for industry-Government relations in this field.

Each year NOAA should provide the President, the Congress, and the general public with an annual report detailing its facilities, general capabilities, activities of its various agencies, its relationship with other oceanographic projects, and its future plans for a long-range, comprehensive national program in the marine sciences.

### Industry's Role

While the primary responsibility for commercially developing ocean resources clearly resides in the industrial area, a basic responsibility for developing scientific, economic and military uses of the sea should be shared by industry, Government, and by private groups. In this regard, the Federal Government does and should function as a major investor in oceanographic research and development, utilizing the experience and expertise that industry is capable of providing.

It has been the initiatives, investments and efforts of the private sector which have developed the capacity of the nation to gather and use the food, mineral and other resources of the oceans and make them available to the people.

The primary responsibility for developing these ocean resources should continue to reside in the industrial area. Proliferation of Government programs and expanding Government expenditures in this area should not be encouraged. While the actual development of marine resources will continue to be actively pursued by the private sector, the Federal Government should adopt policies to facilitate and encourage these efforts.

In pursuit of this aim, an important step would be the creation of a National Advisory Committee for the Oceans and Atmosphere (NACOA). Functioning as a coordinating agency between Government and the private sector, the National Advisory Committee should be composed of individuals from outside the Federal Government, broadly representative of the indus-

trial community, the states, the scientific community and other interested groups. NACOA should be independent of related Government agencies such as the Department of Commerce and the National Oceanic and Atmospheric Administration.

Regarding operating procedures, this Committee should annually report directly to the President, and should provide the President, Congress and the general public with an annual report describing the status of and progress made by private and governmental programs in ocean areas, and provide continuing guidance for a national ocean resources development program.

Research efforts relating to national defense, forecasts of weather and climate conditions, and the gathering and dissemination of basic information concerning the oceans are responsibilities of the Federal Government.

Less than one-fifth of the ocean bottom has been surveyed and mapped in detail, and maps relating to scientific, economic and national defense uses of the seas are often inadequate. To alleviate this problem, the Federal Government should extend and intensify its reconnaissance of the Continental Shelves and the ocean bottom, producing accurate maps of biological and mineral resources, as well as detailed maps of bathymetric characteristics of the ocean environment. Federal agencies originating many of these basic projects involving general surveys and the gathering of basic information and engineering data should contract these projects to the private sector whenever practical or possible.

An essential part of any far-sighted oceans policy must be the protection of the ocean environment and sea life from harmful pollution. The President has called for regulation of ocean dumping. Many of our coastal cities have used the ocean to dispose of solid wastes and sludge from sewage treatment plants. The abyss has been used to deposit potentially harmful substances such as radioactive and toxic compounds. The possibility of widespread damage to the delicate balance of life in the seas indicates that appropriate regulations to minimize pollution of waters in which operations are being conducted and to minimize other harm to the environment are necessary and desirable, and industry has pledged full cooperation toward that end.

### Living Resources

The United States' fishing fleets have declined to embarrassing proportions. The Bureau of Commercial Fisheries estimates that the U.S. Coastal Zones could produce six to seven times more fish and shellfish than its current annual production, yet U.S. fishermen harvest only one-tenth of this potential.

While the world fishery production has markedly increased over the years, the United States catch for 1968 was less than 1965 figures,

with the United States currently running sixth in world figures behind Peru, Japan, the Soviet Union, Mainland China, and Norway. Since 1956, the United States has dropped from second to sixth among the fishing nations of the world.

Despite the fact that the United States is one of the world's major consumers of fish, poor management, outdated equipment, and antiquated harvesting techniques explain why less than 40 percent of the total U.S. fish consumption is provided by domestic fishermen, although U.S. consumption of fish has actually tripled during the last 20 years.

In 1966, the average age of a U.S. fish vessel was 20 years, and the average age of a West Coast halibut vessel was 36 years. It is obvious that the equipment, techniques, and fishing methods used by our fishing fleet are as outdated as the ships they sail.

The United States should adopt a progressive national fisheries policy which will advance the harvesting and utilization of the living resources of the sea.

Such a policy should mitigate jurisdictional differences among the several states and the Federal Government and should embrace and foster those international treaties and commissions dealing with conservation of resources and the law of the seas.

Complicated and often contradictory sets of local, state and Federal laws and regulations—originally designed to conserve species and reduce conflicts among the various users of the seas and waterways—have evolved into cumbersome and outdated regulations that inhibit fishing efficiency and shamefully limit the use of new technologies and capabilities. Inadequate information about fish distribution and behavior contribute to the problems faced by the fishing industry today. The Federal Government clearly needs to re-examine and eliminate fishing regulations that restrict efficiency and encourage irrational practices.

### Looking Ahead

In the years past, men spoke of the sea in terms of ballads, sea chanteys and prose. Today, we live in a more practical age. The poets, singers and dreamers of yesterday have been replaced by the scientists and engineers of today. As the world's population and standard of living increase, we realize that man's future existence on this planet will require his effective use of the seas and products they produce. Even though we are more practical today, it may not be too romantic to visualize undersea habitats for people mining in the seabeds; offshore nuclear power plants; and a national aquaculture program which will result in the harvesting of a vast amount of food substances. There is every indication that the uses of marine transportation and fisheries could expand substantially. The sea can be used to a greater extent to sustain

life, and almost undoubtedly must be used for this purpose. To use these resources, we must preserve the ecology of the oceans.

In this process, we should not jeopardize the national security and well-being of the citizens of the United States. For example, new offshore oil and gas reserves are urgently needed to help the United States meet an energy demand which will double in the next 15 years to meet the national defense, employment, and recreation needs of our citizens. Unfortunately, we do not have the luxury of deciding which source of energy we would like to use. The United States is rapidly approaching an era in which all available energy sources must be used. Just to meet forecast demand over the next 15 years, it will be necessary to find almost 50-billion barrels of oil, which is about 40 percent as much oil as has been discovered in the United States in its entire history.

The development of offshore areas is clearly in the national interest. How to develop these natural resources in a manner consistent with local interest should be the real question. It is American industry's objective to operate in a responsible manner consistent with the concept of multiple use of the seas—a concept which recognizes that the benefits offered by the seas, whether food, recreation, transportation or energy, can be utilized by all, through a system of orderly and cooperative development.

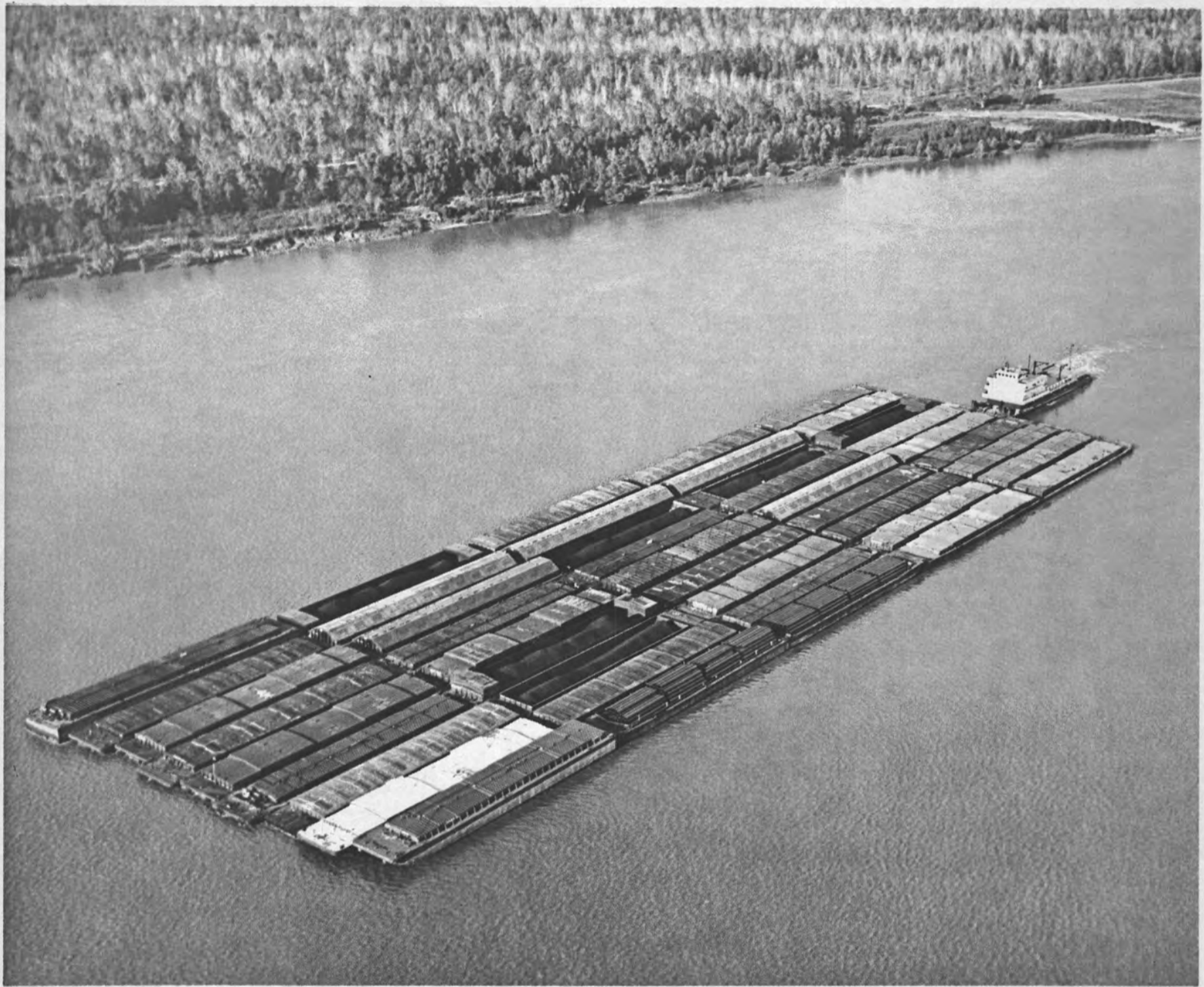
Our country should assert its exclusive jurisdiction over mineral resources off its shores down to the junction of the submerged portion of the continent with the abyssal ocean floor. The current proposal to internationalize ocean areas beyond a depth of 200 meters should be strongly opposed. The proposed treaty to accomplish this should be carefully re-examined and an amended position should be resubmitted by the Federal Government which would be more favorable to the security and well-being of the people of the United States.

Although we have learned more about the seas in the past 10 years than we have in the past 20 centuries, the process of unwrapping this great gift that has been given to mankind has just begun.

The technology for recovering these resources is in the embryonic stage or nonexistent. If we are to open the vaults of the ocean for the benefit of our own and other nations, then a great deal of hard work lies ahead. We should not underestimate the difficulties to be overcome before we can apply the living and nonliving resources of the ocean to the needs of men.

Industry believes that this nation should create a climate that encourages private enterprise to venture its skills and capital in developing these ocean resources.

To achieve this goal, we must develop a coordinated and rational national program in the marine sciences and the development of marine natural resources.



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When you specify or buy any marine engine, one big choice is basic engine design: two-stroke cycle vs. four-stroke cycle. For marine use the Alco four-stroke cycle has key advantages.

The intermediate non-firing stroke improves cooling and lubrication of the engine. You get improved fuel economy.

With better cooling, there is measurably lower thermal stress and so reduced wear.

And the non-firing stroke helps put a better oil film on wrist pins and crankshaft bearings

to help reduce wear in these critical areas.

To further lengthen life, every Alco four-stroke cycle engine is conservatively rated. It's so rugged you can anticipate up to 25,000 hours' operation or more before overhaul. And it is so tough it passes severe high shock and endurance Navy tests. They are proven profit performers.

For the full story on Alco marine diesel engines from 675 bhp @ 720 rpm to 4000 bhp @ 1100 rpm, write Alco Engines Division, White Industrial Power, Inc., Auburn, N.Y. 13021.

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## Wallach To Head Colt's Power And Fluid Systems Group

Colt Industries has announced the appointment of **Philip Wallach** as vice president of Colt Industries and group executive of the Power and Fluid Systems Group.

Mr. Wallach has been president of the group's Fairbanks Morse Power Systems Division in Beloit, Wis., since 1969, and this division

will be part of the group he will manage. The group will also include the Fairbanks Morse Pump Division, Quincy Compressor Division, Central Moloney Transformer Division, Colt Utility Sales Division, Engine Accessories Operation, and the Beloit Research Center.

Mr. Wallach has been in the engine industry since 1950, in operation engineering and sales. His background includes an engineer-

ing degree from the United States Merchant Marine Academy at Kings Point, N.Y. He also is a licensed marine engineer and attended the graduate schools of diesel engineering at North Carolina State College, and Business Administration at New York University.

Mr. Wallach served in the United States merchant marine and in the U.S. Navy as an engineering officer in the shipbuilding and ship repair programs. He is presently a mem-

ber of The Society of Naval Architects and Marine Engineers, Society of Naval Engineers, Propeller Club, Whitehall Club, and the Economic Club of New York.



Philip Wallach

The Power and Fluid Systems Group is a leading supplier of materials, components, and systems to the electric utility and marine industries, as well as many other industrial equipment users. Products of the group include distribution and main line transformers, air compressors, pumps, electric motors and generators, desalting and marine sewage equipment, and diesel, gas and dual fuel engines for marine utility and industrial applications.

Mr. Wallach joined the Power Systems Division in 1967 as vice president/marketing. He had been in sales management with the Nordberg Manufacturing Company. The group headquarters will be established at the Colt Industries plant in Beloit, Wisc.

## Ogden Corporation Elects Russo Treasurer



James M. Russo

The election of **James M. Russo** as treasurer of the Ogden Corporation has been announced by **Ralph E. Ablon**, Ogden chairman and chief executive officer.

Mr. Russo joins Ogden after having served as assistant treasurer of the Continental Can Company from July 1969 until the present. Before that, he was with the Irving Trust Company for 10 years, where he had been assistant vice president.

A graduate of the Bernard Baruch School of Business Administration of the City College of New York, Mr. Russo holds an M.B.A. degree in corporate financial management from New York University Graduate Business School. He is a member of the financial management committee of the New York chapter of the Financial Executives Institute, and has conducted seminars on cash management for the American Management Association.



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## Mesco Tectonics Appoints Occhetti



Louis A. Occhetti

Louis A. Occhetti, P.E., was appointed corporate chief engineer of Mesco Tectonics, Inc., Clifton, N.J., a manufacturer of industrial and marine heat exchangers, manifolds, hoists, deck machinery and other marine products and equipment.

Mr. Occhetti attended the U.S. Naval Academy and holds a bachelor of science degree in naval architecture and marine engineering and a bachelor of science degree in mechanical engineering from the University of Michigan. He has done additional graduate work in electronics and management.

An author of numerous technical and management articles, lecturer and holder of several patents, Mr. Occhetti's background includes previous positions as chief engineer and other assignments of responsibility with Lidgerwood Manufacturing, F.H. McGraw, M.W. Kellogg, Singmaster and Breyer, and George G. Sharp, prior to his joining Mesco Tectonics, Inc.

## MacGregor Int'l Announces Changes In Structure And Policy

Basic changes to the structure and policy of the MacGregor International Organization were announced by its president, Henri Kummerman, to delegates from 19 countries attending the Group's annual convention in Italy. Mr. Kummerman outlined plans to establish in London, before the end of this year, a control and advisory company headed by R.P. Holubowicz, executive vice president of the Organization.

The company also conducted an OBO symposium which was held in the Waldorf Astoria Hotel, New York, N.Y., for the American maritime fraternity.

Coordinated by the American MacGregor Company, the symposium offered OBO "know-how" and experience to owners contemplating new tonnage for the U.S. Government's program for a large fleet of bulk combination carriers.

Symposiums were also held in New Orleans and San Francisco.

The new company, announced at the annual convention in Italy, will be named Central MacGregor Ltd., which will be responsible for monitoring and counseling MacGregor companies throughout the world in matters of finance, management techniques, public relations and other matters of group policy. Its

principal task will be however, Mr. Kummerman noted, to implement diversification plans both in maritime and non-maritime business activities.

Reviewing the current technical problems and trends faced by the world's shipbuilding industries, the delegates unanimously adopted a resolution to press the classification societies to give more attention to the present structural problems caused by the torsional hull

movement of containerships, OBO carriers and other "open" vessels while at sea.

Another policy reviewed at the convention in Italy was to increase the Group's manufacturing facilities to cope with the steadily increasing size of the access equipment designed and sold by MacGregor. This consideration and the trend for package supply, i.e. covers and coamings, has resulted in new manufacturing capacity in

Germany, Norway, Japan and Sweden, and further fabrication locations are proposed for Brazil and Poland.

Among delegates who attended from the 25-member companies of the Organization were, for the first time, representatives from Centromor, the MacGregor licensee in Poland. The American representative was J.H. Klewsaat, president from MacGregor-Comarain Inc., Cranford, N.J.

**Bronze Gate Valve**  
Fig. 2102

# *Lunkenheimer launches a new first line of defense against valve failure*

Traditional Lunkenheimer quality and performance in a new line of bronze double union end marine valves. Designed especially for long maintenance-free service in naval vessel applications, they have all passed High Impact Shock Test Mil-S-901C. Available in 1/4 inch through 2 inches, with pressure ratings of 200 lbs. W.S.P. — 400 lbs. W. O. G. For additional information on these and other marine valves, write The Lunkenheimer Company, Cincinnati, Ohio 45214.

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**Bronze Globe Valve**  
Fig. 2100

**Bronze Angle Valve**  
Fig. 2101

**Bronze Check Valve**  
Fig. 2103

All valves comply with BuShips Drawings

L-1171-127

## Alco Appoints Three To Engineering Staff

Alco Engines Division of White Industrial Power, Inc., has recently added **Alexander S. Lamb**, **Mathias Hefti**, and **Lawrence E. Panton** to its engineering staff in Auburn, N.Y., according to an announcement by president **John V. Sylvester**.

Mr. Lamb, who has gained experience in both Scotland and the

United States, was named senior development engineer. He has worked for Rolls-Royce Ltd., North British Locomotive Co., and Bicara in Scotland, and most recently served as product engineer for Technicon Corp. of Tarrytown, N.Y. Mr. Lamb holds a bachelor of science degree in mechanical engineering from St. Andrews University, Scotland, and is a member of the Institution of Mechanical Engineers. His list of accomplishments

includes designing the world's largest motor-driven reciprocating compressor in 1962, as well as other technical achievements.

Mr. Hefti is now serving as a project engineer at Alco. He holds a bachelor of science degree in mechanical engineering from Polytechnic Institute in Winterthur, Switzerland, and a master of business administration degree from the Avor Institute in Borsach, Switzerland. He is currently a

member of the American Society of Mechanical Engineers.

Mr. Panton, of Auburn, N.Y., was named analytical engineer after receiving his master's degree in mechanical engineering at Syracuse University this year, where he studied under a three-year NASA fellowship.

## Sun Ship Elects Donald P. Jones Board Chairman



Donald P. Jones

Donald P. Jones, senior vice president, finance for Sun Oil Company, was elected chairman of the board of Sun Shipbuilding and Dry Dock Co., Chester, Pa.

Mr. Jones succeeds **Robert G. Dunlop**, who announced he was resigning the chairmanship because of the demands of his position as board chairman of the parent Sun Oil Company. Mr. Dunlop will remain a member of Sun Ship's board of directors.

**Paul E. Atkinson** remains as president and chief executive officer of Sun Ship, a wholly owned subsidiary of Sun Oil Company.

## Crane Names Geiss Manager Of Sales, Valve And Fitting Div.



J.R. Geiss

J.R. Geiss, who launched his career with the company 10 years ago, has been named manager of sales, Valve and Fitting Division of Crane Co.

Mr. Geiss, a graduate of Pennsylvania State University, has served in numerous sales and management capacities during his decade with Crane. Regional sales managers and product sales managers, directly responsible for all Crane valve and fitting sales, will now report to Mr. Geiss.

In his new post, Mr. Geiss reports directly to **Paul V. Shea**, general manager of Crane's Valve and Fitting Division.

## New guide to marine protective coatings!

Completely new marine coating manual from CARBOLINE

This fact-packed marine coating manual is aimed squarely at solving the many corrosion problems of the marine world. This indispensable handbook for owners, shipyards, naval architects and other marine personnel is based on Carboline's many years of experience in the marine field. You'll find detailed data on the special knowledge, skills and coating systems available for upgrading protection against marine corrosion. Many systems include Carboline's popular Carbo Zinc 11, inorganic zinc. Send for your free copy today. It's worth a look.

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



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## El Paso Natural Gas Announces Plans To Build Six U.S.-Flag LNG Ships

The largest private shipbuilding plans in U.S. maritime history were recently announced in Washington, D.C., and involved construction of six huge U.S.-flag liquefied natural gas (LNG) carriers to bring fuel from Algeria to East Coast U.S. utilities.

The total package could run to more than \$400 million, according to a joint announcement by the Commerce Department and El Paso Natural Gas Co. It is also the first of these new type carriers slated for the American merchant fleet.

An application for construction subsidy for the ships—to a maximum extent of 43 percent of the contract price—is to be filed, officials said.

Commerce Secretary **Maurice Stans** said the prospective orders were the "most significant ac-

tion so far taken under the President's new maritime program . . . it will add importantly to domestic employment" as well as the balance of payments, since equipment for an Algerian-based liquefaction plant will be exported.

El Paso was said to be hoping to get bids from as many shipyards as possible.

The six ships, each of 900-foot length, 140-foot beam, 36-foot draft, speed of 20 knots, 90,000 deadweight tons, and capable of hauling 125,000 cubic meters of liquefied gas, will bring the product from the liquefaction plant to be built, at a cost of \$350 million near Arzew, Algeria, to regasification plants in Cove Point, Md., and Savannah, Ga. These two plants will cost some \$200 million, an announcement said.

Construction of the six ships, Mr. **Stans** estimated, will mean 30,000 to 40,000 man years of employment in U.S. yards, not counting the jobs arising from the regasification plants. Mr. **Stans**

also noted that the planned-for service will open a new supply of natural gas for the heavy demand area of the Eastern Seaboard and helps "maintain United States leadership in an important developing technology."

El Paso's board chairman **Howard Boyd** said the company hopes to take delivery of the ships in 1975 and 1976.

## Holme And Duncan Appointed At Paceco International Ltd.



Alan L. Holme



Alastair C. Duncan

Paceco International Limited announces the addition of two new staff members to its London headquarters office. **Alan L. Holme** has been appointed deputy managing director, and **Alastair C. Duncan** is the new area sales manager. The company is a subsidiary of Paceco, a Division of Fruehauf Corporation, U.S.A.

Mr. **Holme**, who received his degree in engineering from Cambridge, was previously manager of the Contracts Division of David Bridge & Company. Prior to that, he was marketing manager of the Gear Division of David Brown Corporation.

Mr. **Duncan** was export executive with Coles Crane Limited before joining Paceco. He gained his engineering experience through appointments with U.K.A.E.A. and as chief mechanical engineer, technical advisor to the Iran Plan Organization, and project engineer to the U.S. Mission in Iran. Both men are British subjects.

## National Shipping & Trading Orders 2 Tankers From Hitachi

Two 127,800-dwt tankers have been ordered from Hitachi Zosen of Japan by the National Shipping & Trading Corp., New York, N.Y. The approximate measurements of the ship will be 837 feet in length, with a 136-foot beam and a depth of 73 feet. The tankers will be powered by a 23,200-shp Hitachi B&W diesel engine producing a speed of 15.4 knots. One vessel is scheduled for completion in 1973 and the other in 1974.

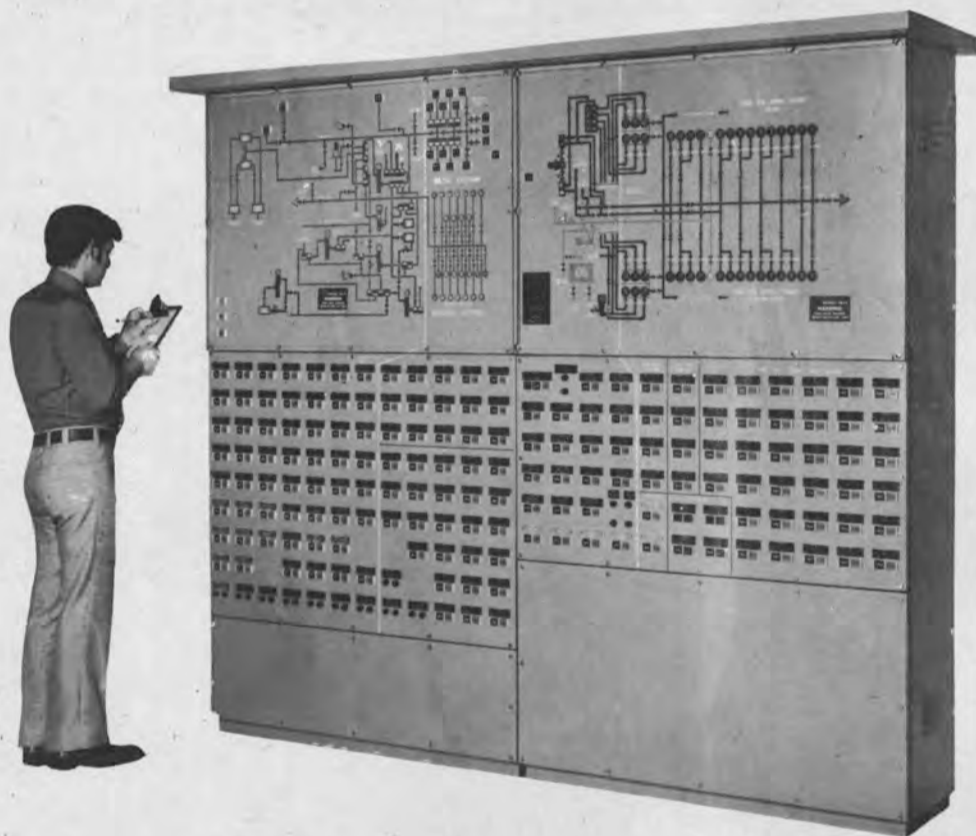


**BLOUNT DELIVERY:** Blount Marine Corporation, Warren, R.I., recently delivered the 65-foot steel tanker **Duff** shown above to The Vane Brothers Company, Baltimore, Md. Built under U.S. Coast Guard supervision, the **Duff** will carry 1,000 barrels of diesel oil for direct bunkering and delivery to shore depots in the Chesapeake area. Designed by the Blount Marine Corporation design staff, the vessel is equipped with both 2-inch and 4-inch discharge lines operated by a Viking pump for fast bunkering service. Power is furnished by a General Motors 6-71N diesel driving a 46-inch Federal propeller. The Vane Brothers Company have been ship chandlers since 1898.

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## Sperry Marine Demonstrates New Doppler Speed Log



Morton J. Howard, Sperry Marine Systems Division, points to the speed and distance reading of the new Doppler Speed Log in the pilothouse of the demonstration vessel.

Sperry's new SRD-301 Doppler Speed Log was shown to the maritime fraternity during more than 100 hours of demonstrations in the New York area in which speed and distance were constantly displayed with less than 1 percent error.

The high accuracy results from measuring vessel water speed outside the boundary layer of water around the hull. Sperry accomplishes this measurement without the "fin" or protruding sword used in electro-magnetic units. Such protrusions add to vessel maintenance costs through fouling or breakage.

The Sperry Speed Log utilizes a small flush-mounted transducer in the hull which, in addition to minimizing maintenance, results in easy and low cost installations, supporting Sperry's claim of "lowest cost of ownership" for its log.

The Sperry Log can be used on all classes of vessels, ranging from supertankers to fishing vessels. The log was demonstrated to more than 25 potential users who expressed enthusiasm for its demonstrated performance.

The SRD-301 Speed Log is sold worldwide by Sperry Rand Corporation's Sperry Marine Systems Division, with headquarters in Charlottesville, Va. The division sells a line of Doppler Sonar products for maritime use, including navigation and docking systems.

## Norwegian Shipowners Award Construction Contracts To Two U.S. Shipyards

Two Norwegian shipowners have placed orders for oil drilling equipment and vessels with U.S. shipyards, according to reports from Oslo.

Hagbart Waage has ordered two oil drilling rigs for use in the North Sea from the Avondale Shipyards in New Orleans, La. They will be delivered in 1973.

The Wilh. Wilhelmsen Co. announced they have ordered three supply ships for oil drill work from the Mangone Shipbuilding Co. of Houston, Texas, for delivery before March 1973. Each ship will total 900 gross tons.

## Singapore Slipway To Build Two 400-Ton Ro/Ro Vessels For Offshore Supplies Group

Singapore Slipway & Engineering Co. (Private) Ltd., P.O. Box 2169, Singapore, a wholly owned subsidiary of Keppel Shipyard (Private) Ltd., has won a contract to build two 400-ton ro/ro vessels for Offshore Supplies Association (S.E.A.) Pte. Ltd., which is a company comprising Sime Darby, Development Bank of Singapore, Offshore Marine Ltd., Hansa, and V.T.G. interests.

Singapore Slipway only started building

ships early this year, and the fact that Offshore Supplies Association (S.E.A.) Pte. Ltd. has given the contract to it is a clear indication of Singapore's progress in the shipbuilding industry.

These two specialized vessels built to Lloyd's Register + 100A1 would be used to assist in the offshore oil industry and are ideal because they require no wharf or crane facilities to unload or load.

Chua Chor Teck, general manager of Singapore Slipway & Engineering Co. (Private) Ltd. said that the new contract, worth about three million dollars, is a good indicator of things to come and has expressed satisfaction that despite his company's brief existence, it has contributed significantly to the shipbuilding industry in Singapore. To the best of Mr. Chua's knowledge, these two ro/ro vessels will be the first built in Singapore.

## Calpac Traders, Ltd. Named Distributor In Malta For Arnessen Chipping Hammers

Corrosion Dynamics, Inc. of Roselle, N.J., manufacturers of the well-known line of Arnessen Chipping Hammers and Production Deck Scalers, has announced the appointment of Calpac Traders, Ltd., Valletta, Malta, as their distributor for the Mediterranean Area. According to Kenneth Westphal, vice president of Corrosion Dynamics, Inc., Calpac Traders will handle the complete line of Chipping Hammers and Deck Scalers for vessels calling at the Port of Valletta.

Additional information may be obtained from Calpac Traders, Ltd., 25, Pinto Wharf (P.O. Box 422) Valletta, Malta, or direct from Corrosion Dynamics, Inc., 1100 Walnut Street, Roselle, N.J. 07203.

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## Raymond International Announces Move To Houston, Texas

Henry C. Boschen, chairman of the board of Raymond International, Inc., has announced that the company's corporate headquarters will be moved to Houston, Texas during the summer of 1972. Raymond International, a heavy con-

struction, engineering and manufacturing company with worldwide operations, now has its headquarters at Two Pennsylvania Plaza, New York City.

Mr. Boschen said that the primary reason for the move is to effectively reduce the escalating costs of operating corporate headquarters. Houston, he said, was selected as the best of a number of possible

locations where operating costs would be substantially lower than those projected for the existing location. Also, he said, Houston is a strategic site from which to administer the company's domestic and international activities.

Mr. Boschen pointed out that Raymond International will maintain a large organization in the New York area that will be respon-

sible for continuing engineering and construction work in the East.

A district office of the Raymond Concrete Pile Division is presently located in Houston. Arctic Engineers and Constructors, a joint venture of Raymond and Global Marine Inc., has its headquarters in the city. Arctic Engineers and Constructors is pioneering in the use of air cushion vehicles to perform engineering, drilling and construction work in Alaska and the Canadian Arctic.

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## Electric Boat Division Forms New Department —Henry Hyman Named



Z. Henry Hyman

A new department, construction engineering, has been established at Electric Boat Division of General Dynamics, Groton, Conn., consolidating engineering and research activities in support of submarine construction.

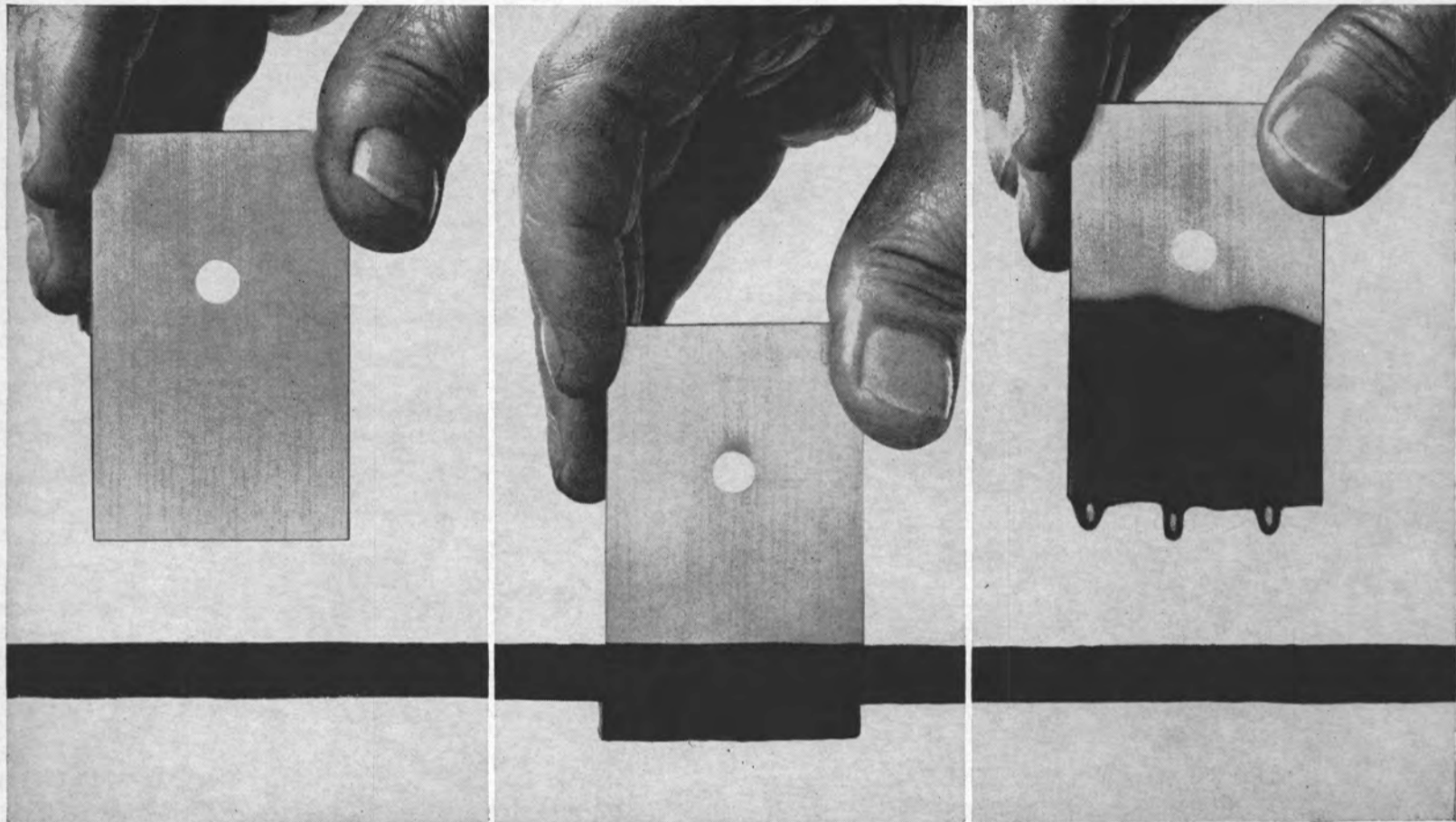
Z. Henry Hyman of Groton has been named construction engineering manager according to an announcement by John R. Hunter, engineering director. Mr. Hunter said the new group would "centralize shipyard support activities, resolve shipyard technical problems, and perform laboratory and test services essential to submarine construction."

A native of Brooklyn, N.Y., Mr. Hyman holds a 1951 bachelor's degree in structural engineering from North Carolina Agricultural and Technical State University and has done graduate work in civil engineering at Columbia University. After teaching at the North Carolina institution, he became a designer for Curtiss-Wright Corp.

Since joining Electric Boat Division in 1956, Mr. Hyman has held supervisory positions in marine engineering and, from 1968 until his present appointment, was chief of planning and estimating for engineering and research administration. He is a licensed professional engineer in the state of Connecticut and is listed in "Who's Who in American Colleges and Universities."

Appointed to assist Mr. Hyman are: David O. Higley, of Noank, manager of product assurance engineering; Howard C. Schink of Quaker Hill, manager of product support engineering; Arthur H. Pritchard of Waterford, manager of product support design, and Francis A. Fanelli of Old Lyme, manager of construction services.

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Naval Architects, Marine Engineers, Chief Draftsmen .....	533
Shipbuilding & Ship Repair Personnel (Draftsmen, Foremen, Inspectors & Others) not included in above classification .....	669
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Deck Captains, First, Second & Third Mates Only .....	2,276
Engine Room Chiefs & Licensed Assistants .....	3,250
Ship Operating Personnel Ashore & Aboard not included in above classifications .....	408
<b>PROFESSIONAL MEN:</b>	
Naval Architects & Marine Engineers .....	984
Admiralty lawyers .....	64
Insurance Companies, Agents & Brokers .....	48
<b>NAVY</b> .....	364
<b>MARINE SUPPLIES &amp; EQUIPMENT: Manufacturers</b> .....	
Ship Chandlers, Dealers & Agents .....	1,480
Bunkers (Coal & Fuel Oil) .....	74
<b>ALLIED MARINE INDUSTRIES:</b>	4
Freight Agents & Forwarders .....	2
Exporter & Importers .....	4
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Companies, directors, owners, presidents, vice-presidents, secretaries and treasurers .....	1,025
Superintendents, managers and purchasing agents .....	1,146
Naval architects, engineers and chief draftsmen .....	793
Other employees (draftsmen, inspectors, foremen and others em- ployed by shipbuilding and repair companies) not included in above classifications .....	90
<b>VESSEL OPERATING COMPANIES—</b>	
<b>OCEAN, RIVERS, HARBORS, OFFSHORE OIL DRILLING AND RELATED OPERATIONS</b>	
(Owners, Agencies & Brokers) Companies, directors, owners, agents, presidents, vice-presidents, managers, secretaries and treasurers .....	4,277
Port engineers, superintendents, purchasing agents, port captains, port stewards, naval architects and engineers shoreside .....	1,275
Other employees ashore not included in above classifications .....	38
<b>PROFESSIONAL MEN:</b>	
Naval architects, engineers and consultants shoreside .....	1,468
Admiralty lawyers and insurance .....	30
<b>MARINE SUPPLIES &amp; EQUIPMENT:</b>	
Manufacturers, dealers and agents .....	2,211
Ship Chandlers .....	207
Allied marine industries .....	256
<b>GOVERNMENT:</b>	
U.S. Navy and U.S. Coast Guard shoreside .....	31
U.S. Maritime Administration, U.S. Senators, U.S. Congressmen and others in official capacities .....	42
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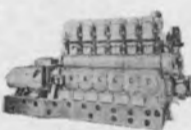
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## DIESEL GENERATOR SETS

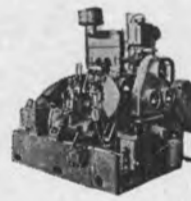
**1**  **G.M. 6-71 DIESEL GENERATOR SET**  
60 KW—440/3/60—1200 RPM—with switchgear.

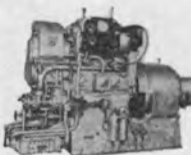
**2**  **350 KW 120/240 VDC DIESEL GENERATOR SET**  
Ingersoll-Rand heavy duty type S engine—8 cyl.—505 HP—10 1/2 x 12. GENERATOR: G.E. 350 K.W. 120/240—600 RPM—switchgear. Good condition—as removed from Grace Line ships.


**3**  **250 KW DIESEL GENERATOR SET**  
ENGINE: Enterprise 12 x 15 DSG—6 cyl.—450 RPM crank No. 50J. GENERATOR: Westinghouse 250 KW—120/240 DC—1040 amps—450 RPM. Typical serial No. 35-10P-913. Complete with switch gear.  
**\$12,500.**

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


**5**  **UNUSED 100 KW SUPERIOR DIESEL GENERATOR SET**  
GENERATOR: 120/240 VDC—417 amps—stab. shunt—1200 RPM. DIESEL: Superior GBD-8—8 cyl.—5 1/2 x 7.


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

**7**  **100 KW G.M. 3-268A DIESEL GENERATOR SET**  
Like new. ENGINE: G.M. 3-268A—3 cylinder—6 1/2" x 7" bore and stroke. GENERATOR: General Electric—100 KW—440 volts—3 phase—60 cycle.


**8**  **250 KW COOPER BESSEMER DIESEL GENERATOR SET**  
250 KW Cooper Bessemer constant duty diesel generator set. ENGINE: Cooper Bessemer FS-6—6 cylinder—8 3/4" x 11" bore and stroke—900 RPM—3968 cubic inches. GENERATOR: General Electric 250 KW—312 K.V.A.—type ATI—frame 975Y—450 volts—3 phase—60 cycle—80% P.F. continuous. EXCITER: 4.5 KW—120 volts. With switch gear.

## TURBO GENERATOR SETS

**9**  **WESTINGHOUSE 440/3/60 200 KW UNIT**  
GENERATOR: Westinghouse 200 KW—250 KVA—450/3/60—1200 RPM—80% PF—with 40 KW—120 VDC on same shaft. GEAR: 9989/1200 RPM—double helical. TURBINE: Westinghouse—540 PSI—superheat 322°F. Test 930 PSI 800°TT. Also operates 615 PSI—850°TT.

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

**11**  **300 KW WORTHINGTON-MOORE CROCKER-WHEELER UNITS**  
AP2 ExMedina Victory units. Worthington-Moore turbine—440 lbs—740°TT—28 1/2" vac.—type S4—5-stage—6097 RPM—serial 7547 & 7548. GEAR: 14x7—6097/1200. GENERATOR: Crocker-Wheeler 300 KW 120/240 DC—1250 amps—type 102-H—compound—973643—999759—armature flange 8 1/4"—bolt circle 7"—12 holes. Also new armature in stock (weighs 1840 lbs). Also have 2 units—generator 102 HP—300—KW120/240—stab. shunt—1200 RPM.

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

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G.E. 600 KW geared turbo generator sets—525 lbs—825°F. TURBINE: Type FN3-FN-20—6-stage—882 HP—600 KW—525/565 lbs. G—superheat 355/371°F—exhaust pressure 1" abs. Test steam chest 850# G. 10033 RPM—6390 lbs steam flow per hour. REDUCTION GEAR: Single helix—single reduction—10033/1200. GENERATOR: G.E.—600 KW—450/3/60—1200 RPM—type ATI—0.8 PF—961 amps continuous—2 hours 25% overload—(750 KW) 1200 amps—5 minutes (900 KW) 1400 amps. Totally enclosed—water cooled—amb. temp. reg. 50°C. EXCITER: 7.5 KW—120 VDC—direct connected. Complete with rheostat type voltage regulator & motor operated generator field rheostat.

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H.P.—8-stage—serial 78040  
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G.E.I. 16262

## VICTORY SHIP AP2 H.P. & L.P. TURBINES NEW — UNUSED — 6000 HP SETS

G.E.—H.P. & L.P.—with throttle valve  
Westinghouse—L.P.—with throttle valve  
Allis-Chalmers—H.P. & L.P.—with throttle valve

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

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Turbine—3H-69 Gear—52269  
Turbine—3H-52 Gear—52252  
Turbine—3H-62 Gear—52262

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

### ELLIOTT 10-STAGE MAIN PROPULSION TURBINE ROTOR

26

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

27

### UNUSED G.E. MAIN GENERATOR AIR COOLER

## PUMPS

28



### VICTORY AP2 MAIN CIRCULATOR

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

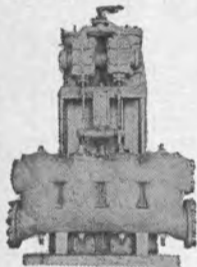
29



### UNUSED 10x9x12 VERTICAL SIMPLEX FUEL OIL TRANSFER PUMPS

Furnished on some T-2 Tankers. 160 GPM Bunker C—viscosity 70 to 700 SSF 122°F @ 100 lbs. discharge pressure. WP steam 150 lbs.—exhaust 10 lbs. 1 1/4" steam inlet—1 1/2" exhaust. 4" Pump suction—3 1/2" discharge.

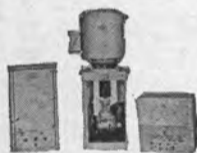
30



### WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP

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

31



### NEW BLACKMER FUEL OIL TRANSFER PUMP

Rotary—50 GPM—50 lbs.—2"—5 HP—440/3/60—with starter & spares.

32



### UNUSED BLACKMER VERTICAL ROTARY PUMP

4"—100 GPM—100 PSI—15 HP—440/3/60—gear head.

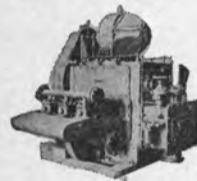
33



### R-2418 WATEROUS CARGO PUMP

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

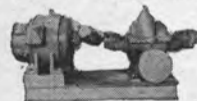
34



### UNUSED BOILER FEED PUMP

Worthington Triplex—36.5 GPM—590 PSI—variable stroke—2 3/4 x 5—P2—S2—R2 vessels. 40 HP—230 VDC—1800/2400 RPM.

35



### UNUSED WARREN BRONZE PUMP

1175 GPM—11.1 lbs.—8" x 8". MOTOR: Reliance 10 HP—115 VDC—850—RPM—76 amps.

36



### NEW WORTHINGTON VERTICAL SUBMERS- IBLE BILGE PUMP

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

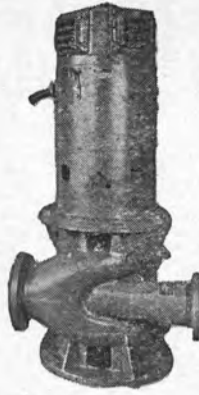
37



### EXCELSIOR MOLASSES PUMP—SIZE 5 1/2"

6" Suction and discharge—210 GPM—45 PSI—125 RPM. MOTOR: 10 HP—230 VDC—Frame 67—with gear.

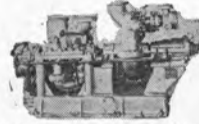
38



### NEW—UNUSED BRONZE VERTICAL LST BALLAST PUMP

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

39



### UNUSED SIZE 4 BUFFALO FEED PUMPS

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

## WINCHES AND WINDLASSES

40



### VICTORY UNIT WINCHES

50 HP—230 VDC—U-1, U-2, U-4, U-5—reconditioned.

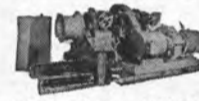
41



### MODEL U-6 DOUBLE DRUM WINCHES WITH GYPSIES

50 HP—230 VDC—reconditioned.

42



### HYDE NO. 7 WINDLASS

1 3/4" Chain—Wildcat centers 3'3"—Handles 3000 lb anchors. MOTOR: 8.7/35 HP—440/3/60—1800/450 RPM.

43



### NEW—UNUSED LINK BELT WINDLASS

1 1/2" and 7000 lb. anchors. 56" Centers—50 HP—230 VDC—spares.

44



### IDEAL WINDLASS— UNUSED

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

45



### UNUSED 70 HP McKIERNAN-TERRY WINDLASSES

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

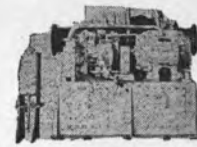
46



### LCT-6 JAEGER GASOLINE DRIVEN WINCH

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

47



### 4 SINGLE DRUM ELECTRIC HYDRAULIC WINCHES

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

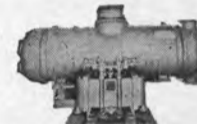
48



### VICTORY AP2—WESTINGHOUSE MAIN PROPULSION GEAR

6000 SHP—Serial 4A—1620—Medina Victory.

49



### UNUSED 1135 SQ. FT. C.H. WHEELER CONDENSER

20" Ex. inlet—5/8" Cu-Ni tubes—with or without air ejector.

50



### 1 PAIR OF 300 HP UNION DIESEL ENGINES

Port and starboard—model 06—1300 HP at 350 RPM—4 cycle—direct reversible—11 x 15—overhauled 1966—in good condition. Just in from Navy.

51



### MODEL O-2-D M&T RECONDITIONED UNITS

Hydraulic starting steering, raising & lowering tailfin. Navy reconditioned 1965—fully checked out by us. Will demonstrate running. Wt. about 9500 lbs. PROPELLOR: 48"x24"—3 blade.

52



### HYDE 30" DOCK CAPSTAN

10" x 10"—reversible—W.P. 125 lbs—2 1/2" steam—3" exhaust.

53



### DOUBLE INPUT— SINGLE OUTPUT DIESEL REDUCTION GEARS

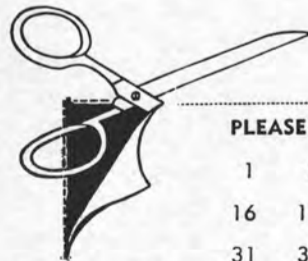
Farrell-Birmingham—3200 SHP. Reduction gear: 1.81:1—handles two 1600 HP diesels @ 720 RPM. With hydraulic couplings & Fawick clutch. Port and starboard.

54



### INGERSOLL-RAND MODEL 40 AIR COMPRESSOR

Two stage—135 CFM—7" x 6 1/4" x 5"—110 lbs—870 RPM—inner cooler. MOTOR: Allis-Chalmers 40 HP—230 VDC—145 amps—1750 RPM—Model EB 121.



PLEASE SEND INFORMATION ON THE FOLLOWING: (Please circle items)

11/15/71

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16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54						

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# T-2 TANKER MAIN & AUXILIARY EQUIPMENT

## From 2 Vessels Reconditioned by U.S. Gov't

### ALL MATERIAL IN FIRST CLASS CONDITION WITH A.B.S.



**MAIN PROPULSION ROTOR — G.E.**

Large Schenectady — serial 77418—reconditioned Bethlehem Steel 1970—all stages magnafluxed.

#### 2 COMPLETE G.E. TURBINES

#61818 and #61834—large Lynn—all stages magnafluxed.

WILL INTERCHANGE WITH ELLIOTT MAIN TURBINE

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- 2 COMPLETE SETS LABYRINTH PACKING
- THRUST BEARINGS
- COMPLETE GOVERNOR ASSEMBLIES
- OPERATING CYLINDERS
- CONTROL VALVES
- SHAFT BEARINGS

ALSO

#### THROTTLE VALVE ASSEMBLY



**G.E. REVOLVING FIELDS**

Rewound 1968—main propulsion—by G.E. Seattle. Re-checked June 1971 by G.E. Service Shop—A.B.S.



**WESTINGHOUSE REVOLVING FIELD**

With A.B.S.—ex-Ohio Sun.



**MAIN G.E. STATOR**

With A.B.S. — reconditioned 1970.



**WESTINGHOUSE MAIN GENERATOR STATOR**

Reconditioned Westinghouse — #39519P915 — Thermoplastic winding.



**NEW—UNUSED G.E. MAIN GENERATOR COOLER**

Also Westinghouse—reconditioned to A.B.S.



**G.E. AUXILIARY TURBINE ROTOR**

For 525 KW G.E. Turbine DORV-325M—5645 RPM.



**COMPLETE T2 TANKER TURBO GENERATORS**

TURBINE: DORV-325M—525 KW—5645 RPM—435 PSIG—28" exhaust. REDUCTION GEAR: S-162—Form D—5641/1200. A.C. GENERATOR: 500 KVA—400 KW—440/3/60—1200 RPM—0.8 PF. D.C. EXCITATION GENERATORS: 75/55 KW—form AL—110 volts D.C.



**NEW STYLE AMPLIDYNE**

5LY148A—Type A.M.—Frame 605.



**75 KW—55 KW EXCITER ARMATURES**

Also stators & pedestal bearings—400 KW aux. generator revolving fields.



**T2 AUXILIARY GENERATOR S-162 REDUCTION GEARS—PINION & BULL GEAR—BEARINGS**



**AUXILIARY GENERATOR THROTTLE VALVE**



**WESTINGHOUSE MAIN CARGO PUMP MOTORS**

1 Unit—frame 874—125 HP—440/3/60—168 amps 590 RPM. 2 Units—frame 876C—125 HP—type CS—440/3/60—159 amps—585 RPM.

#### G.E. MAIN CIRCULATING PUMP MOTORS—125 HP

#### COFFIN FEED PUMPS



Type C-G 2-A



Type F

#### WESTINGHOUSE MAIN PROPULSION TURBINE

Profile (unshrouded)—serial 2-A-9361-21.



**COMPLETE G.E. THROTTLE VALVE**

With governor—for above turbine.

#### 2 WESTINGHOUSE AUX. 538 KW TURBO GENS

Turbines—gears—400 KW generators—(110 KW—32.5 KW—5 KW excitation).

WILL SELL ROTORS—GEARS—EXCITERS SEPARATELY.



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ALSO AVAILABLE — EXCITERS

(110 KW—28 KW—5 KW) or (110 KW—32.5 KW—5 KW)

SWITCHGEAR FOR ABOVE

also available.



**T2 ANCHOR WINDLASSES**

1 American Hoist & Derrick —12x14 for 2 5/16" chain. 1 American Engineering Co. —12x14 for 2 5/16" chain.

#### T2 WARPING WINCH

Poop—9x12—AH&D.

#### T2 DECK WARPING & HOSE HANDLING WINCH

8 1/4 x 10—Hunt Tool Co.

#### MAIN CIRCULATING PUMPS

Ingersoll-Rand—24 V.C.M.



**INGERSOLL-RAND CARGO PUMPS**

200 GPM—100 PSI—Model 6 GT—10" suction—8" discharge.

#### BRONZE T2 TANKER STRIPPING PUMPS

14x14x12—700 GPM @ 100 lbs. ALSO EX-MISSION 14x14x12 WILSON-SNYDER IN STOCK.



**T2 TANKER FIRE & BILGE PUMP**

Bronze — 10x7x10—vertical duplex. Steam pressure 150 lbs gauge—exhaust pressure 10 lbs gauge—discharge pressure 100 lbs gauge—300 GPM.



**MAIN INJECTION VALVES**

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## Great Lakes Dredge And Dock Promotes Colnon And Hazard



William L. Colnon



Frederick R. Hazard

William L. Colnon has been named senior vice president of Great Lakes Dredge & Dock Company and Frederick R. Hazard vice president and general superintendent, according to an announcement by John A. Downs, president.

Mr. Colnon was formerly vice president, engineering, and Mr. Hazard was general superintendent.

Mr. Colnon joined Great Lakes in 1949. A native Chicagoan, he received his bachelor's degree from Harvard College and his master's degree in business administration from the University of Chicago. He also attended Massachusetts Institute of Technology and the Colorado School of Mines. He is a member of the North Shore Country Club.

Mr. Hazard, a native of Rhode Island, joined Great Lakes in 1967, after serving in various executive capacities with Fitzsimons & Connell and Dunbar Sullivan. He received his bachelor of science degree in civil engineering from Brown University. He is a member of and American Society of Civil Engineers.

## George Panitz Receives Maritime Service Award

The Maritime Service Award issued annually by the Maritime Port Council of Greater New York and Vicinity has been presented to George Panitz, editor of transportation and maritime news of The Journal of Commerce, at the Americana Hotel in New York.

The council, an affiliate of the 7.5-million member AFL-CIO Maritime Trades Department, cited Mr. Panitz for his coverage of industry news and affairs and its contribution to the understanding of ship industry problems.



## Transportation Techniques, Inc. Applies To MarAd For Subsidy To Build Three LNG Ships

The Maritime Administration has received an application for a construction subsidy in connection with building three 120,000-cubic-meter LNG ships at an estimated cost of \$68 million each. The applicant, Transportation Techniques, Inc., 551 Fifth Avenue, New York, N.Y., is negotiating with General Dynamics regarding construction.

## Third 255,000-Dwt Tanker Awarded To NKK By Esso

Esso Tankers, a subsidiary of Standard Oil Company (New Jersey), has ordered a third 255,000-dwt supertanker from Nippon Kokan, Japan's only integrated shipbuilder-steelmaker-fabricator.

Sachio Sasabe, NKK-New York shipbuilding department manager, said the vessel is scheduled to be delivered in the second half of 1974. This brings to 12 the number of 255,000 type tankers contracted by various owners based on an NKK-developed standard basic design.

The main particulars of the vessel are: length overall, 1,109 feet; length between perpendiculars, 1,050 feet; breadth molded, 170 feet; depth molded, 88 feet; draft molded, 69 feet, and approximately 120,000 gross tons. The main turbine engine has an output of 31,000 shp at 85 rpm with a service speed of 15.4 knots.

## Liberia And Japan Continue Lead In Sun Oil Co.'s 29th Annual Tank Ship Survey

For the 14th consecutive year, Liberia with 24.7 percent, led the world in total carrying capacity of tank ships registered, according to the 29th Annual World Tank Ship Survey recently issued by Sun Oil Company.

Japan again led for the year 1970 in construction of new tankers, a lead position she has maintained for all but one year since 1956. The United States remained fifth in world carrying capacity in 1970 and retained 11th place in tanker construction.

The Sun Oil survey reports that the world tank ship fleet on December 31, 1970 was 14.2 percent larger in deadweight tonnage than a year earlier, with 3,994 vessels of 2,000 gross tons or more totaling 166,744,000 deadweight tons. The fleet increased by 101 vessels and by 20,745,000 dwt. In terms of carrying capacity, United Kingdom, Norway and Japan occupied second, third and fourth places respectively, with the United States in fifth place. Greece and Panama were sixth and seventh leading flags of registry. France was eighth, followed by Italy, U.S.S.R., Sweden and the Netherlands.

Japan had 32.1 percent of the total world tanker tonnage under construction in her shipyards, totaling 24,248,000-dwt., to maintain her lead in new ship construction. Sweden, France, Denmark, Spain and Norway followed in descending order. Western Germany retained seventh place, while the Netherlands rose from 10th to eighth position. The U.S. had at year's end, 21 tankers totaling 1,873,000 dwt under construction.

During 1970, there were 213 tankers delivered into the world fleet, while 125 vessels were scrapped. Transfers between flags totaled 148 vessels. The average deadweight tonnage of oceangoing tank ships of 2,000 gross tons or more increased from 37,500 dwt a year earlier to 41,800 dwt. The average speed remained at 15.8 knots.

Japanese flag tankers continued as the newest among major flags of registry, with an average age of four years two months at the end of 1970. The U.S.-flag tanker fleet was the oldest, averaging 16 years, five months.

At the end of the year, there were 649 tank

ships of 2,000 gross tons or more representing 75,447,000 dwt on order or under construction in the world's shipyards, an increase from the year before of 79 vessels and 16,119,000 dwt. The average vessel under construction increased in size to 116,300 dwt from 104,100 dwt a year earlier.

## Iotron Conducts Vessel Collision Avoidance Seminar

Iotron Corporation of Bedford, Mass., recently conducted a collision avoidance seminar at the Showboat Motor Inn, Greenwich, Conn. Capt. H.E. Van der Linde, president of Transportation Concepts and Techniques, sponsored the seminar to inform both administrative and technical management of the shipping industry on recent advancements made in marine collision avoidance equipment. A seagoing demonstration of the latest production model of Digiplot® was given aboard Tradewinds, Iotron's test vessel, and Long Island Sound provided an excellent setting for proving the benefits of Digiplot in congested waters.

Representatives from the following organizations were present: American Bureau of Shipping, ARCO, Continental Oil Co., Gulf Oil Corp., Island Navigation, Liberian Services, Lykes Bros. Steamship Co., Marcona Corp., Mobil Oil Corp., Moller Steamship Co., National Bulk Carriers, Olympic Steamship Co., Sea-Land Service Inc., Southern Star Shipping Co., Texaco Inc., J.P. Tilden Ltd., Transoceanic Marine Inc., Triton Shipping Inc. and Victory Carriers Inc.

Presentations were given which traced the evolution of various types of radar navigational aids, including a summary of current techniques and systems intended to minimize the risk of collision. John C. Herther, Iotron president and seminar chairman, introduced Digiplot, his company's fully automatic radar plotter. Mr. Herther stated that Digiplot is the most advanced system in operation today.



Pete Wurschy, Gulf Oil Corp., and Capt. K.J. Liu, Island Navigation, listening to a question during the demonstration. John C. Herther, president of Iotron (far right), demonstrates the Digiplot aboard the Tradewinds.

The Digiplot unit will analyze 200 objects on the water within 12 miles and automatically display the 40 most threatening. It also displays the shoreline on the scope with dotted lines.

Each object on the Digiplot scope is represented by a single white dot. Emanating from each white dot is a white line showing the course that the ship in question will travel in so many minutes. The desired number of minutes is set by a control on the console. The computer, memorizing past movements of the ships, generates the course lines in a flash. If there is no white line from a white dot, it indicates that the object is a buoy or a stationary target.

Among other features of the Digiplot were meters showing the closest distance that the ship using it would come to any selected other "target" and the time till that closest approach, audible and visible alarms, and devices to produce indications on the scope of how a certain course change would affect the traffic situation.

Mr. Herther states that Iotron is now in production and that the company had received orders for 18 Digiplot units from vessel operating companies.

## Company To Represent Shipbuilding Firms Formed In London

A reception was recently held in the Wheelton Rooms, London, to mark the creation of Ship Repairers & Shipbuilders Ltd., St. Alphege House, 2 Fore Street, London, E.C.2.

The new company incorporates the London office of the Terrin Group of Companies based in Marseilles; the Terrin London office

covers the companies' activities in the U.K., Holland and Belgium. This group of companies is the largest ship repair organization in France, capable of undertaking all types of repair work and of handling vessels of up to 212,000 dwt. The Terrin Group of Companies includes Societe Provencale des Ateliers Terrin, Sud-Marine, Marseilles, and Mecanique Etang Martigues, Martigues.

Ship Repairers & Shipbuilders Ltd. will also represent Hongkong

& Whampoa Dock Co. Ltd. in the U.K. and Holland, Environ Mechanical and Electrical Engineering Services Ltd., as well as a well known Norwegian shipbuilding and ship repair yard.

Ship Repairers & Shipbuilders Ltd. is a company formed by Terrin, Marseilles. The directors are Ian Morrison, Paul Muletier and Jean-Pierre Terrin. The company will offer to shipowners first-class repair facilities in Northern Europe, the Mediterranean and the

Far East, as well as repairs en route, thus covering the complete repair and maintenance aspects of fleet operation.

Hongkong & Whampoa Dock Co. Ltd. is one of the old established ship repair organizations in the Far East and is able to offer all types of repair facilities for vessels of up to 35,000 dwt. They employ modern techniques and are backed up by a highly skilled labor force.

Among those present were senior representatives of international oil companies, classification societies, the salvage associations and leading shipowners. The following independent shipowners were present among others: M. Kulukundis, C.M. Lemos and P.M. Nomikos.

Terrin and Hongkong & Whampoa Dock Co. Ltd. are represented in the United States by Robert M. Catharine, 11 Broadway, New York, N.Y.

# Look what's coming to you now —to make Antigua the last word in fast, economical bunkering!



READY FOR ACTION IN DECEMBER 1971, BOLD IN CONCEPT AND DESIGN, THE \$2,000,000 Tanker Refueler BUNKER ANTIGUA with high-capacity pumping will reduce your bunkering time to a minimum. Designed specifically for bunkering services at Antigua, this vessel is one of the largest, most modern and sophisticated vessels of its kind in the world.

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grades of marine fuels as well as potable water.

M.T. BUNKER ANTIGUA will ensure prompt delivery and quick turnaround to ocean-going vessels of all types and sizes including mammoth tankers, OBO's, container ships and cruise liners.

To find out all the advantages of bunkering Antigua or to place orders, contact our agent nearest you.

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Bremen area  
Denmark  
Hamburg area  
East Coast Norway  
France  
Benelux, Switzerland  
Sweden, Finland

## Wichita Clutch Offers New Marine Bulletin

Wichita Clutch Co., Inc., which has for years been building a superior line of clutches and brakes for heavy-duty industrial application, has announced publication of a new marine bulletin.

Wichita units are air-tube actuated, utilize disc friction surfaces and offer clutching and braking capacities from 1,000 to 15,000,000 in/lbs. The combined characteristics of the air-tube actuator and disc friction surfaces provide for precise, controllable clutching and braking action. Characteristics of fast, smooth engagement and disengagement with only a small volume of air; controlled slipping action when needed for controlled torque; a high capacity in a small radial and axial space . . . all unaffected by centrifugal force and ideally suited for automated systems and remotely controlled applications, especially marine propulsion systems.

Copies of its new Marine Bulletin No. 119 may be obtained by contacting Wichita Clutch Co., Inc., Wichita Falls, Texas 76307.

## NKK Awarded Conversion Contract Totalling \$4.2 Million

A \$4,200,000 order for conversion of four Royal InterOcean Lines cargoliners to semi-containerships has been received by Nippon Kokan, Japan's only integrated shipbuilder-steelmaker-fabricator. Sachio Sasabe, NKK New York shipbuilding department manager, said the vessel will be converted at the company's Asano Dockyard. Terms of the contract are on a yen basis.

Upon completion, the four ships, now 9,380-gross-ton cargoliners, will each be converted to 10,800-gross-ton vessels and increased in overall length by 66 feet. Other features will be installation of 22-ton capacity deck cranes and engine room automation.

The four conversions are scheduled for completion between August and November 1972. Additional hull sections will be built at NKK's Shimizu Shipyard.

## Clarence F. Williams Joins Brown & Root Oilfield Services Div.



Clarence F. Williams

Clarence F. Williams has joined Brown & Root as regional manager, south Louisiana region, Oilfield Services Division, at Morgan City, La.

The appointment was announced by **Bennie Frennesson**, senior vice president and manager of Oilfield Services.

Mr. Williams comes to Brown & Root from Shell Oil Company, where he served 11 years in the gas department and 16 years in the production department.

He was gasoline plant construction supervisor and project engineer in Texas and Oklahoma, California, and Canada, prior to his assignment to New Orleans in 1956 as offshore division construction foreman. Since 1963, he has been in charge of Delta Division construction.

A Kansas native, Mr. Williams earned his B.A. degree from Tulane University.

## Moore-McCormack Names Top Executives

**Juan C. Llerena** of Rio de Janeiro, Brazil, was elected vice president of Moore-McCormack Lines, Incorporated, and **Capt. Carlos Bezerra de Miranda** was elected managing director of Moore-McCormack (Navegacao) S.A., it was announced by **James R. Barker**, chairman and chief executive officer of the steamship line.

A reception was held in their honor on October 19, 1971, at the Rio de Janeiro Country Club. **R.E. O'Brien**, executive vice president, and **P.R. Tregurtha**, vice president, Moore-McCormack Lines, Incorporated, New York, flew to Rio for the reception.

Mr. Llerena, a native of Rio de Janeiro, came to Moore-McCormack Lines in 1946, after graduating from the University of Pennsylvania. He has served in various managerial positions in traffic and operations and as managing director of Moore-McCormack (Navegacao) S.A. since 1962.

Captain **Bezerra de Miranda** attended the Navy Academy de Villegagnon, and after a distinguished career afloat and ashore as a Brazilian naval officer, became chairman of the Brazil/U.S.-Canada Freight Conference in 1962. He was elected director, Moore-McCormack (Navegacao) S.A. in 1968.

## USCG Approves C.E.A. Marine Solid Waste Compactor

Combustion Equipment Associates of New York have announced the introduction of their Hydra Pack Mark III Solid Waste Compactor to the marine field. Originally designed as a commercial unit for stationary service, it has now received U.S. Coast Guard approval for use aboard ship. The Mark III is the smallest

unit that they manufacture. It has the capability of handling all the solid waste, galley, and otherwise, in a vessel carrying a crew of 40 or more in one compacted slug of 2½ cubic feet weighing approximately 50 pounds. On this basis, only one compacted slug per day will be produced. It is generally conceded that each man will generate approximately one pound of solid waste per day.

The unit consists of two parts: namely, the compactor itself and

secondly, a hydraulic power unit complete with 3-horsepower motor, pump, solenoid valve, and hydraulic tank. The power unit generates 1,500 psi producing a four-to-one compaction ratio.

The compacted slug is stored in a 10-gallon (approximately 3½ cubic feet) plastic bag of 4-mil thickness for off-loading in port.

Combustion Equipment Associates Inc. is located at 555 Madison Avenue, New York, N.Y. 10022.

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# 45th U.S. Propeller Club Convention And American Merchant Marine Conference

Thirty key officials in government, maritime management and labor presented their views on the problems and future of the U.S. maritime industry before the recent 45th National Convention of the Propeller Club of the United States and the American Merchant Marine Conference. The speakers and more than 500 delegates to the convention represented not only ocean shipping interests but also the Great Lakes and inland waterways.

The convention and conference was held in Tulsa, Okla., the newest port in the United States which is located at the head of the McClellan-Kerr Arkansas River Navigation System.

The theme of the convention, "A New Maritime Frontier," appropriately reflected the optimism reflected by the speakers during the three days of meetings.

National Propeller Club President **Arthur E. Farr**, vice-president of Northwest Marine Iron Works, Portland, Ore., and American Merchant Marine Conference Chairman **W.J. Amoss Jr.**, executive vice president of Lykes Bros. Steamship Company, proclaimed at the opening sessions of the conference and again at the close that "We have hurdled the barrier of apathy and neglect so long associated with the U.S. merchant marine policy. We are off to a good start in our new merchant marine program. We are beginning to meet some of its goals. Yet, we must measure the Act's progress in relation to today's business climate. The country is experiencing a period of economic instability coupled with an international monetary crisis. Business expansion is virtually nil. Yet, our merchant marine has moved ahead under the 1970 Act with contracts for 12 ships signed in fiscal '71."

The conference agenda included a panel on "Shipbuilding Outlook" moderated by **Edwin M. Hood**, president of the Shipbuilders Council of America. Mr. Hood in introducing the theme for the panel stated, "In terms of the potentials and demonstrated needs, the future for American shipbuilding can be viewed as most promising. But, these prospects are all still in the offing. Start-up problems in connection with the Merchant Marine Act of 1970 will surely be resolved, but the initial impact of this program will probably not be felt by the shipyards until mid-1972 or perhaps later."

**George M. Steinbrenner III**, chairman and chief executive of The American Ship Building Company and a panel member, called for labor, ship suppliers, shipbuilders and ship owners to work together in the legislative field to complete the build-up of U.S. shipbuilding.

**Walter F. Williams**, vice president, shipbuilding, Bethlehem Steel Corporation, told the panel that

"U.S.-flag vessels must be competitive with foreign vessels in every respect—construction costs, operating costs, rates, trading flexibility and labor stability—if we want a healthy, strong U.S. merchant marine.

The third member of the panel, **C.M. Keeney**, president of Equitable Equipment Company, spoke on building barges for the future.

**James J. Reynolds**, president, American Institute of Merchant Shipping, moderated the panel on "American Merchant Marine Marketing Outlook." He called for "the government to take a substantial portion of the available cargo space. There must be legislative and administrative action to insure that the U.S. cargo liners carry 50 percent of all U.S. liner trade and 100 percent of all government cargo when the U.S. ships are available at fair and reasonable rates."

Serving as panel members were: **Tony Dechant**, president, National Farmers Union; **J.A. Collins**, vice-president transportation, Sun Oil Company; **Alfred Maskin**, executive director, American Maritime Association, and **W.J. Bornholdt**, vice president purchasing and traffic, Caterpillar Tractor Company. The general feeling of these panel members was that exporters buy ocean transportation from those carriers who best demonstrate to them the capacity to provide service most consistent with the quality of their products.

"Barge Shipping Outlook" was the subject of a panel moderated by **J.M. Donnelly**, executive vice president, Ingram Barge Company. Two members of the panel, **F.L. Betz**, director of SEABEE Services for Lykes Bros. Steamship Company, and **H.C. Adams**, executive vice president of Pacific Far East Line, spoke on the promising future for the barge-carrying ships. **W.C. McNeal**, vice president, Oil Transport Company, described how new regulations and legislation will affect shippers' costs.

The fourth panel, dealing with "Waterway, Harbor and Navigation Improvements Outlook," was moderated by Brig. Gen. **K.B. Cooper**, USA. Serving as panel members on this subject were **L.P. Struble**, group vice president, Dravo Corporation; **P.A. Amundsen**, executive director, American Association of Port Authorities, and Rear Adm. **W.L. Morrison**, USCG.

**George M. Stafford**, chairman, Interstate Commerce Commission, moderated the fifth panel which discussed the "Intermodal Outlook." He told the panel that "shippers and consumers alike are no longer willing to accept the excuse that coordinated transport is impractical because competing carrier types refuse to work in harmony for the common good."

Serving on this panel were: **W.J.**

**Keely**, vice president, United States Lines; **G. Hougland**, president, Crouse Corporation, and **R.C. Grayson**, president, St. Louis-San Francisco Railway Company. Mr. **Keely** compared the U.S. and European intermodal operations and said that on the whole, the American intermodal concept has fallen far behind its European counterpart.

The greatest barrier to cooperation, accommodation and coordination, said Mr. **Grayson**, is the fact that the water, rail and highway carriers are regulated so differently.

The final panel discussed the "American Merchant Marine Outlook." **William S. Mailliard**, a member of the House of Representatives Committee on Merchant Marine and Fisheries, served as moderator.

**James R. Barker**, chairman and executive officer, Moore-McCormack Lines, was a member of the panel. He said that if U.S. ship operators are to build ships and be economically competitive with the rest of the world, efforts must be accelerated to develop deep-water port facilities.

Another panel member, **John J. Dwyer**, president, Oglebay Norton Company, advised that "the time is here for a definite coordinated effort on the part of the industry and government to determine just how much regulation is necessary, and we're all going to have to face up to it."

The other panel members were: **J.A. Brogan Jr.**, shipping advisor, Military Sealift Command, and **E. L. Rouvelas**, staff counsel, the Senate Committee on Commerce.

Special luncheons were held each day of the convention. **Carl Albert**, the speaker, House of Representatives, gave the keynote address on the first day of the meetings at the Port of Tulsa luncheon.

**Mrs. Helen Delich Bentley**, chairman, Federal Maritime Commission, was the principal speaker at the Maritime and Marine Industries luncheon. She chastised marine labor and management and the government. "As I've said time and again," Mrs. Bentley stated, "and I firmly believe it, if all interests in the American maritime industry would think positively in behalf of the overall merchant marine, every one would benefit from the resulting fallout. But unfortunately that does not seem to be the direction in which the segments of this industry choose to head."

Continuing, she said, "Although I'm devoting most of this speech to labor entanglements and problems, I do want the record to show that management has not only been inept in many instances, but it has contributed also to the downfall of the American Merchant Marine

through a variety of ways. And, of course, so has the government over the years."

Congressman **Wilbur D. Mills**, chairman, House Committee on Ways and Means, spoke at the American Merchant Marine Conference luncheon. He said there is "tangible evidence that this nation has recognized the necessity of a rebirth, a revival of our once proud maritime tradition and the respected image of the Yankee trader of days gone by."

**Andrew E. Gibson**, assistant secretary for Maritime Affairs, Department of Commerce, addressed the delegates at the Annual Banquet of the Propeller Club of the United States and The American Merchant Marine Conference. Mr. **Gibson** vowed that "the apathy and neglect that have characterized the government's attitude toward the domestic shipping industry is going to end."

Three separate divisions, he said, have been created: "One will deal with the coastwise, non-contiguous and intercoastal trades; another will concentrate on the inland waterways trades, and the third will focus its attention on the Great Lakes trades."

## New Officers

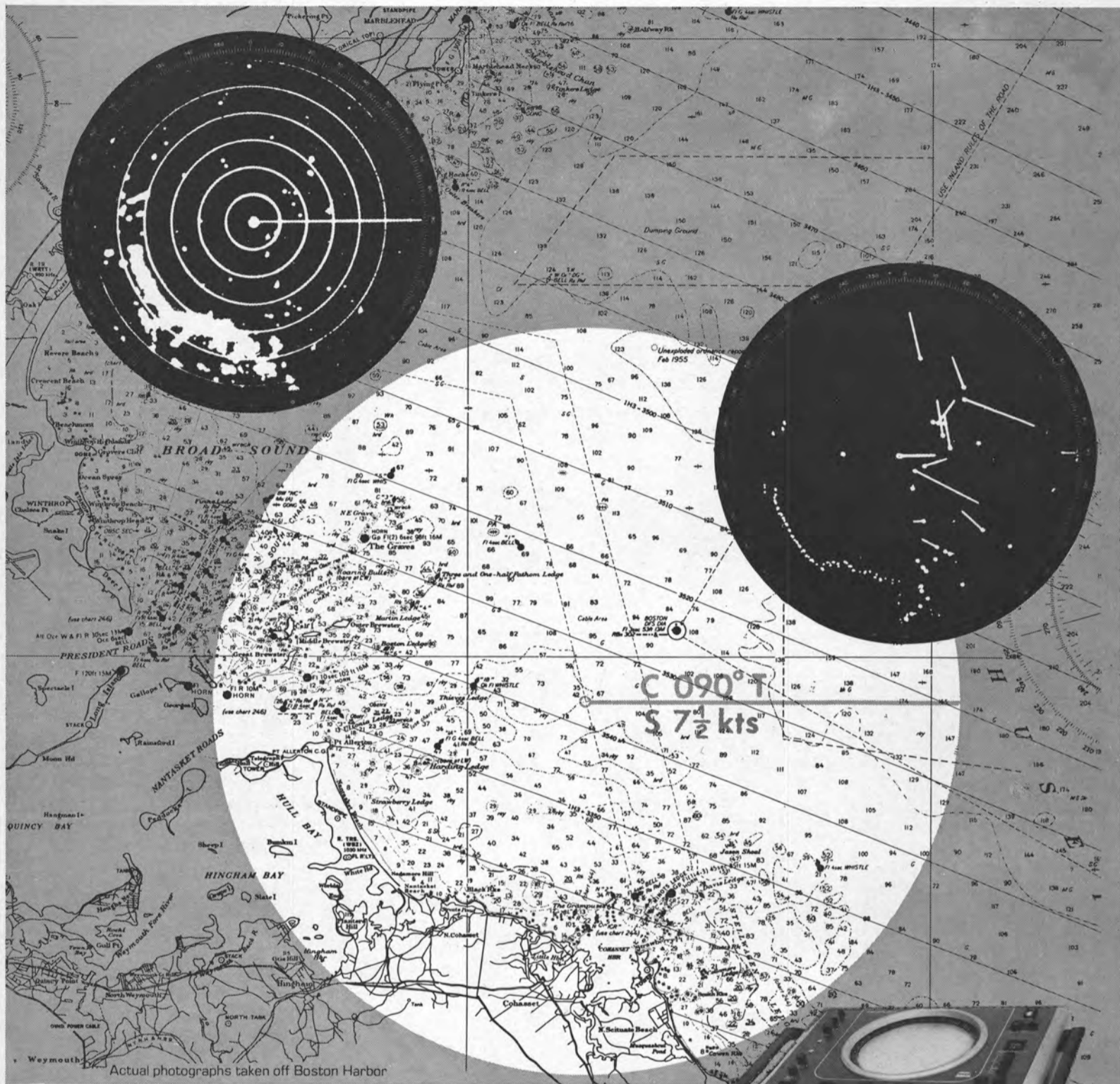
**Arthur E. Farr** was re-elected to serve a second term as national president of the Propeller Club of the United States.

**Jasper S. Baker**, director of government relations, United Fruit Company was elected first vice president. Vice Adm. **Paul E. Trimble**, USCG (ret.), and president of the Lake Carriers Association, was elected second vice president. The executive director for the Port of Houston, **George V. Altwater**, was elected third vice president. **A.R. Philbrick Jr.**, executive officer, Texas Maritime Academy, was elected vice president for student ports. **A. Filiatrault**, was re-elected to the post of executive secretary-treasurer.

The following members were elected as national vice presidents for Propeller Club regions: North Atlantic—**J.J. Steitz Jr.**; Middle Atlantic—**J.M. Lambros**; Southeast Region—**D.M. Hicks Jr.**; West Gulf Region—**Capt. W.A. Walls**; Mississippi Valley—**H.E. Krueger**; Mediterranean—**F.N. Aliotti**; Ohio Valley—**J.H. Fox Jr.**; Upper Great Lakes—**C.T. Burke**; Lower Great Lakes—**J.C. Sherman**; North Pacific Coast—**R.J. Staehli Jr.**; South Pacific Coast—**R.D. Sweeney**, and Asiatic—**J.M. Daley Jr.**

In concluding the convention and conference, Mr. **Farr** thanked the members of the Port of Tulsa Propeller Club for their efforts in preparing and conducting this outstanding affair.





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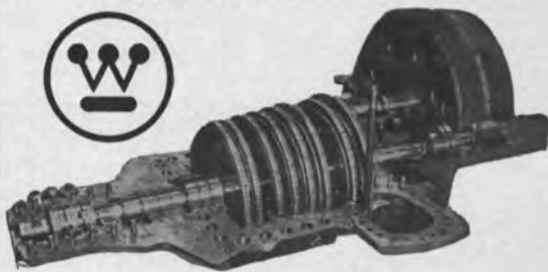
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## Turbo Power & Marine Systems Awarded Installation Contract On World's Largest Icebreaker

Lockheed Shipbuilding and Construction Company, Seattle, Wash., has awarded Turbo Power & Marine Systems, Inc. of Farmington, Conn., a subsidiary of United Aircraft Corp., a contract to supply a combined gas turbine and diesel propulsion system for the Coast Guard's largest icebreaker.

A contract to build the 400-foot icebreaker, which will be the world's largest, was recently awarded to Lockheed. Turbo Power will furnish three Pratt & Whitney FT4A gas turbines for boost power, six diesel engines for cruise power, electric generators and motors, reduction gearing, and various engine room and bridge controls. The design and working plans are being developed by J.J. Henry & Co., Inc. (See Maritime Reporter/Engineering News issue of September 15, 1971).

## Robvon Announces New Line Of Backing Rings For High Temperature/Pressure Systems

A new line of Machined Backing Rings for high temperature and pressure systems is announced by Robvon Backing Ring Co. This new line is available to customers specifications in either split or solid type design.

These machined split or solid backing rings are especially designed for ease of fit-up in quality welding of pipe, tube and other joining areas where maximum strength and uniformity is required. The fabricated solid machined ring welds are X-ray quality. Mill tests or material certifications are available. These rings come in carbon steel, alloys, stainless steel, aluminum, etc.

Complete information on Machined Backing Rings are available by writing to Robvon Backing Ring Co., 675 Garden Street, Elizabeth, N.J. 07207.

## New York Metropolitan Section Discusses Marine Pollution Honors Past Section Chairmen



Shown during the meeting are left to right: Capt. **Richard W. Goode**, USCG; **Norman R. Farmer**, chairman of the N.Y. Metropolitan Section; **Robert P. Fulton**, author, and **Charles W. Wilson**, secretary-treasurer of the Section.

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers met on October 12, 1971, at the U.S. Coast Guard Officers Club, Governors Island, New York. In addition to having a timely and interesting paper presented at the technical session, this meeting honored the past chairmen of the Section and was officially designated as "Past Chairmen's Night."



Past chairmen of the New York Section, shown left to right: (standing) **Charles A. Narwicz**; **Everett A. Catlin**; **Rudolph Schoen 3rd**, and **Warren I. Signell**; (seated) **Robert G. Mende**, **Preston H. Hadley Jr.**, and **Lauren S. McCready**.

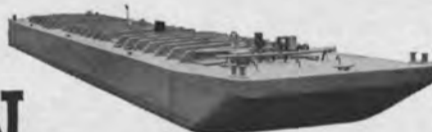
A social hour and dinner preceded the technical session, at which a paper was presented entitled "Marine Pollution Abatement Laws, Problems and Commentary Concerning Large Vessels," by **Robert P. Fulton** of Gibbs & Cox, Inc.

This paper provides an overview of the contribution of the marine transportation industry to the problem of environmental pollution. It defines the scope of the problem, reviews legislation which is designed to control the problem and examines methods and rationales for determining reasonable time phasing for compliance. Specific recommendations are made which are directed at both Government and industry.

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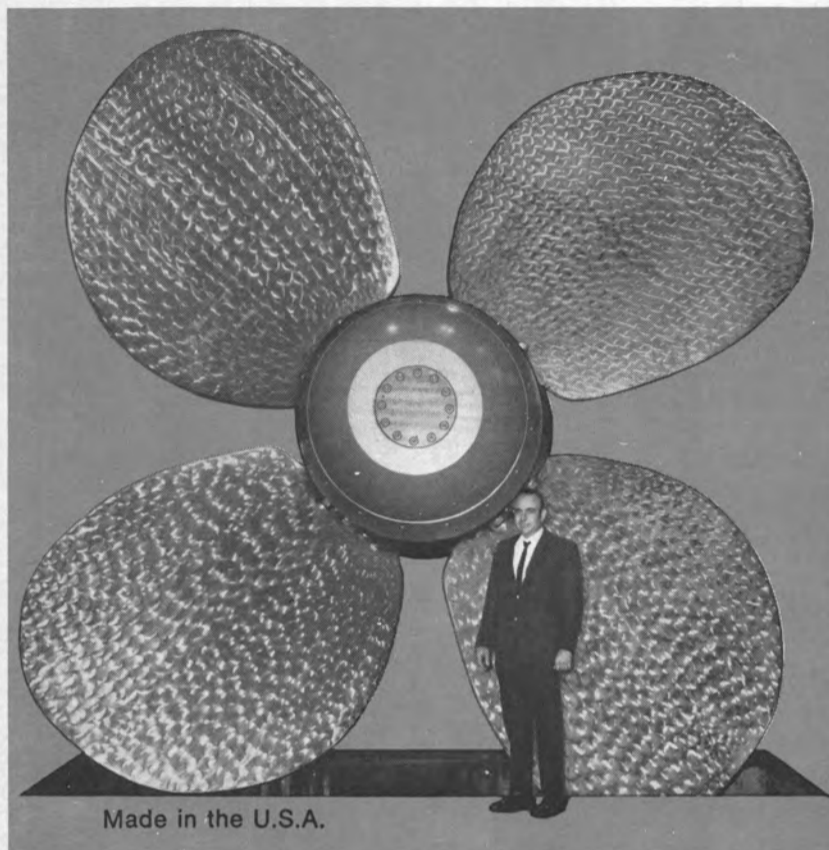
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## New Marine Seal Provides Zero Leakage

A rubber-to-metal bonded seal that provides zero leakage sealing for ship and boat rudder stocks and other applications with a rotation range of plus or minus 45 degrees or more has been developed by The B.F. Goodrich Company and Lucian Q. Moffitt, Inc.

The new seal, called the Romor Seal, is the first of its type to provide zero leakage sealing in marine

applications, according to **Claire A. Drach**, president of Lucian Q. Moffitt, national and international distributor of B.F. Goodrich marine products.

The complete Romor Seal design consists of three precision components—a metal inner ring to which a resilient sealing web of oil-resistant synthetic rubber is bonded and then fitted into a concentric metal outer ring.

In marine application, the inner ring is mounted to the ship's rudder

stock and the outer ring to the rudder trunk. Under actual operating conditions, the rubber web flexes to accommodate shaft rotation for most normal steering requirements.

Where larger rudder angles are required, the web slides in relation to the outer component with no leakage. Functioning with oil on the upper surface and water on the lower surface, Romor provides a positive seal in both directions.

"No water can dilute the lubri-

cant and no oil can escape to contaminate the surrounding water," Mr. Drach said. "The remarkable Romor leakproof qualities have been proved in hours of prototype testing under simulated operating conditions."

Utilizing a steering gear from a decommissioned Victory-type ship, Goodrich and Moffitt engineers designed and built a special device for testing Romor Seals of all sizes.

Mounted on this device, a test Romor Seal was subjected to shaft rotation up to plus or minus 35 degrees while a water box fastened to the upper side of the seal applied up to 15 psi of water pressure. The lower side operated in air.

A 39-1/4-inch ID rudder stock seal, built for a large steamship application, was thoroughly tested according to this procedure. It was also subjected to hydrostatic testing at 30 psi, during which it again performed with zero leakage.

Other features of the Romor Seal include low torque requirements, complete seal integrity under all operating conditions and rugged durability.

Each Romor Seal is designed and built to meet special requirements of specific applications. The seals are completely assembled at the factory with inside and outside diameters finished concentric. There are no loose parts for the user to put together at installation time.

Additional information on Romor Seals may be obtained by writing to Lucian Q. Moffitt, Inc., Post Office Box 1415, Akron, Ohio 44309.

## Third Quarter Of '71 Shipbuilding Returns Reported By Lloyds

For the first time since December 1969 there was a decrease in the tonnage of ships being built in the world, reports Lloyd's Register of Shipping in its report for the quarter ended September 30, 1971. Not including Communist China and Russia, for whom figures are not available, there are under construction 1,939 ships of 21,422,759 gross tons, which is 773,364 tons less than last quarter.

However, the total order book which, apart from ships now building, also includes those on order but which have not been commenced, now stands at the record figure of 84,072,090 tons gross, which is 385,415 tons more than the previous quarter. Despite a high figure for ships completed during the quarter, Japan again shows an increase to her order book, which now totals 32,926,937 tons gross.

With regard to the U.S.A., although the tonnage of ships under construction has fallen slightly to 1,028,502 tons gross, the total order book increased by 83,586 tons to 1,993,852 tons.

Orders for tankers continue to be received and tankers now represent 51.6 percent of the worldwide total order book.

6,640,946 tons gross of the ships actually under construction now are being built under the supervision of Lloyd's Register.

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## American Society Of Naval Engineers Organizes N. Y. Metropolitan Section



Shown left to right are: **L.P. Adair**; Rear Adm. **L.V. Honsinger**, USN, (ret.); Capt. **R.W. Goode**, USCG; Lt. Comdr. **G.H. Moritz**, USCG; **J. Antonetz**; **J.L. Mathieson**; **J. Femenia**, and Lt. Comdr. **G.M. Heinrich**, USCG.

The American Society of Naval Engineers has given birth to a new local chapter in the New York, New Jersey area. A cadre of the membership met over dinner, enacted bylaws, elected officers, and appointed committees.

The Metropolitan Section, as it was named, was organized at Coast Guard Base New York on Governors Island. After dinner at the Officers Club, the members ensured that they met all of the ASNE requirements for a local chapter and had sufficient local support for a charter. They then voted on and passed bylaws and elected an executive committee.

The elected officers are: chairman, Capt. **E.F. Barker Jr.**, USN; vice chairman, Lt. Comdr. **G.F. Ireland**, USCG; and secretary-treasurer, **R.A. Fricke**, area manager for Drew Chemical Marine Division.

Three councilors were also elected to the executive committee. They are: Capt. **R.W. Goode**, USCG; **P.J. Statile**, president of Peter J. Statile Associates. and **J. R. Sparacino**, vice president of Designers & Planners Inc.

The executive committee immediately exercised its power as governing body of the chapter and appointed committees to get the Metro Section under way. Committee chairmen are: for professional activities, **J. Antonetz**, Texaco Marine Dept.; for meetings and programs, co-chairmen, **C.L. Dutoit** of J.J. Henry and **A. St. George** of J.J. McMullen; for membership, **J. Femenia**, N.Y. Maritime Academy, and for publicity, Lt. Comdr. **G.H. Moritz**, USCG.

Adm. **L.V. Honsinger**, USN (ret.), past president of ASNE and vice president of Todd Shipyards, was at the meeting. The admiral said he was pleased with the results and remarked that the section has been needed for a long time and will be of great benefit to naval engineers in the area.

Mr. **Fricke**, the new secretary-treasurer, announced that the executive committee would meet with committee chairmen for the purpose of scheduling the first technical session, which is expected to be held at the end of this month.



Seated at the table (left to right): **J.R. Brasel**; **H.M. Wilson**; **A. St. George**; **W.A. Kemp-ton**; **D.J. Mauter**; Capt. **E.F. Barker**, USN, and **R.A. Fricke**.



Pictured above left to right: **J.R. Sparacino**; **G.J. Labas**; Lt. Comdr. **G.F. Ireland**, USCG; **C.W. Gower**; **K.M. Schau**; **P.J. Statile**; **N.F. Pergola**, and **C.L. Dutoit**.

## APL Names Two Vice Presidents

**J. Donald Kenny** and **John Manseau** have been elected vice presidents of American President Lines, it was announced by **Worth B. Fowler**, APL president.

Mr. **Kenny's** new title is vice president, legal. He has been counsel for APL since joining the company early in 1970. He graduated from Santa Clara University in 1960 and is also a graduate of USF Law School.

Mr. **Manseau** becomes vice president of APL's Southwestern Division, headquartered in Los Angeles. He succeeds **John J. Berryman**, a 44-year veteran with the line, who retired recently. Mr. **Manseau** was previously general manager of the division.

Mr. **Manseau** came to American President Lines as a purser-trainee in 1950. He served in the passenger service and freight divisions, was freight traffic manager in Los Angeles until 1967, and became general manager there last year.

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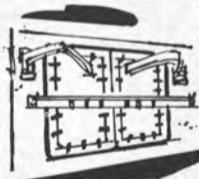
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## Pacific Northwest Section Holds Fall Meeting



Members and guests shown left to right: **Lou D. Chirillo**, chairman, Pacific Northwest Section; Honorable **R. Perrault**, M.P., guest speaker; **Leslie Coward**, chairman, British Columbia area; **George D. Salisbury**, vice chairman, Pacific Northwest Section; **Robert Cullen**, vice chairman, British Columbia area; **David Moreira**, secretary-treasurer, British Columbia area, and Prof. **H.C. Wilkinson** of H.C. Wilkinson and Associates, who co-authored and presented a technical paper entitled "Optimizing and Comparing Different Modes of Marine Transportation Systems." Not shown is **W.E.G. Talbot** of Jackson-Talbot-Walkingshaw and Associates Ltd., who also co-authored and presented the paper.

Traditional hospitality, augmented with the serene view of Harrison Lake, was shared by 340 members, guests and their families, of the Pacific Northwest Section of The Society of Naval Architects and Marine Engineers, who convened at Harrison Hot Springs, British Columbia, for their annual fall meeting, October 1-3, 1971.

An innovative paper was co-authored and presented by **W.E.G. Talbot** of Jackson-Talbot-Walkingshaw and Associates Ltd. and Prof. **H.C. Wilkinson** of H.C. Wilkinson and Associates, entitled "Optimizing and Comparing Different Modes of Marine Transportation Systems." The authors mentioned the problem normally postulated to the naval architect is that of optimizing a vessel design with virtu-

ally every parameter defined. The pre-defined parameters are generally configuration, size, speed, self-propelled or tug/barge, cargo handling type, dockside facility, nationality of crew, owner. The design problem is thus greatly constrained and optimization is relatively simple, if tedious. It is felt by the authors that the transportation consultant is normally approached by the prospective shipper with the problem of moving products for the least cost consistent only with marketing, damage susceptibility and type of product constraints. Even the mode, be it shore or water, is non-constrained. And this problem becomes one of horrendous proportions even with only the marine mode, in terms of accumulation of data,

analysis of all possible modes, and summarizing results in some form meaningful to the accountants. This problem becomes "meat" to the computer programmer.

For a long time, the authors have been interested in the prospect of devising a mechanized method of comparing and optimizing marine transportation systems and have been involved in this type of non-constrained (with the exception of certain dimensions) study, and have been particularly impressed with the necessity to have an expeditious method of checking the sensitivity of the outcome to variation in the transportation modes, cargo handling systems and rates, crew and owner nationalities and tax and financing considerations.

Discussing the paper, **Peter Raven**, distribution research manager of Seaboard Shipping Co., Ltd., **Graham Bender**, assistant manager of chartering and freight sales, Canadian Transport Co. Ltd., **L.R. Glosten** of L.R. Glosten Associates, Seattle, and **L. Seward**, material handling analyst for Crown Zellerbach, all generally agreed with the authors that such a program as presented in their paper is a good tool for the evaluation of marine transportation systems, but that further study and refinements would enhance their program.

The Honorable **R. Perrault**, M.P., was the guest speaker at the main banquet and he spoke of his recent trip with a Canadian trade delegation to Mainland China and discussed the future marine transportation needs of the Chinese people. Mr. Perrault also presented a slide program of scenes of the various cities which he visited.

## Marine Transport Lines Names W.Y.S. Williams Operations Manager



William Y.S. Williams

Marine Transport Lines, Inc., a subsidiary of General American Transportation Corporation, 60 Broad Street, New York, N.Y. 10004, has announced the promotion of **William Y.S. Williams** to the position of manager of the operating department.

Mr. Williams received a B.S. degree in marine transportation from the New York State Maritime College in 1963. He joined Marine Transport Lines in 1965, after completion of service with the U.S. Coast Geodetic Survey.

## Henschel Appoints John G. Landers Vice Pres., Marketing



John G. Landers

**John G. Landers** has been appointed vice president, marketing for Henschel Corporation, Amesbury, Mass. A graduate of the U.S. Naval Academy and Harvard Business School, Mr. Landers has a background of engineering and marketing from Autonetics, North American Rockwell and Corning Electronics. Following his graduation from the Naval Academy in 1949, he served eight years in the U.S. Navy. Most of his active naval service was in shipboard assignments. Mr. Landers joins Henschel Corporation, a unit of General Signal Corporation, after 10 years in marketing positions with Autonetics.

Henschel Corporation is a pioneer in the field of shipboard intercommunications systems for marine applications, both military and commercial. Navies and shipbuilders throughout the world use Henschel's marine interior communications equipment and control instruments. Henschel products are sold through a network of representatives with offices in the United States, Canada and Europe.



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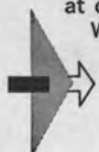
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**State Boat Corp.  
Appoints T.W. Walker**



Tom W. Walker

Tom W. Walker has been named safety engineer of marine operations of State Boat Corporation, 3701 Kirby Drive, Houston, Texas 77006, owners and operators of rig service and geophysical vessels.

Although Mr. Walker is based at Houston headquarters, he administers State Boat Corporation's safety programs on a worldwide basis. Mr. Walker is a graduate of Louisiana State University and has served with the U.S. Marine Corps.

**Mobil Chemical Names  
Distributor In Freeport**

Mobil Chemical Company has appointed Freeport Trading Company, Ltd., as distributor for Mobil marine coatings in Freeport, The Bahamas. A supplier of ship's stores for the past decade, Freeport Trading Company will initially offer a complete line of conventional coatings, adding high-performance coatings as required.

Some 900 tankers a year call at Freeport, where a large oil refinery recently began operations. Because vessels returning to the Persian Gulf and other oil-producing areas usually face a long voyage with good weather, they often take on several hundred gallons of marine coatings to be applied during the trip. To speed loading of larger volumes, Freeport Trading Company provides for palletized cargoes of coatings.

Freeport is one of the few ports in the world capable of serving the new class of 200,000-plus-dwt super-tankers. Mobil marine coatings are available at most of these terminals and at major ports around the world.

**Building Fund Used  
First Time On Lakes  
To Enlarge Vessel**

Pickands Mather & Co., a unit of Diamond Shamrock Corporation, has announced that the 710-foot Steamer Charles M. Beeghly of its Interlake Steamship Co. Division fleet will be lengthened to 806 feet this winter. The vessel's iron ore carrying capacity at mid-summer draft will be increased from approximately 26,000 to 30,000 gross tons, making it the largest straight-deck bulk cargo vessel in service on the Great Lakes.

The project will be financed through a capital construction fund established by Pickands Mather under terms of an agreement signed with the U.S. Department of

Commerce's Maritime Administration on September 13, 1971. In the Merchant Marine Act of 1970, the U.S. Congress extended to Great Lakes shipping firms the privilege of establishing such funds. Lengthening of the Steamer Beeghly will be the first construction project ever financed in this manner by a Great Lakes fleet.

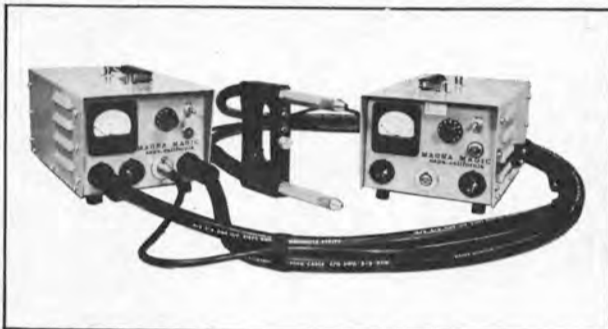
The vessel will be placed in dry-dock at Fraser Shipyards, Inc., Superior, Wis., early in December and

should be ready to sail again during May 1972. The hull will be completely severed slightly aft of midship, and the forward section will be floated 96 feet away. A new 96-foot section will be built between the ends and reinforced with deck and bottom straps. Although the vessel's 75-foot beam will remain unchanged, the number of cargo compartments will be increased from 4 to 5 and the number of hatches from 21 to 25.

Built in 1959 at Toledo, Ohio, the vessel was originally called the Steamer Shenango II. It was acquired by Pickands Mather in 1967 and renamed in honor of Charles M. Beeghly, former chairman of the board of Jones & Laughlin Steel Corporation. One of the most modern of the 15 bulk-cargo vessels in the Interlake Steamship fleet, the Steamer Beeghly is highly automated and is powered by an 8,500-hp oil-fired steam turbine engine.

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**Output:** Half-wave D.C. Delivers 0 to 750 amps. at prod end. Infinitely variable.

**Reliable:** Solid state circuitry enables compact design and increases reliability. Each unit carries a 90-day parts and workmanship guarantee.

**Portable:** Magna Magic is truly a one-man operation that can be carried easily from one assignment to another. Weight - 33 lbs. Height - 6 in. Width - 8 in. Length - 12 in.

Prod handle features built-in light for easy illumination of inspection area. Cables have "quick connect" Cam-Lok connectors for attaching to machine.

**Versatile:** Prod spacing adjustable to 3, 4, 5 or 6 inch spread. Quick-change soft or solid prod tips. Prods can be removed from handle for single prod inspection. Inspection by prods or coiled cable. Available accessories include remote control cable and switch.

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**Price:** Magna Magic Model 27 - \$985.00  
Magna Magic Model 27D - \$1,065.00

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## Mitsubishi To Build Semisubmersible Rig For Ocean Drilling

Ocean Drilling & Exploration Company and its Far East subsidiary, Odeco Nihon, have announced the completion of a contract signaling the start of construction of a fourth self-propelled semisubmersible drilling rig.

The rig, Ocean Kokuei (pronounced Ko-Ku-A), will be built

by Mitsubishi Heavy Industries, Ltd., Hiroshima, Japan shipbuilding firm which completed Odeco's first self-propelled and semisubmersible Ocean Prospector earlier this year.

So far in 1971, Odeco has announced that construction has begun on two semisubmersible units, the Ocean Voyager in Norway and the Ocean Victory in New Orleans. Another new unit, the Ocean King, a jack-up, is under construction at

Vicksburg, Miss.

According to Alden J. Laborde, Odeco president, the new multimillion dollar rig is scheduled for completion in the fall of 1973. Like other Odeco self-propelled semisubmersibles, the Ocean Kokuei will have a rated water depth of 600 feet afloat and a rated drilling depth of 25,000 feet, Mr. Laborde said.

The new unit will be like the forerunner of its class, the Ocean Prospector, but will incorporate

improvements such as increased propulsion horsepower, reduced wave resistance and better moorings. A principal feature of the new rig, also like other Odeco self-propelled semisubmersibles, is its twin Kort nozzle type propulsion system, which will propel Ocean Kokuei ahead at seven knots and astern at three knots. The new rig will be 320-feet long and 266-feet wide, have 6,700 propulsion horsepower, and modern air-conditioned quarters for 81 men.

The lower hull will have four parallel pontoons measuring 28 feet in diameter. Four 12-foot diameter and eight 24-foot diameter stabilizing columns will be connected to the four pontoons. The tops of the columns which support the main deck are 120 feet from the base of the pontoons. Transverse strength for the new unit will be provided by four transverse tubes, two 18 feet in diameter and two 12 feet in diameter, along with the main deck structure.

Ocean Kokuei will incorporate ABS Grade CS steel in its shell plating extending to the tops of the columns and in the principal deck girders, to provide safe operation under extreme low temperature conditions. It will be classed by ABS under its "Rules for Building and Classing Offshore Mobile Drilling Units, 1968," for unrestricted service.

## New Spee-Flo Model For Airless Spraying Of High Viscosity Coating

The Spee-Flo Company has introduced a new power actuated Ram model for airless spraying of heavy viscosity high-surface tension materials. The big 940 Super PowrMastic has a capacity of four gallons per minute and a 40-1 ratio power system. It is designed to handle the heaviest sprayable coatings with full atomization and spray gun control.

The PowrMastic is equipped with a new "Scooper Valve," a device which actually forces high viscosity materials into the pump foot inlet, and assures full priming on each stroke. The high 40-1 power ratio is accomplished without sacrifice in the delivery volume, because the unit is powered by a new, larger 8.5-inch air motor. This means that full, necessary working pressures can be reached for most materials at only 75 to 85 psi air input. Maximum working fluid pressures of 4,000 psi can be produced at 100 psi air input. The new unit is deluxe equipped with automatic oiler, moisture separator, and high volume air regulator. Gun and hose assemblies are optional accessories.

A high-efficiency stainless-steel 4-kw PowrMastic heater is also available for attachment to this system for viscosity reduction, greater film build per spraying pass, or operation in generally low temperature conditions. The PowrMastic heater is designed for operations up to 6,000 psi. Available from Spee-Flo branches and distributors in most major cities, or the factory at 4631 Winfield Road, Houston, Texas 77039.



## BRING 'EM IN STRIP 'EM CLEAN MOVE 'EM OUT

Some Turbine Talk With Russ Lemcke

Men in the marine industry usually like to deal with facts and leave double talk to the politicians. But from time to time, we are guilty of some double talk ourselves. One such example is our use of the word "turbine," which usually brings to mind a prime power source like a steam or gas turbine. And for this, Webster would not be critical. But there are also two types of pumps and both are called turbines.

Here is where the difference is: one type, the Regenerative Turbine, is a horizontal pump, commonly used as a boiler feed unit in small commercial buildings.

The other type is the Vertical Turbine or "Deepwell Turbine" which is used in tanker and tank barge unloading, bilge and ballast services. Ironically, this Vertical Turbine is not a turbine at all but a vertical multi-stage diffuser case pump.

Goulds manufactures the specialized "Autoprime" self-priming turbine as well as standard vertical turbines in Los Angeles in the newest and most modern pump facility in the world. The entire Goulds vertical line is designed for the heavy duty marine services. Some competitors have even accused us of over-design, and this is criticism we enjoy.

In the next issue, I'll be talking more about what we've done and why we've done it.

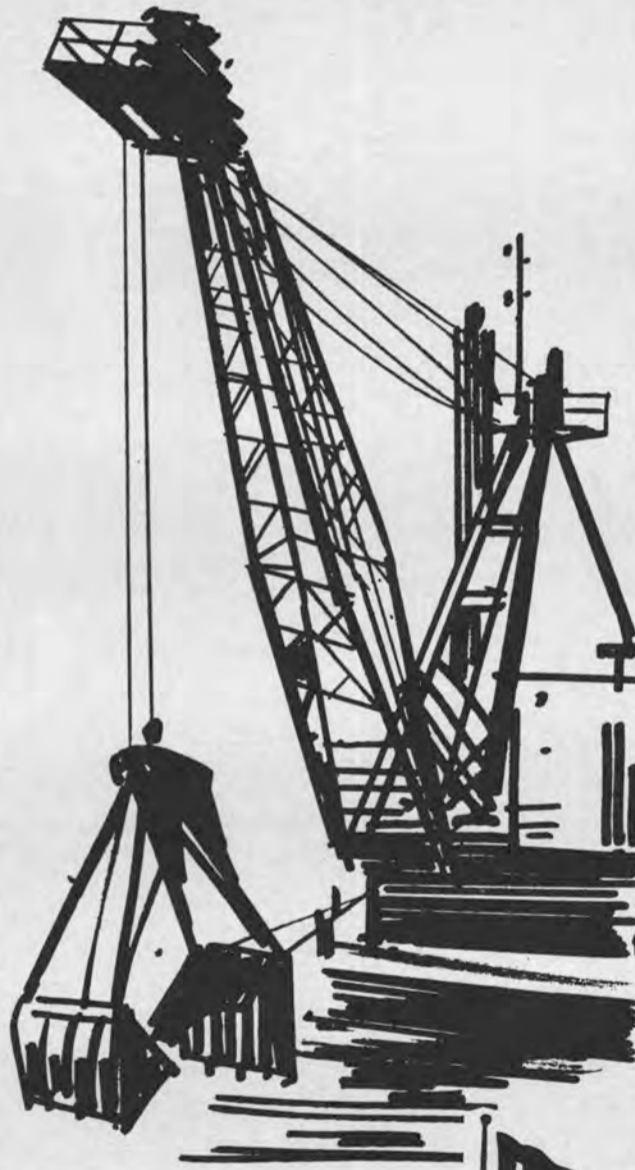
So when you want to bring 'em in, strip 'em clean and move 'em out, call for a Goulds vertical self-priming or standard vertical turbine for tanker and tank barge unloading. Call our Goulds office or sales representative in your area.

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## Solar Names Uriarte Regional Manager For Latin America



Luis A. Uriarte

Luis A. Uriarte, formerly Solar's district sales manager for gas turbines at San Francisco, has been transferred to the International Harvester Export Company and named regional manager for Solar turbomachinery products in Latin America.

Mr. Uriarte will be responsible for sales of Solar gas turbines in Mexico and throughout Central America and South America, which comprises one of the fastest growing markets for equipment manufactured by the San Diego based division of International Harvester Company.

A native of Havana, Cuba, Mr. Uriarte was awarded a bachelor of mechanical engineering degree by Rensselaer Polytechnic Institute in 1962. He earned a master's degree in business administration from the University of San Francisco in 1968, one year after joining Solar as a senior sales engineer. He was promoted to district manager in 1970.

Prior to joining Solar, Mr. Uriarte was associated with Bechtel Corporation at San Francisco and with the Foster Wheeler Corporation, Livingston, N.J.

Solar has built approximately 9,000 gas turbine power packages for customers on all continents save Antarctica. These units, available in outputs from 80 to 3,300 horsepower, have accumulated more than 23-million operating hours in widely varying environments.

## Report Available On Satellite Services For Maritime Industry

Robert Berry, chairman of Automated Marine International, Santa Ana, Calif., has announced the completion of a two-year project devoted to the study of maritime satellite services. The project assesses the maritime industry's probable long-term satellite communication needs and offers industry management, technical and economic planning data related to satellite systems and services, including shore station and shipboard equipment requirements. This data will aid industry in making a decision of whether to implement such services and, if so, when and how.

Automated Marine International has performed numerous studies

for Government agencies and other organizations uniquely qualifying them in this field. A condensation of the detailed report in the form of an Executive Synopsis was included in the general report. This report was sponsored by Standard Oil of New Jersey, Esso International, Humble Oil and Refining Company, Sea Land Services S.S. Company, Chevron Shipping, Standard Oil Company of California, British Petroleum Tanker

Company and Shell International Marine Ltd. for IMSCO.

The report entitled "Maritime Satellites—Technical and Economic Planning Report, Executive Synopsis" will now be made available to all maritime engineers, architects, executives and other interested parties throughout the world. The price will be \$30 in the U.S. and \$35 for foreign countries. Barry Mendoza, project manager, said: "This program is the first major

systems engineering study effort sponsored by and participated in by the ultimate users themselves. As a result, it answers the questions that they need to know. This fact has already made the Executive Synopsis a 'must' document for every maritime planner and designer."

Bound copies may be purchased from Automated Marine International, 1652 Kaiser, Santa Ana, Calif. 92627.



## Tiger Tips For Longer Rope Life



# Proper inspection...a key to good wire rope service.



"Knowing where to look for signs of wear is vital in getting the best possible service from your wire rope," says Del Buck, USS TIGER BRAND Wire Rope Specialist.

"This is especially true when equipment design, weather, terrain, or other factors, result in rope operating conditions which vary from those which would give optimum service life," Del continues.

Even though such conditions may result in faster wire rope wear, satisfactory and safe service can be obtained through a program of regular and thorough inspection, concentrating on those points where wear is most likely to occur. For instance, if operating conditions require over-winding multiple layers on the drum, examine the crossover points at each succeeding layer. Inspection at regular intervals indicates the rate of wear, and enables you to relocate the wear points by shifting the rope, or replacing it if necessary.

Wherever you are, let your TIGER BRAND Specialists advise you in establishing your program of regular inspection and maintenance...and service all your wire rope requirements. Contact your TIGER BRAND Wire Rope Distributor for a copy of "Longer Life From Your Wire Rope" or write United States Steel, Box 86, (USS 7336), Pittsburgh, Pa. 15230.

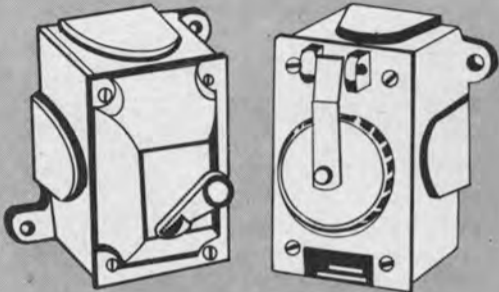
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**Raytheon And University  
Scientists Form Team To  
Study Continental Shelf**

The ecological impact of offshore dredging of sand, gravel and aggregates, lying on the continental shelf will be assessed in a study program soon to get under way off the New England Coast.

Scientists from Raytheon Company and the University of New Hampshire working together have completed the first phase of the program in which they are seeking to develop acoustic techniques to enable observers aboard ship to identify and classify layers of sediment on the ocean floor. Continuing experiments will advance their studies to determine remotely the load-bearing strengths of these sediments from their surface observations.

The first joint industry-university project to be funded under the Sea Grant Act, the study of the technology involved in the management of bottom resources of the continental shelf, is now in its second year. The project is supported by the National Oceanic and Atmospheric Administration's Sea Grant Office.

In the initial studies, methods were developed for studying and understanding the dynamic behaviors of acoustic probe signals as they are absorbed and reflected by sediments on the ocean floor. Relationships between mechanical and acoustical properties of soil are of particular interest.

From these studies, it is possible to correlate physical ocean bottom and sub-bottom characteristics with acoustic measurements. These measurements can now be analyzed for information on sediment of increasing depths.

Gathering samples and associated acoustic profiling were done in Narragansett Bay. Bottom samples were collected using both a small dredge and a Shipek grab-sample, a device containing a spring loaded bucket that snaps closed upon striking the bottom. A Benthos gravity corer was used to take core samples five feet below the bottom. Deeper samples were obtained using a vibratory

"pogo stick" corer. Capable of obtaining sedimentary cores as deep as 24 feet, this UNH-developed device applied a vibratory force to the steel core driving tube. Bottom samples compatible with sub-bottom depths reached by acoustic probes were obtained.

The Narragansett Bay studies were conducted by Raytheon Company's Submarine Signal Division using its oceanographic research vessel. Acoustic echoes collected on a multi-channel, wide dynamic range tape recorder were processed on digital computers, including a Raytheon Data Systems Company Model 520.

Because of the increasing interest in the ecological impact of offshore sediment removal, the future phases of the program will include studies of plant and animal communities at the dredge site, before, during, and after dredging activities.

Further information on the project may be obtained from the Ocean Systems Center, Raytheon Company, Portsmouth, R.I., or the Department of Mechanical Engineering, University of New Hampshire, Durham, N.H.

**Information Kit On Bearings  
That Require No Lubrication  
Now Available From Du Pont**

A complete kit of information about bearings that contain Teflon® fiber is available from E.I. du Pont de Nemours & Company, Inc. Bearings made from Teflon TFE fluorocarbon fiber can take up to 60,000 psi at temperatures from -220°F to 325°F . . . without lubrication. These properties, plus chemical and moisture resistance, make Teflon fiber an ideal bearing material for situations of high load and low speed where lubrication is difficult or impossible.

Included in the kit are bearing manufacturers, technical and performance data, case histories of bearings in a diversity of uses, and informative material such as reprints of pertinent articles. This kit will be a valuable addition to bearing application files.

Copies of this information kit may be obtained by contacting E.I. du Pont de Nemours & Company, Inc., Textile Fibers Department, Teflon® Fiber Marketing, Centre Road Building, Room 12A1, Wilmington, Del. 19898.

**Sabine Towing & Transportation  
Applies For Title XI Insurance  
To Jumboize Tanker Colorado**

Application for Title XI mortgage loan and insurance aid has been received by the Maritime Administration from Sabine Towing & Transportation Co., Port Arthur, Texas. The application is to aid in financing and the jumboizing of the T-2 tanker Colorado.

Newport News Shipbuilding & Dry Dock Co. was awarded the construction contract in May at an estimated cost of \$6.5 million.

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**MARINE DIESEL ENGINES**



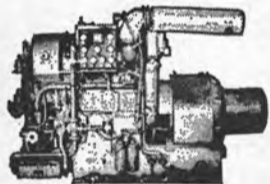
**6—GENERAL MOTORS DIESEL ENGINES**

Model 12-567A, 900 HP, 744 RPM, 3 port, 3 starboard, each complete with Falk Reverse Reduction Gear, 2.48:1 ratio.

**3—COOPER-BESSEMER DIESEL ENGINES**

Model LS-8-DR, 1300 HP, 277 RPM, direct reversing, turbo charged.

**MARINE DIESEL GENERATORS**

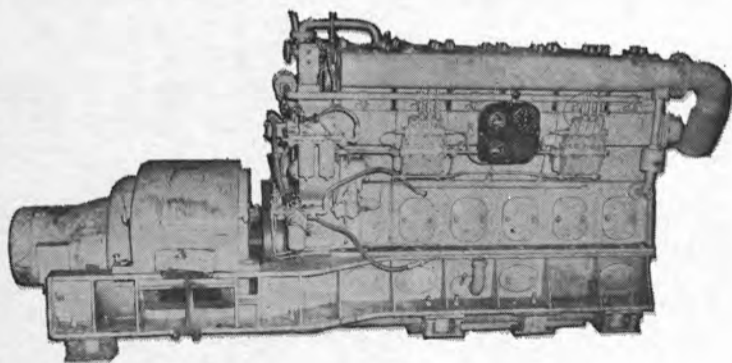


2—DE LAVERGNE, Marine, 560 HP, 514 RPM, Serials #2180 and #2181, with Electric Machinery Generators, 375 KW, 450/3/60.

6—SUPERIOR Diesel Engines, Model GBD-8, Marine, 150 HP, 1200 RPM, 8 cylinder, with Delco Generators, 100 KW, 120/240 DC.

1—GENERAL MOTORS, Model 3-268A, Marine, 150 HP, 1200 RPM, 3 cylinder, with Westinghouse Generators, 100 KW, 450/3/60.

3—GENERAL MOTORS, Model 3-268A, Marine, 150 HP, 1200 RPM, 3 cylinders, with Allis-Chalmers Generators, 100 KW, 120/240 DC.

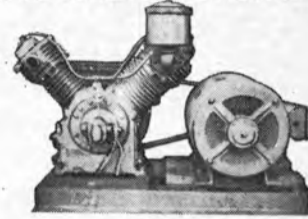


**4—COOPER-BESSEMER, Marine**

Model FSN6, 6 cylinders, 375 HP, 900 RPM, with General Electric Generators, 250 KW, 440/3/60.

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1—INGERSOLL-RAND, Size 5x5x4x4, 50 CFM, 150 PSI, with G.E. Motor, 20 HP, 440/3/60.

2—INGERSOLL-RAND, Size 4x1 1/2 x 3 1/2, 10 CFM, 60 PSI, with Diehl Motor, 7 1/2 HP, 120 Volts DC.

2—WESTINGHOUSE Air Brake Steam, Size 11 x 11 x 12, approximately 60 CFM at 100 PSI.

1—INGERSOLL-RAND, Model 40B, 155 CFM, 110 PSI, 870 RPM, with 40 HP Motor, 230 DC.

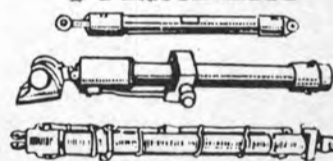
1—WORTHINGTON, 20 CFH, 3000 PSI, 4 stage, 585 RPM, with Worthington Steam Turbine, 47 HP, 5502 RPM.

**HEAT EXCHANGERS**

3—ROSS Lube Oil Coolers, size 1005.5.

2—ROSS Fresh Water Coolers, size 1206.

**HYDRAULIC CYLINDERS**



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

**SPERRY GYRO COMPASSES**



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

**AXIAL FLOW FANS**



Rebuilt  
Guaranteed  
LaDel,  
STURTE-  
VANT  
etc.

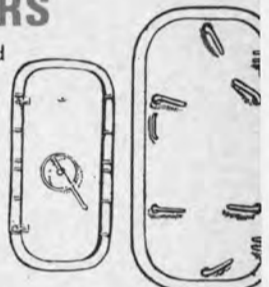
In 440 AC, in 115 DC, and in 230 DC, and in sizes 1 HP through 20 HP Completely reconditioned.

EXAMPLE LISTING:

Size A 1/4	Size A3	Size A8
Size A 1/2	Size A4	Size A10
Size A1	Size A5	Size A12
Size A2	Size A6	Size A16

**Steel Watertight DOORS**

Used, Good Condition, Trimmed Frames.



Many sizes available, priced reasonable. Some Typical Prices shown below. Please Inquire for other sizes.

- 26"x48"-4 Dogs-\$60.00 ea.
- 26"x57"-6 Dogs-\$80.00 ea.
- 26"x60"-4 Dogs, 6 Dogs-\$86.00 ea.
- 26"x66"-6 Dogs, 8 Dogs-\$100.00 ea.
- 26"x66"-Q.A. Type-\$175.00 ea.

**REDUCTION GEARS**

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

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

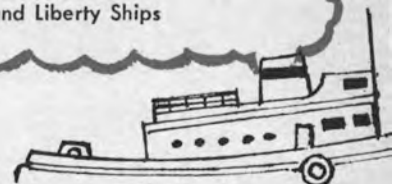
FARREL-BIRMINGHAM, as orig. used on two 1375 HP electric motors in submarine, 2 pinions, single output gear, pinion RPM 1302, Gear RPM 280; ratio 4.65:1.

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

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

**PROPELLER SHAFTS**

From C3M Vessel  
From C3-S1-A3 Vessel,  
C2-S-B1 Vessel (Moore Built,  
AP2 & AP3 Victory  
and Liberty Ships



## CAPSTAN WINDLASSES



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

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

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

## ANCHOR WINDLASSES

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

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

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

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

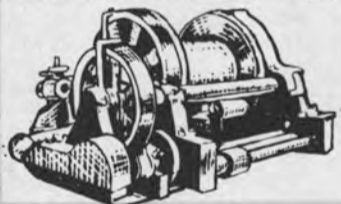
3—HESSE-ERSTED, horizontal, double wildcat, 2 1/8" chain, 60 HP, 230 DC.

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

## ANCHOR WINCHES

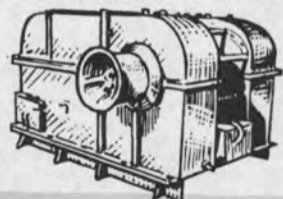
2—JAEGER, single drum—capacity approximately 900' of 1 1/2" wire rope, double gypsy, with 35 HP Motors, 230 Volts DC, complete with electricals.

## STEAM TOWING WINCH



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

## UNIWINCHES



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

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

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

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

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5 ton rated, Steel, as removed from surplus ships. Manufactured by: Young, Draper, etc., 12" & 14" sizes.



39.50 each with pull test certificates

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## 3 — L.S.T. TYPE VESSELS For Immediate Sale



Steel Hull, 328' length overall, 50' extreme beam, maximum draft 14', light displacement 1780 tons, full load displacement 3640 tons, twin screw, with two (2) General Motors Diesel Engines, 900 HP, Model 12-567A. WILL SELL VESSELS COMPLETE (AS IS) OR STRIPPED TO HULL.

## FALK REDUCTION GEARS



6—FALK REVERSE REDUCTION GEARS 3 port, 3 starboard, as used with GM 12-567A Engines on L.S.T. Vessels, ratio 2.48:1 ahead, 2.52:1 astern.

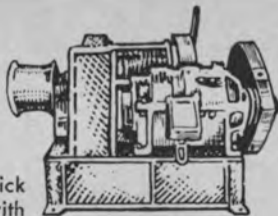
## STERN ANCHOR WINCHES



3—ALMON A. JOHNSON Stern Anchor Winches as removed from L.S.T. Vessels, line pull rating 100,000 pounds at 10 FPM in low gear, complete with Contractor Panels, Resistors, and Master Switches.

## CARGO WINCHES

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



Single Speed, Single Drum  
Two Speed, Single Drum

## OS & D RUBBER HOSE

50—6" size, 20' long sections with flanged ends, in little used, good condition.

Price:  
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per section

12—4" size, ditto the above description.

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subject to prior sale.

## CENTRIFUGES SHARPLES AND DE LAVAL

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



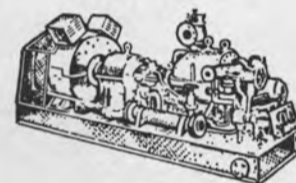
## TURBINE GENERATORS

2—DE LAVAL, 360 HP, 440 PSI, 740°F, with Crocker-Wheeler Generators, 250 KW, 240/120 DC, 1200 RPM.

1—WORTHINGTON, 225 PSI, 397°F, 6510 RPM, with Westinghouse Generator, 150 KW, 120 DC, 1250 Amperes.

6—WESTINGHOUSE, 200 PSI, with Westinghouse Generators, 60 KW, 120 DC.

4—ALLIS-CHALMERS, 440 PSI, 740°F, with Allis-Chalmers Generators, 300 KW, 240/240 DC.



1—GENERAL ELECTRIC, 525 PSI, with G.E. Generator, 250 KW, 440/3/60.

1—GENERAL ELECTRIC, with G.E. Generator, 350 KW, 440/3/60.

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we probably have it!"*

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miscellaneous shipboard  
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American Hoist and Derrick Company

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

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

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

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

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

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# Marine Pumps

## CENTRIFUGAL PUMPS

### DC - HORIZONTAL

- 1—ALLIS-CHALMERS, 40 GPM, 30.2 ft. hd., with Allis-Chalmers Motor, 5 HP, 230 DC, 575/1150/RPM.
- 1—WORTHINGTON, Size 3UB1, 400 GPM, 280' head, with Westinghouse Motor, 50 HP, 230 DC.
- 1—WEINMAN, 220 GPM, 60' head, Size 3, Type KB, with Reliance Motor, 5 HP, 230 DC.
- 2—WORTHINGTON, Size 8L1, 2100 GPM, 138.5 TDM, with Westinghouse Motors, 100 HP, 230 DC.
- 1—WARREN, Size 8DM11½, 1175 GPM, 11.1 PSI, with Reliance Motor, 10 HP 230 Volts DC.
- 1—WORTHINGTON, 3½" suction, 3" discharge, 150 GPM, 23.8 PSI, with Diehl Motor, 3.47 HP, 230 DC, 1750 /3500 RPM.
- 3—GOULDS, 250 GPM, 100 PSI, Figure 3380, 4"x3", with 30 HP Motors, 230 DC.

## CENTRIFUGAL PUMPS

### AC - HORIZONTAL

- 2—WARREN, 60 GPM, 50 PSI, 1.87 HP, 440/3/60, 3500 RPM.
- 1—WARREN, 17 GPM, 110 PSI, 3½ HP, 440/3/60, 3500 RPM.
- 1—WARREN, 600 GPM, 50 PSI, 8¼ HP, 440/3/60, 1135 RPM.
- 1—GARDNER-DENVER, 750 GPM, 360' head, 6" suction, 5" discharge, 3500 RPM, with G.E. Motor, 100 HP, 440/3/60.
- 1—WARREN, Size 3-SED-8, 150 GPM, 26.2' hd., with Westinghouse Motor, 3.96 HP, 440/3/60.
- 4—WORTHINGTON, 200 GPM, 100 PSI, 3½" suction, 3" discharge, Size 2UB1, with Wagner Motor, 25 HP, 440/3/60.
- 1—GARDNER-DENVER, 5" suction, 3" discharge, 350 GPM, 336' head, 50 HP, 440/3/60, 3500 RPM.
- 1—CARVER, 400 GPM, 100 PSI, 3½" suction, 2½" discharge, 3500 RPM, 35.7 HP, 440/3/60.
- 2—WORTHINGTON, 875 GPM, 10 PSI, 1160/860 RPM, with Westinghouse Motor, 4.45 HP/7.92 HP, 440/3/60.
- 3—WORTHINGTON, 6" x 6", 550 GPM, 25' head, 6 HP, 440/3/60, 1750 RPM.
- 2—BUFFALO, 250 GPM, 100 PSI, Class CCS, Size 4 x 3½", with Westinghouse Motors, 25 HP, 440/3/60.

## CENTRIFUGAL PUMPS

### DC - VERTICAL

- 1—AURORA, 4" x 3", with G.E. Motor, 25/40 HP, 230 DC, 1310/1750 RPM.
- 1—INGERSOLL-RAND, Size 8VCM, 8" suction, 8" discharge, with Westinghouse Motor, 15 HP, 230 DC, 850/1210 RPM.
- 1—INGERSOLL-RAND, 4" suction, 3" discharge, with Westinghouse Motor, 15 HP, 230 DC, 1310/1750 RPM.
- 1—WARREN, 6" suction, 3" discharge, with G.E. Motor, 5 HP, 440/3/60, 1725 RPM.
- 1—DAYTON-DOWD, 5" suction, 4" discharge, with Century Motor, 15 HP, 230 DC, 1310/1750 RPM.
- 2—ALLIS-CHALMERS, 170 GPM, 208' head, Type CF2V, 6" suction, 3½" discharge, 20 HP, 230 DC.
- 2—ALLIS-CHALMERS, 30 GPM, 208' hd, Type CF2V, 2½" suction, 1½" discharge, 7½ HP, 230 DC.
- 1—ALLIS-CHALMERS, 12,500 GPM, 10.4 PSI, Type LS-V, Size 20" x 20", 100 HP, 230 DC.
- 1—ALLIS-CHALMERS, 2520 GPM, 14.4 PSI, Size SE-V, 12" x 12", 30 HP, 230 DC.
- 2—ALLIS-CHALMERS, 600 GPM, 30 PSI, Type SGV, 5" x 5", 20 HP, 230 DC.
- 1—ALLIS-CHALMERS, 450 GPM, 120 PSI, 4" x 3", 50 HP, 230 DC.
- 3—GARDNER-DENVER, 1500 GPM, 56' head, 8" suction, 6" discharge, with 30 HP Motors, 230 DC.

## CENTRIFUGAL PUMPS

### AC - VERTICAL

- 1—DE LAVAL, 155 GPM, 59.9 PSI, 440/3/60.
- 1—WARREN, 17 GPM, 55 PSI, with Westinghouse Motor, 4.26 HP, 440/3/60.
- 1—INGERSOLL-RAND, Size 2VHMA, 65 GPM, 75 PSI, 440/3/60.
- 1—BUFFALO, Size 6, 875 GPM, 10 PSI, 6.3 HP, 440/3/60.

## ROTARY PUMPS

### DC - HORIZONTAL

- 3—NATIONAL TRANSIT, 50 GPM, 50 PSI, 3 x 2½, with G.E. Motor, 3 HP, 230 DC.

## ROTARY PUMPS

### DC - VERTICAL

- 1—WORTHINGTON, Size 4GRVS, with Westinghouse Motor, 15 HP, 230 Volts DC, 1310/1750 RPM.
- 2—QUIMBY, Size 4D, 225 GPM, 50 PSI, 15 HP, 230 DC, 540/740 RPM.
- 2—QUIMBY, Size 5, 6 x 5, 400 GPM, 48 PSI, 25 HP, 230 DC.
- 2—QUIMBY, Size 6, 500 GPM, 70 PSI, 40 HP, 230 DC.
- 1—QUIMBY, Size 2½, 17 GPM, 405 PSI, 7½ HP, 230 DC.

### Rotary, AC - Vertical

- 2—NORTHERN, Size 7020, 10 GPM, 350 PSI, 200 RPM, 3.65 HP, 440/3/60, 1720 RPM.

## HYDRAULIC PUMPS

- 1—HELE SHAW, Size JLP12, 1000 PSI, 850 RPM, with Westinghouse Motor, 35 HP, 230 DC.
- 2—OIL GEAR, Type OH35-11, 1100 PSI, 860 RPM, with Reliance Motors, 40 HP, 230 DC.

## BOILER FEED PUMPS

- 2—ALDRICH vertical Triplex, 131 GPM, 520 PSI, 3-5/8" x 5", 125 HP, 230 DC.
- 2—WORTHINGTON vertical Simplex, 120 GPM, 550 PSI, Size 11 x 7 x 24.
- 1—WORTHINGTON vertical Simplex, 185 GPM, 550 PSI, Size 14 x 9 x 24.

## TURBINE DRIVEN FIRE PUMPS

- 4—INGERSOLL-RAND, 1200 GPM, 98 PSI, Size 5UV, with Elliott Turbines, 84.3 HP, 3550 RPM, 1 stage, impulse type.

## FAIRLEADS

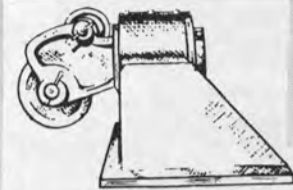
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One size fairlead with universal type sheave to accommodate wire rope sizes 1" up to and including 2".

Self Aligning, Swivel Type Head.

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

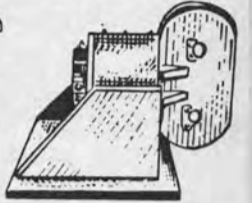


Standard Design  
\$995 each

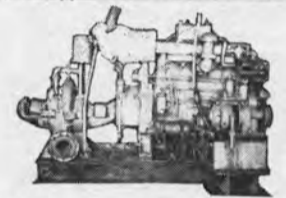
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LIFTING RATE: 25 tons at 50 Ft. Radius at 50 to 60 FPM.

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**Pumping Equipment—**  
 Twenty (20) 40 H.P. Fairbanks-Morse vertical propeller type—4 per Dock section—electrically operated—440 volts, 60 cycle, 3 phase.  
 Dock completely overhauled in 1964 including increasing depth of wingwalls by adding 5' steel extension on top and adding steel pinned hinges between sections.

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De Laval .....	300 KW
Hendy (Terry Design) .....	300 KW
Westinghouse (Victory type) .....	300 KW
Westinghouse .....	250 KW
Worthington .....	150 KW
Westinghouse CA 20 .....	100 HP
G.E. Main Turbine Rotor T2 .....	6000 HP
G.E. HP & LP Turbine C2 .....	6000 HP
G.E. HP & LP Turbine .....	8500 HP
Westinghouse Turbine & Gear C4, C3 Some AP3 .....	8500 HP

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### NICOLAI JOFFE CORPORATION

San Francisco Branch

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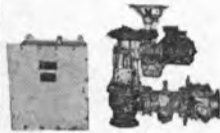
### UNUSED ALUMINUM BILGE EDUCTORS

4" Hose thread—suction; 2½" hose  
thread—discharge.

**\$12950** EACH

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### AUTOMATIC SPRINKLER VALVES

4" Bronze—150 lbs.—Jenkins.  
Motor operated Fire Sprinkler  
Valve—with Ward Leonard re-  
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0.25 HP—440/3/60—1.7 amps.

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### AXIAL FLOW FANS 115 & 230 VDC—440 AC—ALL SIZES

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### 20KW TROY ENBERG LIBERTY GEN. SETS \$695

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5 KW — 120/1/60 A.C. — UNUSED  
10 HP 115 VDC TO 5 KW 120 VOLTS  
SINGLE PHASE AC



INPUT: 10 HP—115 volts DC  
— 78 amps — 1800 RPM.  
OUTPUT: 5 KW—115 volts  
single phase A.C. 4-bearing  
—with 10 HP 115 volt D.C.  
magnetic starter.

FIRST TIME IN A LONG TIME THAT 5 KW  
UNITS ARE ON THE MARKET

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INPUT: 7.5 H.P.—230 volts  
DC—27.5 amps—1800 R.P.M.  
OUTPUT: 3.75 KW—120 volts  
60 cycle—single phase—62.5  
amps—0.5 P.F. Weight 1250  
lbs.

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INPUT: 0.65 HP—115 volts D.C.—4.6 amps—1800 R.P.M.  
OUTPUT: 0.25 KVA 115/1/60—1800 RPM—2.7 amps—  
0.8 PF

**\$8950** F.O.B.

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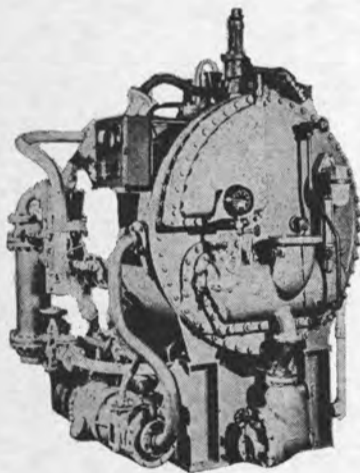
*Lowest Price Ever  
Best Condition*

JUST REMOVED FROM U.S. NAVY SHIPS

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2 L.P. Bethlehem evaporators—bronze—with all pumps  
and controls. Automatic feed water control—salinity  
indicator cells. Always kept in top shape.

**\$11,750.00**



1 AQUA CHEM 8000 GAL/DAY FLASH  
EVAPORATOR All pumps—salinity indicator cells. **\$9850.00**

ALL ARE OFFERED RECONDITIONED AND TESTED TO A.B.S.

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IMMEDIATE DELIVERY

6-Dog right and left hand  
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SIZES:

26" x 48" 26" x 57"  
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(2) T2 MISSION TANKER HULLS  
FOR USE AS DRILL BARGE, DRILL RIG,  
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MISSION SAN RAFAEL MISSION SANTA CRUZ  
Located Beaumont, Tex. Located Baltimore, Md.  
OAL 523'; Beam 68'0"; depth moulded 39'3"; dead-  
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Contact: Harold B. Chait, Exec. V.P.

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GEAR BOX: Link Belt—size  
DM-30—68 RPM output—ratio  
23.63:1. MOTOR: Westinghouse  
type CS—style 7C4894—frame  
225Y—class 1—2 HP—1720  
RPM—220/440/60/3—5.6/2.8  
amps. With push button starter  
and magnetic controller. Wt. 320 lbs—duty 800 lbs  
@ 68 FPM. **\$347.50**

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Self-contained — hermetically sealed—sea-water cooled. 2 HP—440/3/60 with magnetic starter. Suitable for portable reefer boxes, small craft, etc.

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GEN: 20 KW 120 VDC 1200 RPM. ENGINE: GM 2-71 diesel — 2-cycle — 4 1/4 x 5 — 142 cu inch — clockwise — 24 volt start.

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## G.E. 400 KW — 500 KVA TURBO GENERATOR SET

Originally built for DD692 class vessel. GEI 17716. TURBINE: DORV-618N—525 lbs/825°—634 lbs/850°—10059 RPM. GEAR: S-193—reduction 8.382:1. A.C. GENERATOR: 400KW—500 KVA—440/3/60—1200 RPM—with direct-connected exciter. All ABS.

WILL SELL ROTOR SEPARATELY  
WILL SELL GEAR SEPARATELY  
WILL SELL GENERATOR SEPARATELY

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### PROPELLERS

AP3—Victory—with ABS—located Baltimore.  
C-1MAV-1—with ABS—located Beaumont, Texas

### TAILSHAFTS

C-3—reconditioned—with ABS—located Baltimore  
C-1MAV-1—with ABS—located Beaumont, Texas

### RUDDERS

C-1MAV-1—new—unused  
VICTORY—reconditioned  
T-2 As removed from vessel. Good. Subject to your survey.

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Union Carbide Corp., Linde Div., 270 Park Ave., N.Y., N.Y. 10017

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Baldt Anchor, Chain & Forge, P.O. Box 350, Chester, Pa. 19016  
Lockstadt Co., Inc., 179 West 5th St., Bayonne, N.J. 07002

## BEARINGS

BJ Marine Bearings, a Borg-Warner Industry, P.O. Box 2709, Terminal Annex, Los Angeles, Calif. 90054  
Glacier Metal Co. Ltd., Alperston, Wembley, Middlesex, England.  
Johnson Rubber Co., Marine Division, Middlefield, Ohio 44062  
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

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Babcock & Wilcox Co., 161 E. 42nd Street, New York, N.Y. 10017  
Combustion Engineering, Inc., Windsor, Connecticut 06095

## BOW THRUSTERS

Bird Johnson Co., 883 Main St., Walpole, Mass. 02081  
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171

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Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019  
Independent Petroleum Supply Co., 1345 Ave. of the Americas, New York, N.Y. 10019

Reffner Panama, S. A. 277 Park Ave., New York, N.Y. 10017  
The West Indies Oil Co., Ltd., St. John's Antigua, W. I.

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Anixter-Netherlands, Utrecht Gebouw, Coalinga 75, Rotterdam 3002, Netherlands

Anixter-New York, 300 Executive Blvd., Elmsford, N.Y. 10523  
Anixter-New Orleans, 315 Notre Dame, New Orleans, La. 70130  
L. F. Goubert & Co., 700 So. Broad St., New Orleans, La. 70150

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Amarillo Gear Co., 517 No. Polk St., Amarillo, Texas 79105  
Eaton Corp., Industrial Drive Division, 9919 Clinton Rd., Cleveland, Ohio 44111  
Wichita Clutch Co., Inc., Wichita Falls, Texas 76307

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Ameron Corrosion Control Div., Brea, Calif. 92621  
Corboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144  
Devoe & Reynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105

Enjoy Chemical Company, 60 West 49th St., New York, N.Y. 10020  
Farbail Company, 90 West St., N.Y., N.Y. 10006  
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.

Spee-Flo Co., 4631 Winfield Rd., Houston, Texas 77039

## CONTAINERS—CONTAINER HANDLING SYSTEMS

Ameron Corrosion Control Div., Brea, Calif. 92621  
Lighter Aboard Ship, Inc., 225 Baronne St., New Orleans, La. 70112  
Paccoco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98421

## CONTAINER LASHINGS & COMPONENTS

W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233

## CONTROL SYSTEMS

Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215  
General Electric Industrial Control Dept., Salem, Virginia  
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913  
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

## CORROSION CONTROL

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Corboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144  
Radiator Specialty Co., 1400 Independence Blvd., Charlotte, N.C. 28205

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Conrad-Stork, Div. Stork-Werkspoor, P.O. Box 134, Haarlem, Holland  
Hoffman Rigging & Crane Service, 560 Cortlandt St., Belleville, N.J. 07109

Kocks Pittsburgh Corp., Four Gateway Center, Pittsburgh, Pa. 15222  
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany

Paccoco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98401

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Lockstadt Co., Inc., 179 W. 5th Street, Bayonne, New Jersey 07002

Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696

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Fukushima, Ltd., 4 Yonban-Cho, Chiyoda-Ku, Tokyo, Japan. (U.S. Rep. Alfred Conhagen, Inc., 172 Lyndhurst Ave., Staten Island, N.Y. 10305)

Garrett Corp., 9851 Sepulveda Blvd., Los Angeles, Calif. 90009

Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134

Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202

Pacific Pipe Co., 49 Fremont St., San Francisco, Calif. 94080

Red Fox Machine & Supply Co., P.O. Drawer 640, New Iberia, La. 70560

A. G. Weser, Seebeckwerft, 2850 Bremerhaven 1, Germany  
Western Gear Corp., Heavy Machinery Div., Everett, Wash. 98201

## DIESEL ACCESSORIES

Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231

Kiene Diesel Accessories, Inc., P.O. Box 216, Franklin Park, Ill. 60131

A.G. Schoonmaker, Box 757, Sausalito, Calif. 95965

United Filtration Corp., 9600 John St., Santa Fe Springs, Calif. 90670

## DIESEL ENGINES

Alco Engine Div., White Industrial Power, Inc., 100 Orchard St., Auburn, N.Y. 13021

Bruce GM Diesel, Inc., 180 Route #17 S. at Interstate 80, Lodi, N.J. 07644

Caterpillar Tractor Co., Industrial Div., 100 N.E. Adams St., Peoria, Ill. 61602

Colt Industries Inc., Power Systems Div., Beloit, Wisc. 53511

Electro-Motive Division General Motors, La Grange, Illinois 60525

Fiat, Turin, Italy, U.S.A. 375 Park Ave., New York, N.Y. 10022

Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231

M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany

H. O. Penn Machinery Co., 1561 Stewart Ave., Westbury, N.Y. 11590

## DIESEL ENGINE MUFFLERS

Magne Products & Engrg. Co., 20 Vesey St., New York, N.Y. 10007

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Overbeke-Kain Co., 209 Aurora Rd., Bedford, Ohio 44014

Pioneer Industries, 401 Washington Ave., Corlstadt, N.J. 07072

Walz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

## ELECTRICAL EQUIPMENT

Arnessen Electric Co., Inc., 335 Bond St., Brooklyn, N.Y.

Galbraith-Pilot Marine Corp., 600 4th Ave., Brooklyn, N.Y. 11215

L. F. Goubert & Co., 700 So. Broad St., New Orleans, La. 70150

Marine Industrial Products Co., 195 Paterson Ave., Little Falls, N.J. 07424

Merrin Electric, 162 Chambers St., New York, N.Y. 10007

Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014

Pauluhn Electric Mfg. Co., Inc., P.O. Box 12805, Houston, Tex. 77017

## EVAPORATORS

Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004  
Mechanical Equipment Co., Inc., 861 Carondelet St., New Orleans, La. 70130

## FITTINGS & HARDWARE

Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202

Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

## FLOATING EQUIPMENT—Steel—Aluminum Pontoons

Dravo Corporation, Neville Island, Pittsburgh 25, Pa.

## GALLEY RANGES

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Elisha Webb & Son Co., 136 So. Front St., Philadelphia, Pa. 19106

## HEATERS—Ship

Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231

## HULL CLEANING & BLASTING

Key Engineering, 12502 Woodthorpe Lane, Houston, Texas 77024

Trident Marine, 533 East 24th St., Brooklyn, N.Y. 11210

Vacu-Blast Corp., Box 885, Belmont, Calif. 94002

## HYDRAULICS

Bird Johnson Co., 883 Main St., Walpole, Mass. 02081

Bond Hydraulic Equip. Service, Inc., 117 Monroe St., Hoboken, N.J. 07030

Universal Hydraulics, Div. of Ohio Brass Co., 4500 Beidler Road, Willoughby, Ohio 44094

Vickers, MGO Div., Troy, Mich. 48084

## INSULATION—Marine

Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Bklyn, N.Y. 11231

## LININGS

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Corboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144

## MACHINERY MONITORS

IRD Mechanalysis, Inc., 6150 Huntley Rd., Columbus, Ohio 43229

## MARINE DRIVES—GEARS

Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406

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

## MARINE NAVIGATION EQUIPMENT & AIDS

American Hydromath Co., 55 Brixton Rd., Garden City, N.Y. 11530

Edo Western Corp., 2645 So. 2nd St., W. Salt Lake City, Utah 84115

Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016

Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406

National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo. 63108

Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701

RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101

Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

Star Lifeline, Ltd., 1148 W. 15th St., No. Vancouver, B.C., Canada

Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721

## MARINE EQUIPMENT

Adco Div., 34 Millburn St., Buffalo, N.Y. 14212

Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080

Kearfoot Marine (Div. of The Singer Co.) 21 West St., New York, N.Y. 10006

Merrin Electric, 162 Chambers St., New York, N.Y. 10007

Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742

Stow Mfg. Co., 225 Shear St., Binghamton, N.Y. 13902

Vokes Filter Div., (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221

## MARINE FURNITURE

Bailey Joiner Co., 115 King Street, Brooklyn, N.Y. 11231

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Adams & Porter, Cotton Exchange Bldg., Houston, Texas

## MARINE PROPULSION

Buehler Corp., 9000 Precision Drive, Indianapolis, Ind. 46236

Combustion Engineering, Inc., Windsor, Connecticut 06095

General Electric Co., Marine Turbine & Gear Dept., Lynn, Mass. 01910

General Electric Co., Gas Turbine Dept., Schenectady, N.Y. 12305

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

Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014

Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523

Western Gear Corp., Precision Products Div., P.O. Box 190, Lynwood, Calif. 90262

## MARINE RADIO COMMUNICATIONS EQUIPMENT

Collins Radio Co., M/S 407-321, Dallas, Texas 75207

Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746

Electro-Nav, Inc., 555 Fifth Ave., New York, N.Y. 10017

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

ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016

Raytheon Co. Marine Products, 676 Island Pond Rd., Manchester, N.H. 03103

RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101

RF Communications, Inc., 1676 University Ave., Rochester, N.Y. 14610

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Breit Engrg. Inc., 441 Gravier St., New Orleans, La. 70130

Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517

Crandall Dry Dock Engrs., Inc., 238 Main St., Cambridge, Mass. 02142

Cushing & Nordstrom, 50 Trinity Place, New York, N.Y. 10006

Arthur D. Darden, Inc., 1040 International Trade Mart, New Orleans, La. 70130

Sharp DeLong, 29 Broadway, New York, N.Y. 10006

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 Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201  
 H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006

**OIL PURIFIERS—Repair**  
 Peck Equipment Co., 3500 Elm Avenue, Portsmouth, Virginia 23704

**OILS—Marine—Additives**  
 Esso International Inc., 15 West 51 St., New York, N.Y. 10019  
 Ethyl Corp. Marine Div. Perolin Co., New York, N.Y. 10001  
 Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019  
 Humble Oil & Refining Co., Humble Building, Houston, Texas 77002  
 Mobil Oil Corp., 26 Broadway, New York, N.Y. 10004  
 Refinaria Panama, S. A., 277 Park Ave., New York, N.Y. 10017  
 Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
 Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017

**PAINT—Marine—Protective Coatings**  
 Ameron Corrosion Control Div., Brea, Calif. 92621  
 Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144  
 Devco & Reynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105  
 Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020  
 Farboil Company, 90 West St., New York, N.Y. 10006  
 International Paint Co., 21 West St., New York, N.Y. 10006  
 Mobil Chemical Company, Metuchen, N.J. 08840  
 Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.  
 Woolsey Marine Industries Inc., 201 E. 42nd St., New York, N.Y. 10017

**PETROLEUM SUPPLIES**  
 Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019  
 Refinaria Panama, S. A., 277 Park Ave., New York, N.Y. 10017  
 Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
 Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017  
 The West Indies Oil Co., Ltd., St. John's, Antigua, W. I.

**PLASTICS—Marine Applications**  
 Ameron Corrosion Control Div., Brea, Calif. 92621  
 Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231  
 Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936  
 Rotocast Plastic Products, Inc., 6700 N.W. 36th Ave., Miami, Florida 33147

**POLLUTION CONTROL**  
 Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020  
 Unroyal, Inc., 10 Eagle St., Providence, R.I. 02901

**PORTS**  
 Port of Galveston, P.O. Box 328, Galveston, Texas  
 Jacksonville Port Authority, 2701 Tallyrand Ave., Jacksonville, Fla.

**PROPELLERS: NEW AND RECONDITIONED**  
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
 Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004  
 Bird-Johnson Co., 883 Main Street, Walpole, Mass. 02081  
 Coolidge Propeller Co., 1608 Fairview Ave. E., Seattle, Wash. 98102  
 Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich. 49502  
 Ferguson Propeller, 1132 Clinton St., Hoboken, N.J. 07030

**PUMPS**  
 Coffin Turbo Pump/FMC Corp., 326 So. Dean St., Englewood, N.J. 07631  
 Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City, Kansas 66110  
 Goulds Pumps, Seneca Falls, N.Y. 13148  
 Houttin-Pompen N. V. Sophaloran 4, Utrecht, Holland  
 Worthington Corporation, Harrison, New Jersey 07029

**RATCHETS**  
 American Engineered Products Co., Box 74, McKees Rocks, Pa. 15136  
 W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233

**REFRIGERATION—Refrigerant Valves**  
 Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231  
 York Corp., Grantley Road, York, Pa. 17405

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 American Mfg. Co., Inc., Noble & West Sts., Brooklyn, N.Y. 11222  
 Cating Rope Co., 309 Genesee St., Auburn, N.Y. 13022  
 Columbian Rope Co., 309 Genesee St., Auburn, N.Y. 13022  
 Du Pont Co., Room 31H1, Wilmington, Delaware 19898  
 Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604  
 Samson Cordage Works, 470 Atlantic Ave., Boston, Mass. 02210  
 Tubbs Cordage Company, P.O. Box 709, Orange, Calif. 92669  
 Wall Rope Works, Inc., Beverly, N. J. 08010

**RUBBER PRODUCTS—Dock Fenders, Hose, Life Preservers**  
 Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004  
 Schuyler's Engineered Products Co., Box 87, Staten Island, N.Y.  
 Yokohama Rubber Co. Ltd., P.O. Box 46, Shiba, Tokyo 105, Japan

**RUDDER ANGLE INDICATORS**  
 Electric Tachometer Corp., 68th & Upland Sts., Phila., Pa. 19142  
 Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215  
 Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
 Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011  
 Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

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 Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

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 National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731  
 Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

**SHIP BROKERS**  
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 Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006  
 Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119

**SHIPBUILDING STEEL**  
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 Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
 Bethlehem Steel Corp., 25 Broadway, New York, N.Y. 10004  
 Huntington Alloy Products, Div. International Nickel Co., Inc., Huntington, W. Va. 25720  
 International Nickel Co., 1 New York Plaza, New York, N.Y. 10004  
 United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230

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 Astilleros Espanoles, S.A. Zubano, 70, Madrid 10, Spain  
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
 Bellard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium  
 Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004  
 Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885  
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 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., P.O. Box 8001, New Orleans, La. 70122  
 General Dynamics, Electric Boat Division, 99M Eastern Point Road, Groton, Conn. 06340  
 General Dynamics, Quincy Division, Quincy, Mass. 02169  
 Gotaverken American Corp., 39 Broadway, New York, N.Y. 10006

Grafton Boat Co., Inc., Grafton, Ill. 62037  
 Grogan Shipyards, P.O. Box 829 Colbert, Marseilles, France  
 Gunderson Bros. Engrg. Corp., 4700 N.W. Front St., Portland, Oregon 97208  
 Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126

Havre de Grace, Havre de Grace, Md.  
 Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.  
 Hongkong & Whampoa Dock Co. Ltd., Kowloon Docks, Hong Kong  
 Ishikawajima-Harima Heavy Industries Co., Ltd., 15 William St., New York, N.Y. 10005

Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla. 32203  
 Jeffboat, Inc., Jeffersonville, Ind. 47130  
 Kawasaki Dockyard Co., 8 Kaigon-dori, Ikuta-ku, Kobe, Japan  
 Kelso Marine, Inc., P.O. Box 268, Galveston, Texas 77550  
 Kockums Malmo, Fack, Malmo, Sweden  
 Lexington Shipbuilding Co., P.O. Box 968, Orange, Texas 77630  
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 Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230  
 Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134

Maryland Shipbuilding & Drydock, P.O. Box 537, Baltimore, Md. 21203  
 Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047  
 Mitsui Shipbuilding & Engrg. Co. Ltd., 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo, Japan  
 Mitsubishi Heavy Industries, Ltd., 5-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan  
 Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202  
 National Steel & Shipbuilding Corp., San Diego, Calif. 92112  
 Newport News Shipbuilding and Dry Dock Co., Newport News, Va.  
 Northwest Marine Iron Works, P.O. Box 3109, Swan Island, Portland, Oregon 97208

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 St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111  
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 Sembawang Shipyard (Pte) Ltd., P.O. Box 3, Sembawang, P.O. Singapore, 27  
 Star Shipyards, Ltd., 61 Duncan St., New Westminster, Vancouver, B.C., Canada  
 Sumitomo Shipbuilding & Machy. Co., Ltd. 2-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan  
 Teledyne Seawcraft, P.O. Box 108, Berwick, La. 70342  
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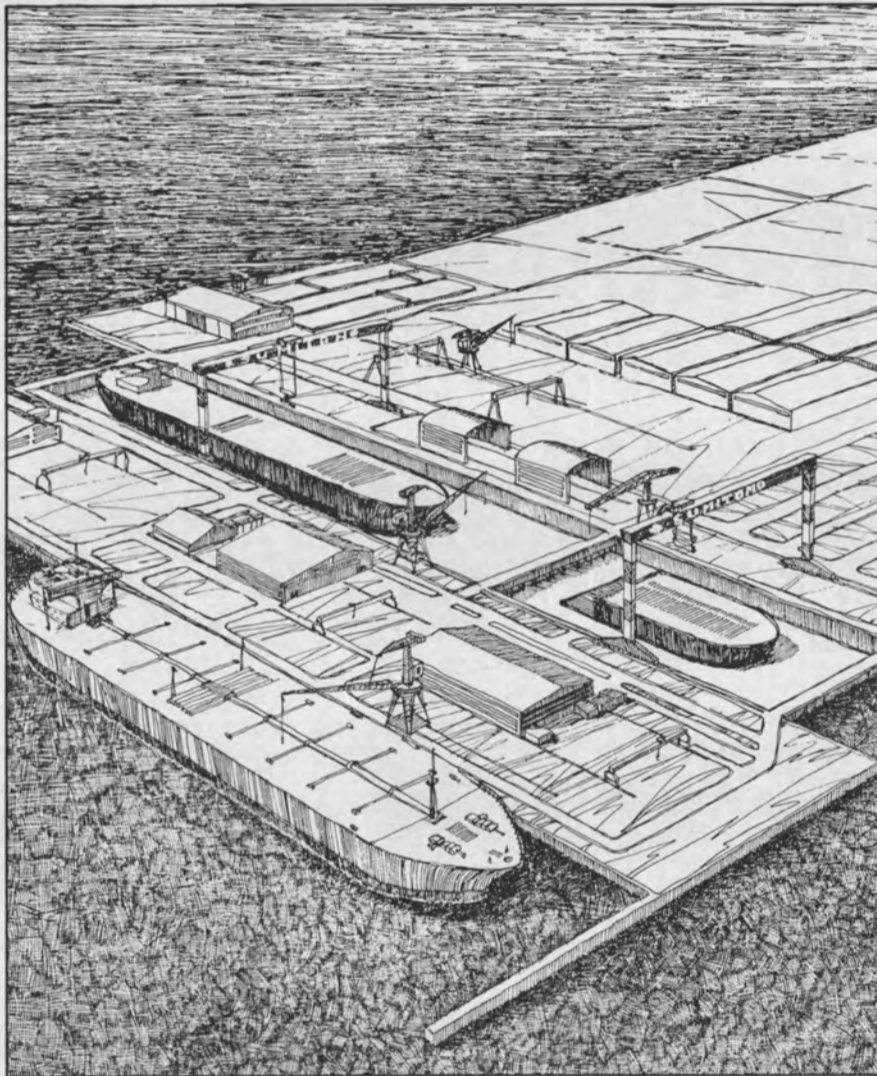
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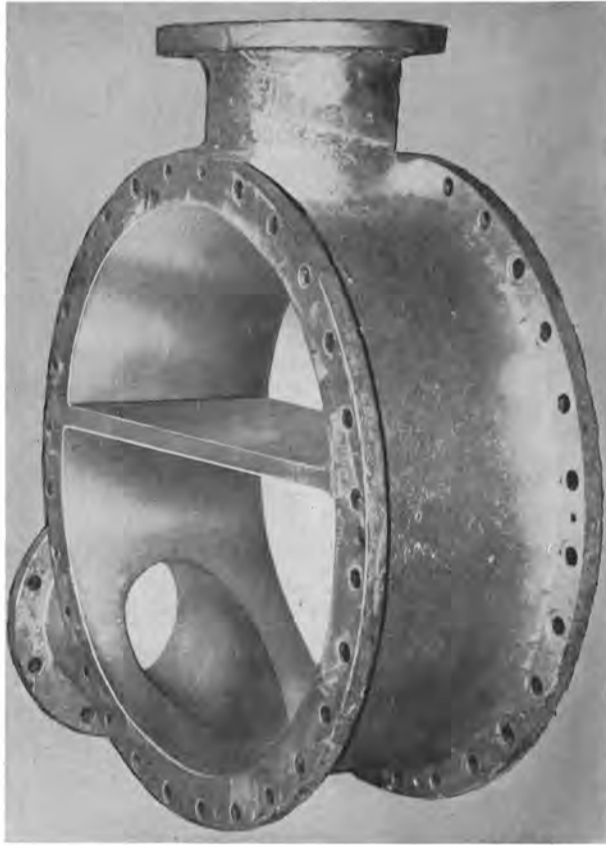
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