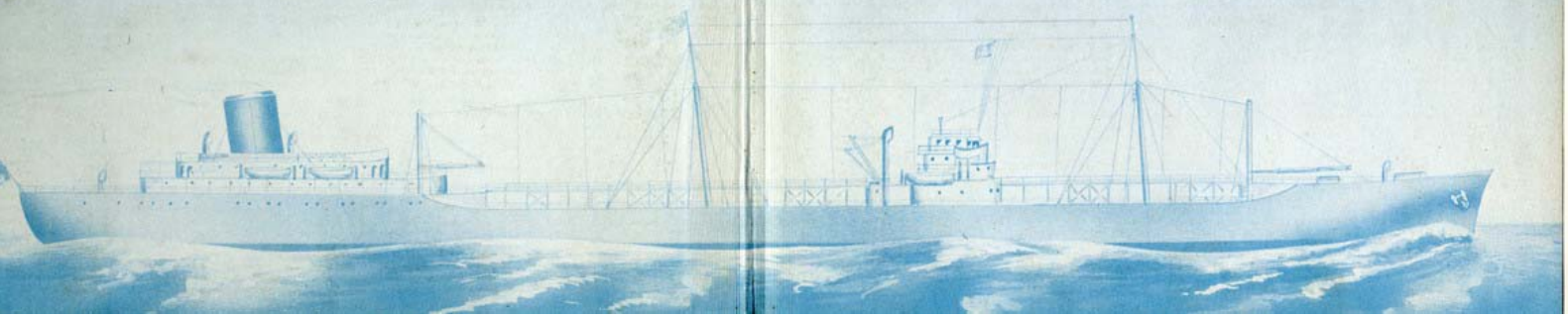
SUN SHIP



HOWARD P. WOOD SR. BADGE # 33-806
MAIN POWER HOUSE (CENTRAL YARD)
SUN SHIPBUILDING & DRY DOCK CO.
BORN 4/20/09
DIED 7/21/86
EMPLOYED ABT — 12/10/28
RETIRED FROM SS+DD CO 4/30/74 > 45 YRS

★ INFORMATION COMPILED BY
HOWARD P. WOOD JR.

Erelong we will launch

A vessel as goodly, and strong, and staunch,

As ever weathered a wint'ry sea!

And first with nicest skill and art,

Perfect and finished in every part.

LONGFELLOW

S. S. "CHESTER SUN" — Hull No. 1

First Ship Built at Sun Ship. Launched October 30, 1917.

Typical Tanker Built During World War I.

Length	430 Feet
Breadth	59 Feet
Depth	33 Feet, 3 Inches
D.W.T.	10,600 Tons
Power	2,600 H.P.
Speed	10½ Knots
Construction	Riveted

Reciprocating Steam Engines, Scotch Marine Boilers.

See Page 30 for Modern All-Welded Tankers.

SUN

PRODUCTS and SERVICES

SHIPS

Passenger Ships, Cargo Vessels
and Tankers; Steam or Diesel.

MARINE REPAIRS

Dry Docking
Unlimited Facilities for Hull and
Machinery Repairs.

ENGINES and MACHINERY

Diesel Oil Engines.
Steam Engines—Boilers.

SPECIAL EQUIPMENT

For Oil Refineries,
Chemical Plants and
Kindred Industries.

SHIPBUILDING and DRY DOCK COMPANY

Main Office and Plant — CHESTER, PENNSYLVANIA, U.S.A.

Philadelphia Office — 1608 WALNUT ST., PHILA., PA.

New York Office — 25 BROADWAY, NEW YORK 4, N. Y.

SU

MAIN OFFICE BUILDING

MMARY OF CONTENTS

FOREWORD

THE SUN SHIPBUILDING & DRY DOCK COMPANY was founded in 1916 with Mr. J. Howard Pew as its first President. He was succeeded by Mr. J. N. Pew, Jr., who has since become Chairman of the Board of Directors, with Mr. John G. Pew as President.

Through the period of the first World War and the intervening years to Pearl Harbor the Company enjoyed a healthy and steady growth. Ever progressive and forward-looking, it has pioneered in many advances made in Shipbuilding. The High-Speed Tanker; the Sub-Assembly Method; the All-Welded Construction and the development of Diesel Engines for ship's Main Propulsion Power are but a few of the important developments introduced here.

With this background of experience and achievement the company was fully prepared, when called upon to make its great contribution to the war effort of World War II.

During the war the Shipyard, which normally consists of eight Shipbuilding Ways, was expanded to a total of twenty-eight Ways, with a corresponding increase in the many types of shops and other facilities required to support such a huge undertaking.

In these war years Sun Ship produced 35,000 tons monthly of fabricated ship steel which went into the building of more than

116,500 dead-weight tons of ships per month; 1,000 tons per month of Pressure Vessels, Oil Refinery and Special Equipment; great quantities of Machinery and Machinery Parts, and at the same time carried out the rebuilding and repairing of many damaged ships.

Now, returned once again to normal operation, with eight Shipbuilding Ways, twenty-five Production Departments and an average operating force of 6500 employees, Sun Ship remains a closely integrated organization of engineering specialists, craftsmen and supervisors, skilled in forty different crafts or trades.

In the pages that follow are shown some of the things built here . . . some of the Ships . . . the Machinery and Special Equipment . . . the Repair Work done and the Facilities available . . . so that friends and prospective clients may know of the company's capacity and versatility.

From the data accumulated herein, it will be understood how we have participated so prominently in great undertakings of the past, and how we are now prepared to offer our engineering skill, experience, and the almost unlimited facilities of this great plant to serve the needs of the future.

ONE OF MANY

sturdy ships which with their gallant crews have won the highest honors in the annals of Shipping.

The story of how the tanker "OHIO" ran a gauntlet of enemy air and submarine torpedoes to save beleaguered Malta, is a story of one of the sturdiest of ships and one of the bravest of crews. When several attempts to get supplies to Malta had failed, and her oil supply was exhausted, the tanker "OHIO" became part of a relief convoy headed for that tiny Mediterranean outpost. The "OHIO" was torpedoed, bombed, and set afire; she was given up for lost, and dropped from convoy. Her gallant crew brought her back to the convoy only to be bombed again and set afire. For five long days she was a target. The "OHIO" stayed afloat and delivered the precious cargo which was to help save Malta.

S. S. "OHIO"—TANKER

Length	485 Feet
Breadth	68 Feet
Depth	36 Feet
Power (Steam Turbine Drive)	9,000 H.P.
Speed	16 Knots
D.W.T.	14,140 Tons

Launched April 22, 1940. Built for the Texas Company, and under the U. S. Flag until she joined the British Merchant Marine. Now sailing the Adriatic Sea under the flag of the Yugoslav Navy. The S.S. "OHIO" is a product of Sun Ship.

SPECIAL CITATION

for the M.S. "ALCHIBA" and her brave crew

While this gallant ship lay off Guadalcanal, loaded with drums of high-test aviation gasoline, bombs and ammunition, she was hit by a Japanese torpedo. A Presidential Citation tells the remainder of the story, except that the shipbuilders received special commendation from the Navy.

THE PRESIDENTIAL CITATION "For outstanding performance in the delivery of vital war supplies through Japanese-patrolled waters in the South Pacific, August to November 1942. Torpedoed by a hostile submarine, the "ALCHIBA", exploding and aflame, was successfully beached while her ship's company berthed ashore nine days and nights, salvaging cargo and fighting fire. Just when their task seemed finished and their ship restored, a second torpedo blasted the engine room and struck out her power. Once again, however, by the gallant determination of her officers and men, tired but undiscouraged, her damage was sufficiently repaired to get her under way, saved to resume her hazardous role in the war effort."

M. S. "ALCHIBA"—Cargo Ship

Length	435 Feet
Breadth	63 Feet
Depth	40 Feet 6 Inches
Power (Diesel Drive)	6,000 H.P.
Speed	15½ Knots
D.W.T.	8,540 Tons

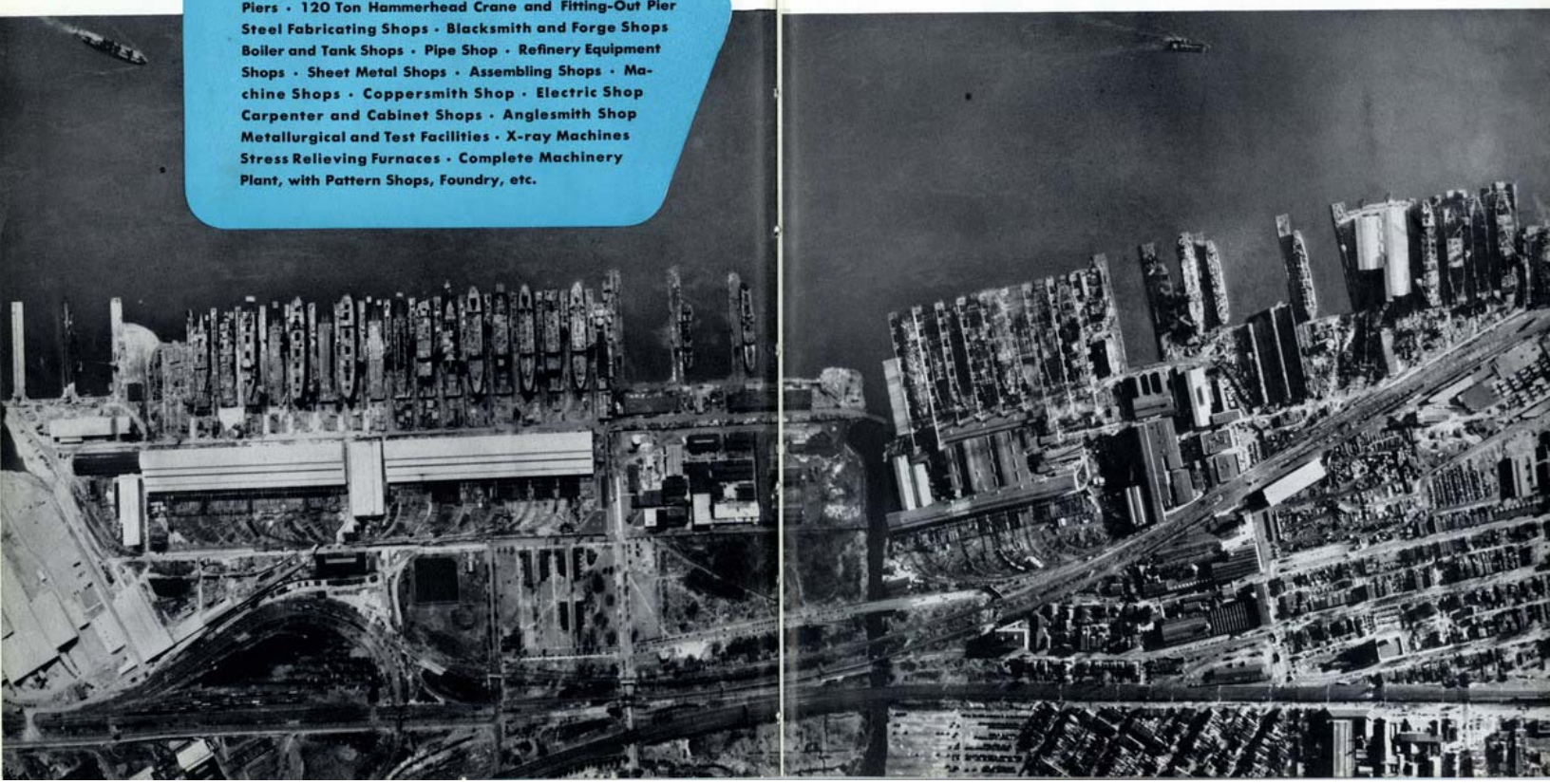
Launched July 6, 1939 as the M. S. "MORMACDOVE". Changed to the "ALCHIBA" when she entered Navy Service. The M. S. "ALCHIBA" and its Main Diesel Engines are products of Sun Ship.

AERIAL VIEW OF THE SUN SHIPBUILDING AND DRY DOCK COMPANY PLANT • CHESTER, PA.

NORMAL FACILITIES AS AN 8-WAY YARD

8 Shipbuilding Ways • 2 Floating Dry Docks • Wet Basins
Piers • 120 Ton Hammerhead Crane and Fitting-Out Pier
Steel Fabricating Shops • Blacksmith and Forge Shops
Boiler and Tank Shops • Pipe Shop • Refinery Equipment
Shops • Sheet Metal Shops • Assembling Shops • Ma-
chine Shops • Coppersmith Shop • Electric Shop
Carpenter and Cabinet Shops • Anglesmith Shop
Metallurgical and Test Facilities • X-ray Machines
Stress Relieving Furnaces • Complete Machinery
Plant, with Pattern Shops, Foundry, etc.

as a 28-Way Yard, with the many shops and facilities for top production during World War II



Hull Structural Drawing Room

Hull Equipment and Fittings Drawing Room

Hull Design Drawing Room

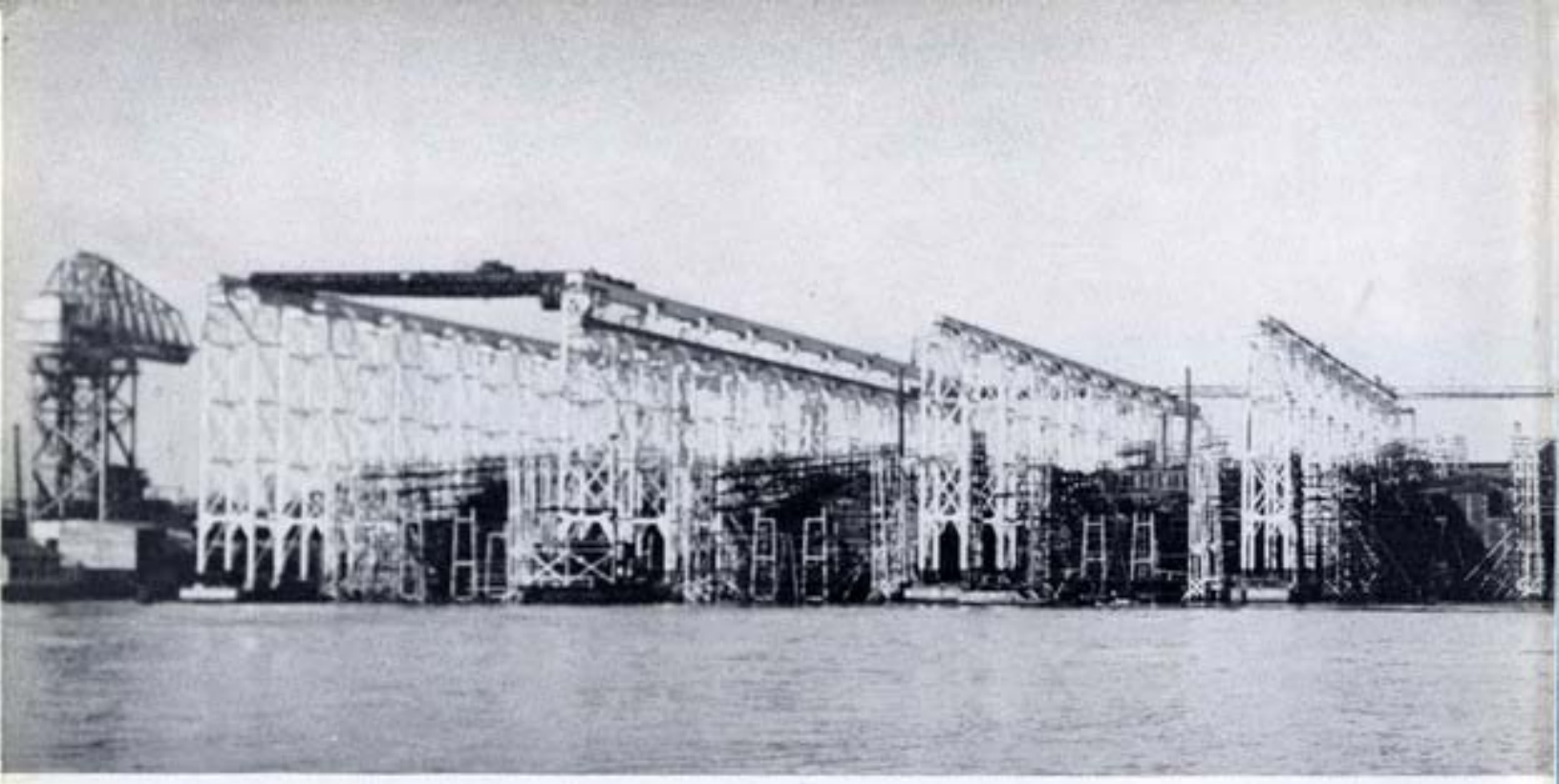
Hull Mold Loft

ENGINEERING FACILITIES

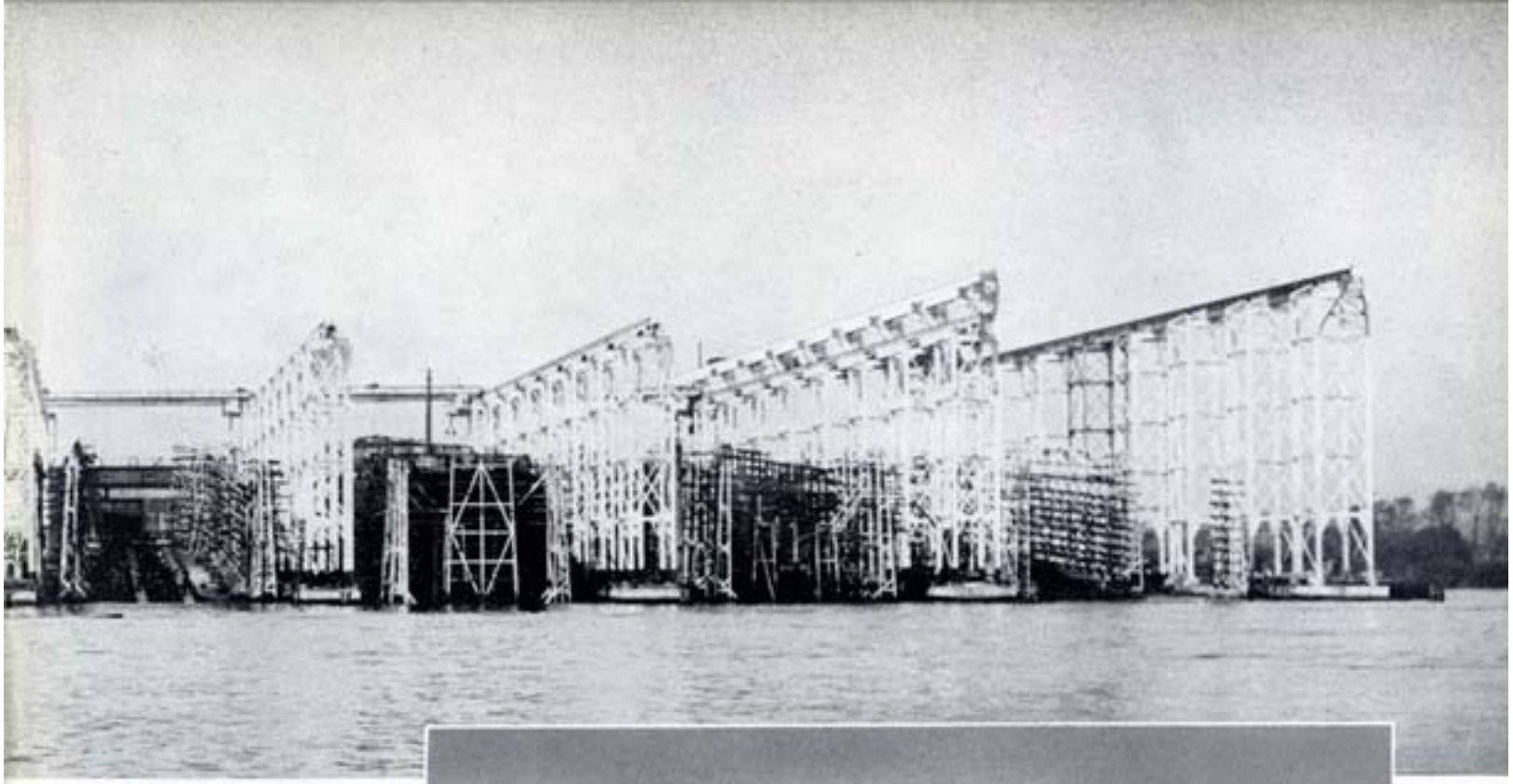
Engineering
Drawing Rooms

Electric Drawing Room

Refinery and Special
Equipment Drawing Room



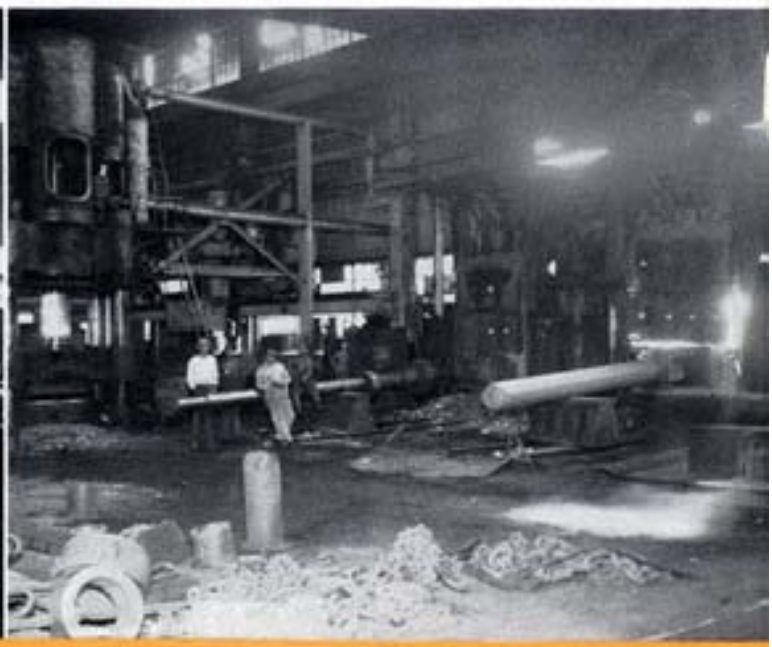
SHIPBUILDING W



AYS

Eight Ways for Ships up to 600 feet

SECTIONS OF THE FABRICATING, WELDING, AND HEAVY FORGE SHOPS



FACILITIES

STEEL-FABRICATING AND FORGE SHOPS—MOLD LOFT

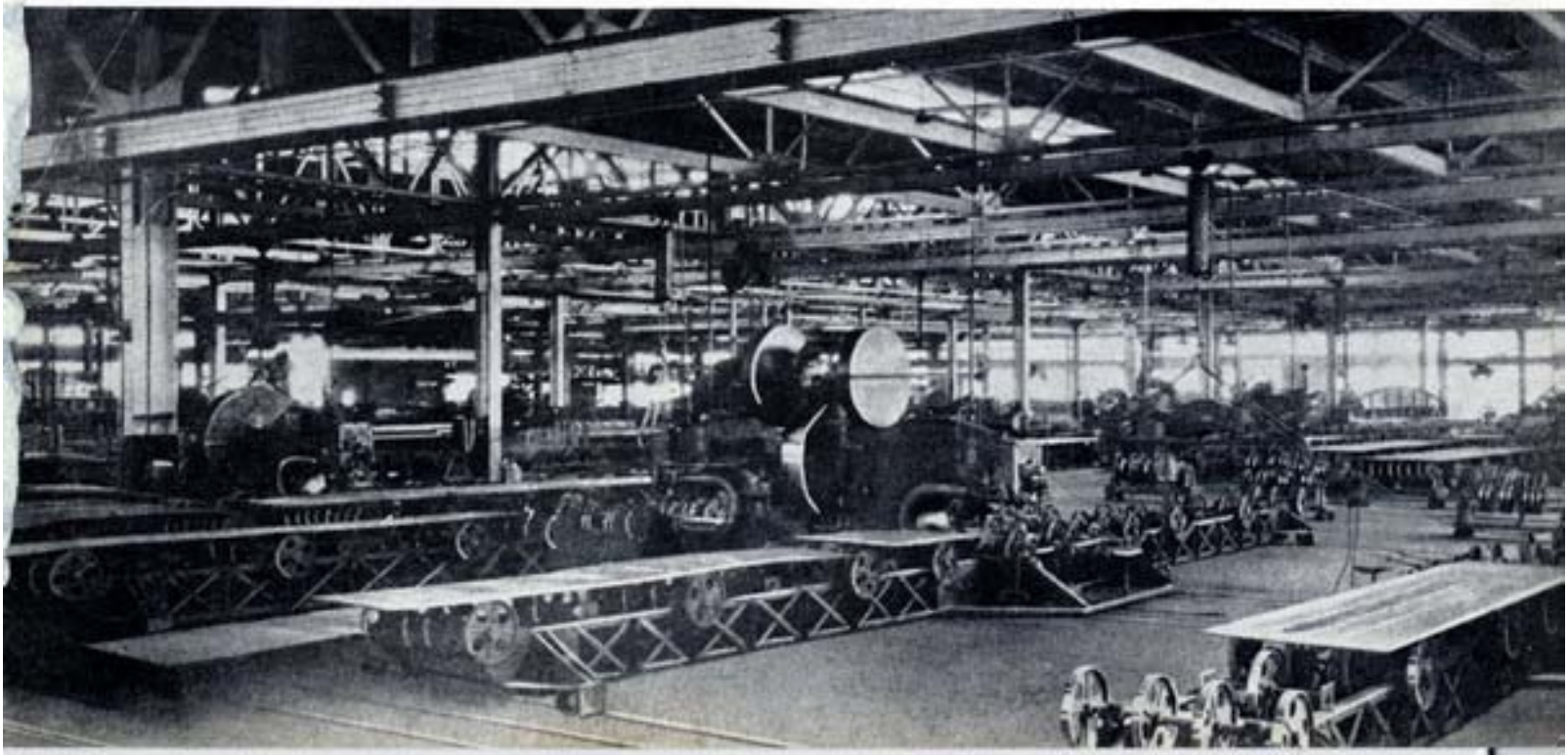
Some of the facilities available for fabricating steel for new construction and repair work are:

Four Steel-Fabricating Shops comprising 252,000 square feet of floor space with Layout, Fabricating, Welding and Assembling Sections . . . each with modern equipment arranged for maximum production. All these shops are equipped with the latest applications of Automatic Electric Welding.

A Mold and Template Loft, 80 feet wide by 1020 feet long—81,600 square feet of floor space—with modern Facilities suitable for all types and sizes of vessels.

Forge and Blacksmith Shops . . . with Presses, Hammers, and Furnaces modernly equipped for heavy and light forgings.

Angle- and Shape-Bending Facilities with 103,000 square feet of floor space.



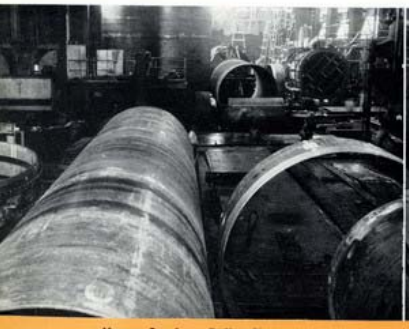
BOILER AND PRESSURE VESSEL SHOPS SHOWING LARGE STRESS RELIEVING FURNACE

BOILER, TANK AND SHEET METAL SHOPS

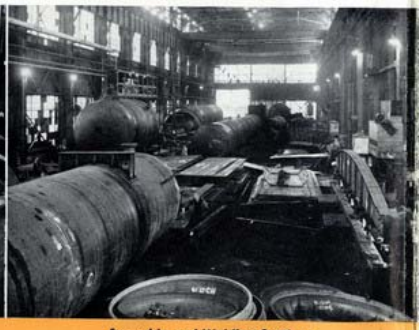
This department includes one shop 120 feet wide by 510 feet long and one shop 100 feet wide by 185 feet long, with sections for heavy and light work . . . the heavy section being equipped with cranes for 300 tons per lift.

These shops have floor space of 105,500 square feet and are fitted out with modern machinery and equipment including X-ray machines and stress relieving furnaces for plate fabrication up to 3½" thick . . . a complete set-up for boiler work, all sizes and shapes of ship tanks and sheet metal work, also, for the building of heavy all-welded pressure vessels for the Process Industries.

For pictures of products from these shops see pages 78 to 92

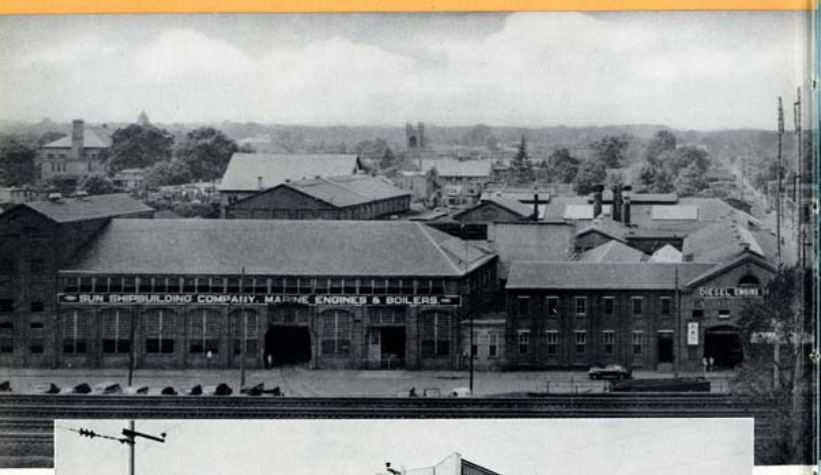


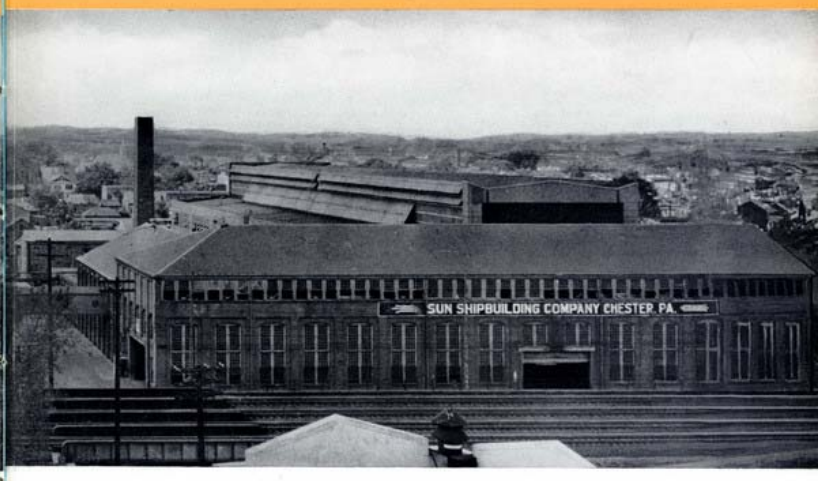
Heavy Section—Boiler Shop



Assembly and Welding Sections

Sheet Metal Shop





MACHINERY PLANT AND FOUNDRY

The Machinery Plant and Foundry, a unit of Sun Ship's great plant, is a complete Machinery-building Plant, with Machine Shops, Pattern Shop and Foundry, all fully equipped with the most modern tools.

This plant, formerly Robert Wetherill and Company, has been in operation since 1872, building Corliss Engines, Reciprocating Steam Marine Engines, etc. It has been modernized and enlarged, and is now building the famous Sun-Doxford Opposed Piston Diesel Engine, Ship Machinery, and Special Machinery.

See Pages 66-77 for illustrations and further information

Welding and Fabricating Shops

Copper and Sheet Metal Shops

Assembly Shops

Paint Shop

MISCELLANEOUS SHOPS

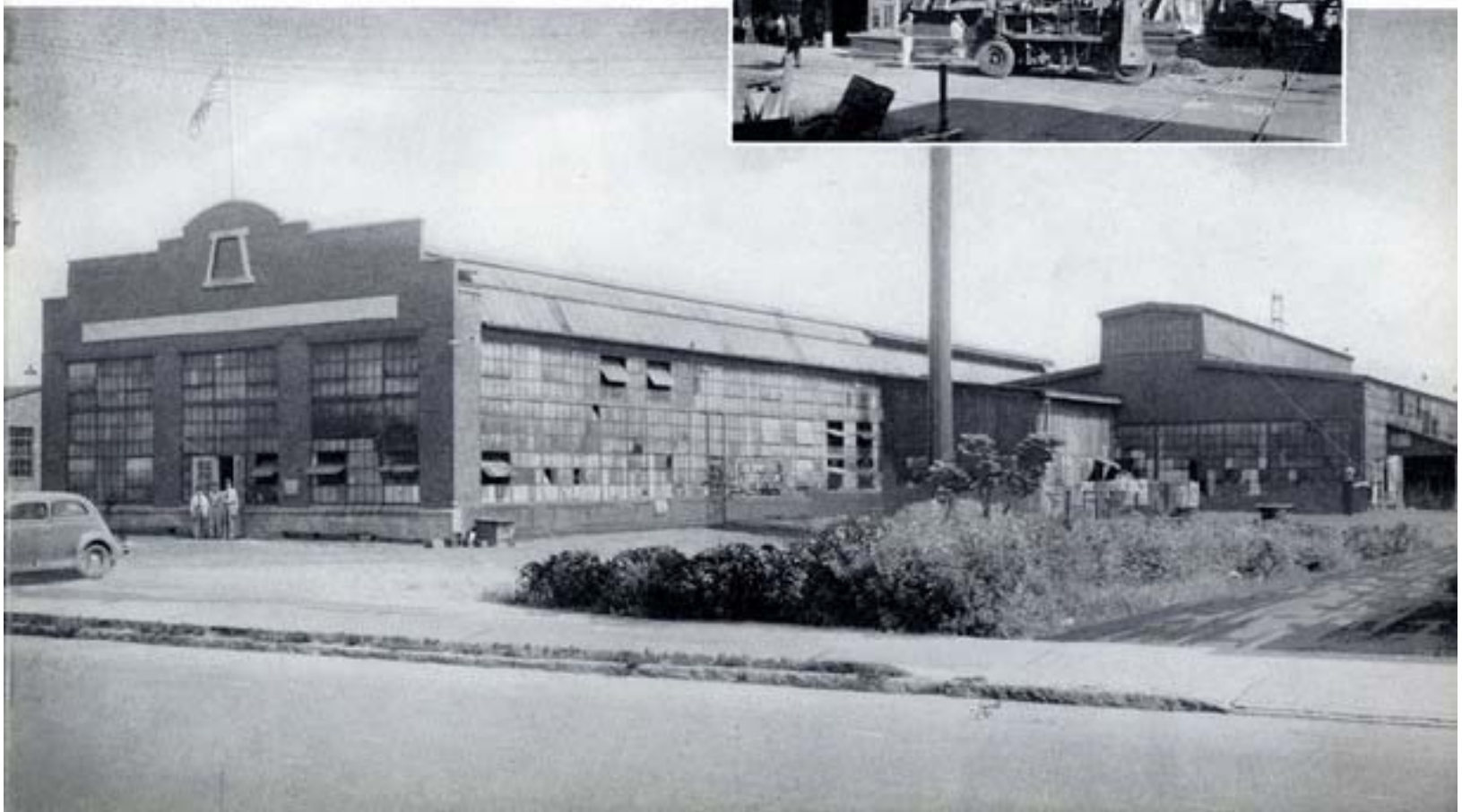
Machine Shop

Electrical Shop

Pipe Shop

Carpenter Shop

Oil Refinery and Special Equipment Plant

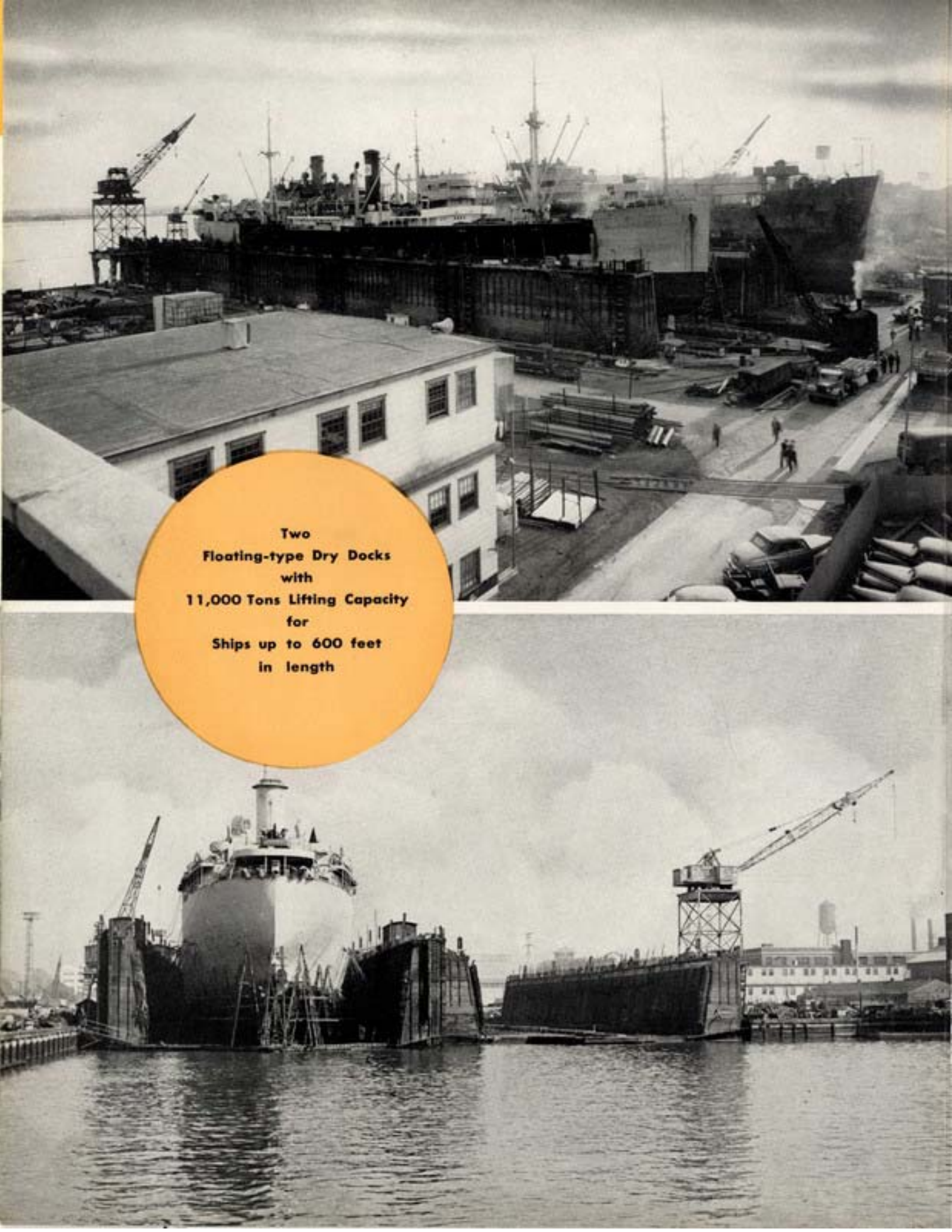


WET BASINS and FITTING-OUT PIERS

Opposite: Lifting Superstructure in place.

Below: Piers, Wet Basins, and Hammerhead Crane.

120 TON HAMMERHEAD CRANE
For lifting Boilers, Engines, and other heavy parts at Outfitting Pier; also, for loading Heavy Cargo.



Two
Floating-type Dry Docks
with
11,000 Tons Lifting Capacity
for
Ships up to 600 feet
in length

DRY DOCKS and SHIP REPAIRING FACILITIES

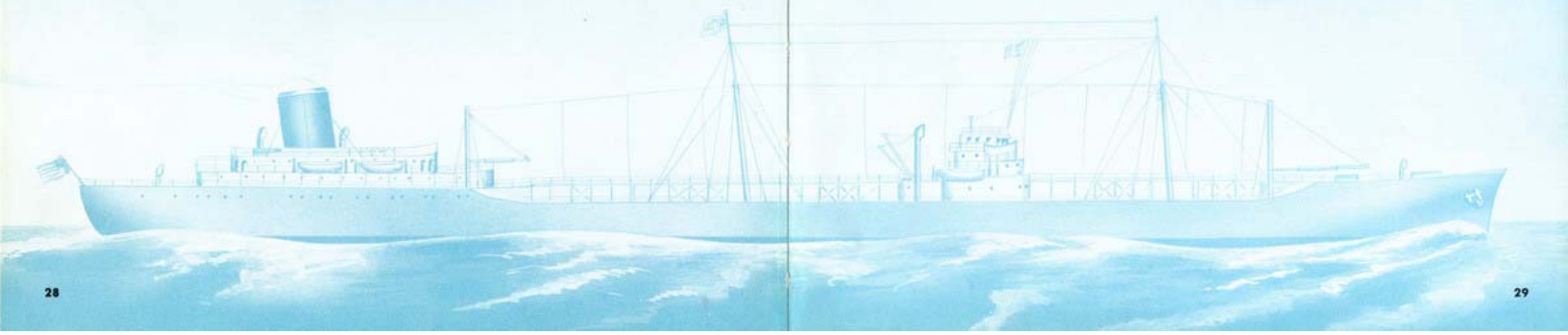
Ships

BY SUN SHIP

CREATOR OF THE ALL-WELDED SHIP

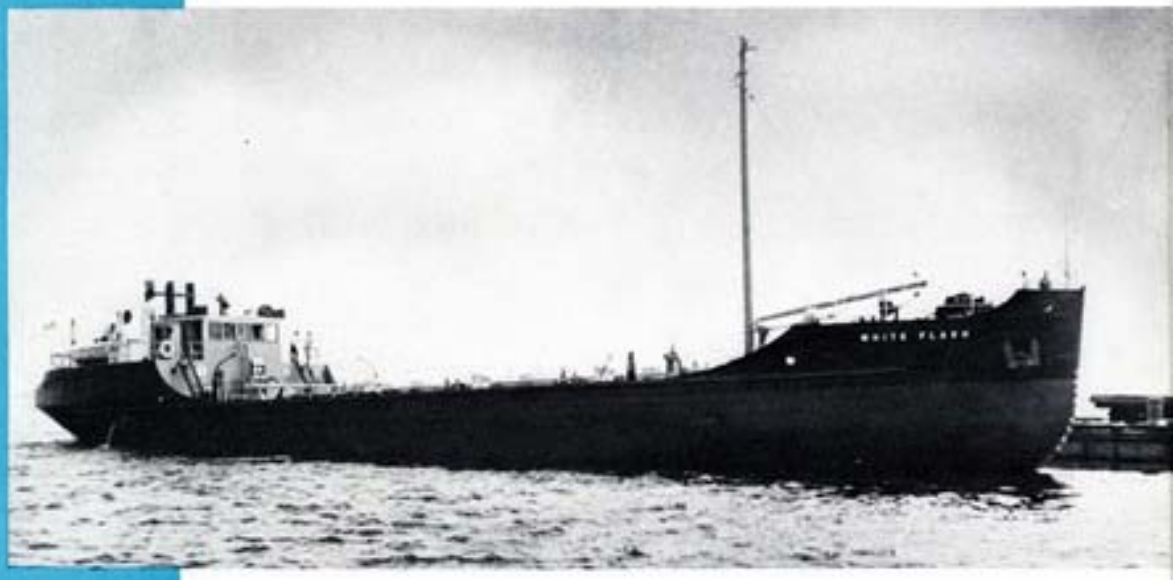
TANKERS · CARGO SHIPS

PASSENGER SHIPS



THE *Pioneers* OF WELDED SHIP CONSTRUCTION

THE building of the S.S. "WHITE FLASH", the S.S. "FRANKLIN", followed by the larger vessels the S.S. "J. W. VAN DYKE" and the S.S. "ROBERT H. COLLEY", marked the beginning of a new day in the building of welded ships. A new phase of Ship Construction, it came just in time to make possible the building of the greatest Merchant Marine of all time, which was to play so important a part in a crucial period of our Nation's History.



S.S. "WHITE FLASH"

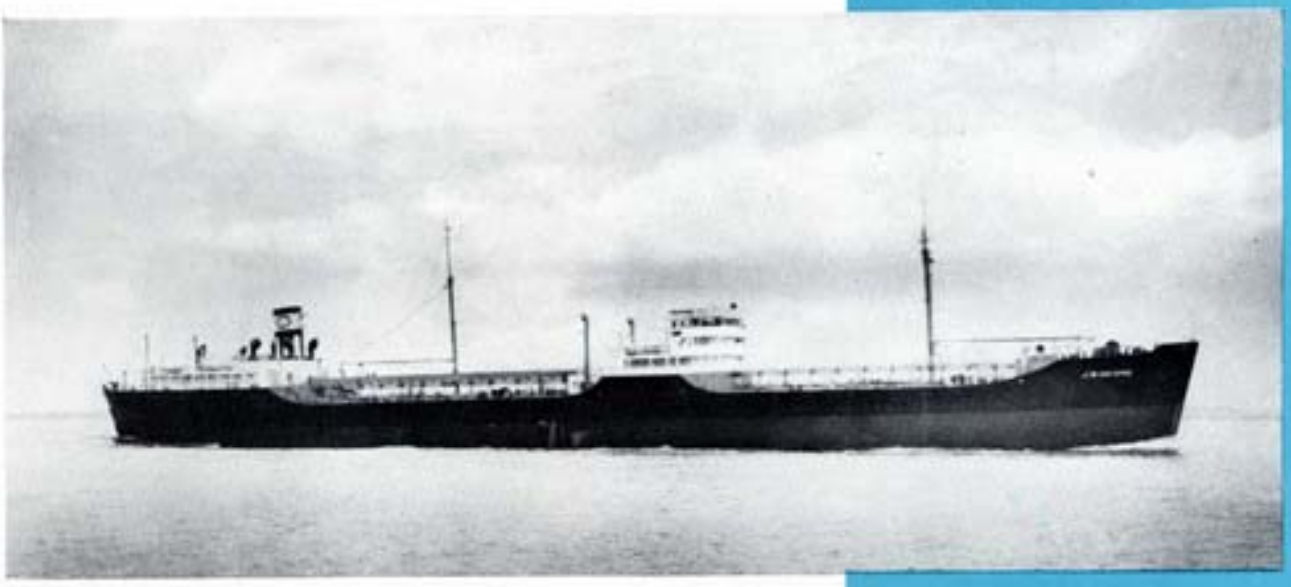
THE FIRST ALL-WELDED SEA-GOING TANKER

Built for the Atlantic Refining Company.

Delivered September 16, 1931.

Length—190 Feet	Breadth—34 Feet
Depth—12 Feet	D.W.T.—887 Tons

Welded TANKERS



S.S. "J.W. VAN DYKE" and class

THE PIONEER OF WELDED CONSTRUCTION FOR LARGE VESSELS

Built for the Atlantic Refining Company

Length	521 Feet
Breadth	70 Feet
Depth	40 Feet
D.W.T.	18,105 Tons
Power (Turbo-Electric Engine)	5,000 H.P.
Speed	13¼ Knots

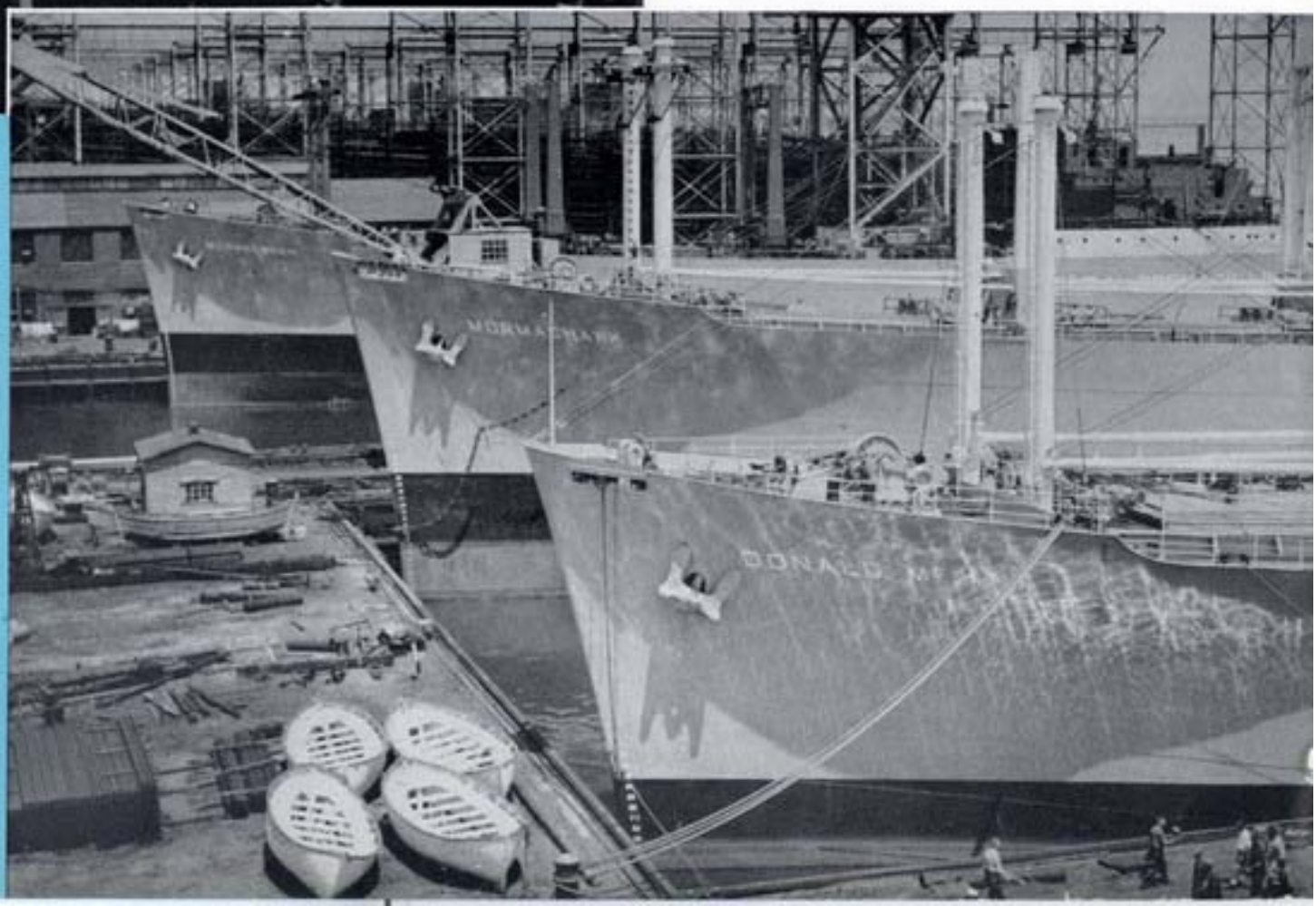
The development of All-Welded Ships made it possible during World War II for the United States Maritime Commission to produce more than three times the ship tonnage that could have been built of riveted construction.

The Launching of
M. S. "DONALD McKAY"

was the beginning of the Maritime Commission's Shipbuilding Program which carried through World War II and built up the U. S. Merchant Marine to more than 50 Million Tons.

The Name
"DONALD McKAY"

was selected for this first ship in a gigantic shipbuilding program . . . not only as the name of an able Clipper ship, but in memory of a famous shipbuilder of Clippers . . . a man who, more than any other, developed this type of vessel, and thus projected one of the most successful eras of shipbuilding.



C2 CARGO SHIPS

M. S. "DONALD McKAY" and class

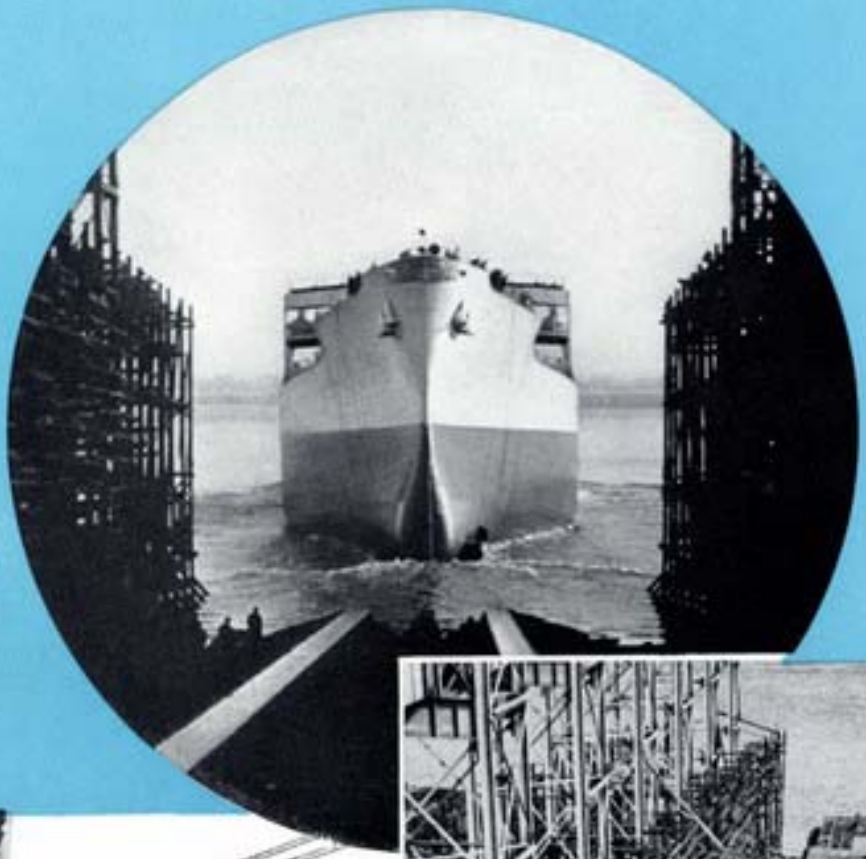
Built for the United States Maritime Commission for Moore-McCormack Lines.

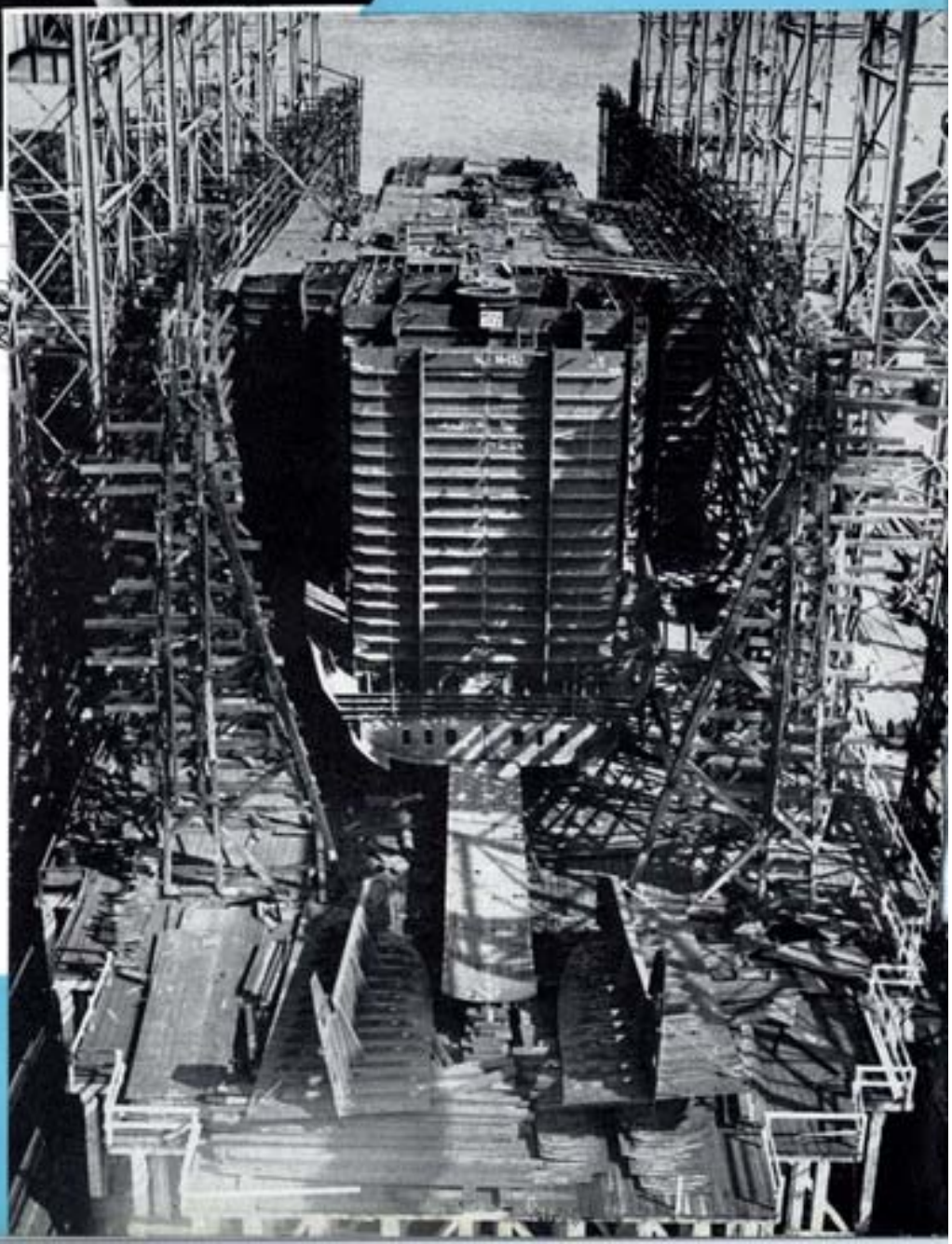
Length	435 Feet
Breadth	63 Feet
Depth	40 Feet, 6 Inches
D.W.T.	8,682 Tons
Power (4-Cylinder Diesel Engine)	6,000 H.P.
Speed	15½ Knots

Powered by Sun-Doxford Diesel Engines.

Admiral EMORY S. LAND who directed the development and building of the greatest Merchant Marine of all history.

DONALD McKAY, V. who christened this ship is the great, great-grandson of the famous Clipper-builder.





T3 TANKERS

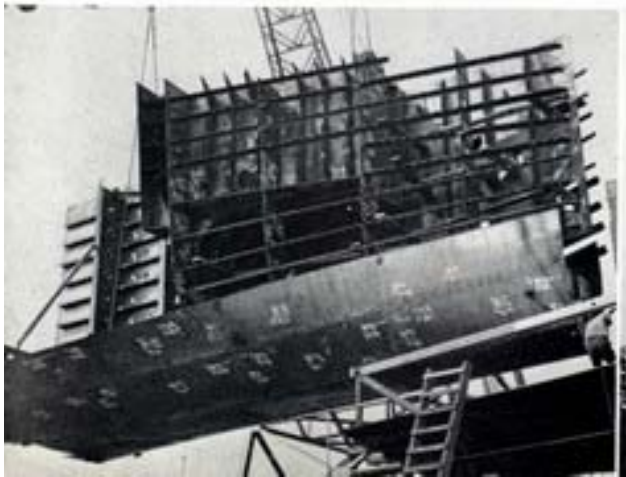
S. S. "CIMARRON" — High Speed Tanker and class

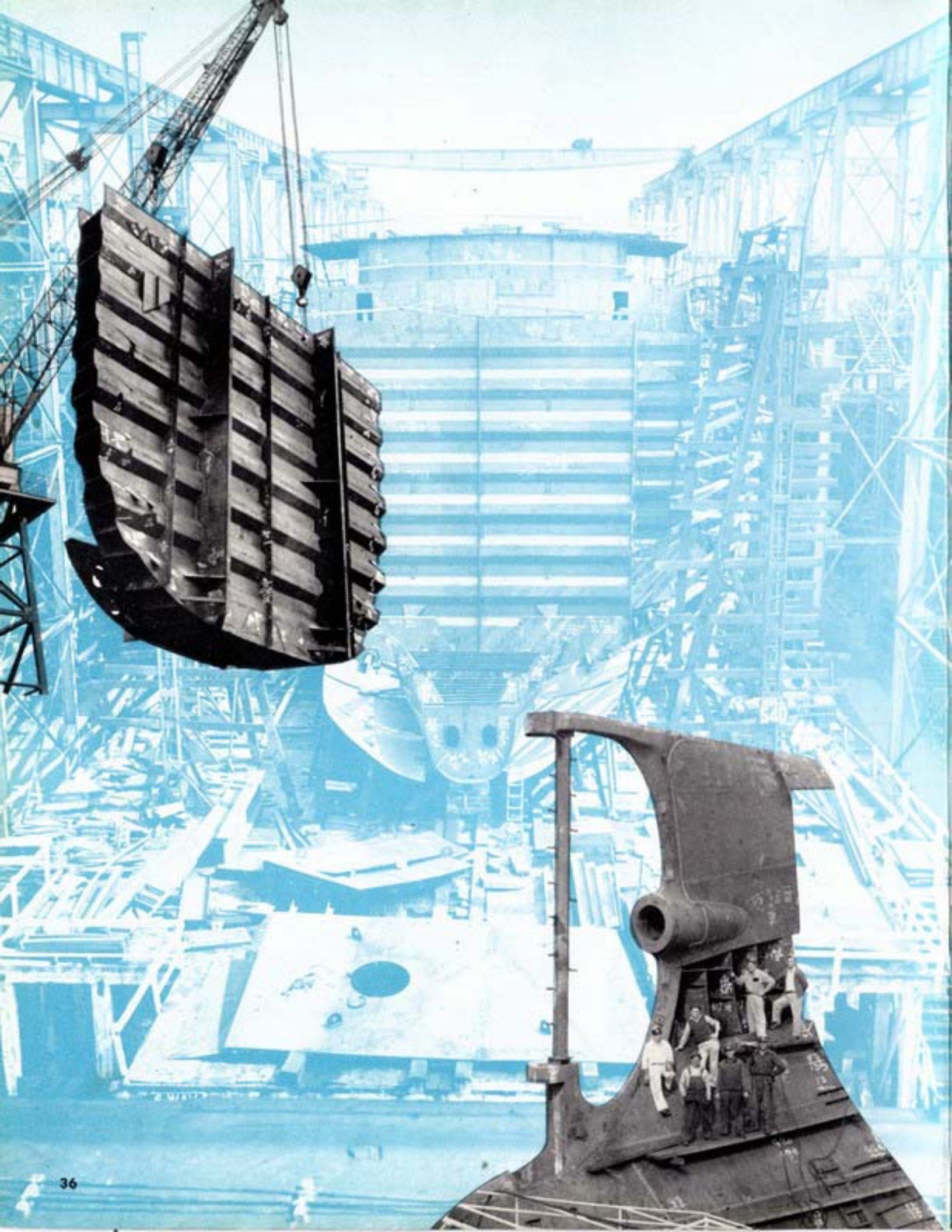
Built for the Standard Oil Company of New Jersey, and United States Navy.

Length	525 Feet
Breadth	75 Feet
Depth	39 Feet
D.W.T.	18,230 Tons
Power (Twin Screw-Steam Turbine)	13,500 H.P.
Speed (Sea Speed)	19 Knots

FASTEST TANKERS AFLOAT

The development of this epoch-making ship, was pioneered by the Standard Oil Company of New Jersey and the Sun Shipbuilding and Dry Dock Co.





T2 TANKERS

S. S. "GETTYSBURG" and class

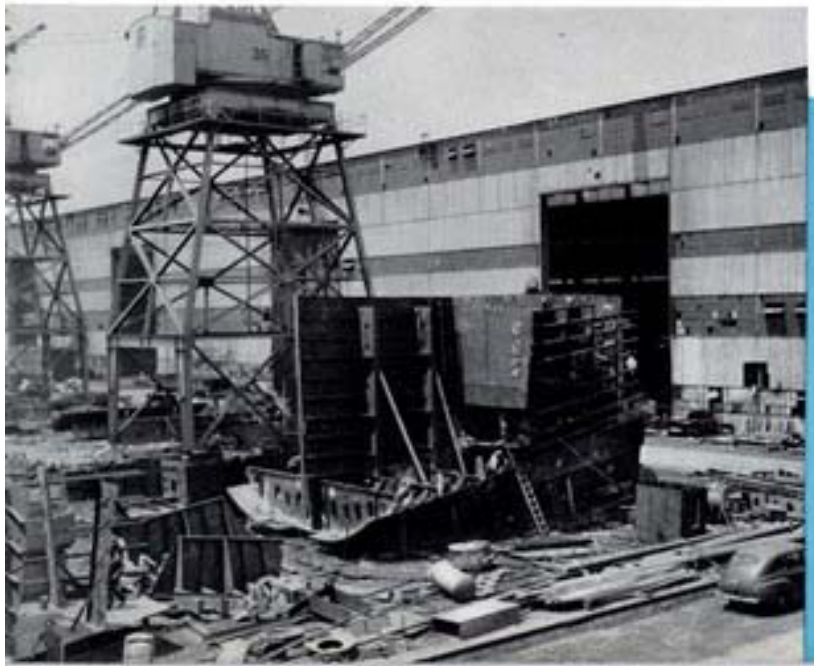
THE FIRST T-2 TANKER, DELIVERED FEBRUARY 28, 1942.

Built for the United States Maritime Commission.

Length	503 Feet
Breadth	68 Feet
Depth	39 Feet, 3 Inches
D.W.T.	16,615 Tons
Power (Single Screw Turbo Electric)	7,500 H.P.
Speed	14½ Knots

ALL-WELDED CONSTRUCTION

198 of these Tankers were delivered from February 28, 1942 to October 30, 1945.




MORMACPENN
MORMACLAND

C3 CARGO SHIPS

M. S. "MORMACPENN" and class

Built for the United States Maritime Commission for Moore-McCormack Lines.

Length	465 Feet
Breadth	69 Feet, 6 Inches
Depth	42 Feet, 6 Inches
D.W.T.	11,975 Tons
Power (Geared Diesel Engine)	8,500 H.P.
Speed	16½ Knots

THE *Lightning*

The famous Clipper, built by Donald McKay in East Boston, in 1853.

The modern ship on the opposite page carries the name of this famous Clipper

C2 SU CARGO SHIPS

M. S. "LIGHTNING" and class

Operation by American Mail Line.
COMPLETE REFRIGERATION

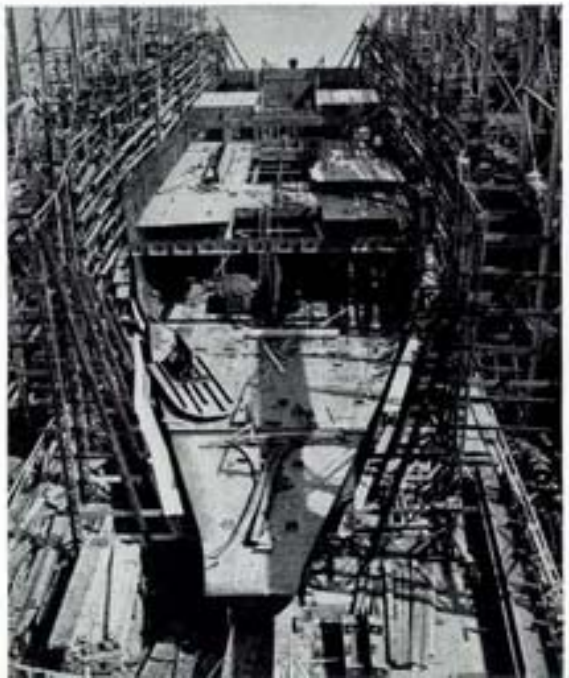
M. S. "OCEAN MAIL" and class

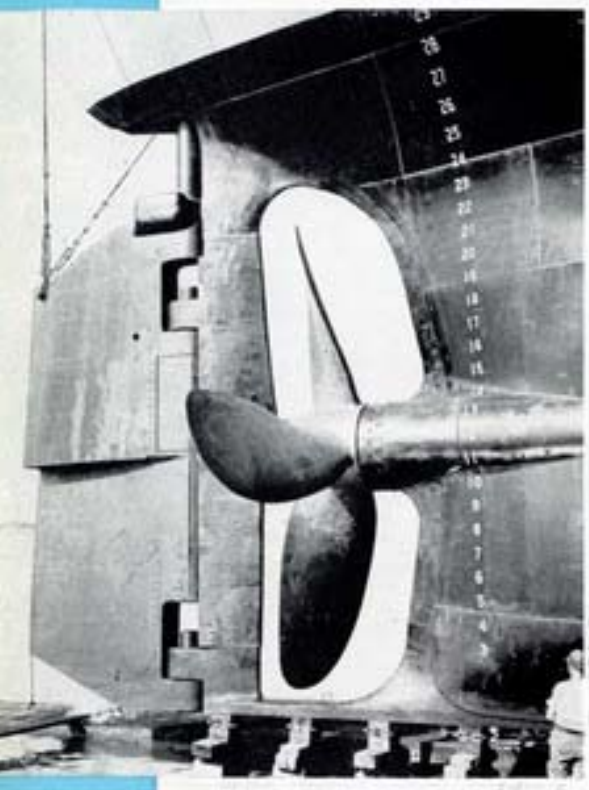
Operation by United States Lines.

Built for the United States Maritime Commission.

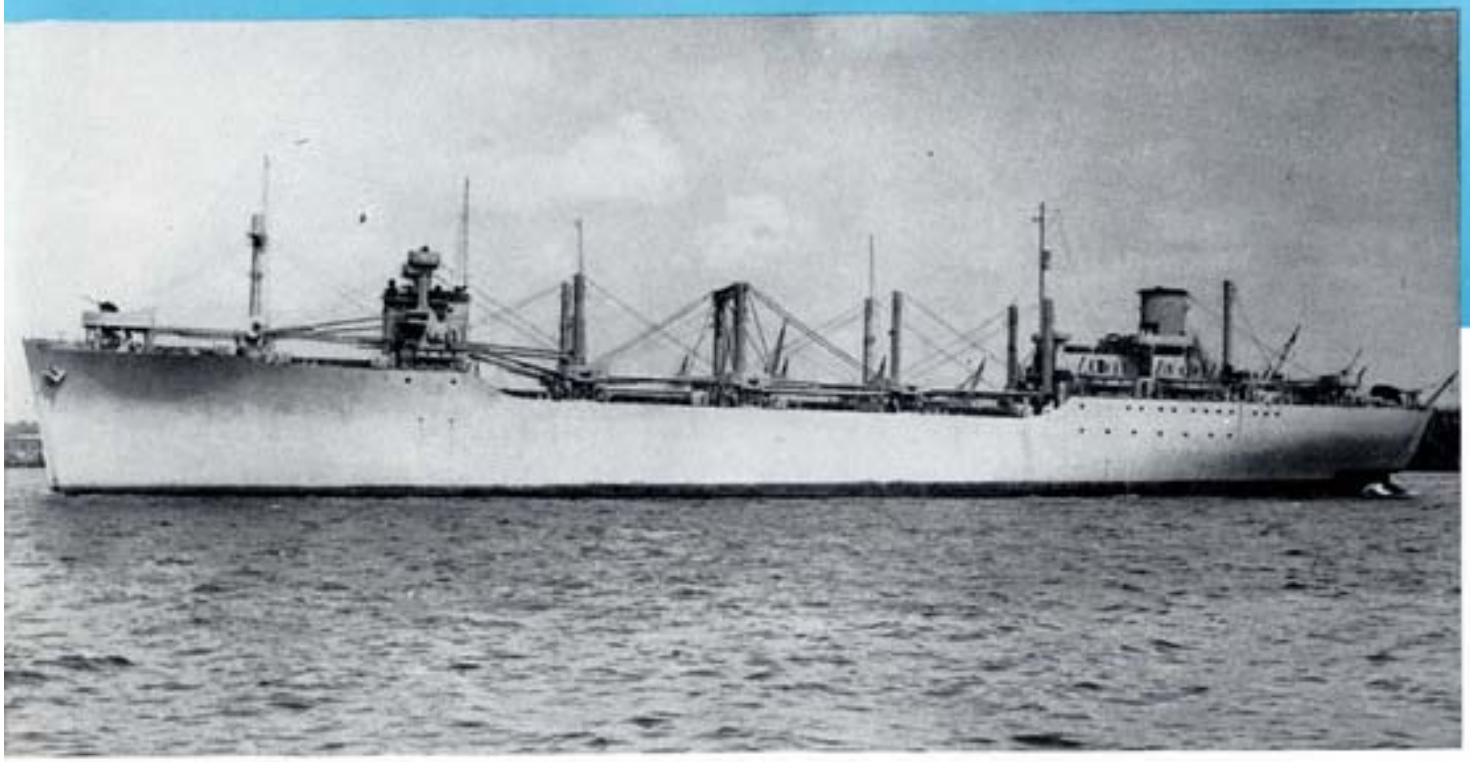
Length	450 Feet
Breadth	63 Feet
Depth	40 Feet, 6 Inches
D.W.T.	9,500 Tons
Power (5-Cylinder Diesel Engine)	7,500 H.P.
Speed	16½ Knots

Powered by Sun-Doxford Diesel Engines.





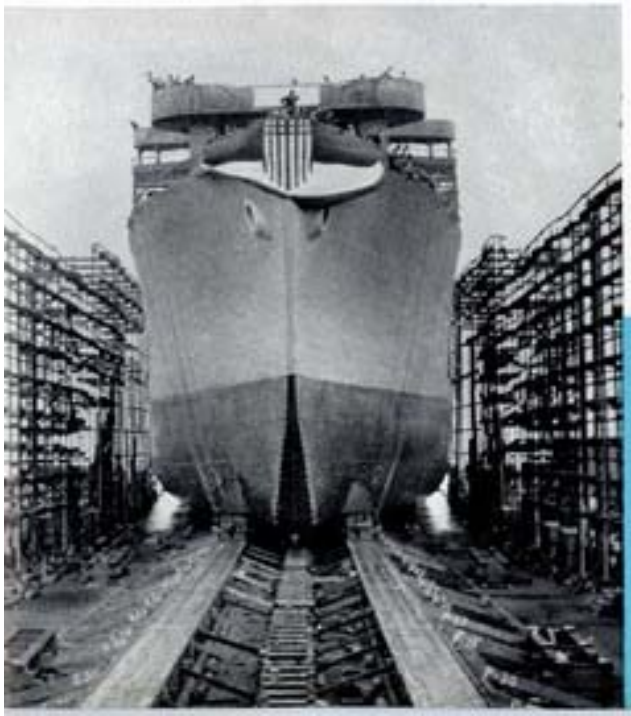
C4 CARGO SHIPS

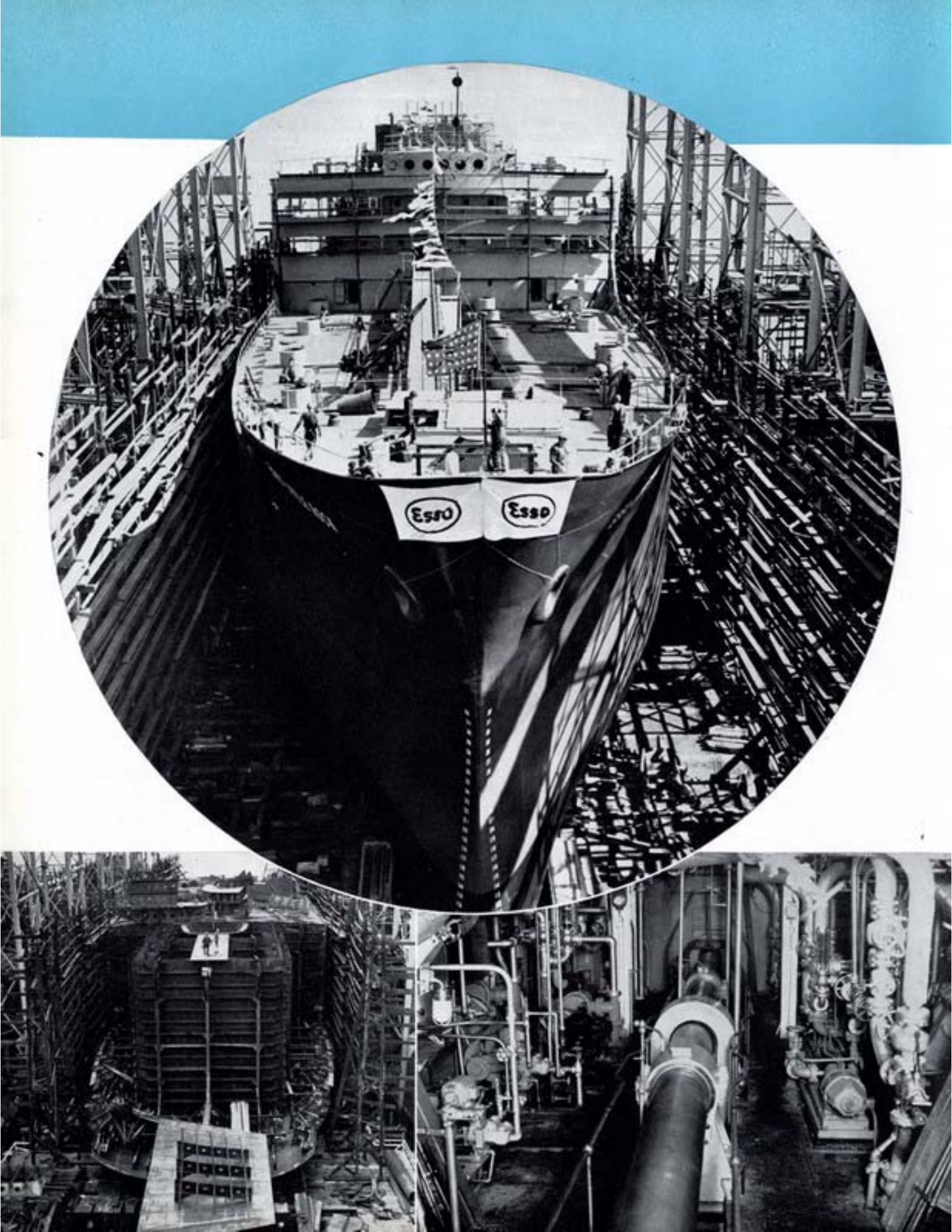


S. S. "MARINE FLIER" and class

Built for the United States Maritime Commission.

Length	496 Feet
Breadth	71 Feet, 6 Inches
Depth	43 Feet, 6 Inches
D.W.T.	15,261 Tons
Power (Geared Turbine)	9,000 H.P.
Speed	17 Knots




ESSO
ESSO

TANKERS

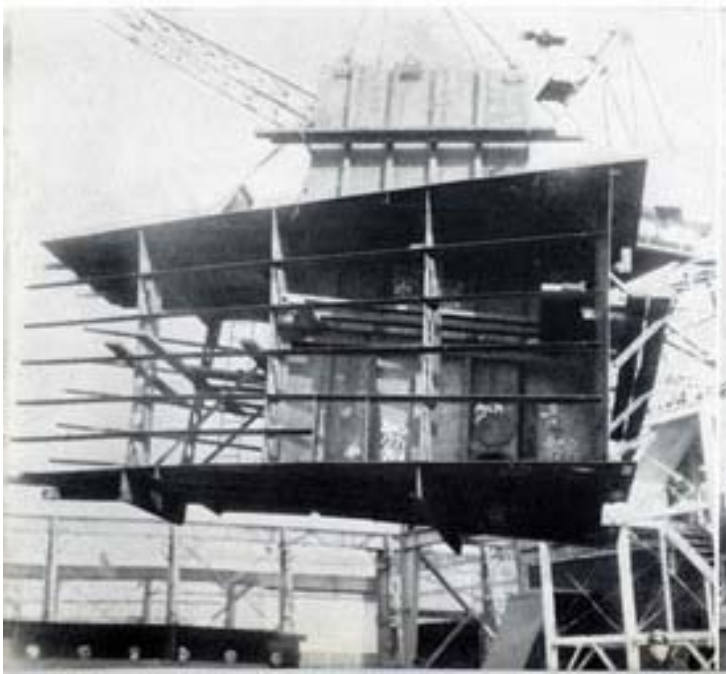
M. S. "ESSO AUGUSTA" and class

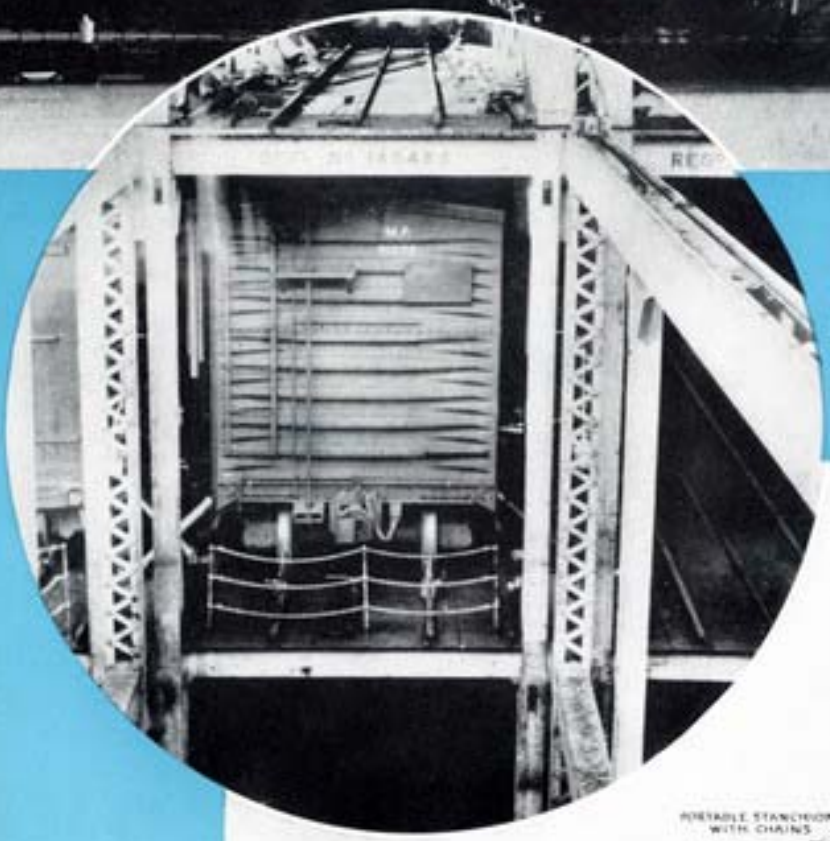
Built for the Standard Oil Company of New Jersey.

Length	521 Feet
Breadth	70 Feet
Depth	40 Feet
D.W.T.	17,928 Tons
Power (5-Cylinder Diesel Engine)	7,500 H.P.
Speed	14½ Knots

Powered by Sun-Doxford Diesel Engines.

For details of this engine see Page 70.

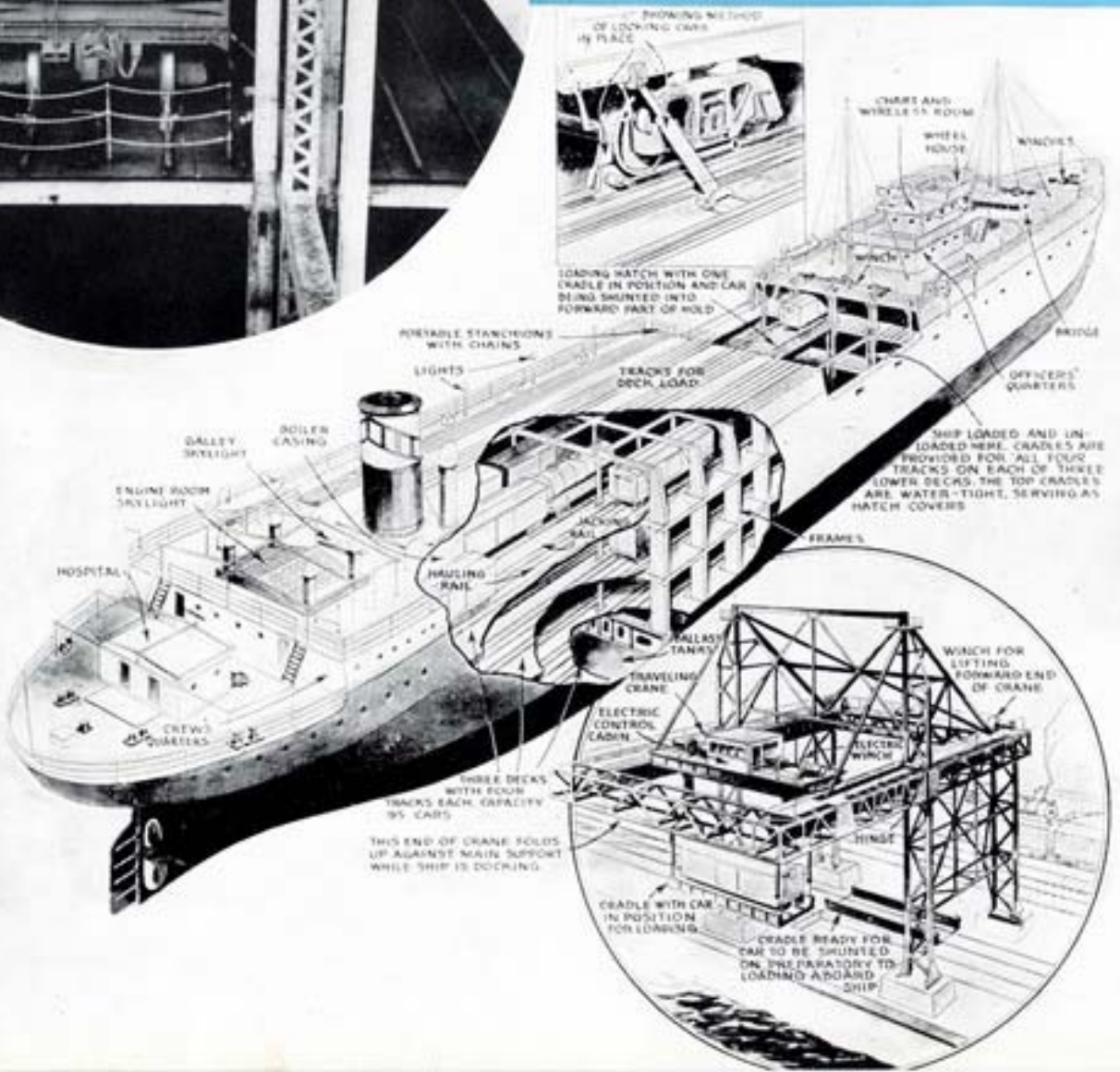




Above: Seatrain at Terminal loaded with railroad cars.

Left: **Cars placed on standard-gauge rails on four decks.**

Below: **Descriptive drawing of a Seatrain.**



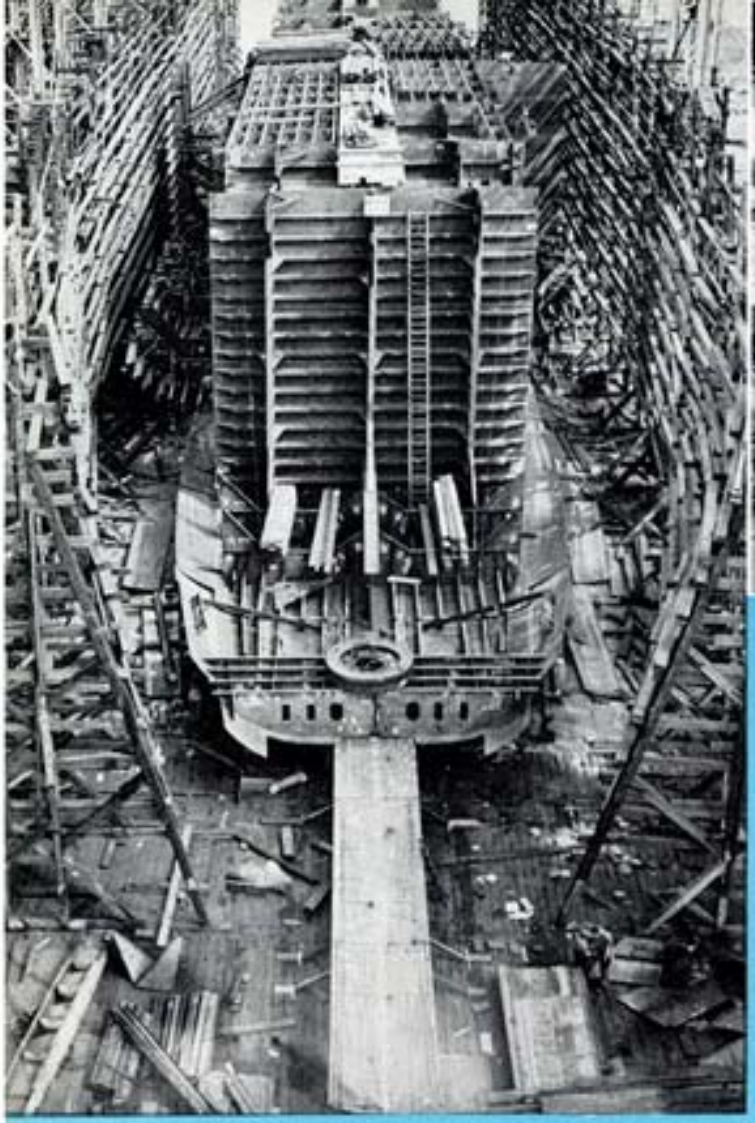
SEATRAINS

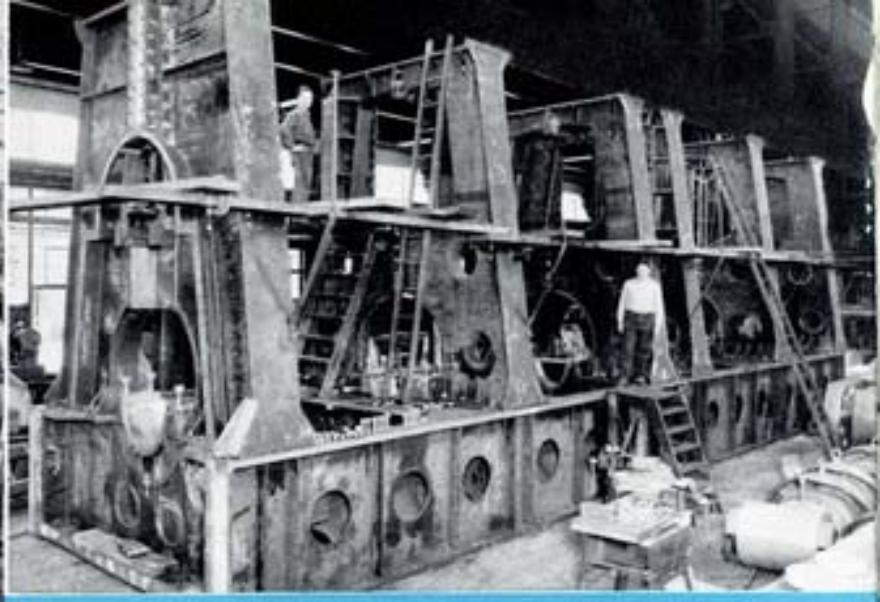
Seatrain "NEW YORK" and class

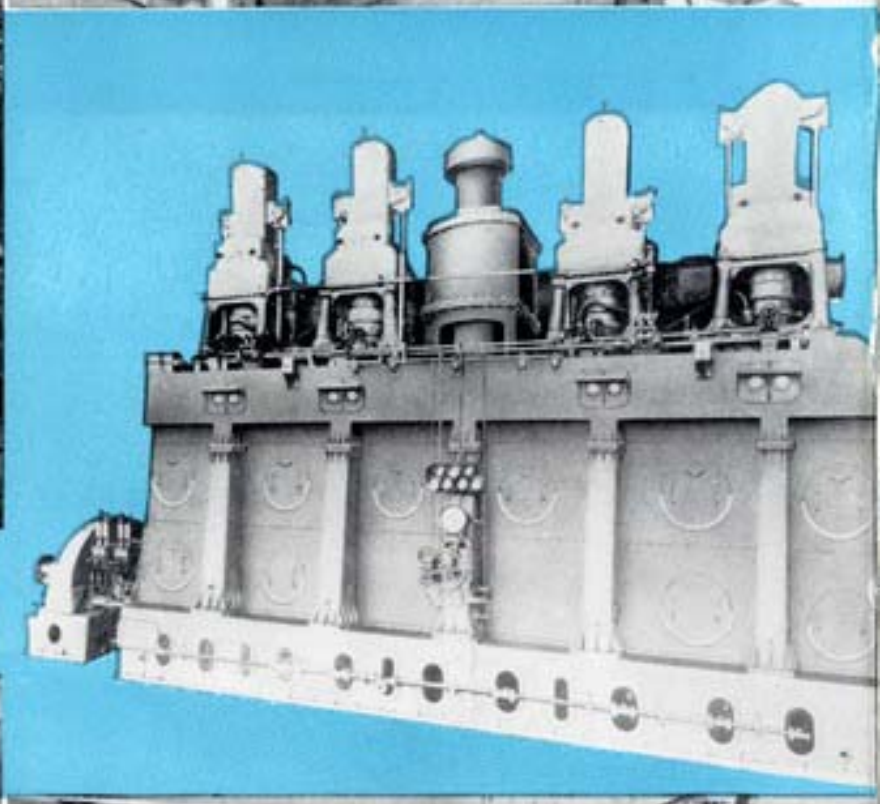
Built for Seatrain Lines, Inc.

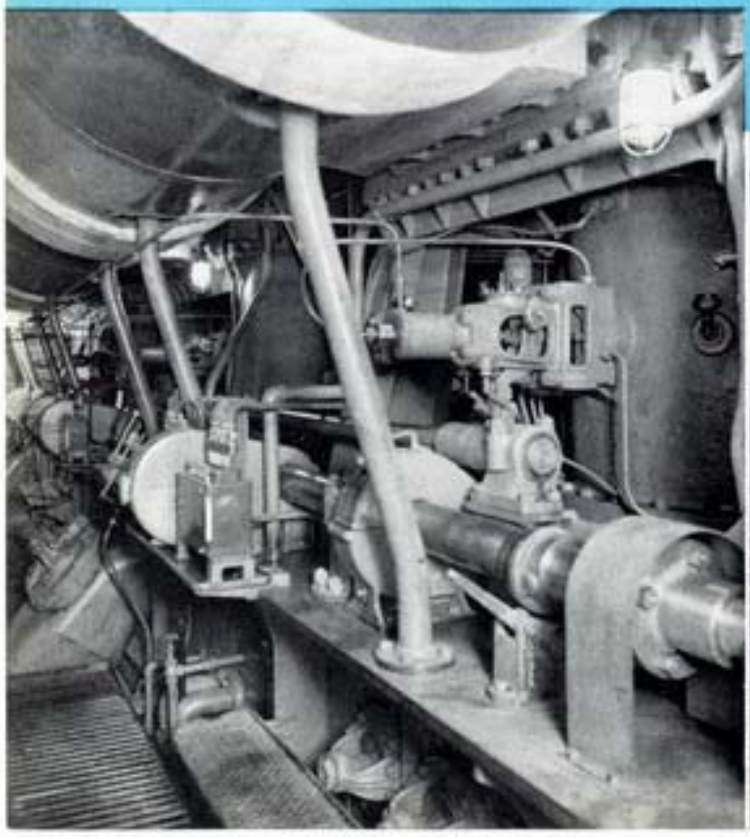
Length	478 Feet
Beam	63½ Feet
Depth	38 Feet, 3 inches
Capacity	100 Cars
Power (Geared Turbine)	8,800 H.P.
Speed	16½ Knots

This type of ship permits a shipper located at an inland point to load and seal railroad cars at his plant, ship them by rail to Seatrain Terminals, where they are then placed on Seatrains for delivery of the loaded cars in Cuba, or other places served by Seatrains. The loaded cars are then moved over rails to final destination as originally loaded.









PASSENGER and CARGO

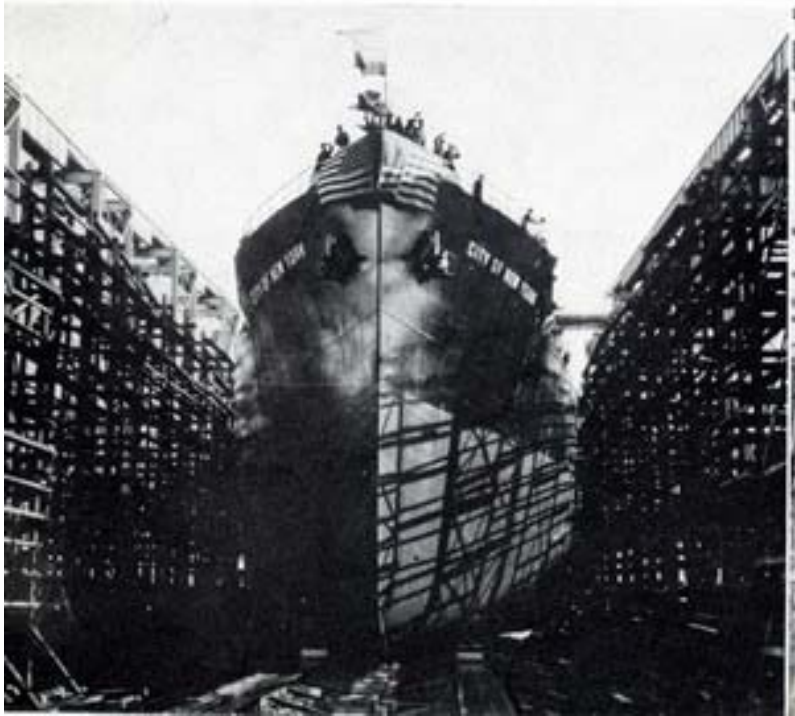
M. S. "CITY OF NEW YORK"

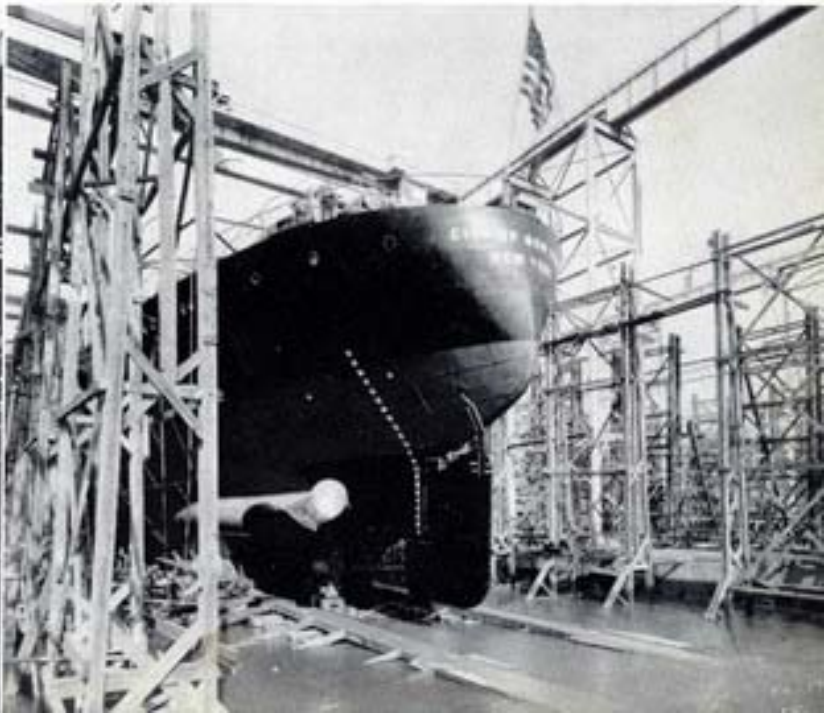
Built for American-South African Lines, Inc.

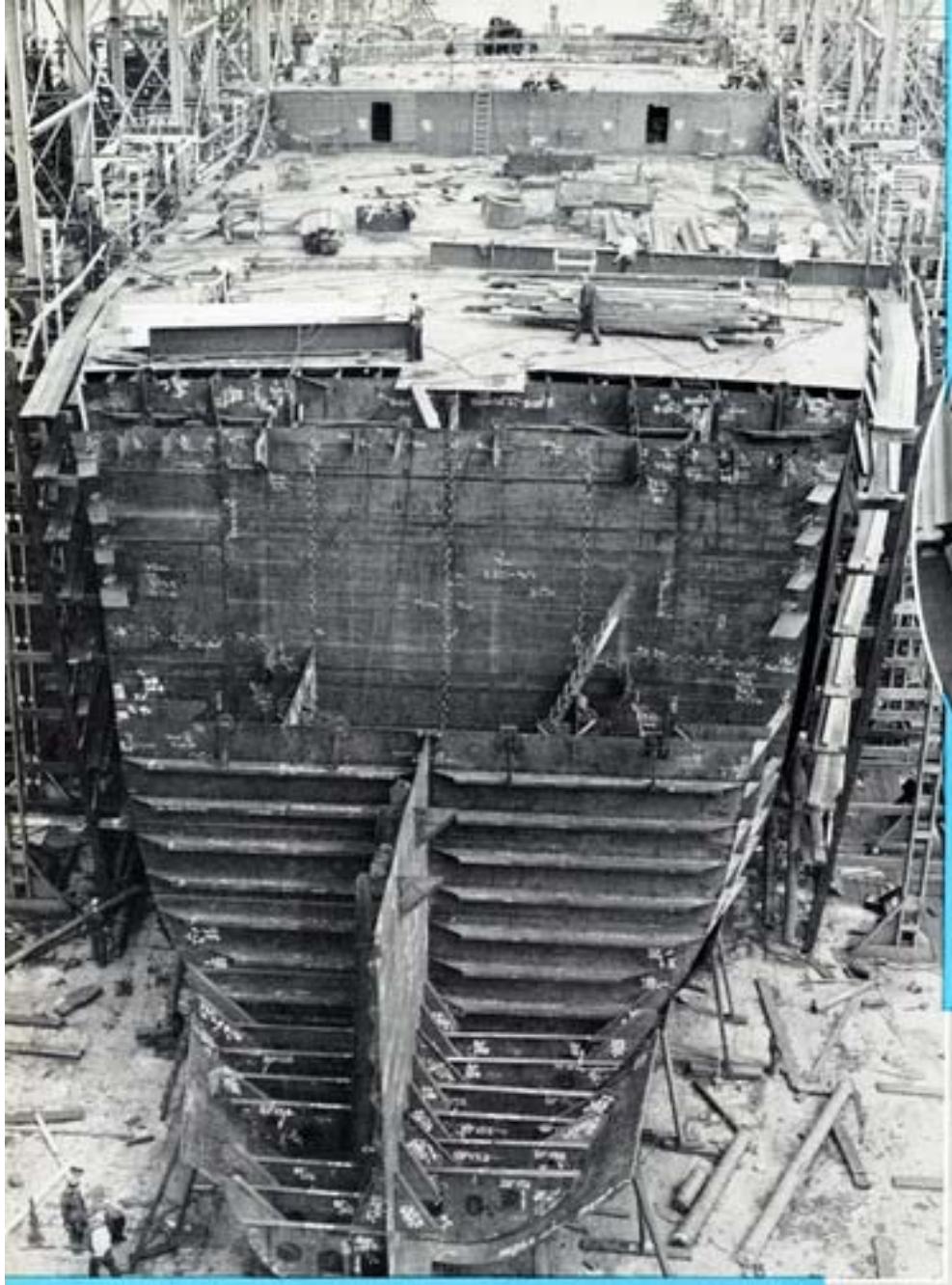
Length	470 Feet, 8 Inches
Breadth	61 Feet, 6 Inches
Depth	37 Feet
D.W.T.	9,350 Tons
Power (Twin-Screw Diesel)	5,400 H.P.
Speed	14 Knots

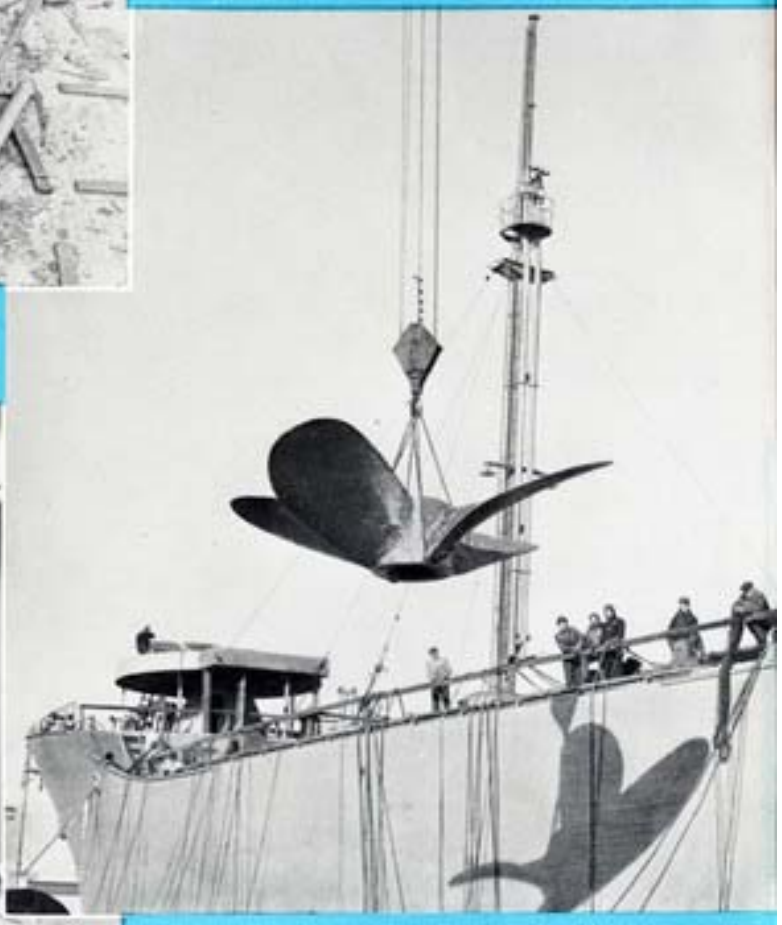
Powered by 2 Sun-Doxford Diesel Engines.

For details of this engine see page 70.

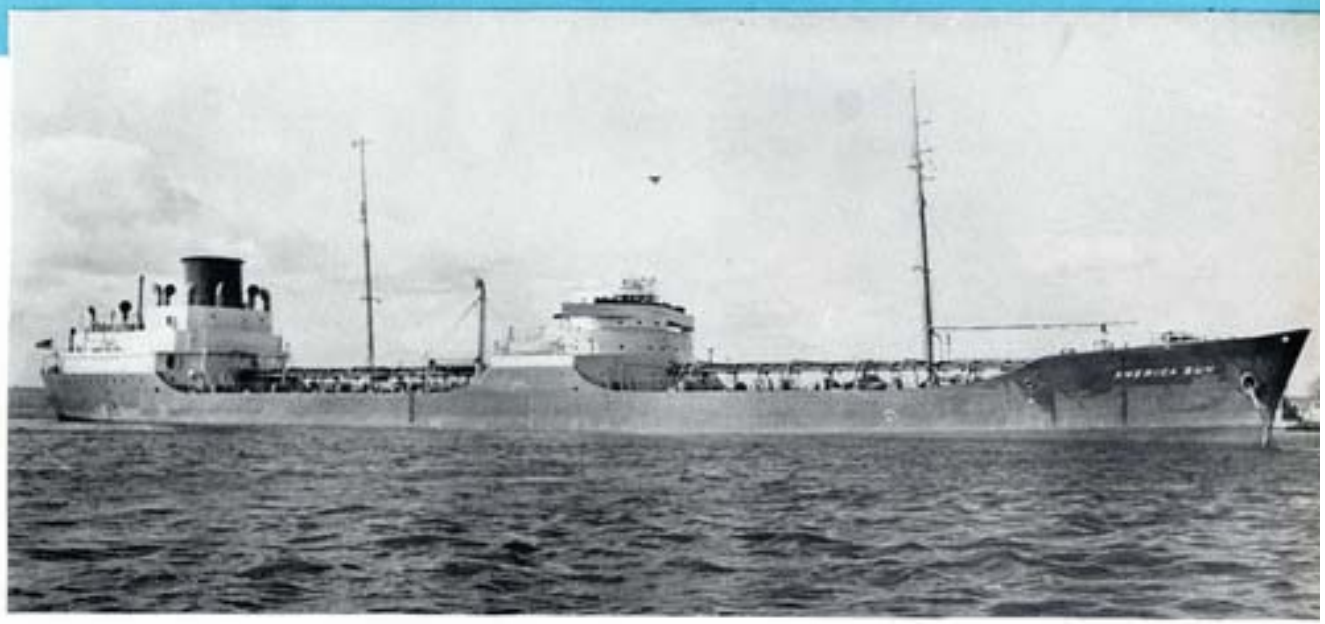








TANKERS

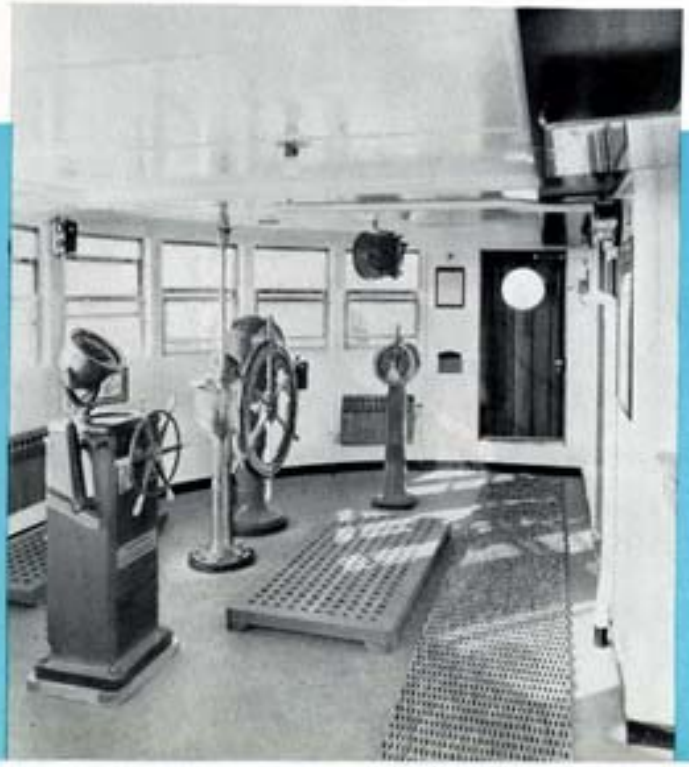


M. S. "AMERICA SUN" and class

Built for the Sun Oil Company.

Length	521 Feet
Breadth	70 Feet
Depth	40 Feet
D.W.T.	17,955 Tons
Power (Diesel Engine)	7,500 H.P.
Speed	14½ Knots

Powered by Sun-Doxford Diesel Engine.



VARIOUS TYPES OF VESSELS and

Tanker
THE TEXAS COMPANY

Tanker
GULF OIL COMPANY

Tanker
SOCONY-VACUUM OIL CO., INC.

Passenger & Cargo Ship
AMERICAN-SOUTH AFRICAN LINES

Tanker
ATLANTIC REFINING COMPANY

Tanker
KEYSTONE TANKSHIP CORPORATION

Tanker
STANDARD OIL CO. OF N. J.

Tanker
SUN OIL COMPANY

Tanker
STANDARD OIL CO. OF CALIFORNIA

Tanker
PAN-AMERICAN PETROLEUM COMPANY

Diesel Engines for Cargo Ships
FORD MOTOR COMPANY

Cargo Ship
MOORE-McCORMACK LINES, INC.

Tanker
TIDEWATER-ASSOC. OIL CO.

Tanker
BERNUTH, LEMBCKE CO., INC.

the Names of SOME OF OUR FRIENDS

Passenger Ship
MOORE-McCORMACK LINES, INC.

Small Tanker
SUN OIL COMPANY

Dredge
UNITED STATES ENGINEERS

Ore Carrier
FORD MOTOR COMPANY

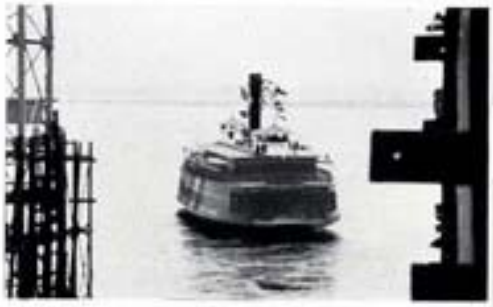
Cargo Ship
LUCKENBACH LINE

Small Tanker
ATLANTIC REFINING COMPANY

Ferry
VIRGINIA FERRY COMPANY

Car Float
U. S. MARITIME COMMISSION

Oil Barge
NEW YORK CENTRAL RAILROAD



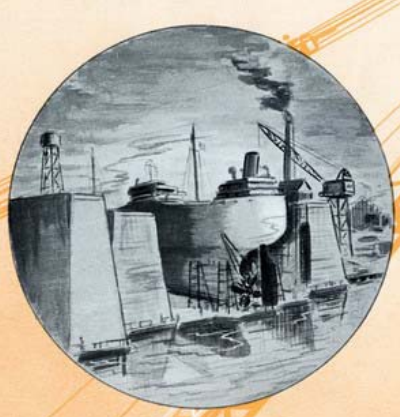
Ferry
ERIE RAILROAD CO.

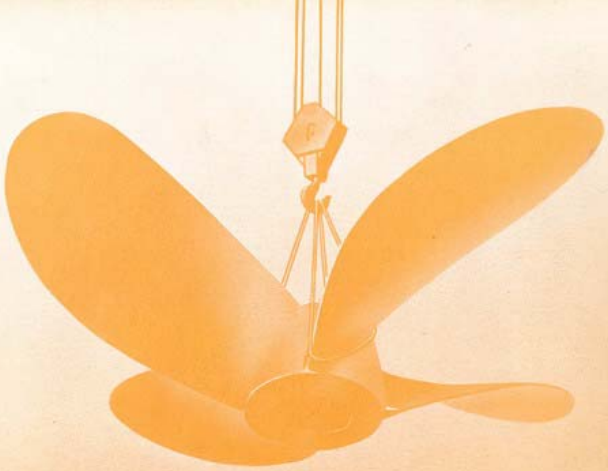
Tow Boat
INTERNATIONAL PETROLEUM COMPANY

Hospital Ship
U. S. MARITIME COMMISSION

Small Tanker
COLONIAL BEACON OIL CO.

Small Passenger Ship
INTER-ISLAND STEAM NAVIGATION CO.





SHIP REPAIRS

2 Floating-Type Dry Docks for Ships up to 600 feet in length each with a lifting capacity of 11,000 tons

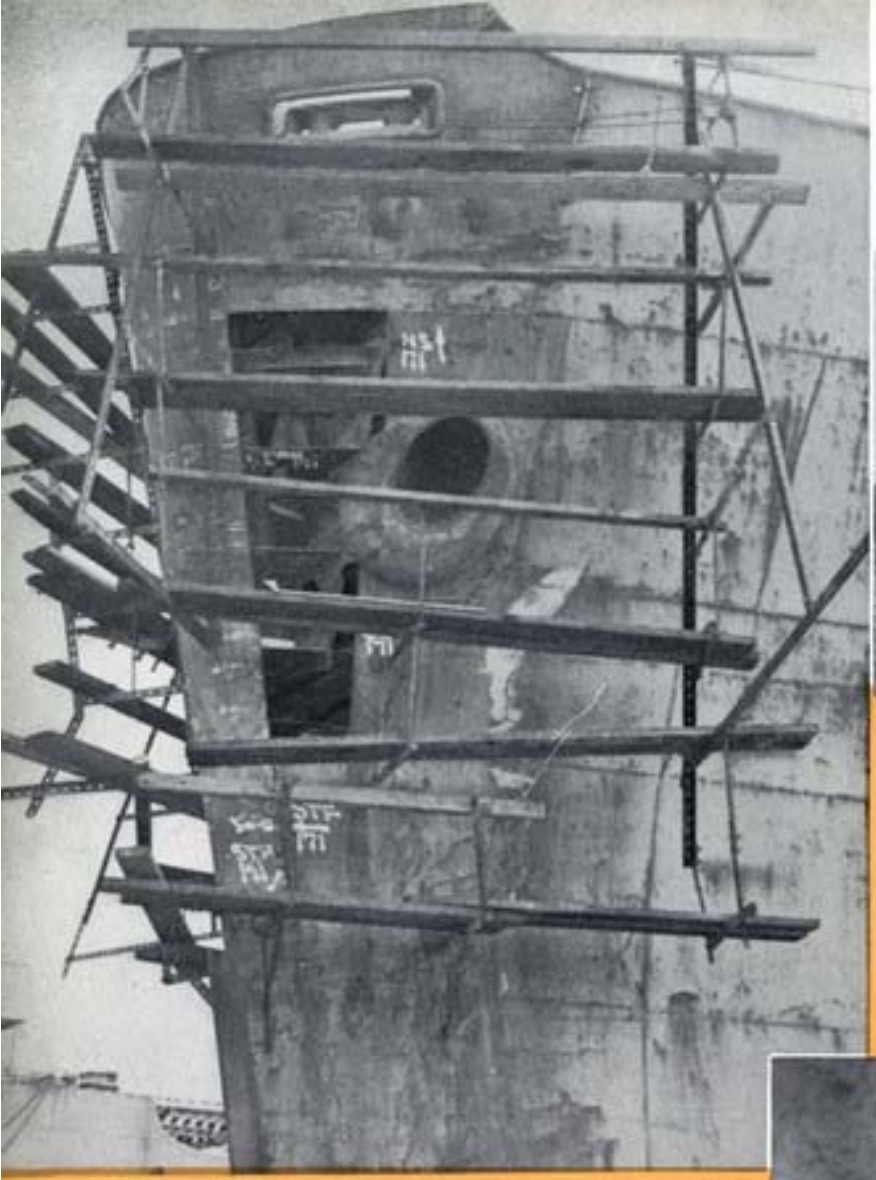
Wet Basins up to 600 feet in length

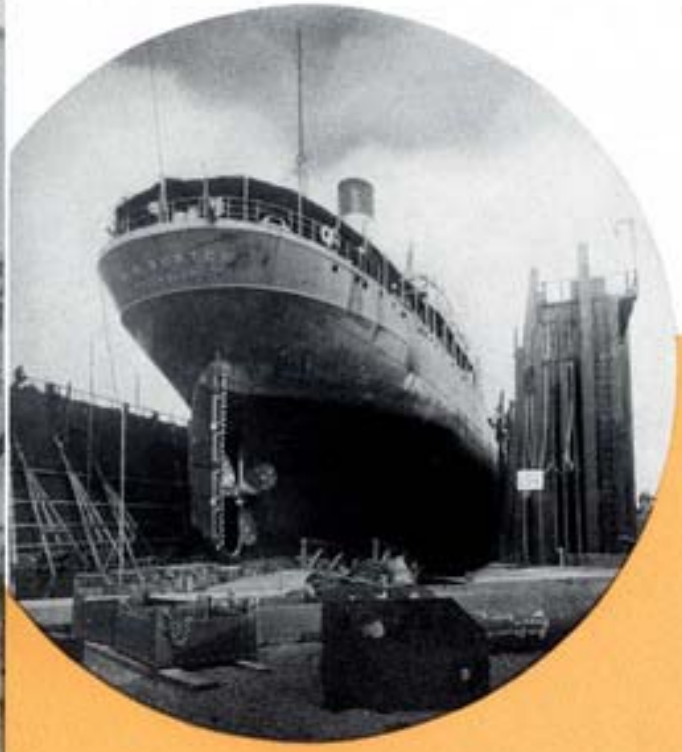
Fitting-Out Piers

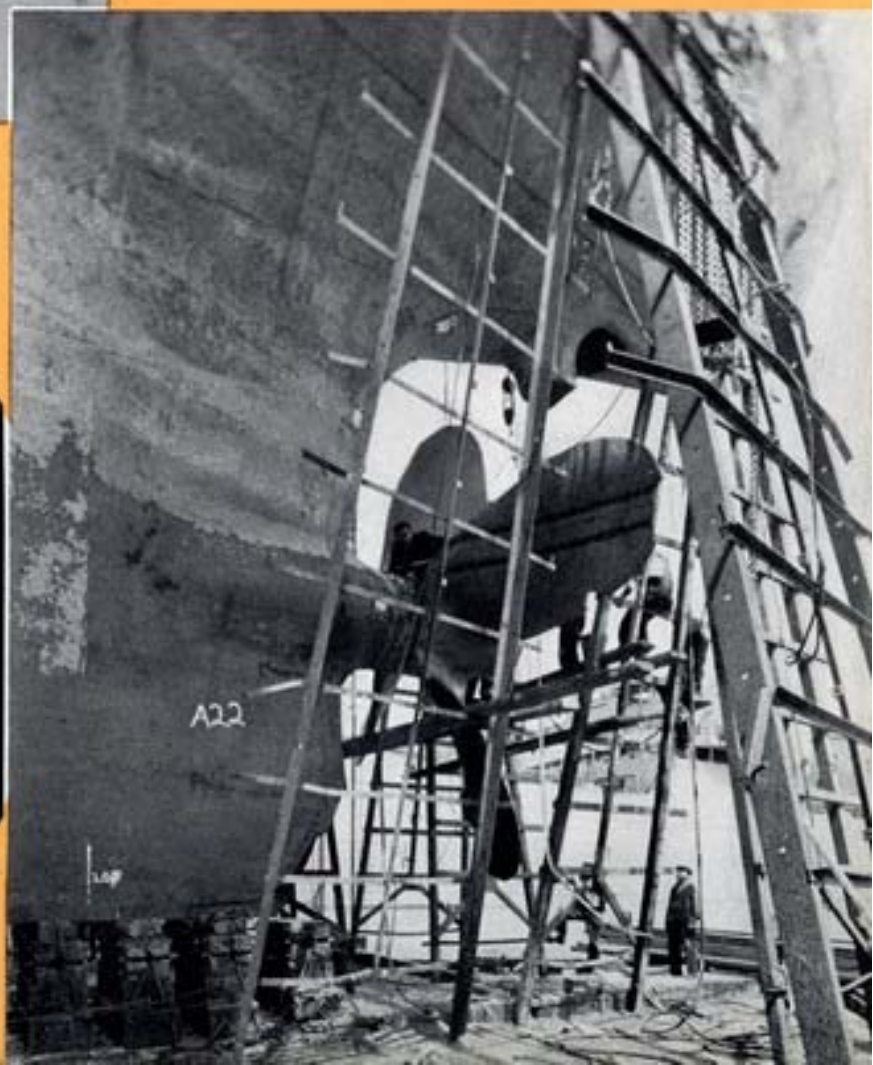
Hammerhead Crane - up to 120 Ton Capacity

The various shops and equipment for New Construction described in these pages are also always available for Repair Work: Forgings, Fabricated Plates, Machinery Parts, etc.

We are prepared to handle any work of this nature from the smallest ship repair to the largest conversions.

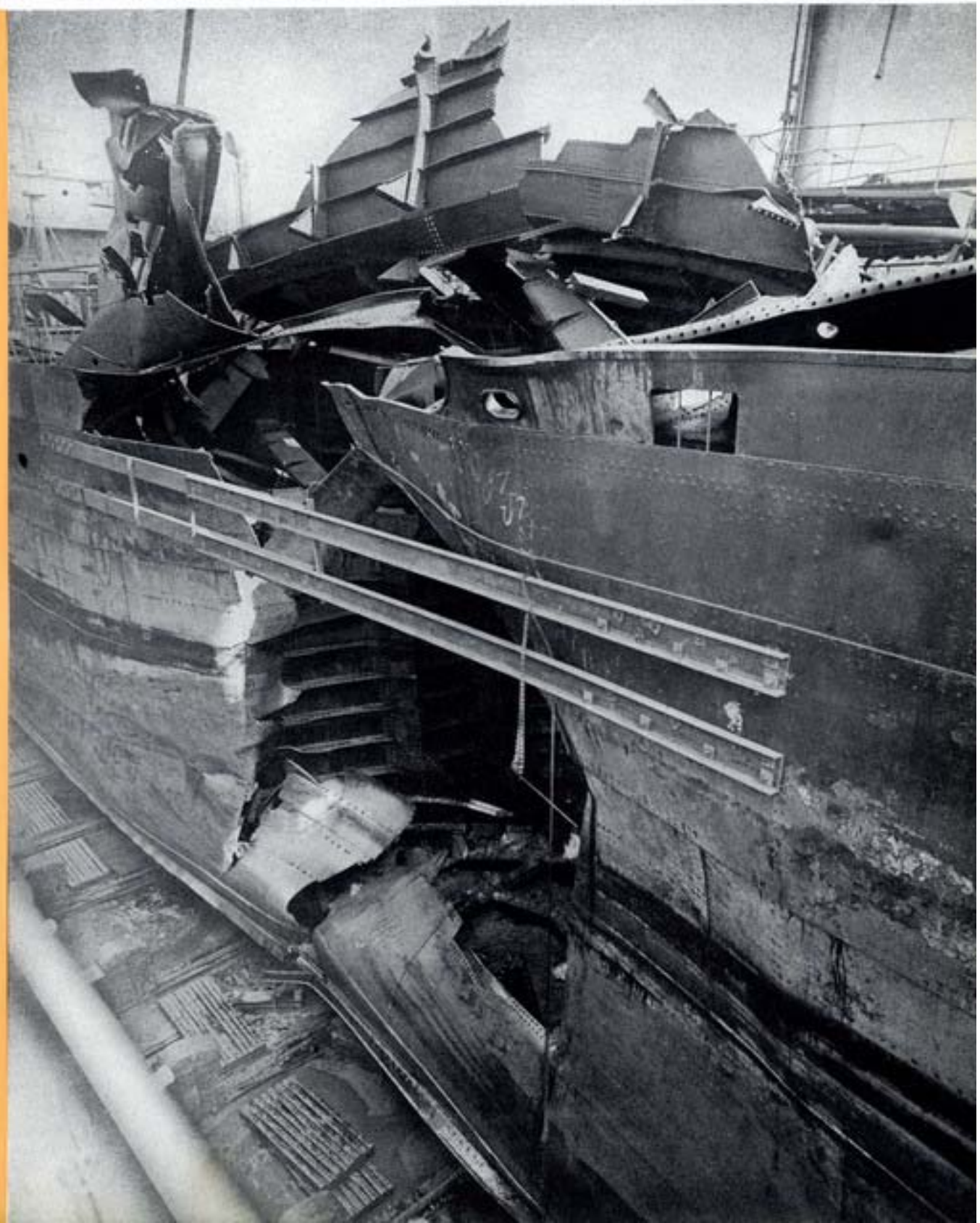


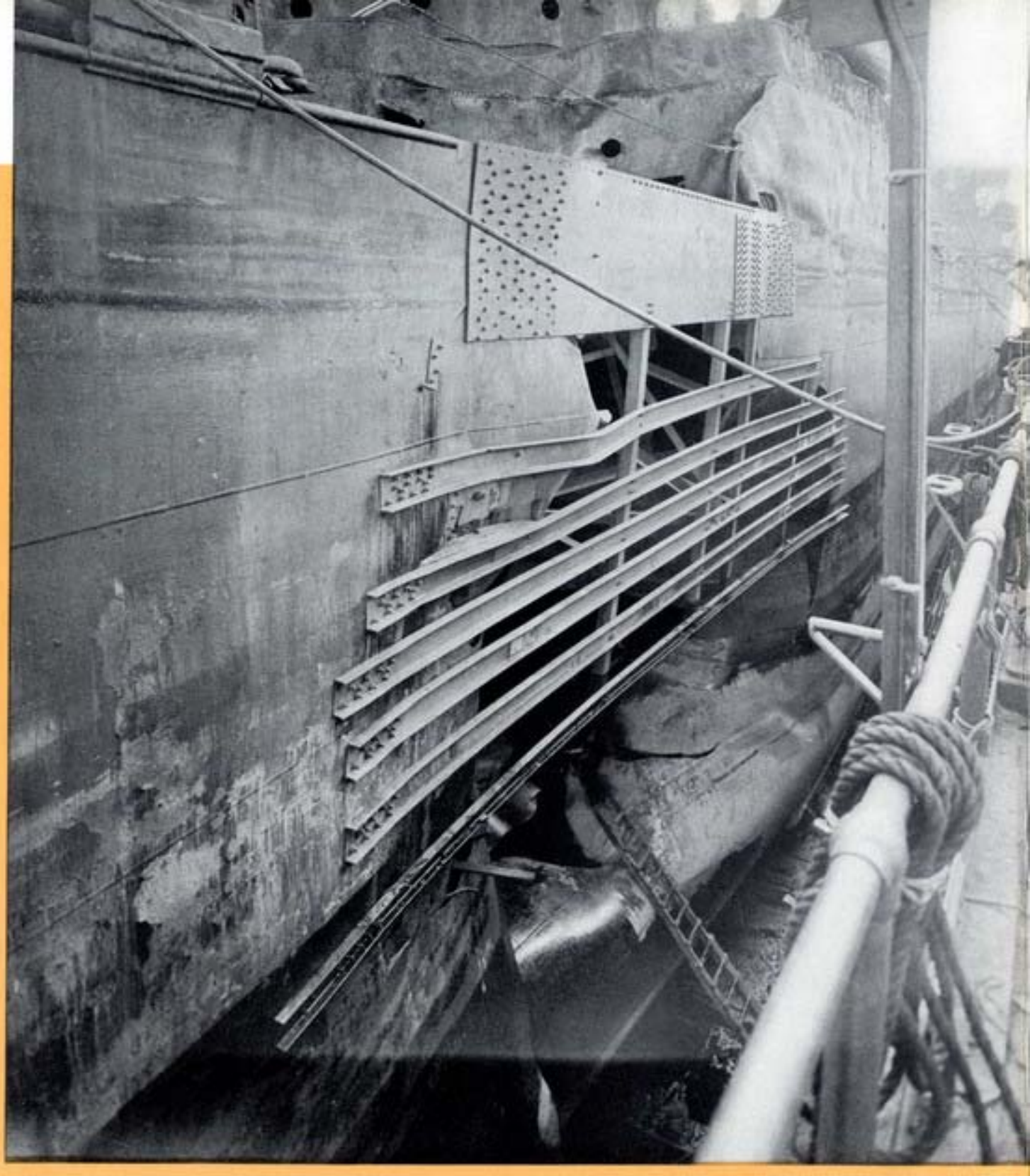



A22

UNUSUAL REPAIR JOBS

The M. S. "BIDWELL" in Dry Dock, having been tied together after being torpedoed. Over half of the vessel's strength had been destroyed with the damage extending three tank-lengths on each side of the ship. This ship was of the riveted type of construction, having been built in World War I. A new welded section was made and installed by welding to the riveted portion, thus considerably reducing the repair time.





The M. S. "PENNSYLVANIA SUN" shown in dry dock after having been torpedoed and left burning for four days off the Florida Keys.

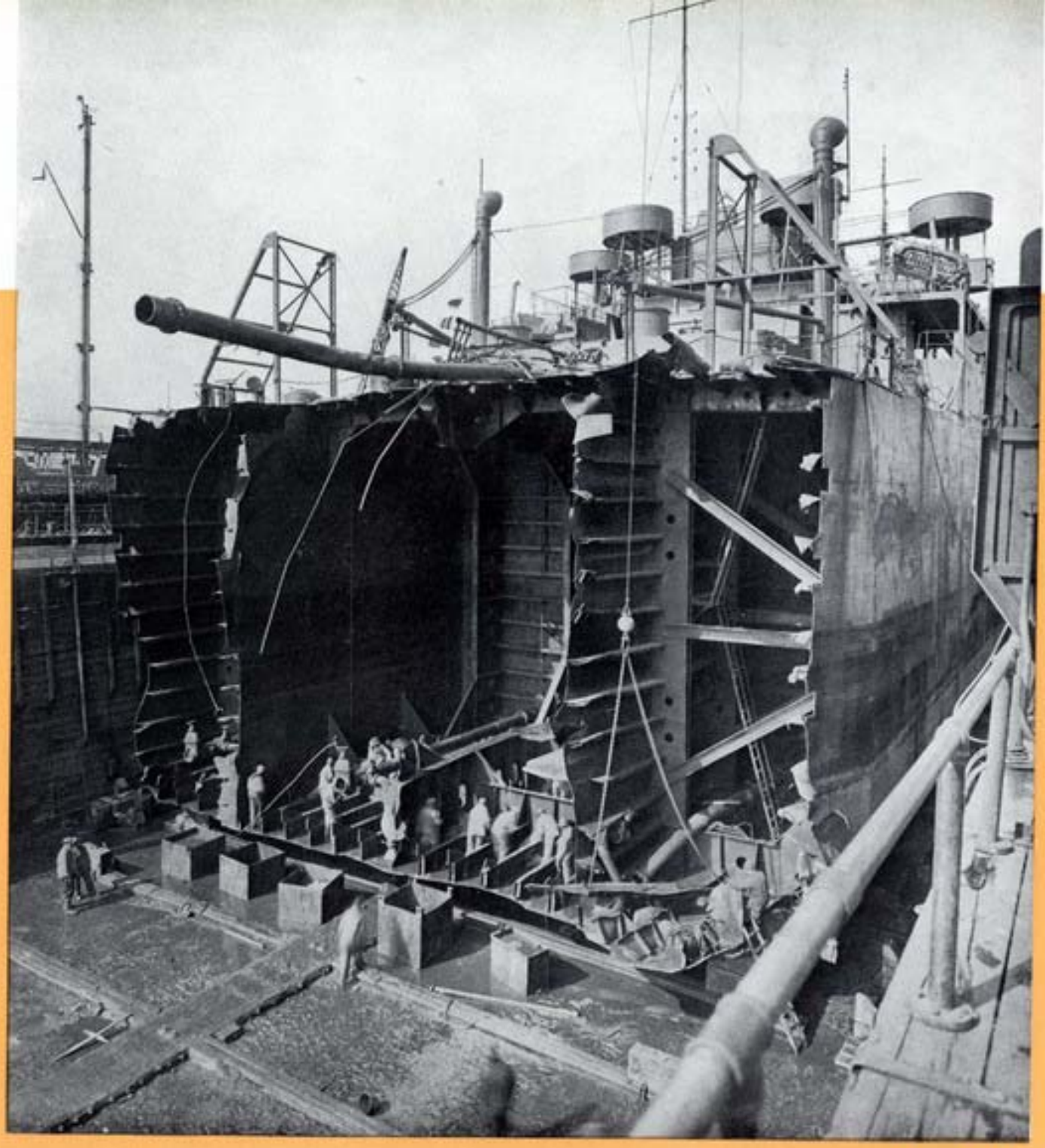
The crew reboarded the vessel, extinguished the fires, and brought the vessel to the Yard under her own power.

The vessel was rebuilt with the machinery and fittings partly renewed; the ship then returned to service. Note the buckled and collapsed superstructure and the damaged hull structure from midship aft.

The M. S. "PENNSYLVANIA SUN" burning at sea after being torpedoed.

The damaged ship entering the Yard, September 2, 1942.

Ship leaving the Yard, after repairs, November 30, 1942.



Forward-Half.

The photographs above and on the opposite page, show the S. S. "E. H. BLUM" in two halves in Sun Ship's Dry Dock, after her second accident at sea.

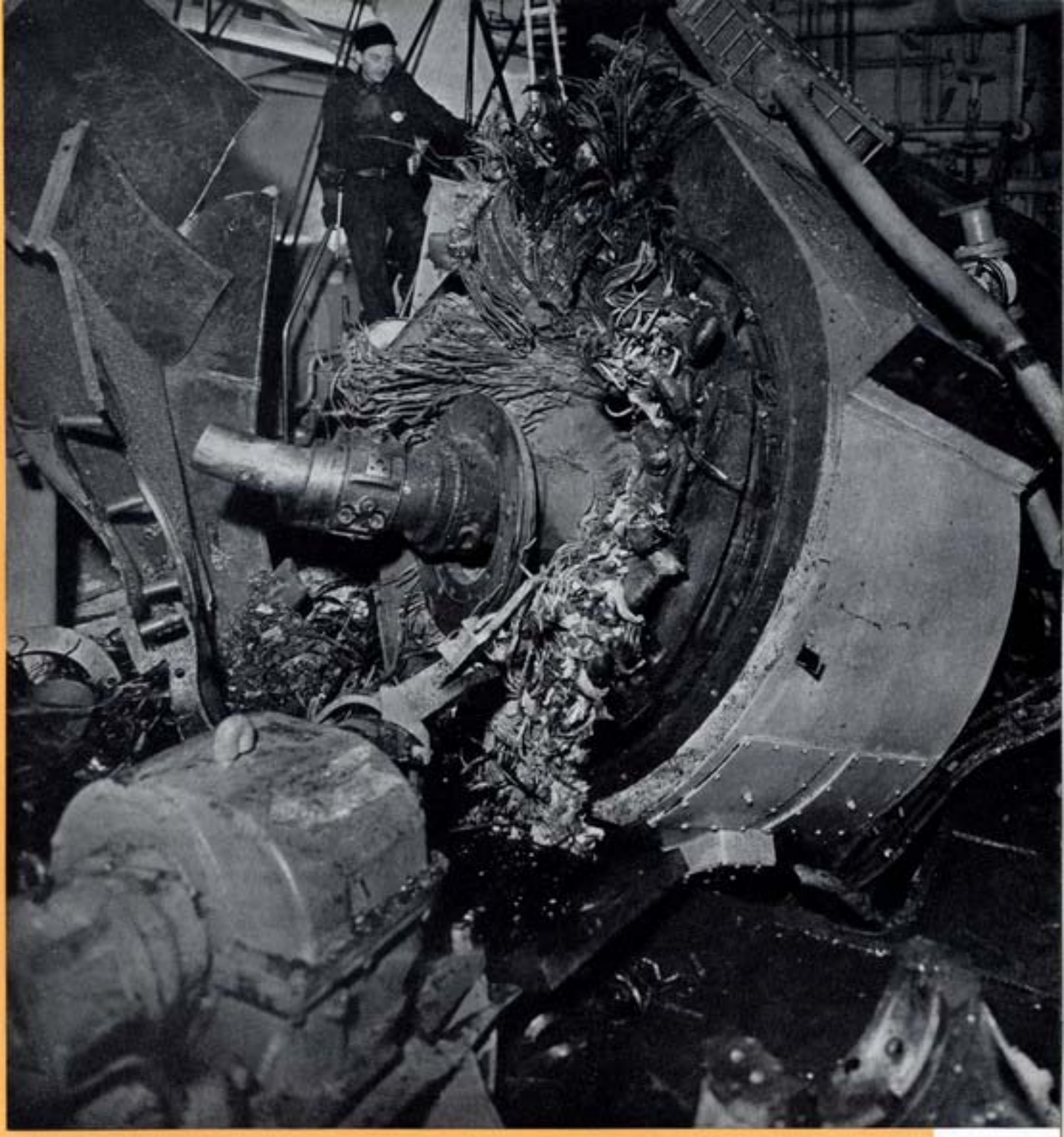
In her first War accident at sea, she was divided into two parts; the sections were joined together in dry dock at another yard, and the vessel returned to service.

The second accident again separated her into halves. The two parts were then brought to our dry dock and the bottom of each part was renewed where severely damaged. The two halves were joined together and the ship has now been in continuous service for more than two years without any sign of weakness.

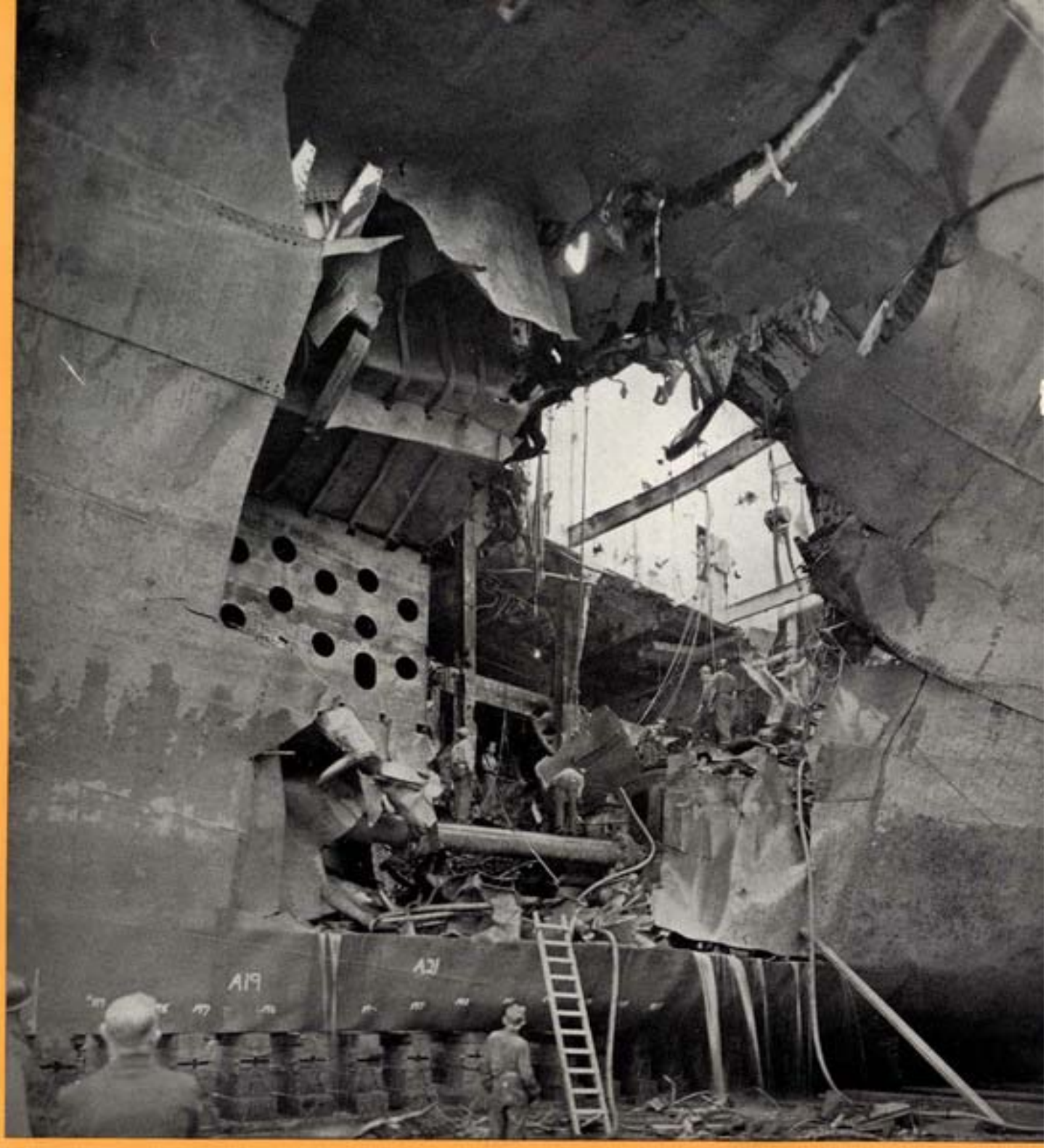
After-Half.

The S. S. "E. H. BLUM" after repair.

The M. S. "FLORIDA", owned by The Texas Company, after being torpedoed, sunk, and her back broken, was salvaged and brought to the dry dock. The stern frame, propeller and rudder were missing. The engine room had been flooded and the machinery damaged. All electrical work was damaged beyond repair. This was a typical Hull and Machinery repair job, with the vessel being returned to service in a minimum of time.



An accident on the S. S. "BALLS BLUFF" caused an explosion and complete destruction of the Main Turbine and Main Generator. Many of the pumps and auxiliaries were damaged. The repair and renewal of the machinery and electric units is another typical example of the kind of repair work we are equipped to handle. These units were 7,240 H.P. capacity.

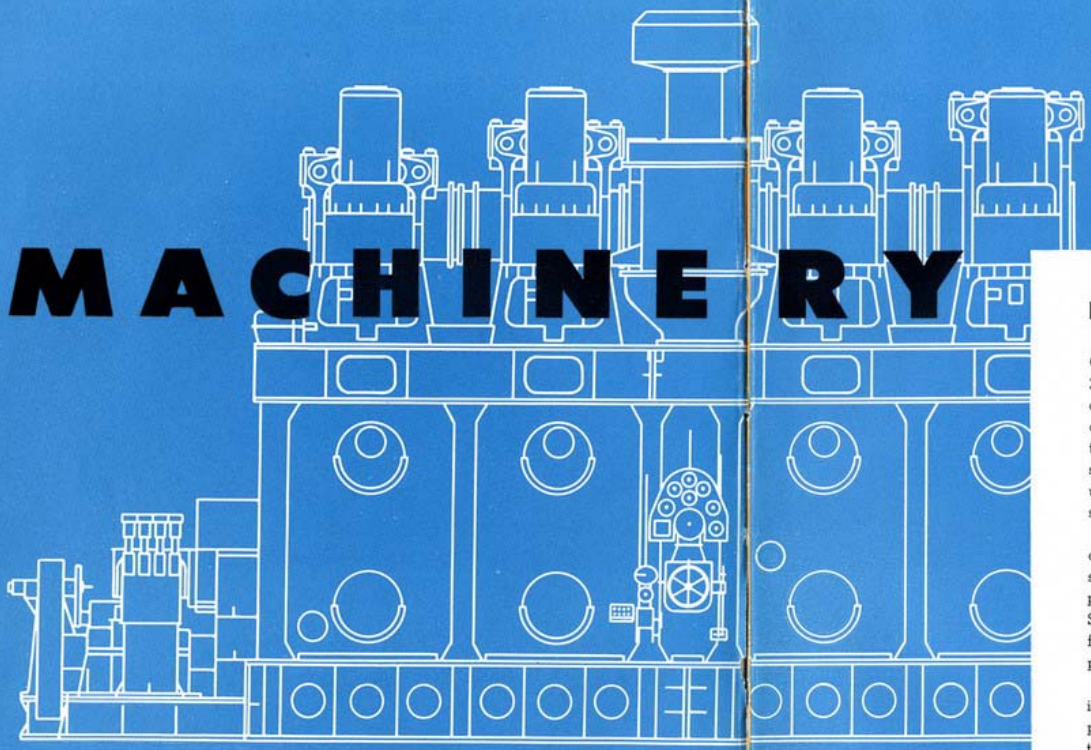


The S. S. "OKLAHOMA" shown in Dry Dock. Notice the holes in the bow and sides closed with wooden patches as shown on opposite page. These were the result of several hours of shelling by a submarine after the vessel had been torpedoed and rendered helpless. The engine room had been opened up to the sea and the structure over the engine room completely demolished. The vessel's machinery and electric work were seriously damaged as well as the hull. This job was rebuilt in the most critical period of the war when shortages of materials and manpower were extremely acute, but the vessel was returned to service in a short time.

The S. S. "OKLAHOMA"
in Dry Dock.

Leaving the Yard
after repairs.

MACHINERY



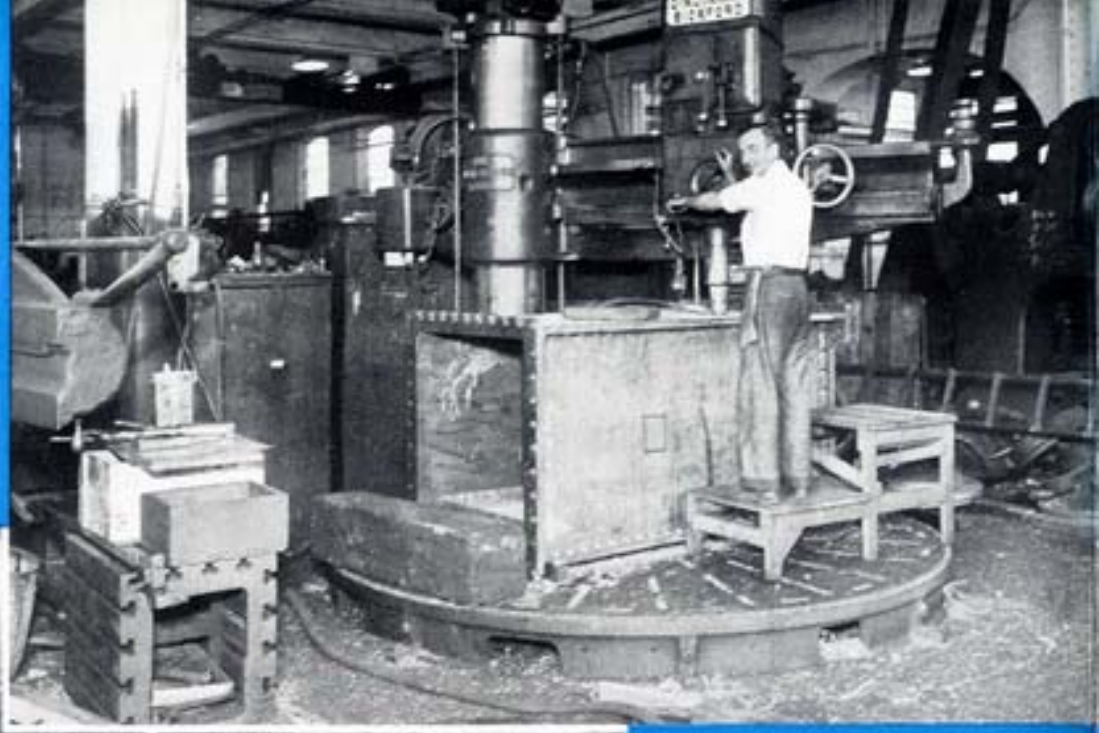
BUILDING FACILITIES

Our Machinery Plant described on page 21 is equipped with a wide assortment of modern machine tools, both large and small, varying from small turret to giant engine lathes with 132 inch swing by 50 feet in length . . . planers up to 14 feet wide and a special crankshaft machine for shafts of largest sizes.

In addition to this complete Machinery-Building Plant, there are the smaller Machine Shops in the Shipyard proper . . . the Forge Shops, Welding Shops and other Machinery-Building facilities described elsewhere in these pages.

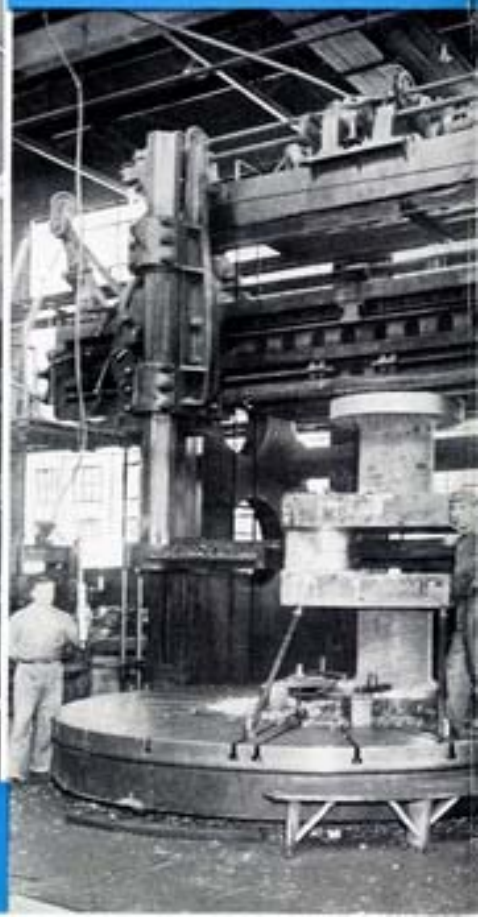
This combination of Machinery-Building Facilities is seldom found in one plant or organization. Here are facilities suitable for building almost any type of machinery.

SHIP MACHINERY • MACHINERY REPAIR PARTS • DIESEL ENGINES • SPECIAL MACHINES • MACHINE WORK



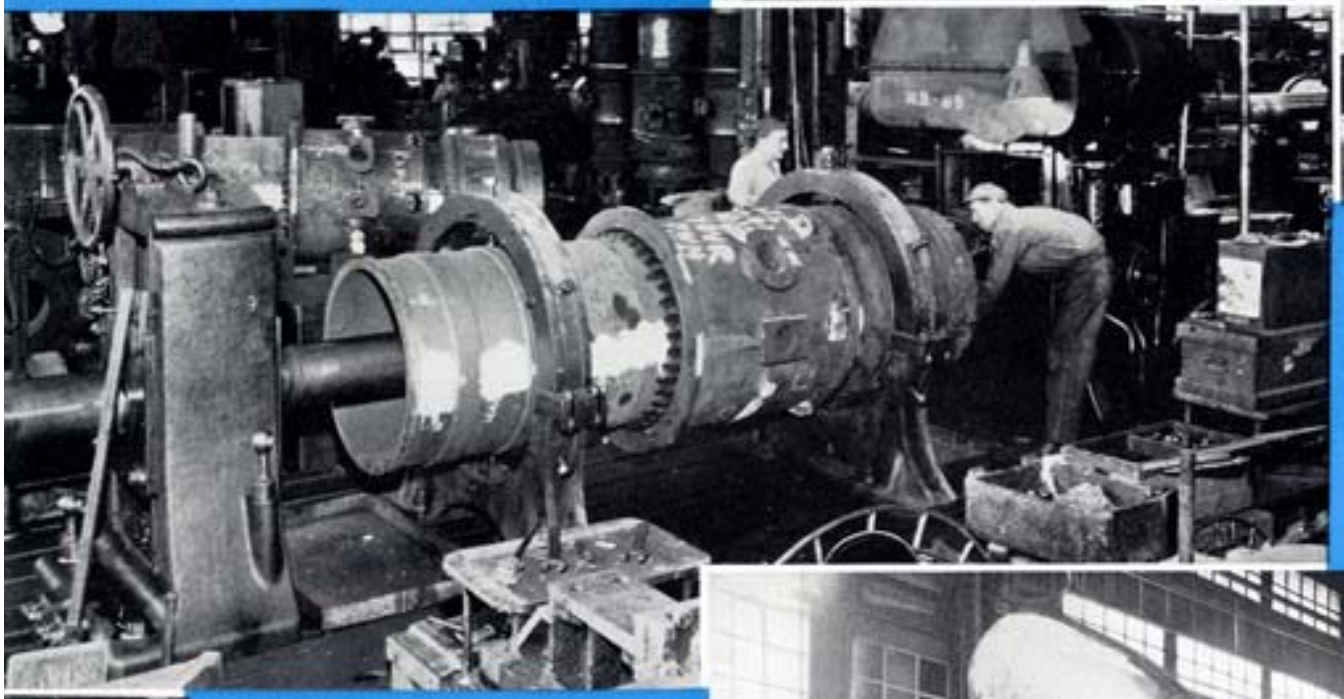
Drilling Condenser Tube Sheets.

General View of Light Machine Shop.



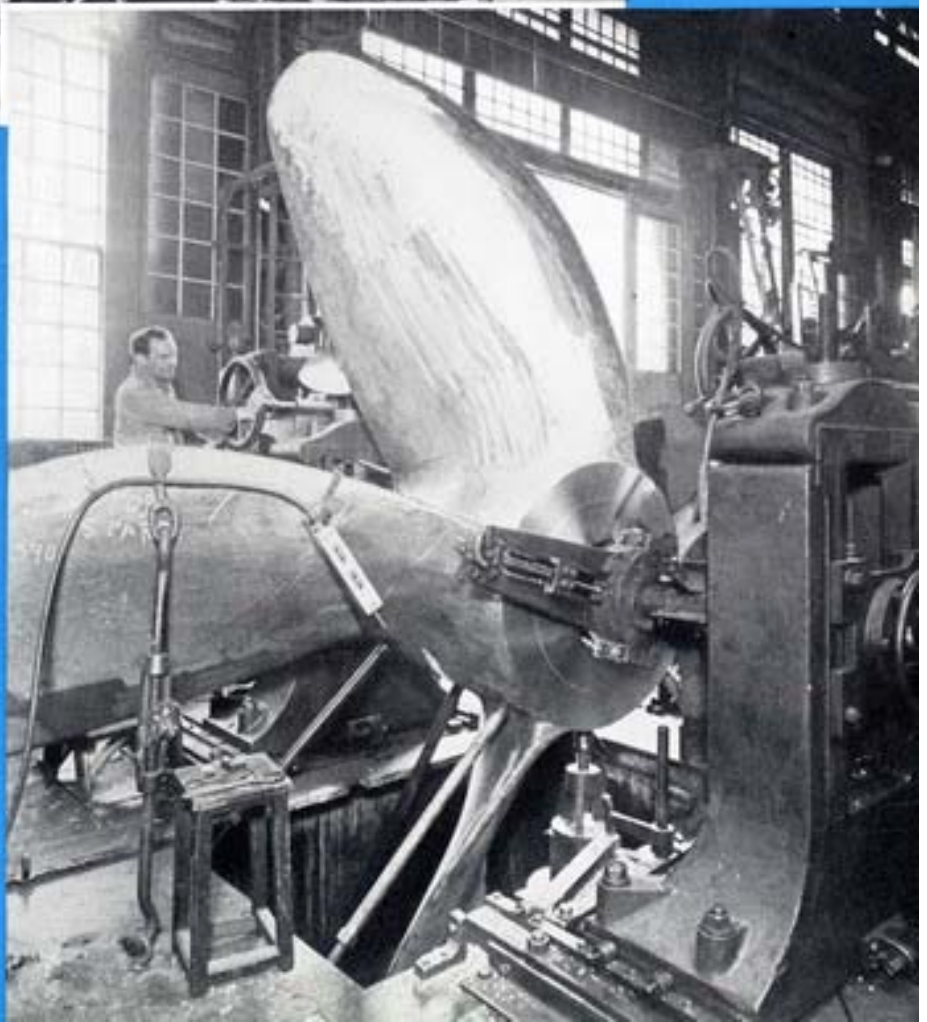
View of Machine Shop Section devoted to Small Parts.

Boring Diesel Engine Cylinder Liners.



Machining Diesel Engine Crankshaft Section.

Machining 22 ft. diameter Propeller Wheel.



THE SUN-DOXFORD

Opposed Piston—2 Cycle

Airless Injection with attached Scavenge Pumps

or Independent Scavenge Blowers

ARE BUILT IN SIZES FROM 1,000 TO 10,000 B.H.P.

TABLE OF MODELS AND SIZES

MODEL	No.	*CYLINDERS		Rated B.H.P.	R.P.M.	M. E. P. at Rated Power	DIMENSIONS			
		Bore	Stroke				Length	Height Power Cyls.	Height Scavenge Pump	Width Bed Plate
540-L-4	4	21¼"	42½" + 42½"	2,500	90	91	48'0"	29'4¾"	30'1⅞"	11'0"
600-LB-4	4	23⅜"	45⅝" + 33⅞"	2,700	100	77.4	52'0"	29'10⅝"	32'0¼"	11'2"
580-L-4	4	22 13/16"	45⅝" + 45⅝"	2,800	80	93	51'0"	32'5"	31'9¼"	11'2"
600-L-4	4	23⅜"	45⅝" + 45⅝"	3,000	80	92.6	52'0"	32'5"	32'3⅞"	11'2"
26-LB-4	4	26"	46" + 33"	3,600	115	74	51'11"	29'11"	33'4"	11'2"
21-LB-6	6	21"	35" + 25"	4,500	180	79.2	50'1⅞"	24'4"	—	10'6¼"
31-LB-4	4	31"	50" + 36"	4,800	90	81.7	60'9"	33'10½"	36'0⅞"	12'8"
640-LB-6	6	25 13/16"	45⅝" + 33⅞"	5,600	100	93.7	68'0"	29'10½"	35'6½"	11'2"
32-LB-4	4	32"	55" + 40"	6,000	94	82.8	56'2"	35'7"	—	12'8"
31-LB-5	5	31"	50" + 36"	7,200	100	86	67'3¾"	33'10½"	—	12'8"
32-LB-5	5	32"	55" + 40"	7,500	94	82.8	71'9 11/16"	35'7"	40'9¼"	12'8"

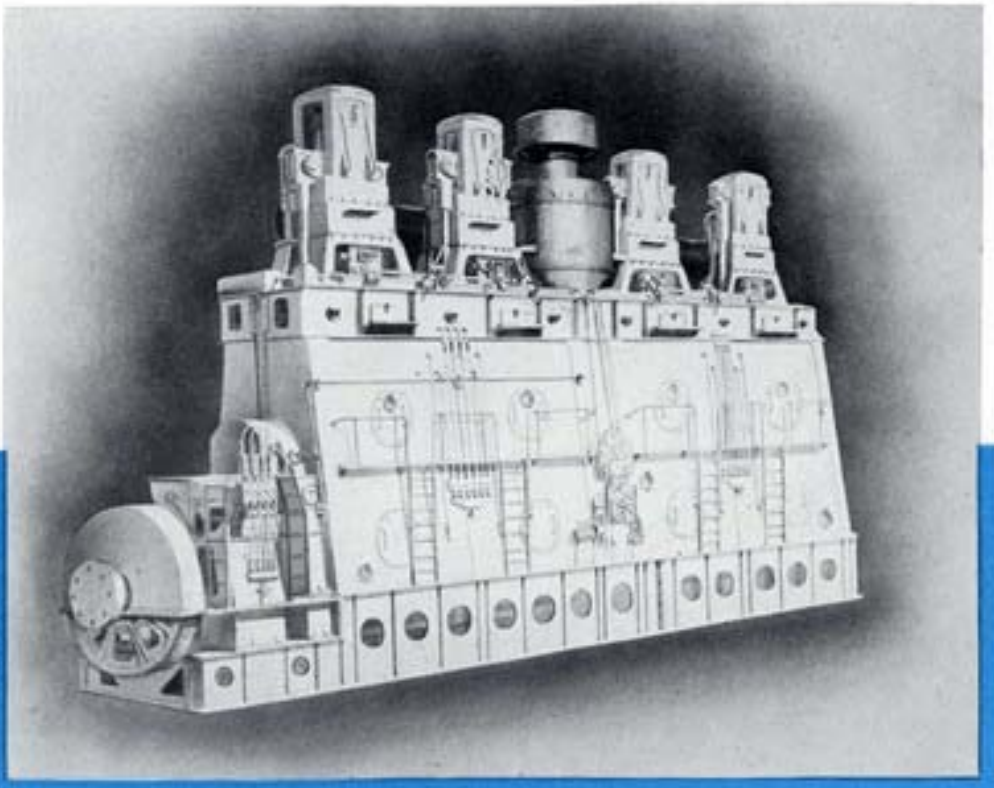
*Engines can be furnished with 3, 4, 5 or 6 cylinders.

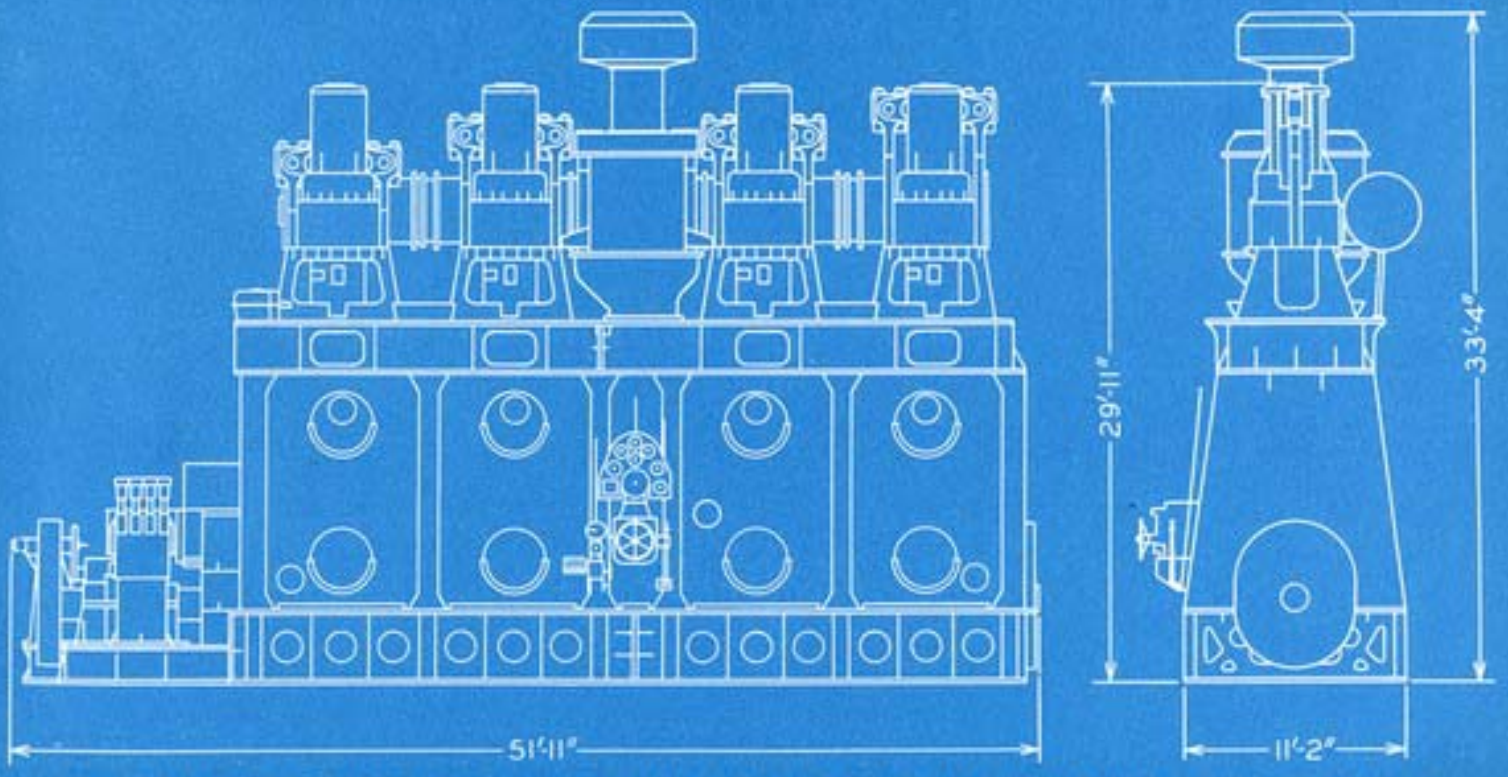
Information for sizes not listed, furnished on application.

DIESEL OIL ENGINES

Front View of
SUN-DOXFORD ENGINE
with
ATTACHED SCAVENGE
PUMP

Single Acting
Direct Reversing

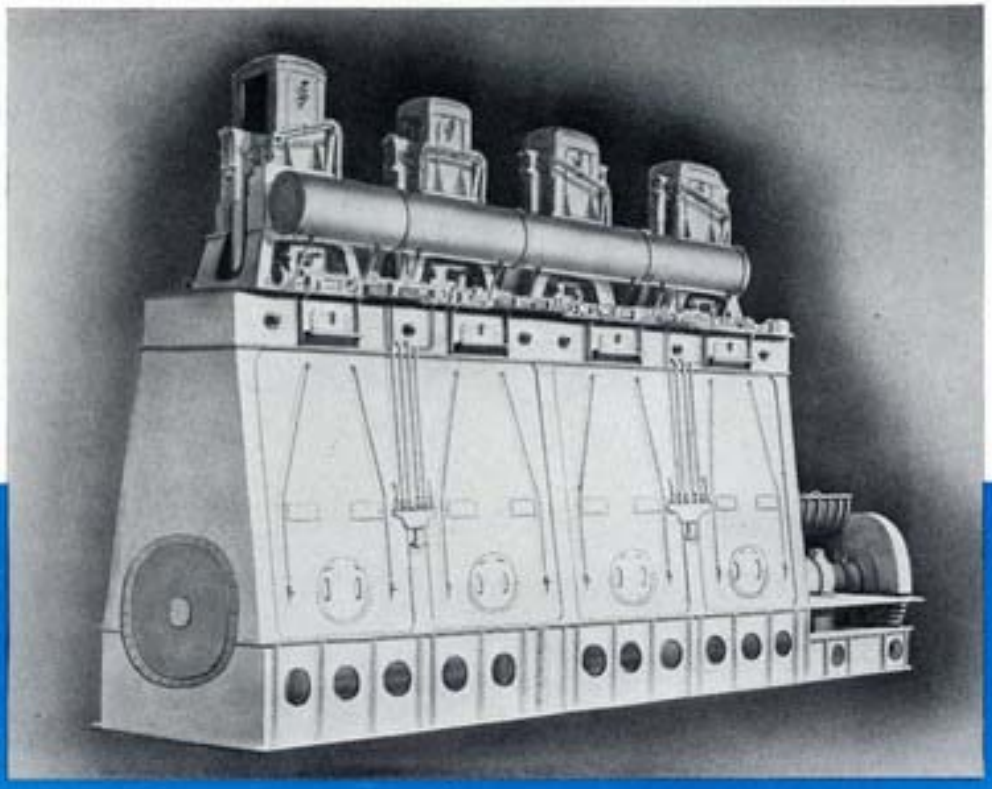




ELEVATION GIVING GENERAL DIMENSIONS OF MODEL 26-LB-4

SUN-DOXFORD ENGINE

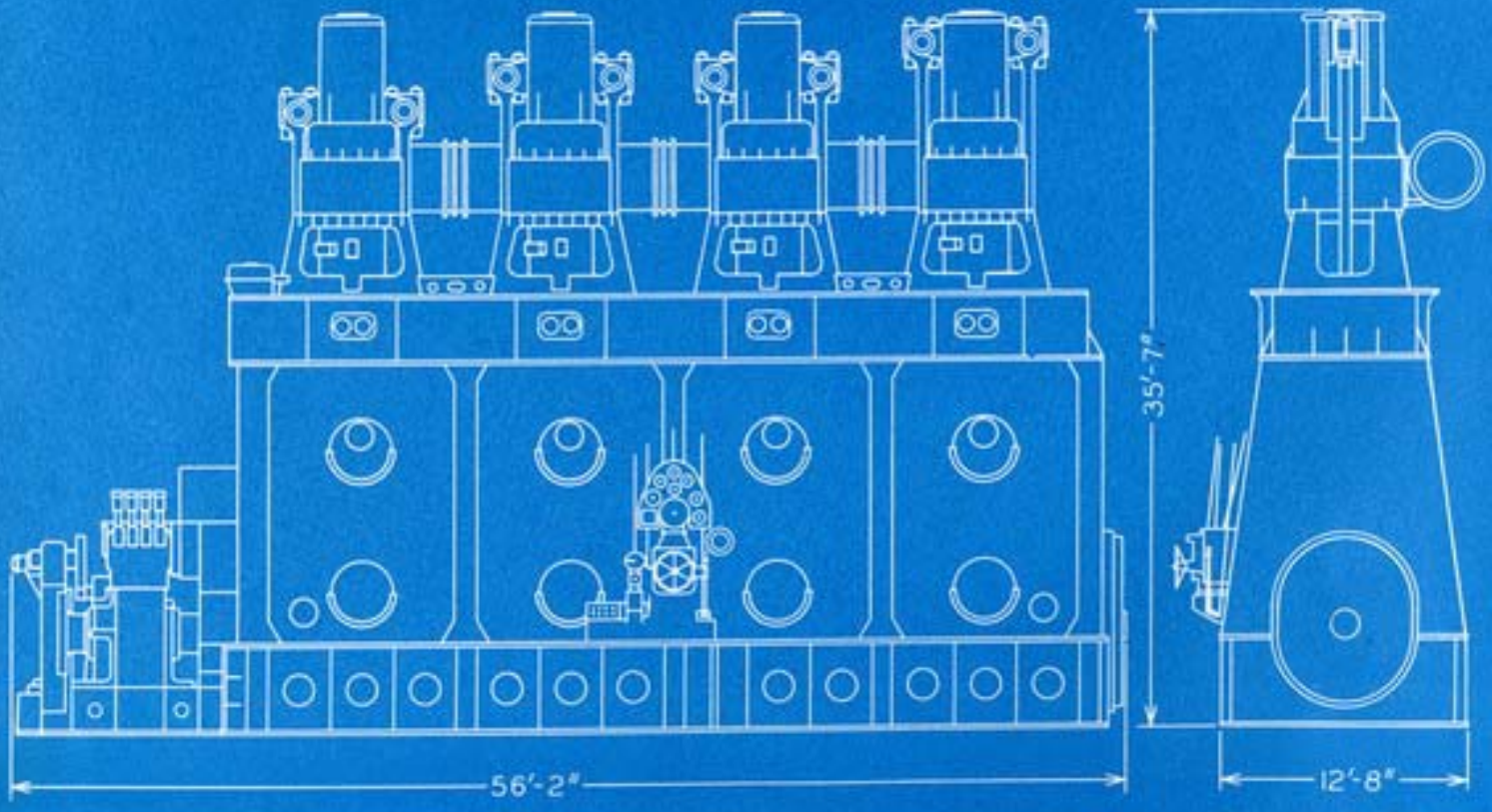
WITH INDEPENDENT SCAVENGE PUMP



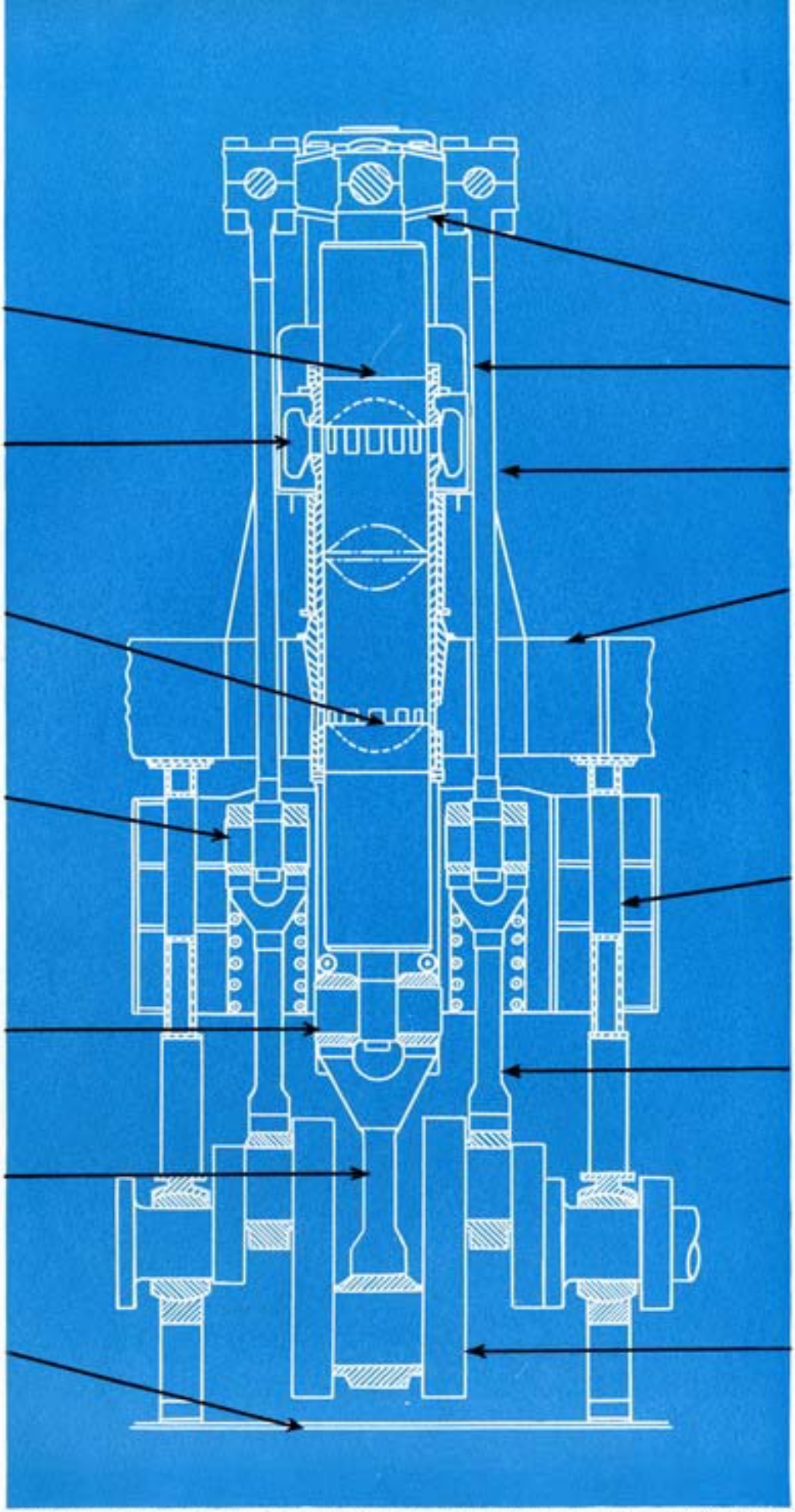
Single Acting

Direct Reversing

Rear View

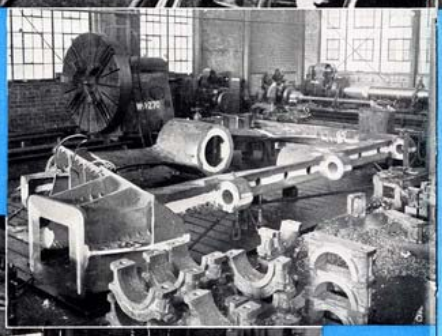


ELEVATION GIVING GENERAL DIMENSIONS OF MODEL 32-LB-4



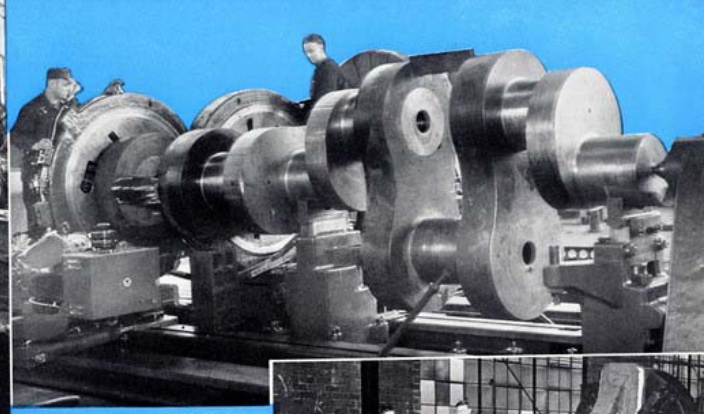
LONGITUDINAL SECTION OF MODEL 32-LB-4 SUN-DOXFORD ENGINE

Heavy Machine Section.



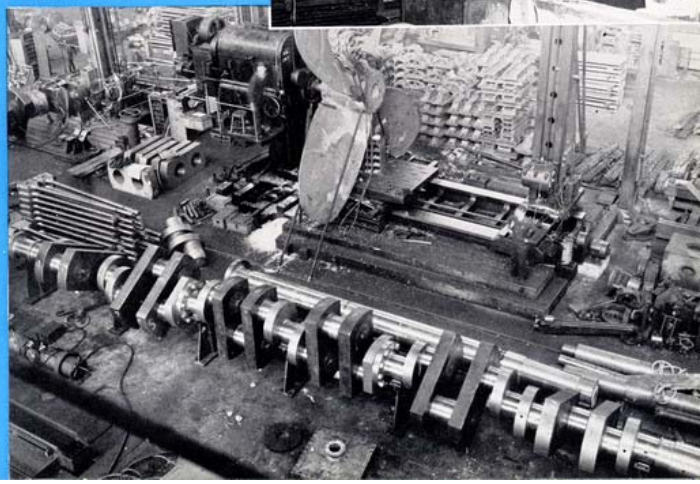
Stern Frame.

Section of Assembly Floor.



Crankshaft Section in Special Crankshaft Machine.

Rudder Stock in 132 in. x 50 ft. Lathe.

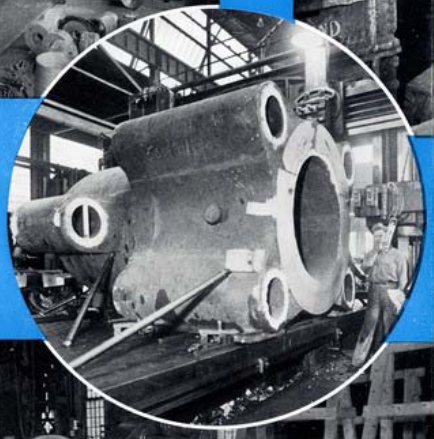


Crankshafts, Propeller Wheels and Shafts, etc.

Heavy Machine Section.

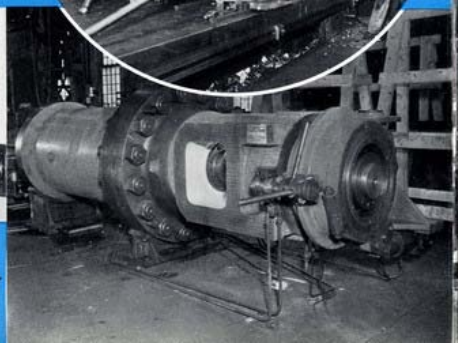
Pouring Metal in Iron Foundry.

Jig Boring Machine.



80 ton Hydraulic Cylinder, on 14 ft. wide Planer.

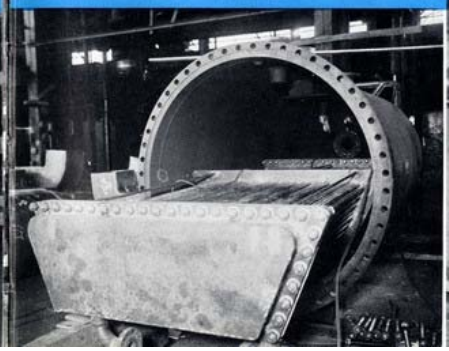
Special Valves.



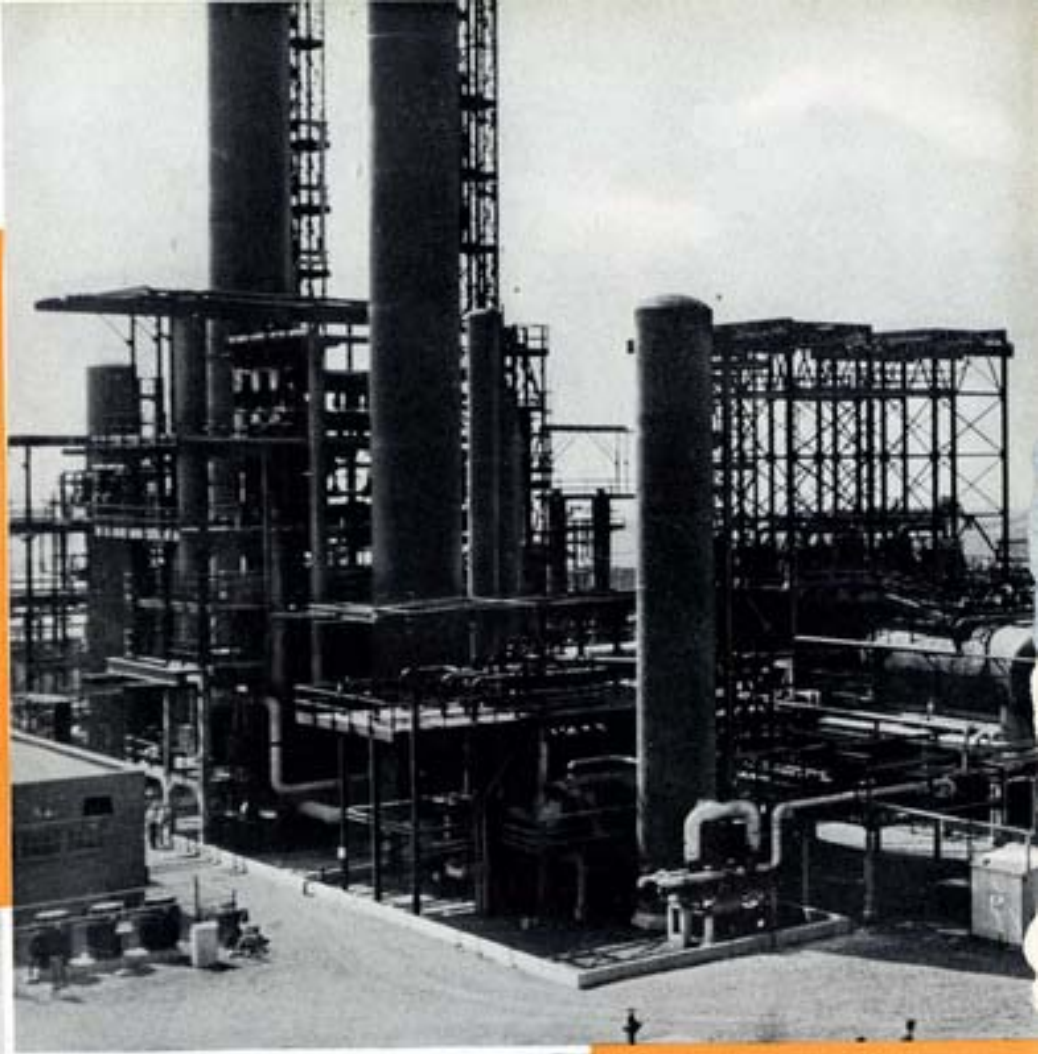
Hydraulic Press being assembled.

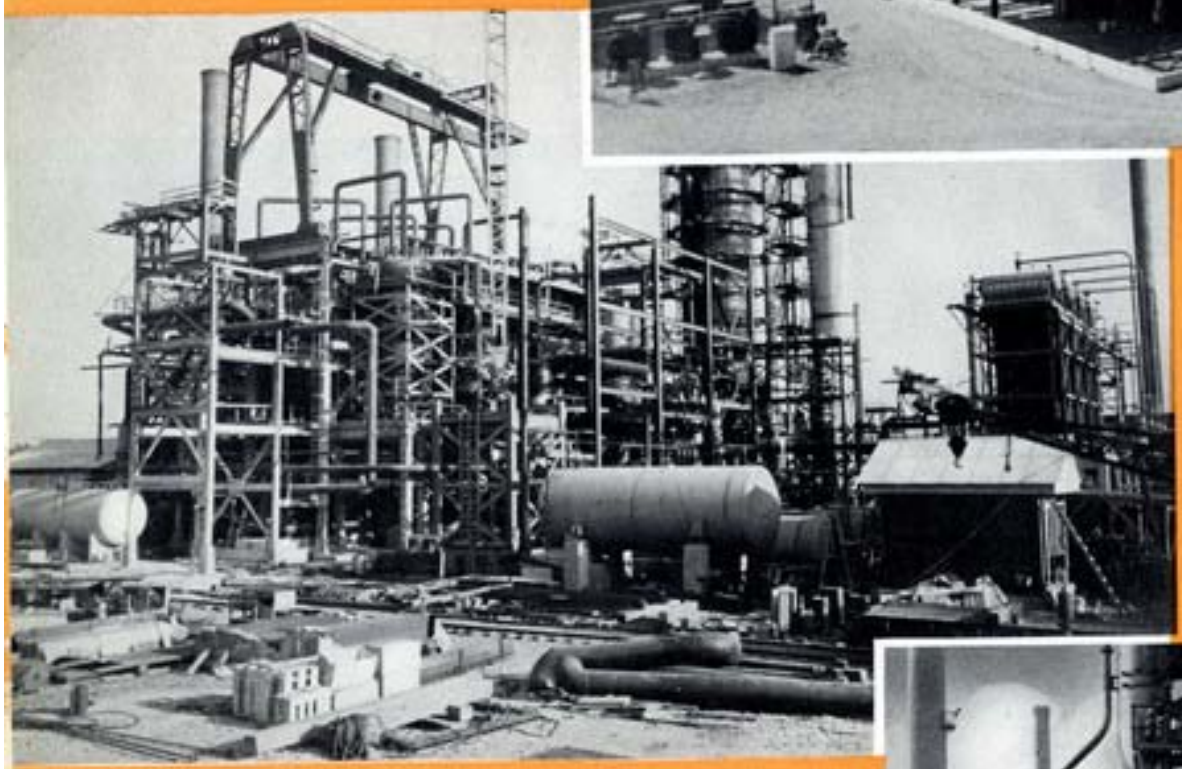
Oil Blending Machine.

Special Condenser.

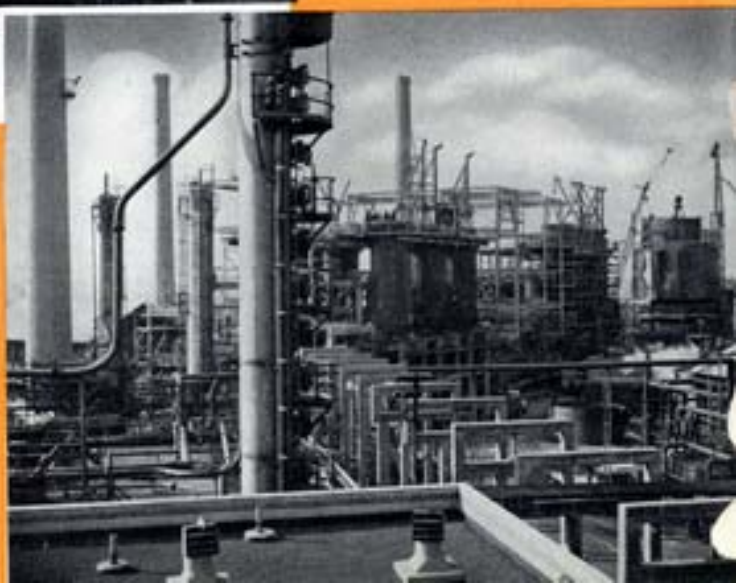


TOWERS • TANKS CRACKING CASES and SPECIAL EQUIPMENT...

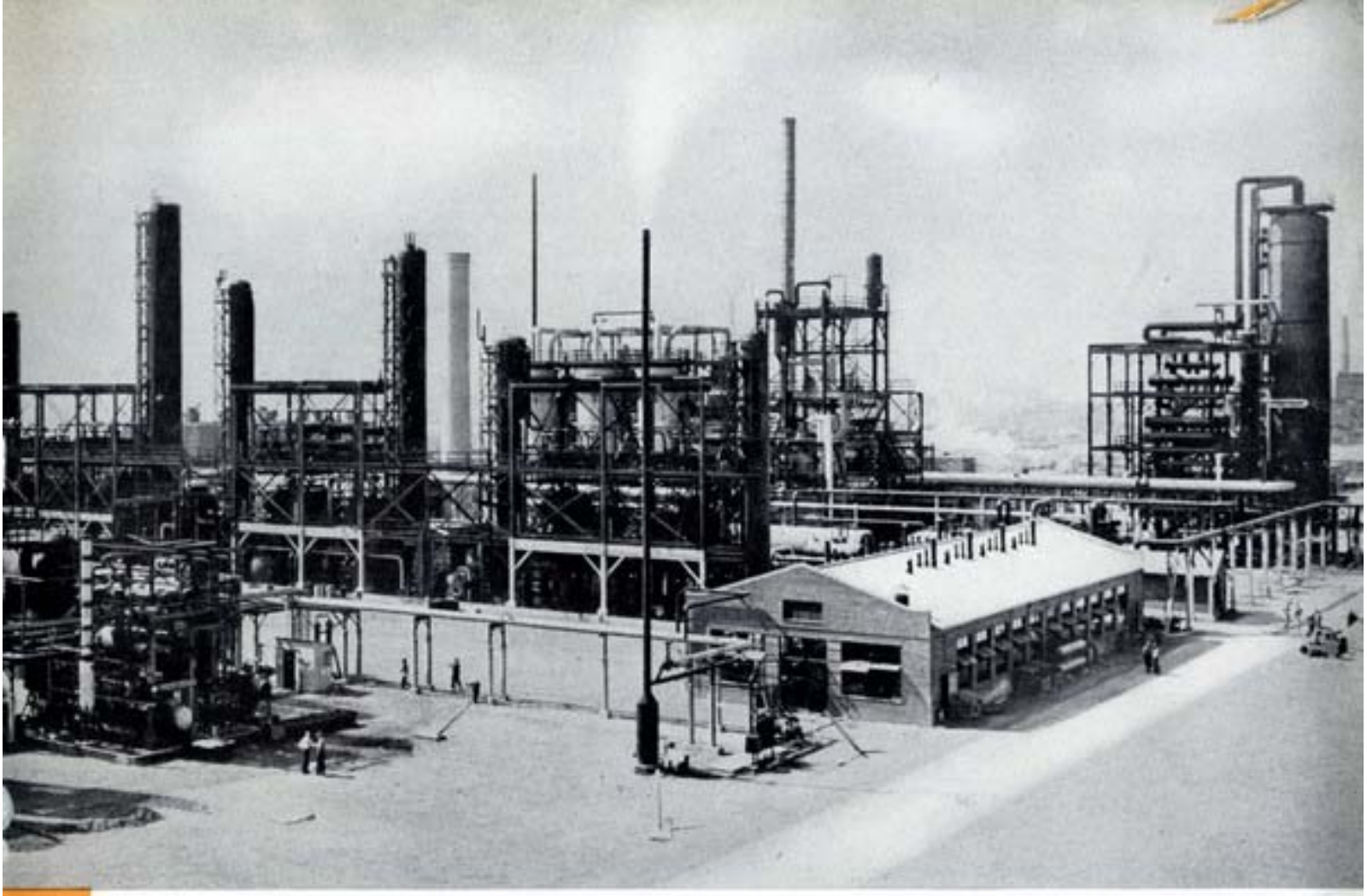




ORGAN



... for the units shown on these pages were made in our plant. All Pressure Vessels were X-rayed and Stress-Relieved. All Codes—All Alloys.



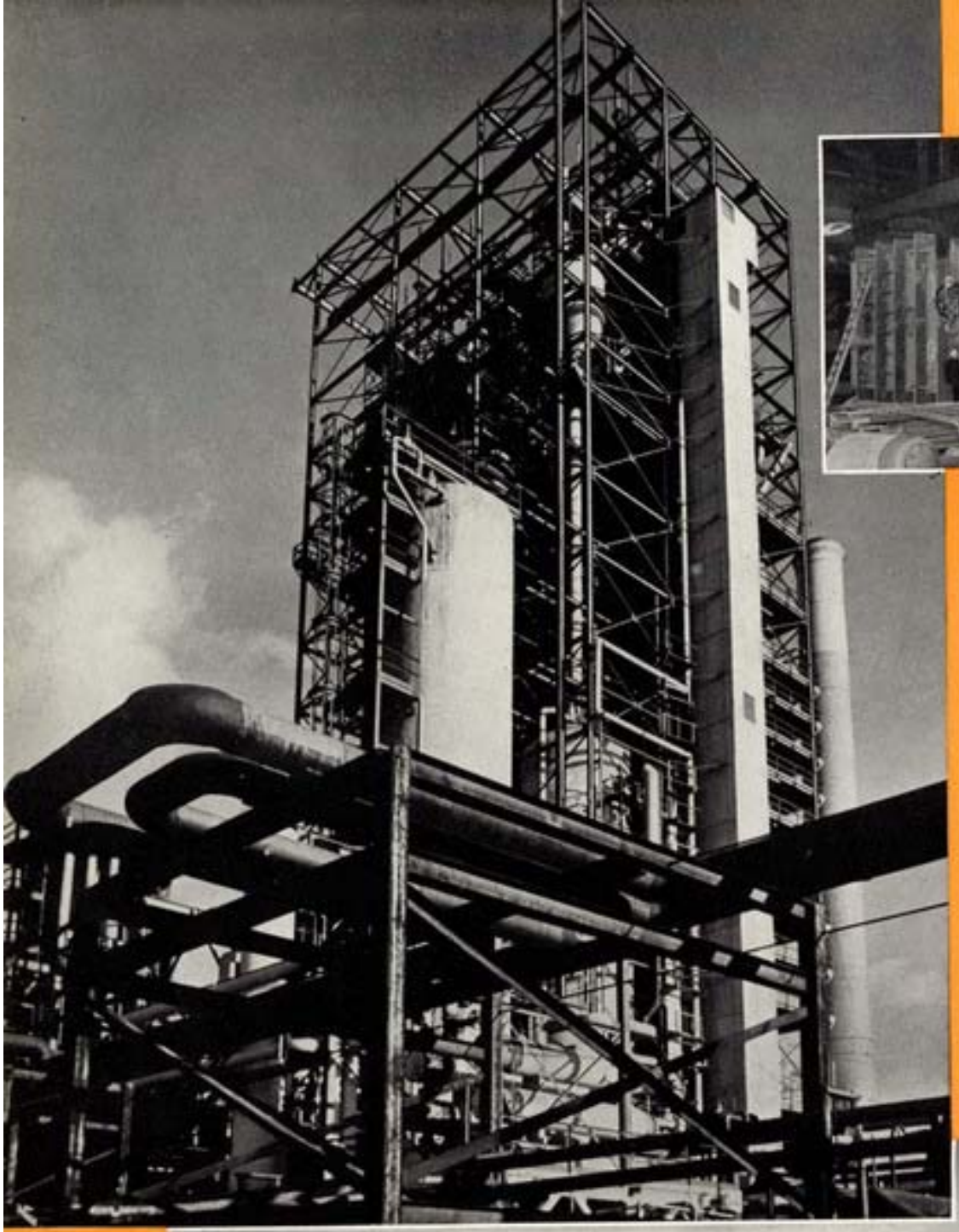
IZATION and EQUIPMENT

SUN SHIP'S complete plant and experienced organization are ideally suited for manufacturing any of the various units here illustrated.

While we have established a large and successful business in Shipbuilding, Ship Repairing and Engineering, we have also developed an extensive business in building Oil Refinery Equipment and similar Machinery.

Our vast Facilities, Modern Manufacturing Methods and Skilled Personnel provide a combination seldom found elsewhere . . . an ideal plant in which to have Oil Refining and Chemical Equipment built. We are adequately equipped to handle this type of work in all its phases, without having to sublet any part of it.

Overseas or Coastal shipments can be loaded and shipment made direct from piers in our Plant on the Delaware River, near the Port of Philadelphia.

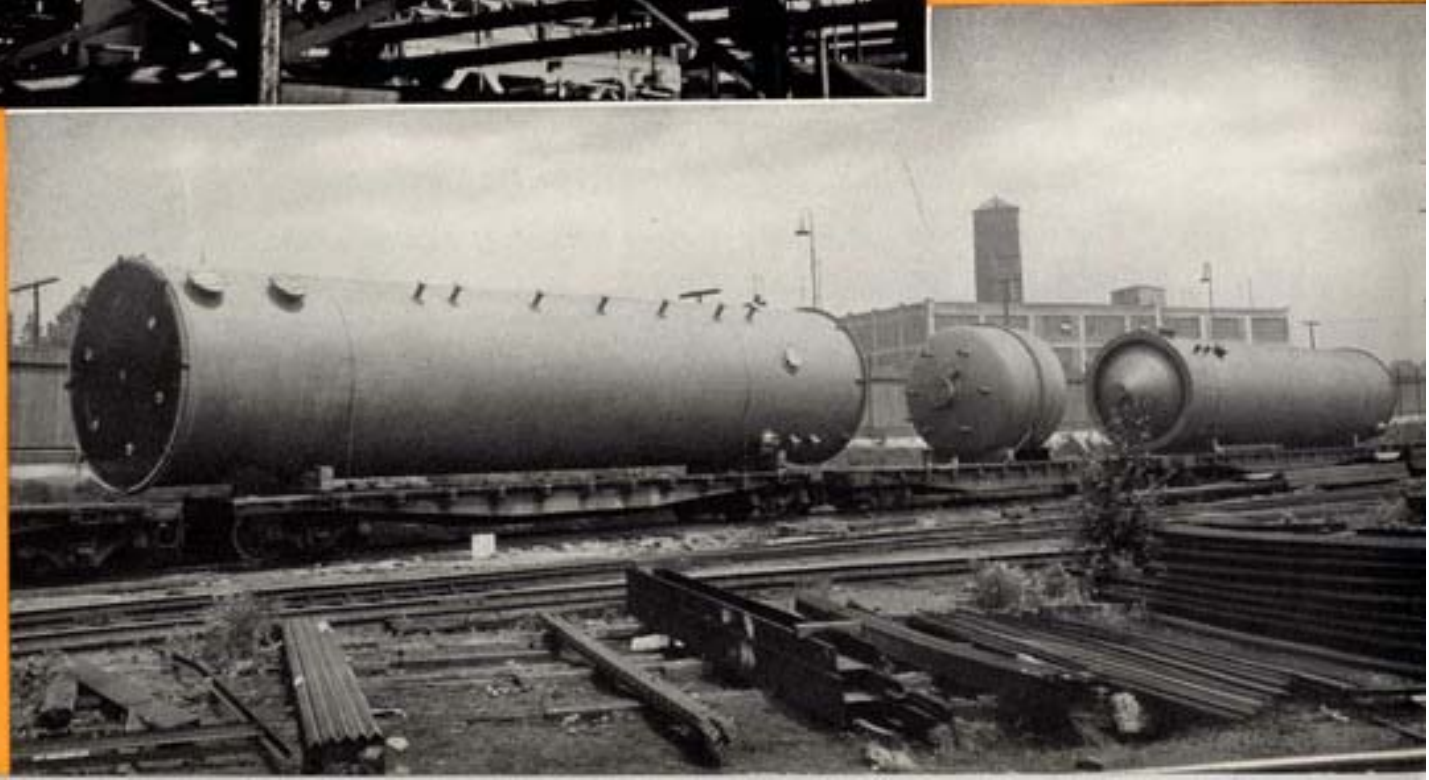


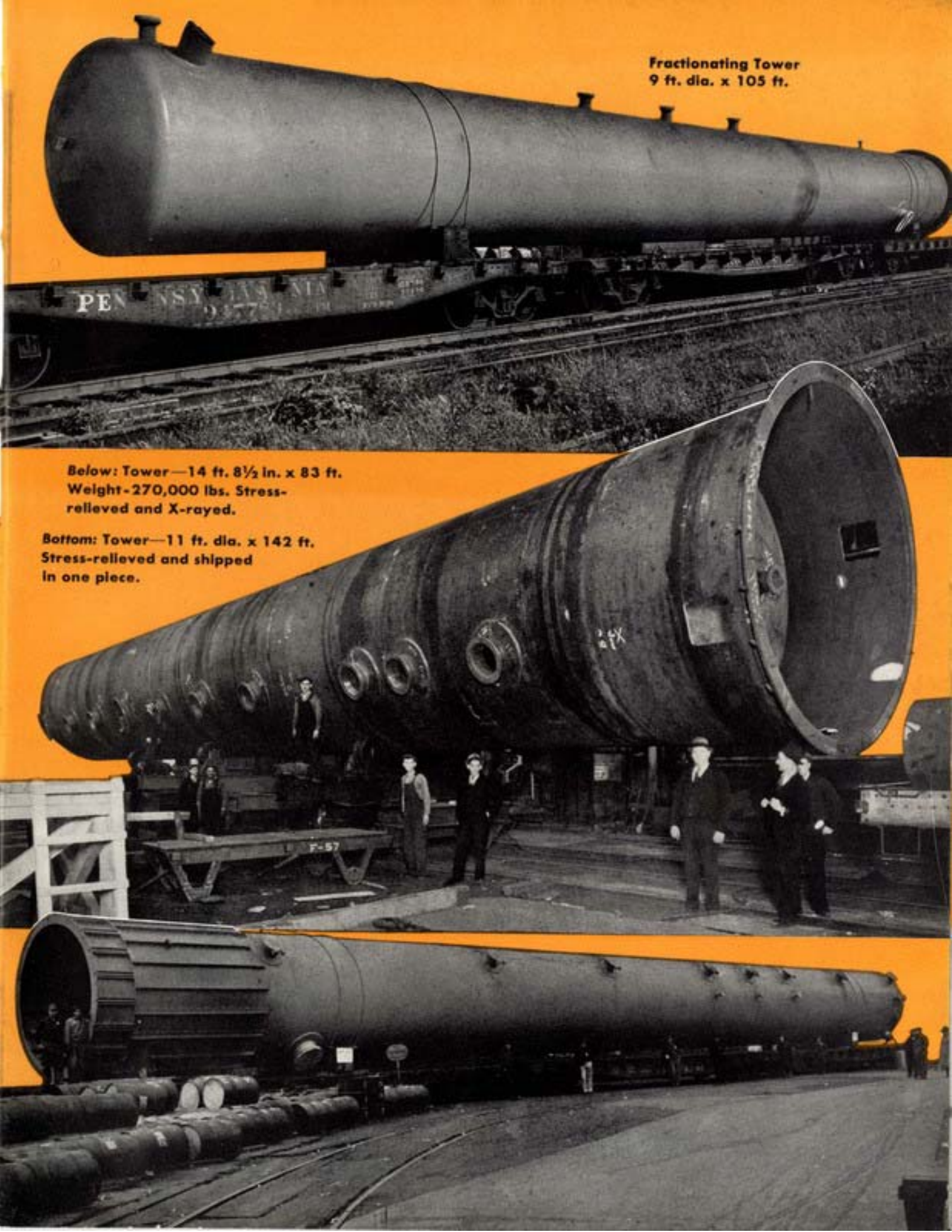
Kilns on Assembly Floor.

T. C. C. UNIT

TOWER KILNS
REACTORS
and
other Pressure Vessels
of
Alloy and Ordinary
Steel
made at
SUN SHIP'S PLANT

Reactors being shipped.





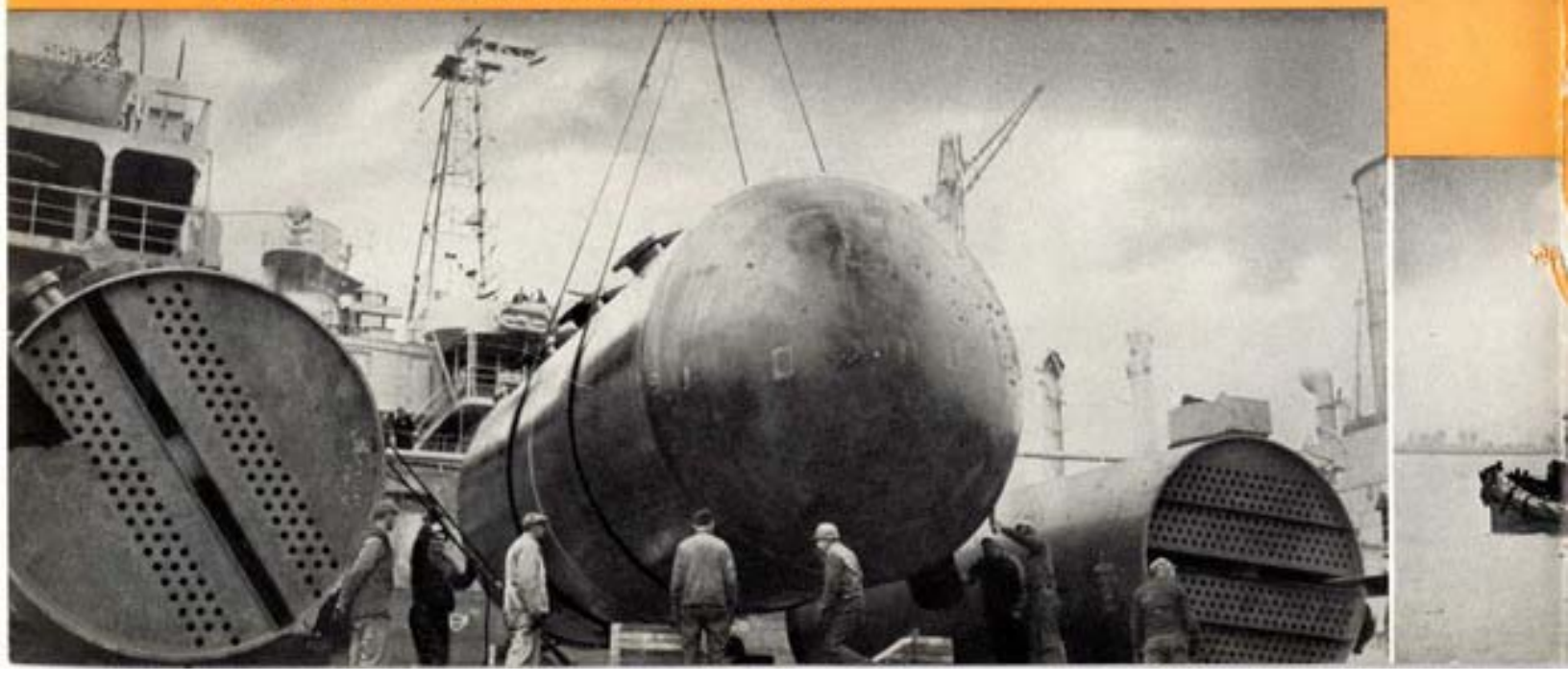
Fractionating Tower
9 ft. dia. x 105 ft.

Below: Tower—14 ft. 8½ in. x 83 ft.
Weight - 270,000 lbs. Stress-relieved and X-rayed.

Bottom: Tower—11 ft. dia. x 142 ft.
Stress-relieved and shipped in one piece.

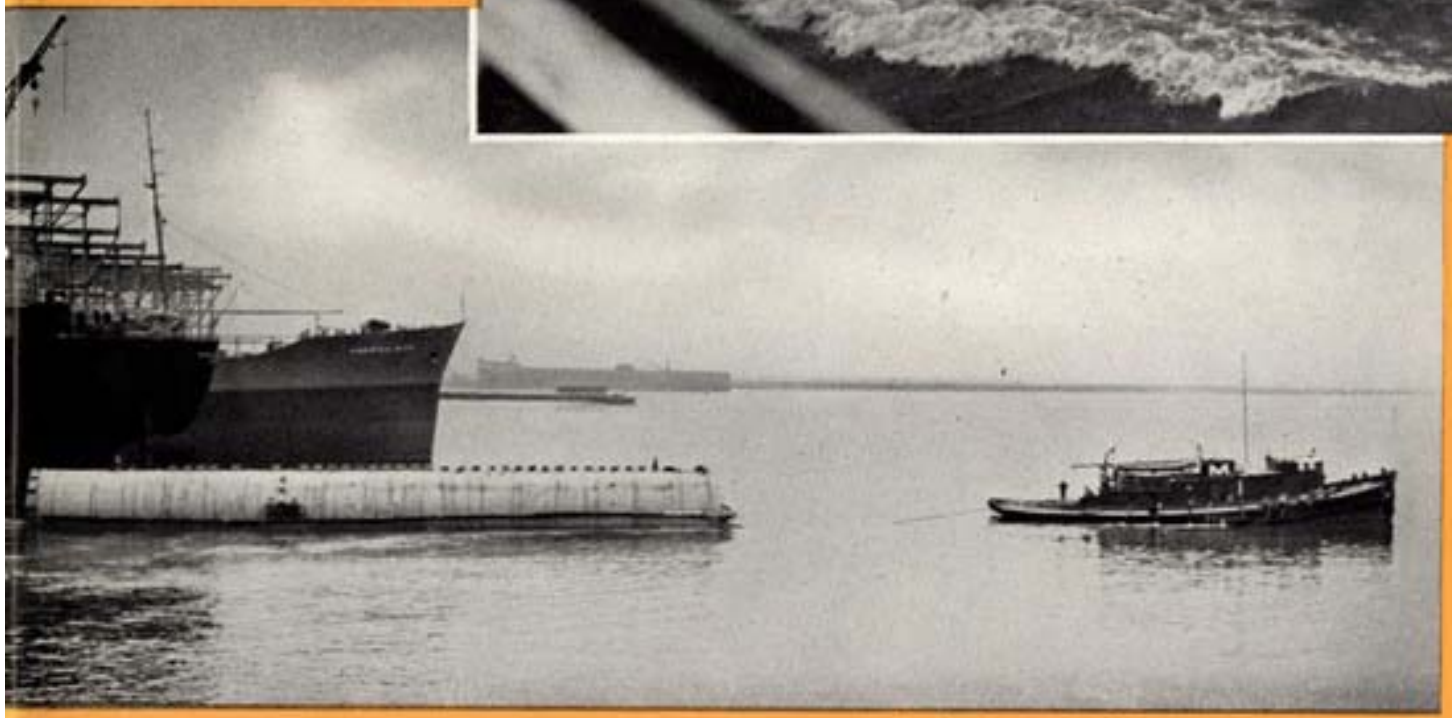
150 ton 16 ft. Reactor being lifted by Hammerhead Crane for shipment from the yard by water.

Deck Loads for water shipments; too large for rail.



Vessels too large for rail shipments being floated or shipped as deck loads or by barges.

Launching an 18 ft. Tower; too large for rail shipment, it was shipped to distant refinery by water.



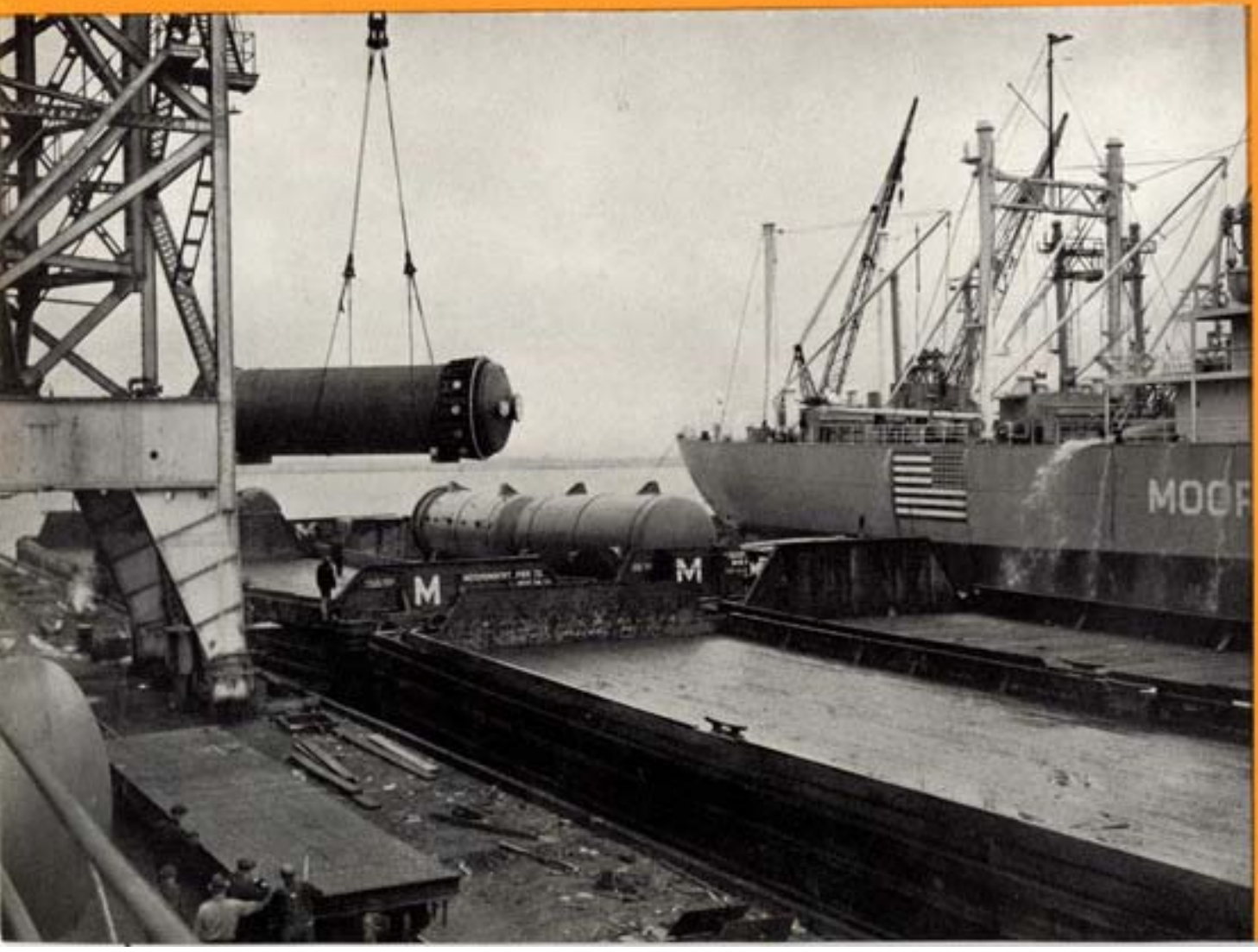
Beginning a 1,130 mile journey by water.

Alloy Lined Reactor, 16 ft. diameter; too large for land shipment.

EXPORT

Oil refinery equipment is exported to Russia, France, Arabia and other countries throughout the world.

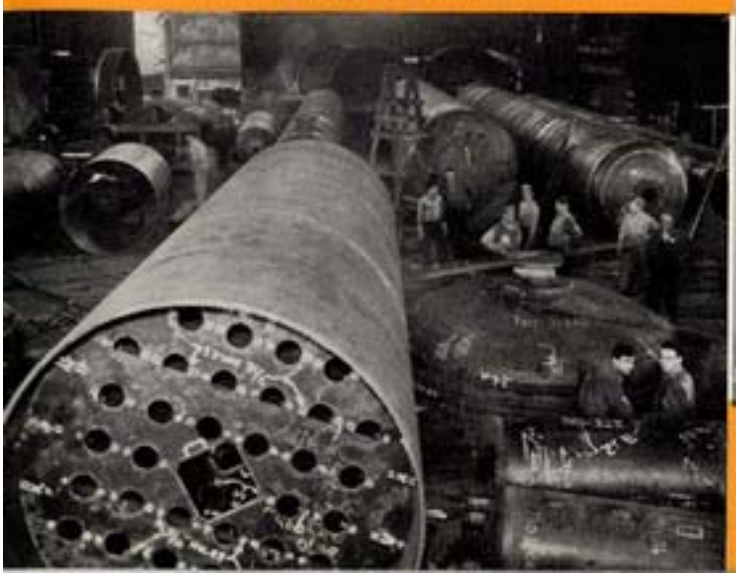
EXPORT SHIPMENTS DIRECT FROM OUR PLANT.



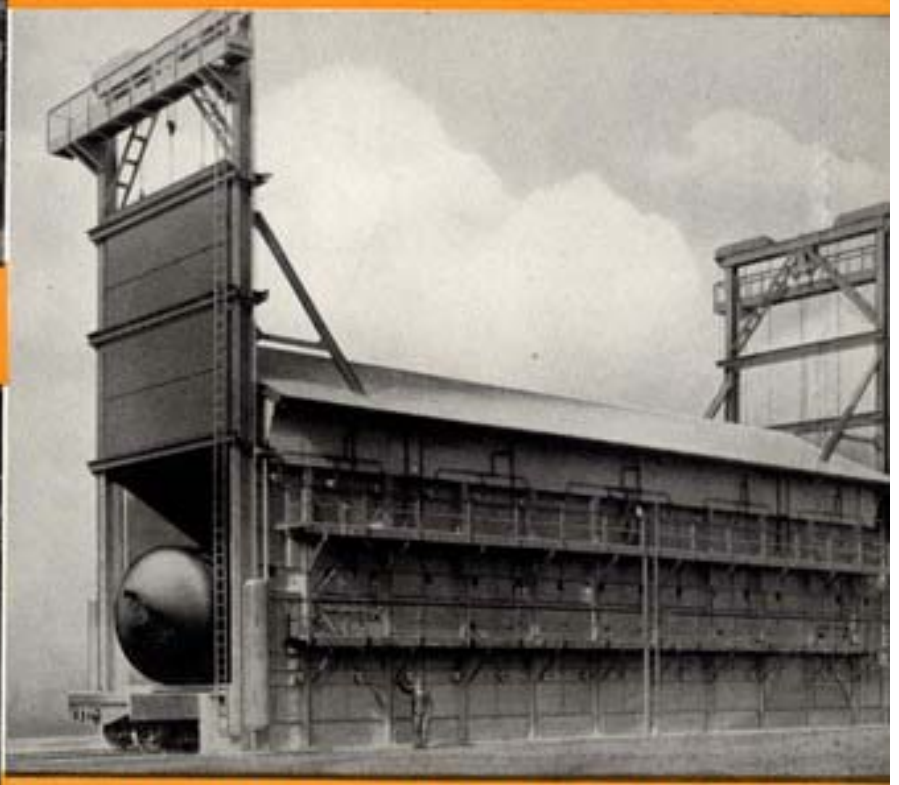
Boiler Shop; Light Work Section.

Bending Rolls for plate thickness to 3½ in.

Boiler and Tank Shop.



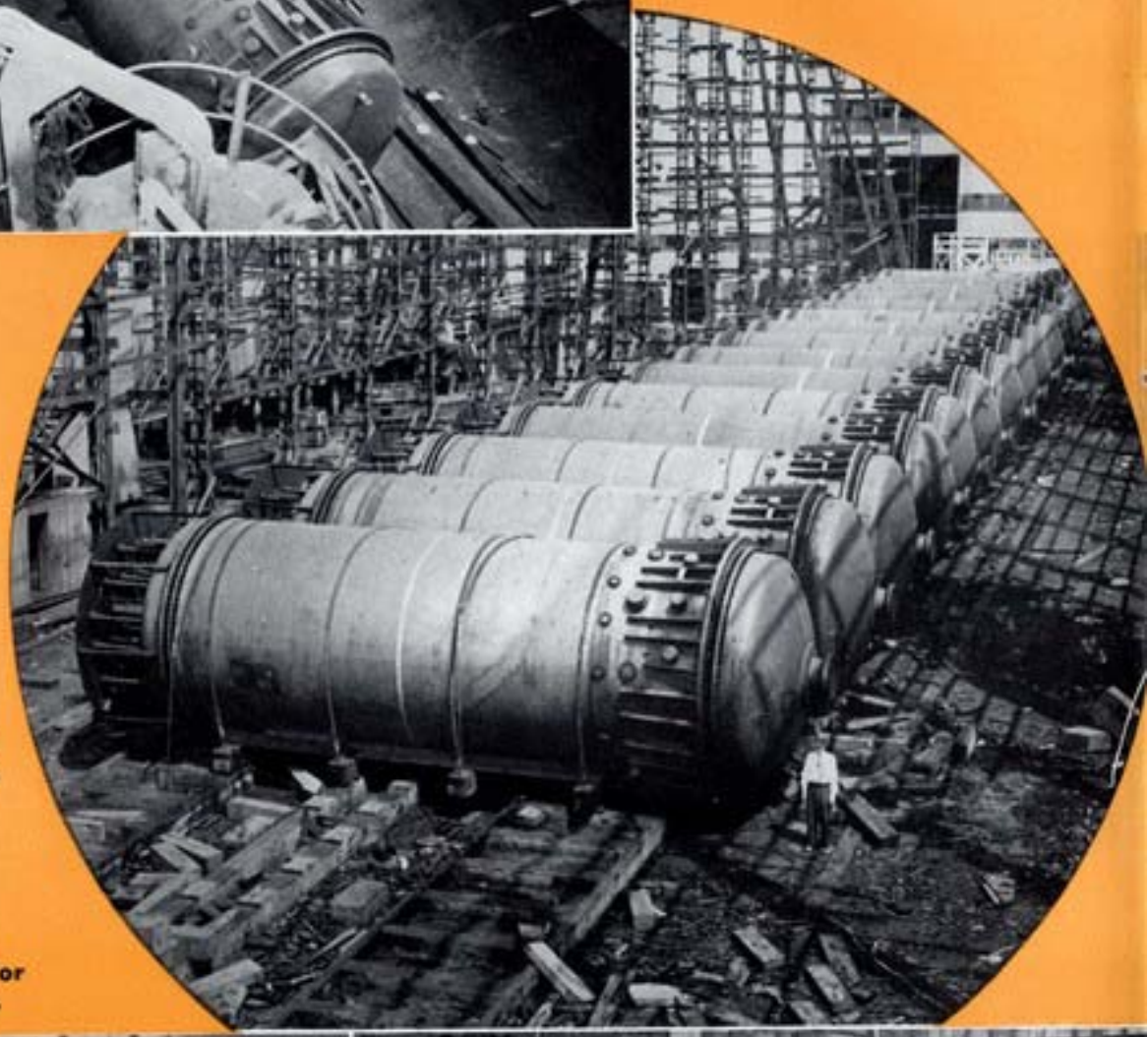
Heavy Welding Section.



Stress-Relieving Furnace, 18 ft. wide x 80 ft. long.

CRACKING

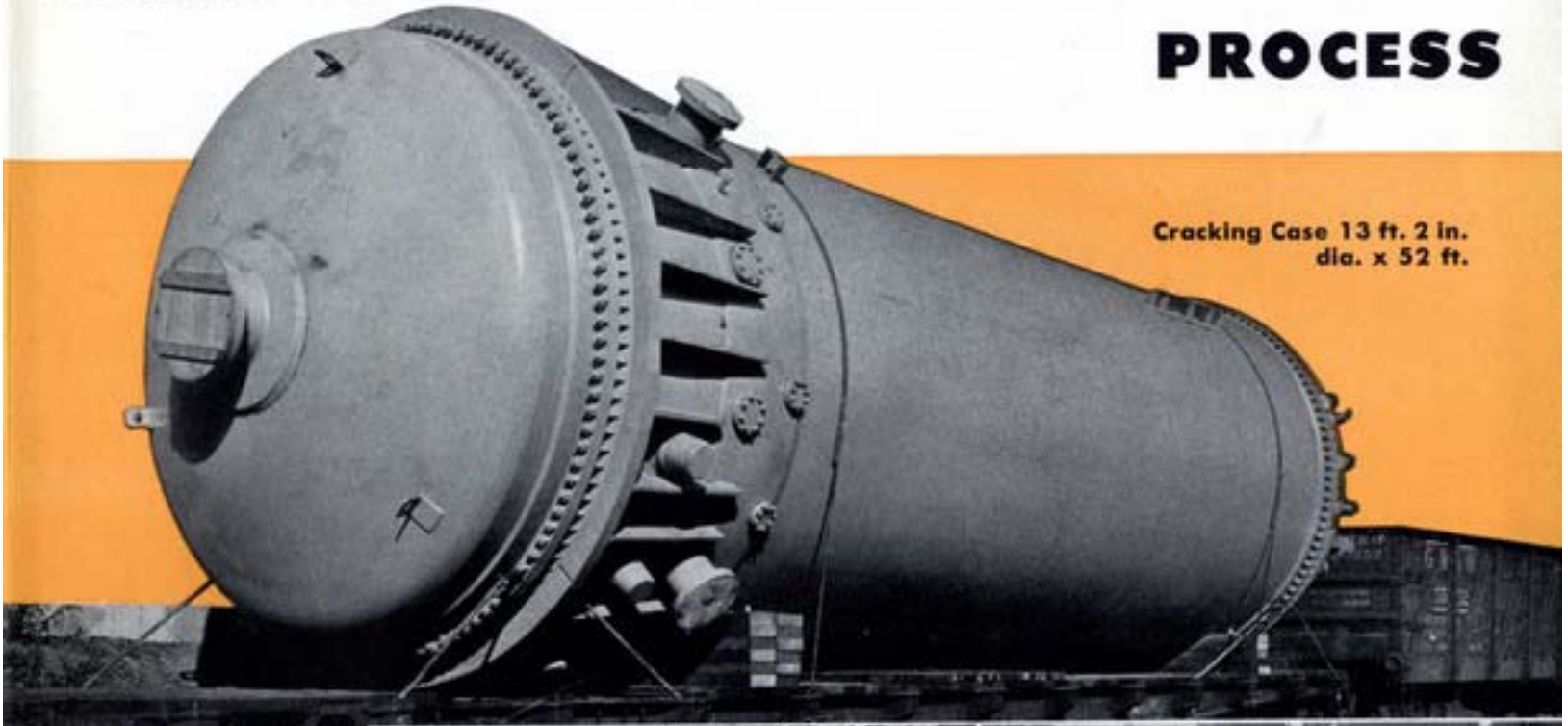
Cracking Cases on Assembly Floor.



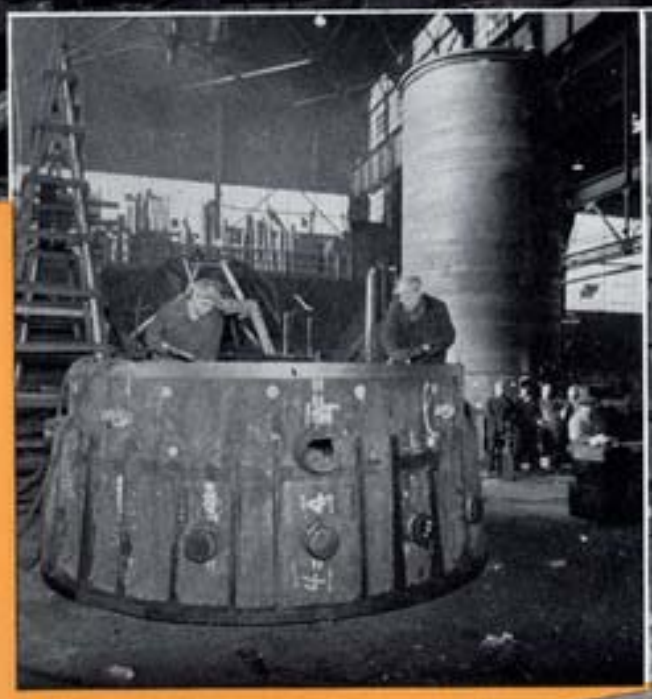
Cracking Cases ready for export.

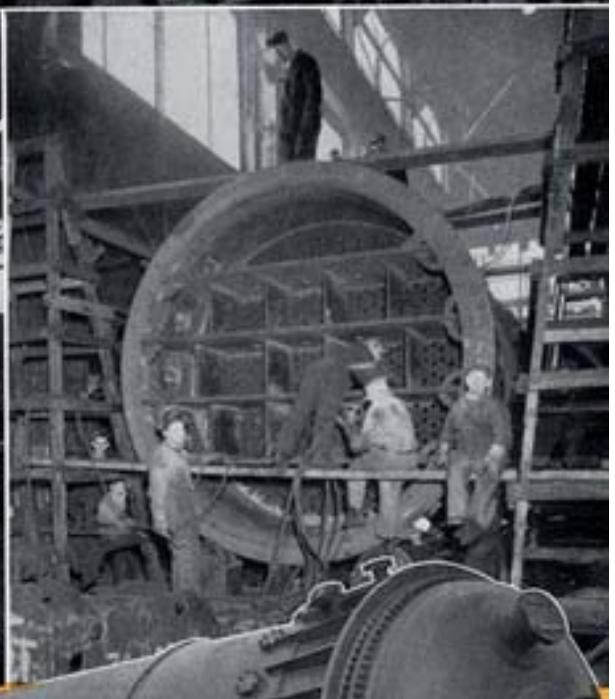
Tube Elements for Cracking Cases.

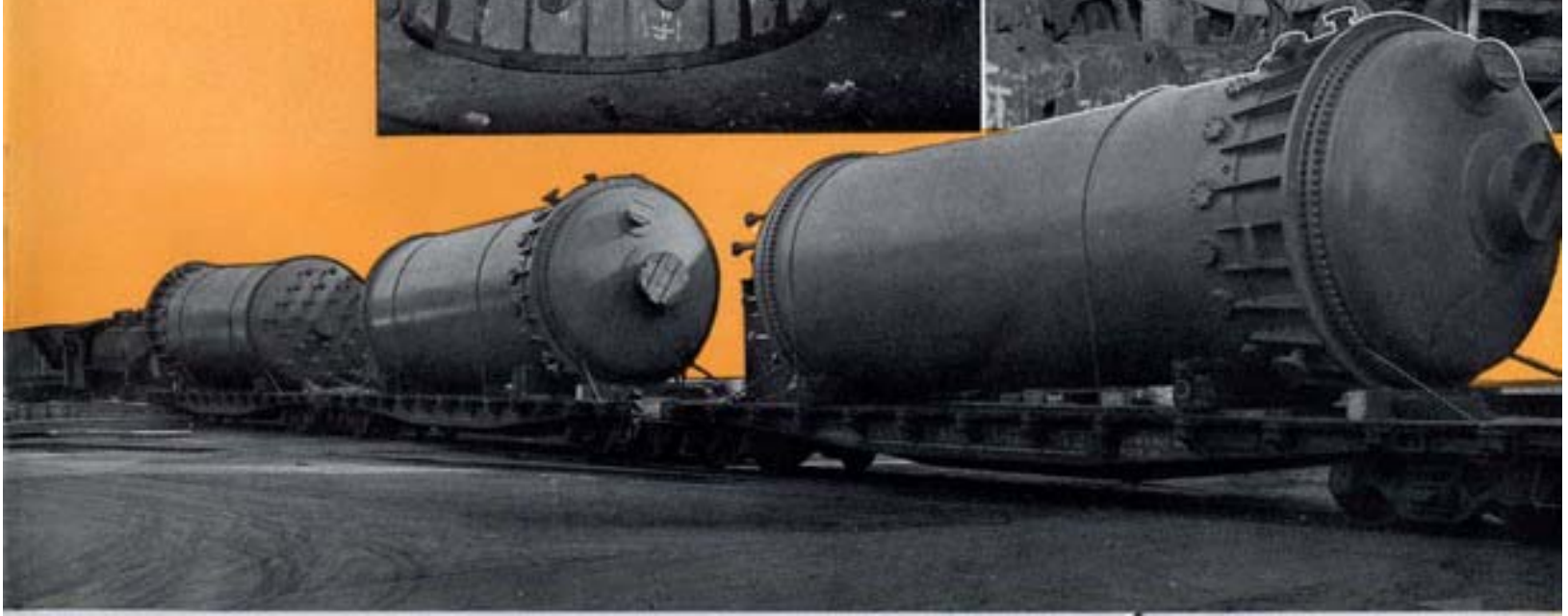
CASES FOR THE FAMOUS HOUDRY CATALYTIC PROCESS



Cracking Case 13 ft. 2 in. dia. x 52 ft.







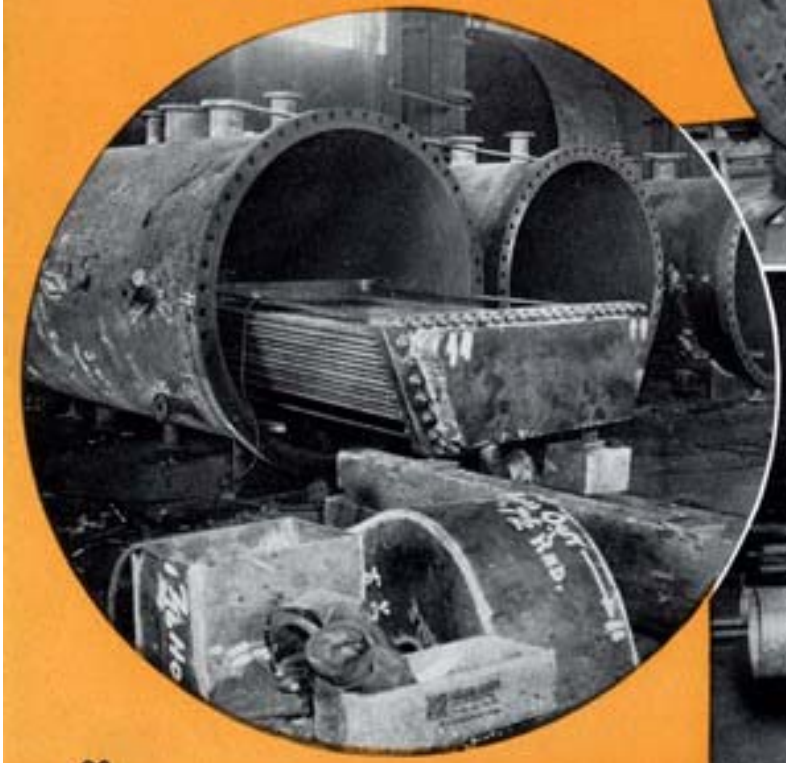
SOME EXAMPLES OF MISCELLANEOUS ITEMS OF

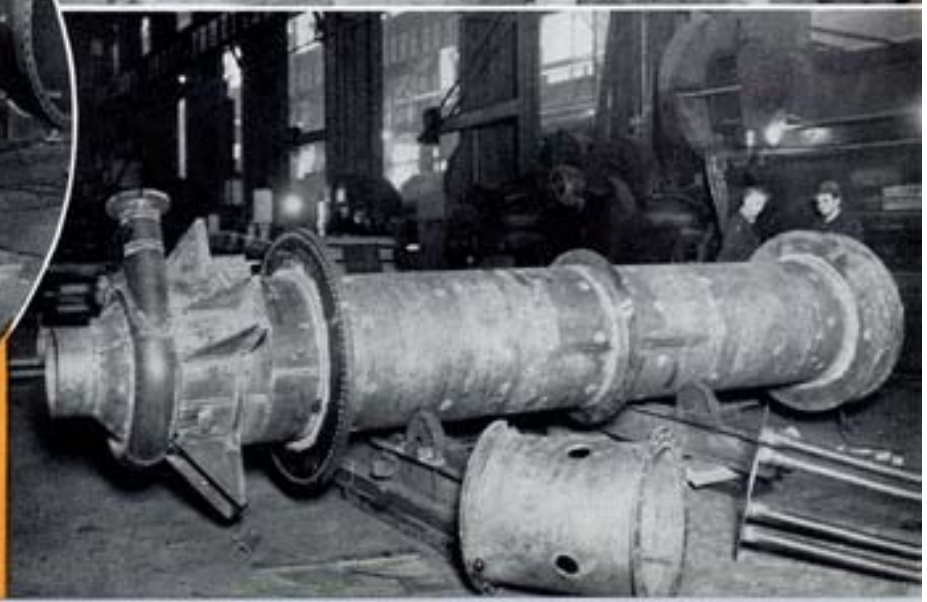
Above: Condensers

X-raying Special Thick-Welded Sections.

Evaporator Tower

Below: Special Alloy Heaters

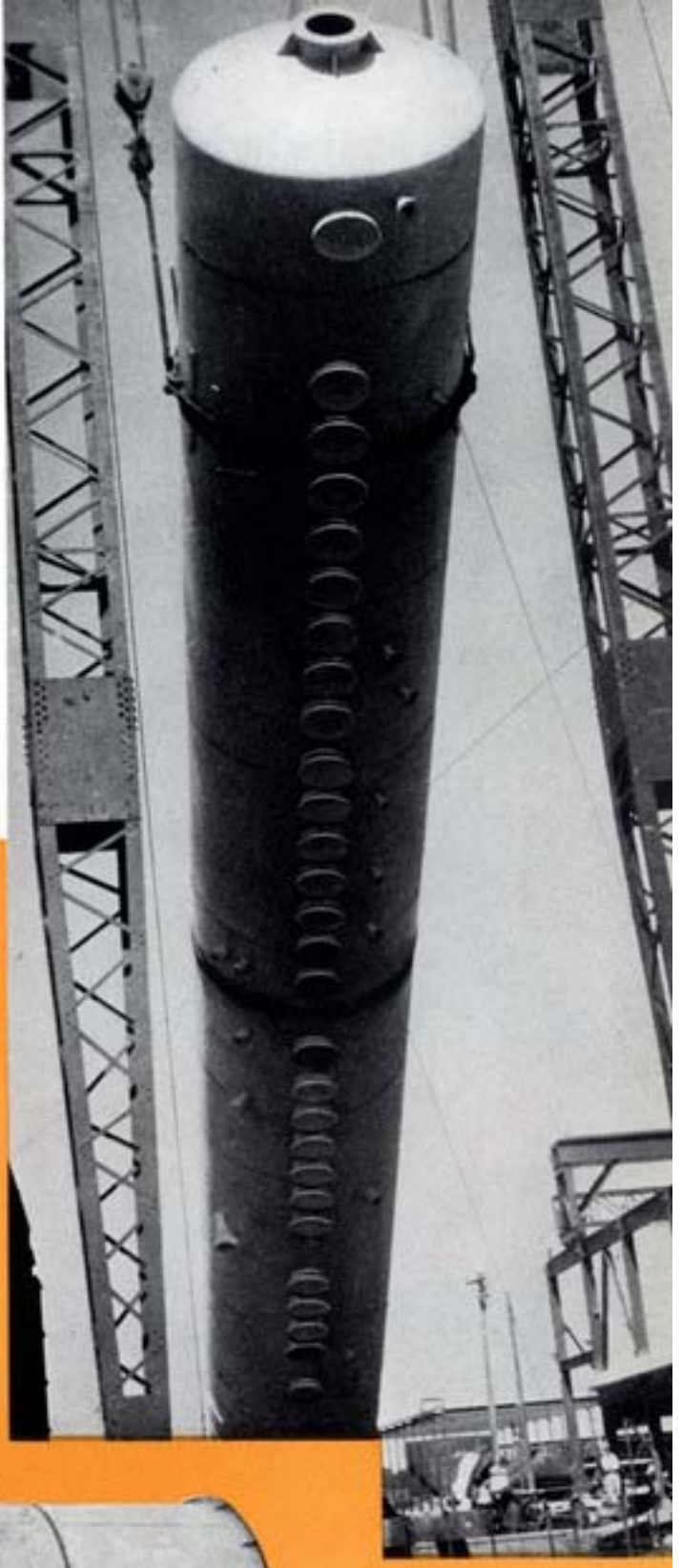




ALL-WELDED MACHINERY

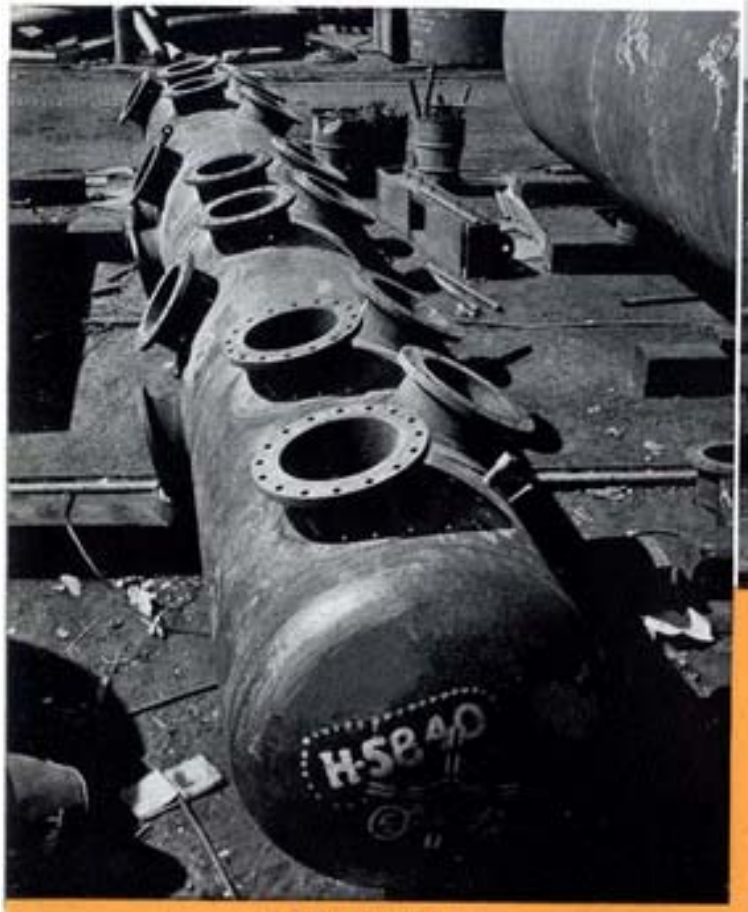
. . . from the smallest pieces to the very largest units . . . some so huge they cannot be moved by rail and must be shipped by water.

All-Welded Scotch Marine Boiler, 15 ft. 3 in. Dia.



Alloy Tower.

SPECIAL ALL-WELDED UNITS

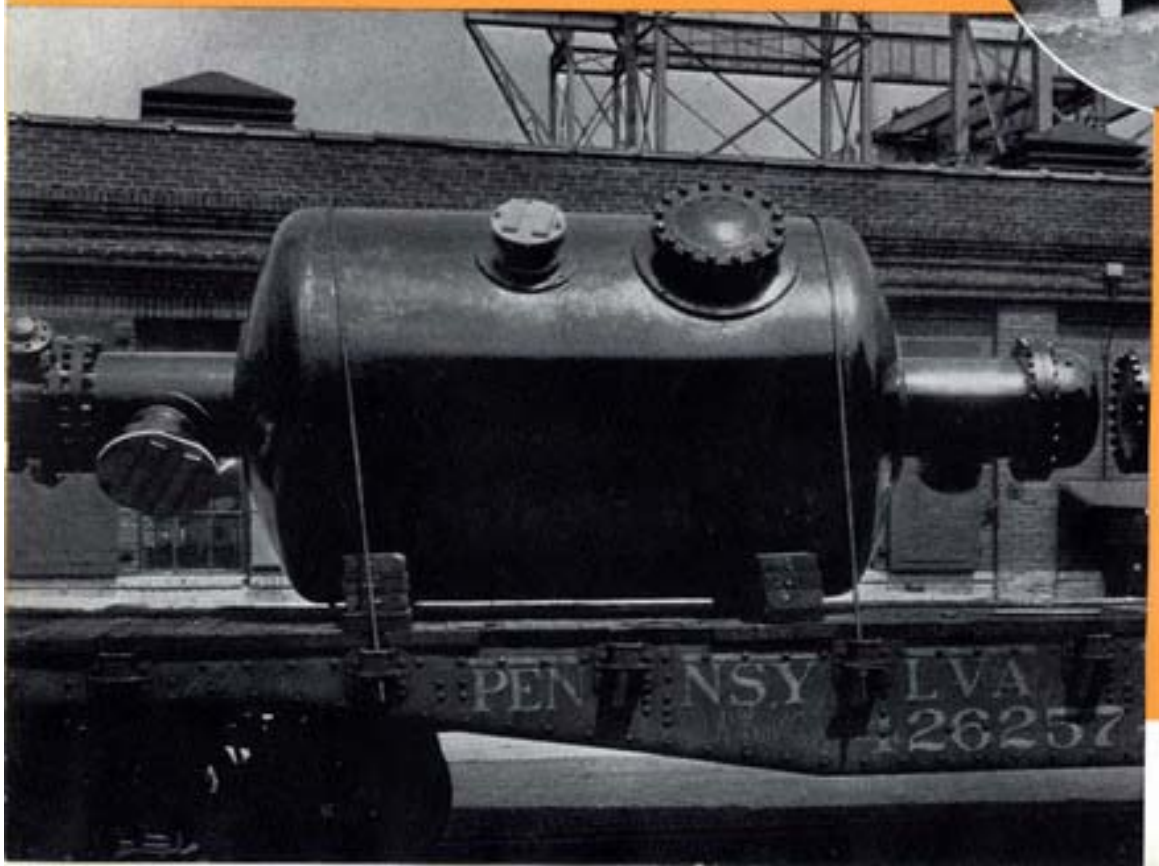


Bubble Tower

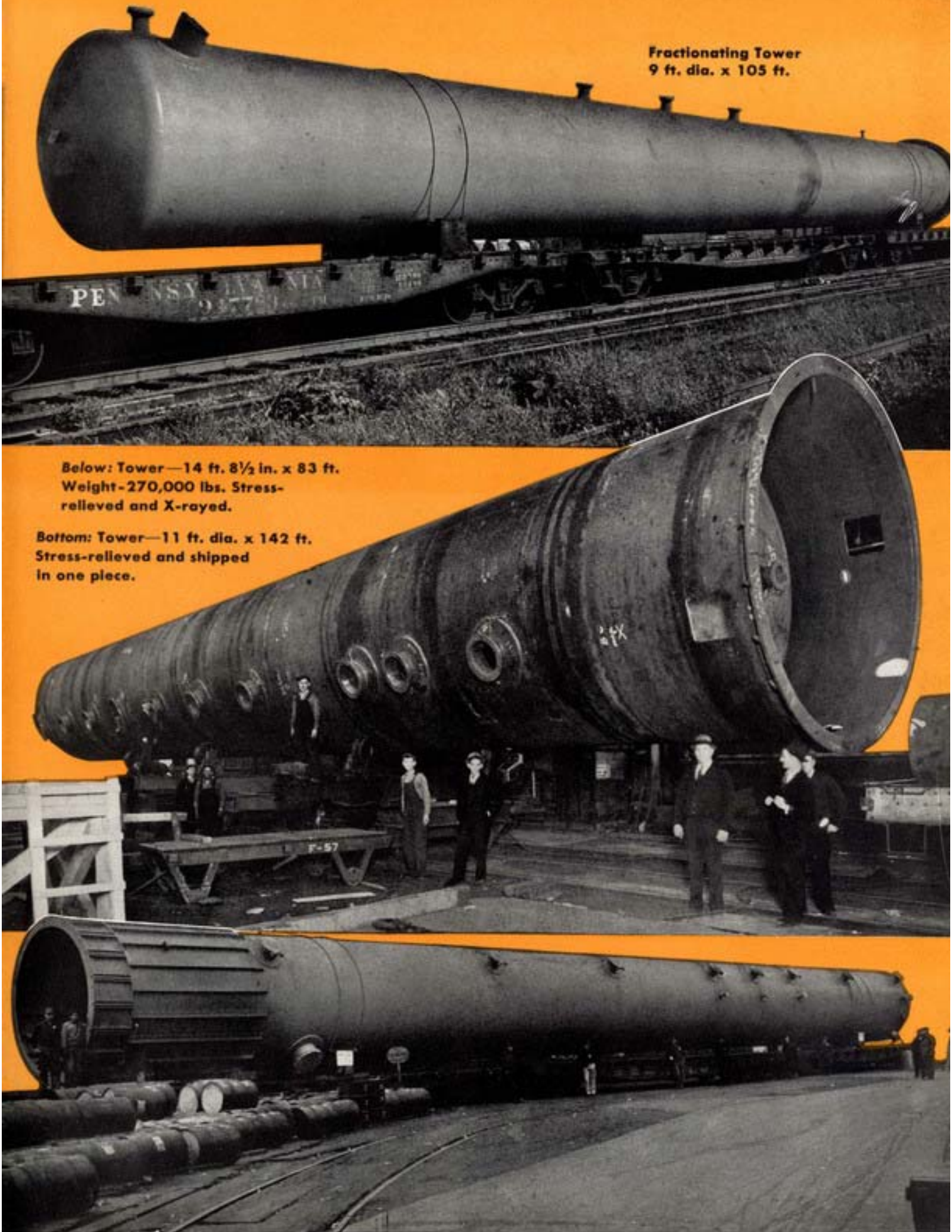
Special Pressure Vessel

Pipe Line Strainers

Laboratory Unit



Reboiler



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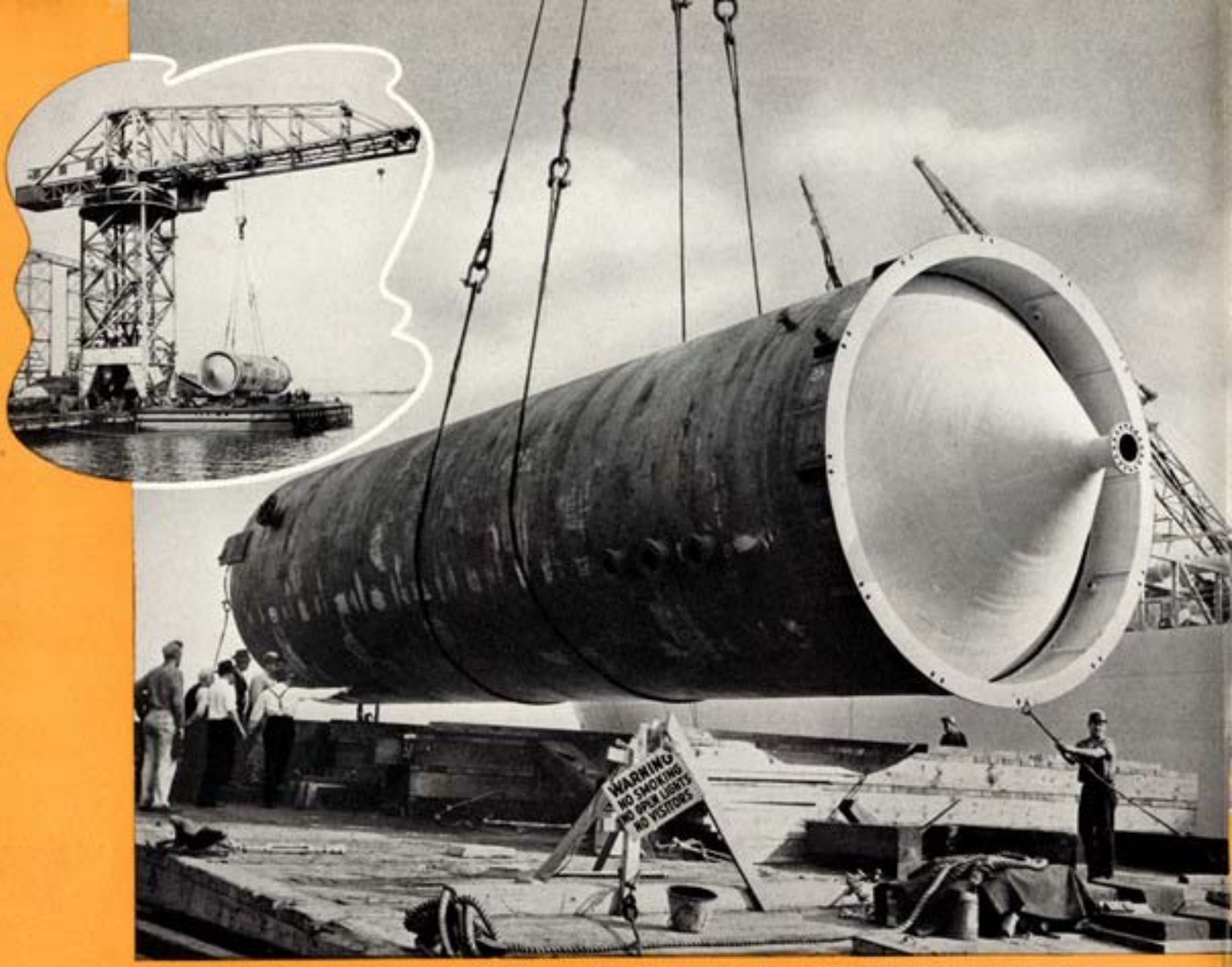

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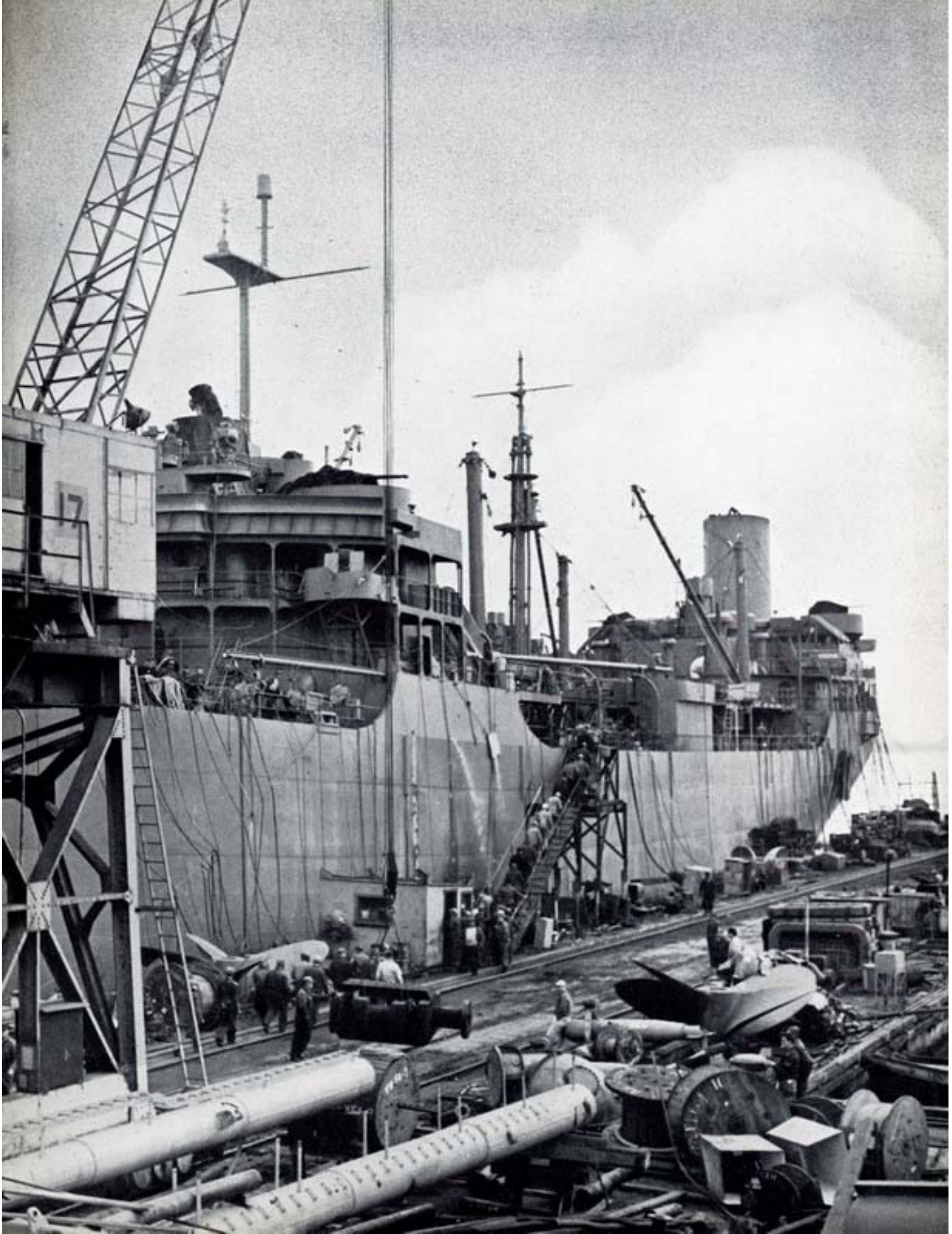

In These Pages . . .

We have shown some of our facilities, some of the ships we have built and repaired, some of our designs, developments and products.

Since our beginning thirty years ago, we have passed through two World Wars . . . periods in which our production soared to great heights . . . with not only the ships we built, but all of our other products as well, going to the service of our Country or to that of our Allies.

It is our fervent hope that never again will it be necessary to turn our energies to the production of the sinews of war . . . for the ships we build to be used to carry troops or ammunition . . . but rather that we shall be able to devote ourselves to the making of useful things for the peaceful commerce of the world.

SUN SHIP

CREATOR OF THE ALL-WELDED SHIP